

**EVALUATING THE OUTCOMES AND THE IMPACT OF SUBSTANCE USE  
PREVENTION INTERVENTIONS**

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**PhD in PSYCHOLOGY**

Clinical Psychology

**PhD in PUBLIC HEALTH**

Substance Use

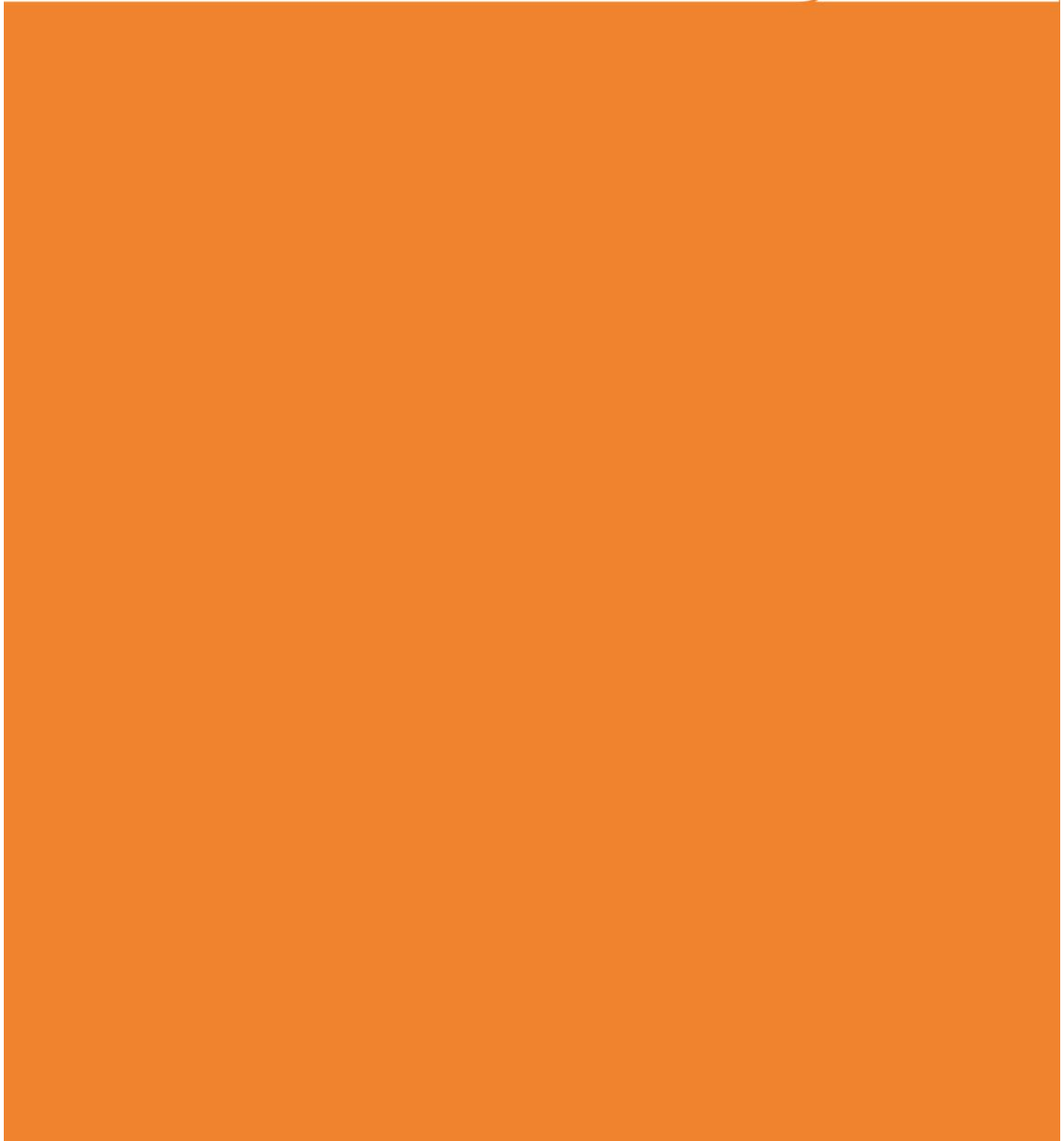
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▮ To my children, Matias, Alice, and Júlia,  
the most important and lasting project of my life...

**ABSTRACT**



As this research has been undertaken jointly at Liverpool John Moores University and the University of Lisbon, the following abstract is provided in both English and Portuguese.

## **Abstract**

### **Theoretical framework**

Substance use among adolescents is a major cause of concern as it can compromise adolescents' health, defined in 1948 by the World Health Organization (WHO) as "a state of complete physical, mental, and social well-being" and may hinder adolescents from achieving the developmental transitions they are supposed to accomplish. Further, when individuals initiate substance use as adolescents, addiction is established more easily and quickly (Crews, He, & Hodge, 2007; Prokhorov et al., 2006) and individuals remain at greater risk for negative outcomes in the future even if they successfully stop using (Georgiades & Boyle, 2007; Meier et al., 2012; von Sydow, Lieb, Pfister, Höfler, & Wittchen, 2002).

With substance use being a preventable behaviour, prevention interventions have been implemented worldwide, mostly focused on demand reduction (Kulis, Nieri, Yabiku, Stromwall, & Marsiglia, 2007) and aimed at achieving some form of abstinence (Midford, 2009). Over recent years, efforts to determine whether prevention interventions are effective have increased due to the growing demand for accountability of interventions in public health (Hillebrand & Burkhart, 2009). Programme evaluation, besides considering the positive and desirable effects from prevention interventions, should also taken into consideration its negative and undesirable effects (i.e. iatrogenic effects) (European Monitoring Centre for Drugs and Drug Addiction (EMCDDA, 2012a). Programme evaluation is the mechanism through which this judgment on efficacy can be made (Midford, 2000), and is an essential tool to enable policy makers and practitioners to decide which projects to fund and whether a particular intervention is worth continuing, adapting, or discarding (EMCDDA, 2012a).

However, in Europe, despite prevention interventions now being systematically monitored by the majority of Member States (EMCDDA, 2009a), prevention effectiveness remains poorly researched (EMCDDA, 2010) and very few prevention interventions have actually been

evaluated (EMCDDA, 2012b). Thus, evaluation of prevention interventions is urgently required to increase knowledge about how to enhance their intended effects and decrease the unintended, which in turn will contribute to future prevention interventions' success in reducing the prevalence of substance use among adolescents.

### **Aims and objectives**

The main aim of this research is to evaluate the outcomes of substance use prevention interventions among a sample of vulnerable Portuguese adolescents. The research consists of two related studies: Study 1 aimed to (a) examine substance use patterns; (b) identify proximal, distal, and ultimate variables associated with substance use; (c) determine the differential effect of these variables on substance use; and (d) recognize risk and protective factors for substance use; and study 2 aimed to (a) assess the effects of preventive interventions on variables associated with substance use; (b) evaluate interventions' effects on substance use itself; (c) determine which prevention approaches are effective in changing risk factors for substance use; and (d) examine any iatrogenic effects associated with prevention interventions.

### **Method**

Participants were vulnerable Portuguese adolescents aged between 12 and 18 years old participating in substance use prevention interventions in Portugal (hereinafter designated as cases) and a control group of adolescents not participating in such programmes (hereinafter designated as controls). Cases completed a structured questionnaire on substance use behaviours and related variables prior to their participation in a prevention programme (i.e., pre-test), during the intervention (i.e., intermediate-test), after the intervention (i.e., post-test), and at six and 12 months follow-up (i.e., follow-up 1 and follow-up 2 respectively). Control students completed the questionnaires at equivalent time periods. Study 1 used a cross-sectional research design including 2,581 cases completing pre-test questionnaires. These data were analysed to identify factors associated with substance use, and these factors were used as outcome measurements in study 2. From the study 1 sample, 1,756 adolescents

formed the experimental group and an additional 375 adolescents not participating in such programmes constituted the control group. Study 2 used a quasi-experimental research design using data from five time points to examine any changes in substance use and related variables.

## **Results**

Results from this research revealed that, among the sample of vulnerable adolescents assessed, alcohol was considered the least harmful substance; the substance leading to less problems and more benefits; the substance towards which adolescents hold more positive and neutral attitudes; the most consumed substance among best friends; the substance perceived as most accessible; and the substance towards which parents were least expected to prohibit. These findings indicated that alcohol consumption is widespread among adolescents and perceived as socially accepted, framing the fact that alcohol was the substance which most adolescents express an intention to use. As for prevention interventions, the study found no evidence that they were effective in changing any of the variables associated with drinking. Further, there was evidence that prevention interventions seem to have lead vulnerable adolescents to perceive drinking as less risky along with a increase on drinking level among these adolescents.

Regarding smoking, tobacco was found to be the substance with the highest percentage of consumers becoming regular users and, after alcohol, the substance which adolescents most expressed intention to use. There was evidence that prevention interventions significantly reduced positive attitudes towards smoking, smoking level, and best friends' smoking behaviour. However, there was also evidence that prevention interventions were associated with an increase in the expected benefits from smoking.

For cannabis, there was evidence that the percentage of adolescents holding positive attitudes towards cannabis was higher than for tobacco and very similar as for alcohol; that adolescents use cannabis despite holding negative attitudes and not expecting benefits from use; and that adolescents consider using cannabis to be less harmful than smoking tobacco. There was no evidence that prevention interventions were effective in changing any of the variables associated with cannabis use assessed in this research. Further, there was evidence that

prevention interventions were associated with an increase in expected benefits from cannabis use.

Data on cocaine demonstrates that it was considered the most harmful substance and the substance for which most adolescents expected problems and least expected benefits from use, framing the fact that cocaine was the substance that least adolescents expressed intention to use. Data suggested that prevention interventions were not effective in changing any of the variables associated with cocaine use assessed in this research. Further, there was evidence that prevention interventions were associated with an increase in intention to use cocaine among vulnerable adolescents.

### **Conclusions**

Overall, this research has shown that prevention interventions have not produced statistically significant changes in most of the variables associated with vulnerable adolescents' substance use. Although some positive effects were found, prevention interventions led to more negative and even iatrogenic outcomes than positive and effective outcomes.

### **Recommendations**

This research presents recommendations for practice regarding the most suitable target age for prevention interventions with vulnerable adolescents, the contents of prevention packages, as well as specific socio-demographic features that should be considered when designing prevention interventions for vulnerable adolescents. Questions for further research are also presented.

**Keywords:** substance use; prevention interventions; programme evaluation; vulnerable adolescents; efficacy; iatrogenia.

## Resumo

### Enquadramento teórico

O consumo de substâncias entre os jovens é motivo de preocupação pois pode comprometer a sua saúde, definida em 1948 pela Organização Mundial de Saúde como o completo estado de bem-estar físico, mental e social, podendo mesmo impedi-los de alcançarem as transições desenvolvimentistas que é suposto alcançarem. Acresce que, quando os indivíduos iniciam o consumo de substâncias durante a adolescência, a adição estabelece-se mais fácil e rapidamente (Crews et al., 2007; Prokhorov et al., 2006) existe um maior risco de consequências negativas no futuro, mesmo que os indivíduos consigam cessar o consumo (Georgiades & Boyle, 2007; Meier et al., 2012; von Sydow et al., 2002).

Sendo o consumo de substâncias um comportamento passível de ser prevenido, intervenções preventivas têm sido implementadas em todo o mundo, na maioria das vezes centradas na redução da procura (Kulis et al., 2007) e tendo como objetivo promover a abstinência (Midford, 2009). Nos últimos anos, devido à crescente exigência de responsabilidade das intervenções em saúde pública, os esforços para determinar se as intervenções preventivas são eficazes têm aumentado (Hillebrand & Burkhart, 2009). Para além de considerar os efeitos positivos e intencionais das intervenções preventivas, a avaliação da eficácia deve igualmente considerar os efeitos negativos e não intencionais (i.e., iatrogénicos) (EMCDDA, 2012a). Nesse sentido, a avaliação de programas é a ferramenta que permite que este julgamento sobre a eficácia seja feito (Midford, 2000), sendo uma ferramenta essencial para decisores e interventores aferirem se uma determinada intervenção deve ser mantida, adaptada ou abandonada e quais os projetos que devem ser financiados (EMCDDA, 2012a). No entanto, na Europa, apesar das intervenções preventivas serem agora sistematicamente monitorizadas pela maioria dos Estados Membros (EMCDDA, 2009a), a sua eficácia continua insuficientemente investigada (EMCDDA, 2010) e poucas intervenções têm sido, de facto, avaliadas (EMCDDA, 2012b). Assim, a avaliação das intervenções preventivas é urgentemente requerida como forma de aumentar o conhecimento sobre como potenciar os efeitos desejados e diminuir os efeitos indesejados, o que, por sua vez, contribuirá para o sucesso das intervenções preventivas na redução da prevalência do consumo de substâncias entre os adolescentes.

## **Objetivo geral e objetivos específicos**

O objetivo geral desta investigação é avaliar os resultados de intervenções preventivas do consumo de substâncias em adolescentes Portugueses vulneráveis. A investigação integra dois estudos: O estudo 1 teve como objetivos específicos (a) examinar padrões de consumo de substâncias; (b) identificar variáveis proximais, distais e ultimas associados ao consumo de substâncias; (c) determinar o efeito diferencial das variáveis proximais, distais e ultimas no consumo de substâncias; e (d) reconhecer fatores de risco e de proteção para o consumo de substâncias; e o estudo 2 teve como objetivos específicos (a) avaliar os efeitos das intervenções nas variáveis associadas ao consumo de substâncias; (b) avaliar os efeitos das intervenções no consumo de substâncias; (c) determinar que abordagens preventivas são eficazes na mudança de fatores de risco para o consumo de substâncias; e (d) examinar efeitos iatrogénicos associados às intervenções preventivas.

## **Método**

Os participantes nesta investigação foram adolescentes Portugueses vulneráveis com idades compreendidas entre os 12 e os 18 anos que integraram programas de prevenção do consumo de substâncias em Portugal (grupo experimental) e um grupo de controlo constituído por adolescentes não participantes neste tipo de programas (grupo de controlo). O grupo experimental preencheu um questionário sobre consumo de substâncias e variáveis associadas antes da sua participação nos programas de prevenção (i.e., pré-teste), durante a intervenção (i.e., teste intermédio), depois da intervenção (i.e., pós-teste), e seis e 12 meses depois da intervenção (i.e., follow-up 1 e follow-up 2 respetivamente). O grupo de controlo preencheu o mesmo questionário em períodos de tempo equivalentes. O estudo 1 utilizou uma metodologia de corte transversal e incluiu 2.581 adolescentes no momento de pré-teste. Os dados recolhidos no pré-teste foram analisados de forma a identificar fatores associados ao consumo de substâncias, fatores esses utilizados como medidas de avaliação no estudo 2. Da amostra do estudo 1, 1.756 adolescentes constituíram o grupo experimental, tendo sido constituído um grupo adicional de 375 adolescentes não participantes em programas preventivos como grupo de controlo. O estudo 2 utilizou uma metodologia quasi-experimental



com cinco momentos de recolha de dados para examinar mudanças no consumo de substâncias e variáveis relacionadas.

## **Resultados**

Os resultados desta investigação revelaram que, na amostra de adolescentes vulneráveis avaliados, o álcool foi considerado a substância menos nociva; a substância que causa menos problemas e origina mais benefícios; a substância face à qual os adolescentes mais assumiram atitude positivas e neutras; a substância mais consumida pelos melhores amigos; a substância percebida como mais acessível; e a substância face à qual a proibição por parte dos pais é menos esperada. Estes dados indicam que o consumo de álcool está disseminado entre os adolescentes e é percebido como socialmente aceite, o que enquadra o facto do álcool ser a substância face à qual mais adolescentes expressam intenção de consumo. Quanto às intervenções preventivas, esta investigação não encontrou evidência de que tenham sido eficazes na mudança das variáveis associadas ao consumo de álcool. Adicionalmente, as intervenções preventivas parecem ter contribuído para que os adolescentes vulneráveis percecionassem o consumo de álcool como acarretando menos riscos, ao mesmo tempo que contribuíram para o aumento do consumo de álcool nestes adolescentes.

No que respeita ao consumo de tabaco, os dados mostram que o tabaco é a substância com maior percentagem de consumidores regulares e, a seguir ao álcool, a substância face à qual mais adolescentes expressam intenção de consumo. Existe evidência de que as intervenções preventivas reduziram significativamente as atitudes positivas face ao tabaco, o consumo de tabaco e o consumo de tabaco entre os melhores amigos. No entanto, também existe evidência de que as intervenções estiveram associadas a um aumento dos benefícios esperados com o consumo de tabaco.

Relativamente ao consumo de cannabis, existe evidência de que a percentagem de adolescentes que expressam atitudes positivas face à cannabis foi superior à dos que as expressam face ao tabaco e muito similar à dos que as expressam face ao álcool; que os adolescentes consomem cannabis apesar de expressarem atitudes negativas e de não esperarem benefícios com o consumo; e que os adolescentes consideram que consumir

cannabis é menos prejudicial do que fumar tabaco. Não foi encontrada evidência de que as intervenções preventivas tenham sido eficazes na mudança das variáveis associadas ao consumo de cannabis. Adicionalmente, existe evidência de que as intervenções estiveram associadas a um aumento dos benefícios esperados com o consumo de cannabis.

Resultados sobre a cocaína demonstram que foi considerada a substância mais prejudicial e a substância face à qual mais adolescentes esperam problemas e menos adolescentes esperam benefícios, enquadrando o facto da cocaína ser a substância face à qual menos adolescentes expressam intenção de consumir. Os dados sugerem que as intervenções preventivas não foram eficazes na mudança das variáveis associadas ao consumo de cocaína. Adicionalmente, existe evidência de que as intervenções preventivas estiveram associadas a um aumento na intenção de consumir cocaína nos adolescentes vulneráveis.

### **Conclusões**

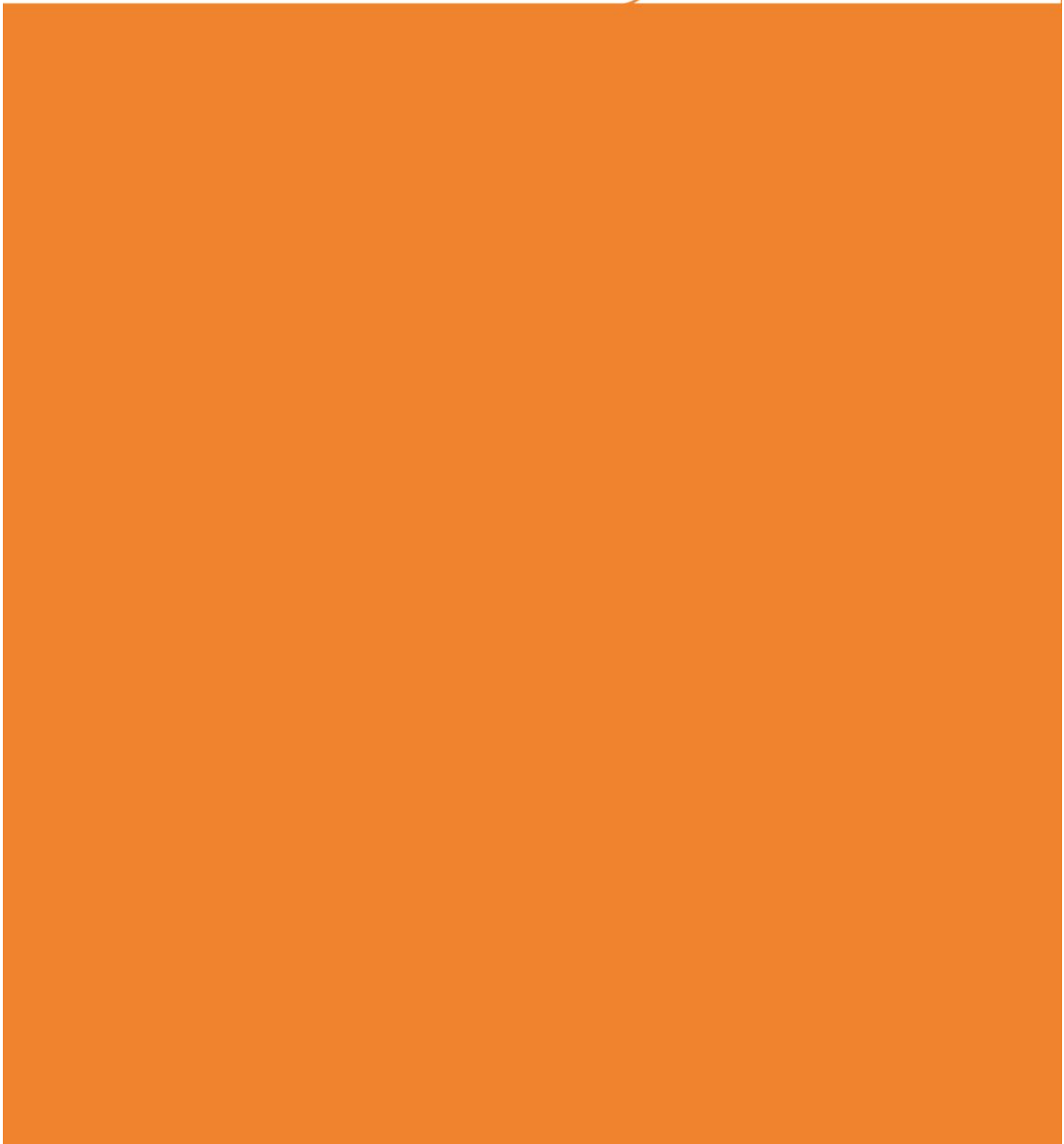
Globalmente, os resultados mostraram que as intervenções preventivas não produziram mudanças estatisticamente significativas na maioria das variáveis associadas ao consumo de substâncias em adolescentes vulneráveis. Apesar de terem sido encontrados alguns efeitos positivos, as intervenções preventivas originaram mais efeitos negativos e iatrogénicos do que efeitos positivos e eficazes.

### **Recomendações**

Esta investigação apresenta recomendações para a prática no que respeita à idade mais aconselhável para iniciar as intervenções preventivas com adolescentes vulneráveis, aos conteúdos a abordar, bem como relativas às características sociodemográficas que devem ser consideradas quando se concebem intervenções preventivas para adolescentes vulneráveis. São ainda apresentadas questões para investigação futura.

**Palavras-chave:** consumo de substâncias; intervenções preventivas; avaliação de programas; adolescentes vulneráveis; eficácia, iatrogenia.

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The idea of undertaking this research derived from my practice in substance abuse prevention field. Ten years ago, I worked as part of a substance use prevention team and delivering information sessions to adolescents on the effects of legal and illegal substances was part of my professional routine. However, after the initial euphoria of the first sessions that lead me to believe that I was being helpful to adolescents by sharing my knowledge about substances with them, I started to question the extent to which these sessions would really be of any use to prevent substance use among young people. Gradually, the practice of delivering isolated information sessions gave way to more comprehensive interventions, most of them aimed at enhancing social skills among young people, but that still including information provision on substances' effects. I believe it was by this time that my interest in programme evaluation arose. I started by undertaking evaluations aimed at examining to what extent adolescents, their parents, or teachers had been satisfied with the content of the prevention interventions. However, the question regarding the impact of interventions remained unanswered and, for that reason, I started to perform outcome evaluations in an attempt to understand to what extent interventions were a valuable contribution to prevent substance use among young people and to help their parents and teachers in the task of guiding adolescents on their journey to accomplish the main developmental transitions that adolescents are supposed to achieve. After a few outcome evaluations and even fewer meaningful results, I decided to undertake this research project to develop a better understanding of the outcomes and impact of substance use prevention interventions.

When I started, I was wisely advised by one of my supervisors to develop a project in which I needed to depend as little as possible on other people, to make it simpler to accomplish the research aims. In reality, not only did I ignore this advice, but I also managed to develop a research project entirely dependent on other people and little did I realize how gratifying this research project would be for me. All along the 15.147 km that I travelled through the 55 pieces of field work I undertook for this research, I met competent professionals, unquestionably committed to their work, and I got to know new intervention settings and new social realities, which considerably increased my awareness and knowledge of my own country.

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## Index of Abbreviations

<b>AOR</b>	Adjusted Odds Ratio
<b>APA</b>	American Psychological Association
<b>ASATID</b>	Attitudinal Scale for Alcohol, Tobacco and Illicit Drugs Escala de Atitudes Gerais em Relação ao Álcool, Tabaco e Drogas Ilícitas
<b>CNPD</b>	National Commission on Data Protection Comissão Nacional de Proteção de Dados
<b>CRI</b>	Centers of Integrated Responses Centro de Respostas Integradas
<b>CTC</b>	Communities That Care
<b>DGIDC</b>	Portuguese Agency for Innovation and Curricula Development from the Ministry of Education Direção Geral de Inovação e de Desenvolvimento Curricular do Ministério da Educação
<b>ECATD</b>	National Study on Alcohol, Tobacco, and Drugs Estudosobre o Consumo de Álcool, Tabaco e Drogas
<b>EDDRA</b>	Exchange on Drug Demand Reduction Action
<b>EMCDDA</b>	European Monitoring Centre for Drugs and Drug Addiction
<b>ESPAD</b>	European School Survey Project on Alcohol and Other Drugs
<b>EU</b>	European Union União Europeia
<b>HBSC/WHO</b>	Health Behaviour in School-Aged Children from the World Health Organization
<b>IDT,IP</b>	National Institute on Drugs and Drug Addiction Instituto da Droga e da Toxicodependência, Instituto Público
<b>INCSPPP</b>	National Survey on Substance Use in the General Population Inquérito Nacional ao Consumo de Substâncias Psicoativas na População Portuguesa

<b>NHSDA</b>	National Household Survey on Drug Abuse
<b>NIDA</b>	National Institute on Drugs and Drug Abuse
<b>NSDUH</b>	National Survey on Drug Use and Health
<b>PORI</b>	Operational Plan for Integrated Responses Plano Operacional de Respostas Integradas
<b>SAMHSA</b>	Substance Abuse and Mental Health Services Administration
<b>SES</b>	Socio-Economic Status
<b>SFP</b>	Strengthening Families Program
<b>SPSS</b>	Statistical Package for the Social Sciences
<b>SUPPOIEQ</b>	Substance Use Prevention Interventions' Outcomes and Impact Evaluation Questionnaire Questionário de Avaliação dos Resultados e do Impacto de Programas de Prevenção das Toxicodependências
<b>UNODC</b>	United Nations Office on Drugs and Crime
<b>WHO</b>	World Health Organization

## INTRODUCTION

## **Substance Use Among Adolescents**

Adolescence is a developmental stage during which individuals have to face numerous changes and challenges (Windle, 2000). Besides dramatic physical changes, adolescents also have the challenge of building up their identities, rebuilding interpersonal relationships, and rehearsing and taking on adult roles. Over this developmental stage and along with these developmental tasks, adolescents often undertake behaviours that may compromise their physical and mental integrity (i.e., risk behaviours), but that are believed to play a significant role in allowing adolescents to achieve some of these major developmental transitions (Engels & ter Bogt, 2001; Spear, 2007).

Thus, while it seems reasonable to consider adolescents' risk behaviours as normative, biologically driven, and to some extent, inevitable (Steinberg, 2008), it is no less reasonable to consider that risk behaviours may, as well, lead to unintended and undesirable consequences. According to the WHO (WHO, 2011), 2.6 million young people aged 10 to 24 die every year mostly due to preventable causes. Many more individuals suffer from illnesses which jeopardize their growth and development to their full potential, and an even greater number engage in behaviours that compromise their current and future state of health.

Verily, risk behaviours pose serious threats to the health and safety of adolescents and young adults (Lindberg, Boggess, Porter, Williams, & Urban Institute, 2000). According to the WHO (2011), early pregnancy and child birth, HIV infection, violence, injuries, smoking, and harmful drinking are some of the main health issues affecting young people. Undoubtedly, all these risky behaviours are preventable and given that these behaviours represent the greatest threat to the well-being of young people in industrialized societies (Chein, Albert, O'Brien, Uckert, & Steinberg, 2011; Lindberg et al., 2000), the role of prevention interventions targeting young people is unquestionable. Moreover, considering that many health issues affecting young people are frequently associated with drinking and smoking, the relevance of substance use prevention is incontestable.

On the whole, substance use may compromise adolescents' health, defined by the WHO (1948) as a state of complete physical, mental, and social well-being. Adolescents' physical well-being may be affected by substance use through a range of conditions that can include brain function and motor skills impairment in cases of alcohol intoxication (National Institute

onDrug Abuse (NIDA), 2012a); lung cancer, emphysema, bronchial disorders, and cardiovascular diseases from smoking (NIDA, 2012b); and impairment of attention, working and verbal memory, perceptual reasoning, processing speed, or learning from cannabis use (Bava, Jacobus, Mahmood, Yang, & Tapert, 2010; Meier et al., 2012; Schweinsburg, Brown, & Tapert, 2008). Substance use among adolescents is particularly worrying not only because addiction is established more easily and quickly among adolescents (Prokhorov et al., 2006), but also because individuals who initiate substance use as adolescents, even if they successfully stop using, are still at greater risk for poorer physical health (Georgiades & Boyle, 2007), greater impairment and decline in neurocognitive functions (Meier et al., 2012), and greater probability of using other substances later in life (von Sydow et al., 2002).

Substance use has been associated with lower levels of life satisfaction (Georgiades & Boyle, 2007), depression (Mason, Hitchings, & Spoth, 2007), mental health (Arseneault et al., 2007), and suicidal ideation (Ortin, Lake, Kleinman & Gould, 2012). Other associated problematic outcomes include school absenteeism and poor academic achievement (Ellickson, Tucker, & Klein, 2003), school drop-out (Degenhardt et al., 2010), reckless driving (Delhomme, Chaurand, & Paran, 2012), aggressive behaviour (Unger, Sussman, & Dent, 2003), delinquency (Mason et al., 2007) and stealing (Tucker, Ellickson, Orlando, Martino, & Klein, 2005). It is reasonable to conclude that besides affecting adolescents' physical and mental well-being, substance use may also hinder adolescents from achieving the developmental transitions they are supposed to achieve, negatively affecting their social well-being, and increasing the vulnerability inherent to this developmental stage.

### **Substance Use Prevention Interventions for Adolescents**

Considering the impact that substance use may have on adolescents, it follows naturally that society is mobilizing resources to conceive and implement strategies to prevent or mitigate substance use among young people. Despite being consensually accepted that successful efforts to prevent substance use must focus both on reducing adolescents' willingness to use substances (i.e. demand reduction) and on restraining adolescents' access to substances (i.e., supply reduction) (Harrison, Fulkerson, & Park, 2000), efforts to ameliorate substance use among young people focus mostly on demand reduction (Kulis et al., 2007) and aim to achieve



some form of abstinence (Midford, 2009). However, for Burkhart and Simon (in press), the challenge of prevention is not merely to prevent substance use or to delay initiation, but instead to help young people adjust their behaviour, capacities, and well-being in several domains of their lives above and beyond substance use.

Indeed, the relevance of prevention is well expressed on the reference documents framing substance use in Europe and in Portugal that were in effect at the time this research started to be planned as well as those that are in effect currently. Both the European Drugs Strategy in place at the time this research started (i.e., European Drugs Strategy 2005-2012) and the European Drugs Strategy currently in effect (i.e., European Drugs Strategy 2013-2020), identified as priorities in the field of demand reduction (a) the improvement of availability, accessibility, and coverage of effective substance use prevention measures, the promotion of the use and exchange of best practices, and the development and implementation of quality standards in prevention; (b) the improvement of the availability and effectiveness of prevention interventions and the raising awareness about the risks of substance use and related consequences, namely through early detection and intervention, promotion of healthy life styles and targeted prevention to families and communities; and (c) the development of effective and differentiated demand reduction measures that aim to reduce and/or delay the onset of substance use and that are appropriate particularly to vulnerable groups.

On the other hand, the Portuguese National Plan Against Drugs and Drug Addiction also in effect at the time this research was planned<sup>1</sup> (i.e., Plano Nacional Contra a Droga e as Toxicodependências 2005-2012) pointed towards (a) the increase of the scientific knowledge of the substance use phenomena for helping professionals to make evidence-based decisions; (b) the increase of prevention interventions' quality, namely through the increase of the number of evidence-based interventions and the improvement of selection, monitoring, and evaluation of prevention interventions; and (c) the increase of scope, accessibility, efficacy, and efficiency of prevention interventions through 14 measures that range from an increase in information about substances and the risks associated with its use to an increase in the number of selective and indicated prevention interventions.

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<sup>1</sup>The Portuguese National Plan Against Drugs and Drug Addiction (2013-2020) is not yet available.

Moreover, the Portuguese National Health Plan in effect at the time this research began (i.e., Plano Nacional de Saúde 2004/2010) considered that health promotion activities in Portugal did not always have the priority that they should have and that the Portuguese Health System had not been supported by strong scientific evidence for the Portuguese context. In order to mitigate this vulnerability, this Plan suggested that the investment on substance use prevention should be maintained and that prevention interventions should continue to be a priority; especially those targeting younger groups and aimed at decreasing smoking, drinking, and illicit substance use. This Plan also suggested that scientific research in the field of substance use should be encouraged, considering substance use and addiction as priority areas for scientific research projects.

### **Preventive Interventions Evaluation**

Efforts to determine whether prevention interventions are effective in achieving substance demand reduction have increased due to the growing demand for accountability of interventions in public health (Hillebrand & Burkhart, 2009). Evaluation enables the identification of whether prevention interventions are effective, or not, in reducing substance use prevalence (Midford, 2000). Evaluation is a useful tool to improve the level of knowledge about prevention, and supports policymakers and those financing projects in their assessment of which projects to support (EMCDDA, 2012a).

Evaluation is mentioned in the reference documents framing substance use in Europe and in Portugal, both in effect at the time this research started and currently. In fact, both the European Drugs Strategies (2005-2012; 2013-2020) mention the need to recognize the role of scientific evaluation of interventions with a focus on the outcomes achieved as a key element in strengthening the European Union (EU) approach to substance use. Thus, they should promote evaluation both at national, EU, and international level.

The Portuguese National Plan Against Drugs and Drug Addiction 2005-2012 (Plano Nacional Contra a Droga e as Toxicodependências 2005-2012) stresses the need to promote a culture of quality and evaluation and to raise professionals' awareness on the necessity to use indicators capable of measuring the outcomes achieved within prevention interventions. However, in Europe, even though prevention interventions are now being

systematically monitored by the majority of Member States (EMCDDA, 2009a), effectiveness remains poorly researched (EMCDDA, 2010) and very few prevention interventions have actually been evaluated (EMCDDA, 2012b). Hence, even though much has been done and achieved regarding the decrease of substance use prevalence over the recent years, the Portuguese National Health Plan currently in effect (i.e., Plano Nacional de Saúde 2012-2016) continues to emphasize drinking and smoking as the main life-style health determinants to be addressed within the Portuguese population.

### **Aims and Objectives**

This study aims to evaluate the impact of substance use prevention interventions among Portuguese adolescents aged between 12 and 18 years, identified by the National Institute on Drugs and Drug Addiction, Public Institute (IDT, IP)<sup>2</sup> as in need of substance use prevention interventions (hereinafter designated as vulnerable adolescents). To achieve this aim, this study identified and engaged with 15 non-governmental agencies delivering substance use prevention interventions in a range of settings across Portugal from 2009 until 2011.

Data were collected on 3.952 adolescents participating in these prevention interventions before, during, and post intervention. Data collected before interventions (i.e., at the pre-test) were analysed within a specific study (i.e., study 1) in order to (a) examine substance use patterns; (b) identify proximal, distal, and ultimate variables associated with substance use; (c) determine the differential effect of proximal, distal, and ultimate variables on substance use; and (d) recognize risk and protective factors for substance use.

Thereafter, the variables that study 1 demonstrated to be significantly associated with substance use among vulnerable adolescents were included within a following study (i.e., study 2) with the aims of (a) assessing interventions' effects on proximal and distal variables; (b) evaluating interventions' effects on substance use; (c) determining which prevention approaches are effective in changing risk factors for substance use; and (d) examining any iatrogenic effects associated with prevention interventions.

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<sup>2</sup>The IDT, IP is the national governmental structure responsible for coordinating policy in the field of illicit drugs and alcohol and for assuring planning, conception, funding management, monitoring, and evaluation of prevention in the field of substance use.

Considering the objectives defined for study 1, a cross-sectional research design with a one-time measurement point was implemented, whereas for study 2 a quasi-experimental research design with five measurement points was implemented. Data were collected not only among adolescents participating in substance use prevention interventions (i.e., case group), but also among adolescents matched by sociodemographic features that had not been targeted with any prevention intervention (i.e., control group). The decision to include several measurement points was based on the need to determine if, after interventions, there was an effect on the variables under assessment and, if so, to assess the type of effect observed on each variable. Having a control group was based on the need to determine if the effects observed were, or were not, the result of prevention interventions.

By achieving the aforementioned aims, this research project will contribute to the understanding of substance use among Portuguese vulnerable adolescents, not only by collecting epidemiological data on substance use patterns, but also by examining which risk and protective factors are significant for substance use in this sample of Portuguese vulnerable adolescents. Furthermore, this research intends to contribute to a better understanding of prevention interventions delivered in Portugal, by assessing the impact of interventions on substance use behaviour itself, as well as on risk and protective factors significantly associated with substance use among Portuguese vulnerable adolescents.

Throughout the process of implementing this research involving nearly 300 professionals working on prevention interventions, a practical impact will be to raise awareness of the need for and added value of evaluation, thus contributing to evaluation practice and the consolidation of an evaluation culture in Portugal. Overall, this research aims to contribute to substance use prevention science by increasing knowledge about how to enhance the intended effects of prevention interventions together with knowledge about how to decrease their iatrogenic effects, which will contribute to future prevention interventions' success in reducing the prevalence of substance use among vulnerable adolescents.

## **Thesis Structure**

This thesis is structured into seven chapters. The first chapter presents a literature review on substance use among adolescents and substance use prevention interventions targeting adolescents. The first theme (i.e., substance use among adolescents), starts with a brief overview of adolescence and risk behaviours, followed by the presentation of the main substance use theories. A focus on risk and protective factors for substance use acts as a framework for presenting the intrapersonal, interpersonal, and socio-environmental risk and protective factors assessed in this research. The second theme (i.e., substance use prevention targeting adolescents), starts with the description of the main substance use prevention models, followed by the current classifications of prevention intervention types and the three main settings for delivering prevention interventions. Finally, a description of the four main types of components delivered in preventive interventions implemented in Portugal is provided.

The second chapter describes the method used within this research, presenting data on the recruitment process, the ethical and legal consents to collect data, the research design, the participants profile, the sampling procedures, the instruments used to collect data, the measures and covariates, the data collection procedures and monitoring, the data analyses and editing, the statistical analyses performed, and the statistical software used. Details of study 1 and study 2 are given whenever appropriate.

The third chapter considers study 1 and displays the results for smoking, drinking, cannabis use, and cocaine use from the univariate analyses for the proximal variables, health-related quality-of-life items, and sociodemographic variables as well as the results from the multivariate analyses for lifetime, current, and regular use of each of these four substances. These results are discussed at the end of this chapter taking into consideration some of the main findings reported by previous relevant studies from the literature review.

The fourth chapter presents study 2 and displays the results from the pre and post intervention comparative analysis on variables that the multivariate analyses from study 1 found to be significantly associated with lifetime, current, or regular smoking, drinking, cannabis use, and cocaine use. It also presents comparative analyses for health-related quality-of-life. These results are discussed at the end of this chapter taking into consideration some of the main findings reported by previous relevant studies discussed in the literature review.

The fifth chapter consists of an overall discussion integrating the main findings from study 1 and 2, framed with some of the main findings reported by previous relevant studies. The sixth chapter summarizes the main conclusions that can be extracted from this research, followed by the seventh chapter where a set of recommendations for further research and practice are proposed in order to contribute to increases in the quality of preventive interventions. At the end of the seventh chapter a list of the references used within this thesis is presented, followed by the appendices considered relevant for a better understanding of the work presented.

## LITERATURE REVIEW



This chapter presents a literature review for the two major themes addressed within this study, each presented in a specific section: the first covers substance use among adolescents and the second covers substance use prevention interventions for adolescents.

## **Substance Use Among Adolescents**

### **Adolescence.**

Adolescence has been characterized as a developmental stage where individuals have to face, in Windle's words (2000), several changes and challenges. Besides the dramatic changes on their bodies, adolescents have the challenge of building up their identities, remodeling their interpersonal relationships, and rehearsing and taking on adult roles. As defined by Schulenberg, Maggs, and Hurrelman (1997) the developmental transitions of interest during adolescence can be grouped into (a) fundamental changes of pubertal and cognitive development, (b) identity transitions, (c) affiliative transitions, and (d) achievement transitions.

During pubertal development there are dramatic alterations in body morphology and appearance and the development of primary and secondary sex characteristics. There are also remarkable changes in the human brain such as increased growth, connectivity, and synaptic pruning (Spear, 2000). The changes in the dopaminergic system are particularly noteworthy. According to Steinberg (2008), because dopamine plays a critical role in the brain's rewards circuitry, as well as in affective and motivational regulation, changes in its concentration may substantially increase sensation-seeking, making adolescents more inclined to take risks in order to gain rewards. Several studies have shown that sensation-seeking is associated with a host of risky behaviours, such as, sexual risk behaviours (Teva, Bermúdez, Buéla-Casal, 2010), delinquency (Harden, Quinn, & Tucker-Drob, 2012), and substance use (MacPherson, Magidson, Reynolds, Kahler, & Lejuez, 2010; Ortin et al., 2012; Stephenson & Helme, 2006; Zucherman & Kuhlman, 2000).

Regarding cognitive development, perhaps the main change is what Jean Piaget (1896-1980) called the transition from the concrete operational thinking to formal operational, or abstract



thinking. This transition allows more complex cognitive abilities such as reasoning hypothetically, thinking about thinking, planning ahead, and thinking beyond conventional limits (Cole & Cole, 2001). As stated by Lehalle (2006), cognitive transformations in adolescence change the relation between what is "possible" and what is "real", with reality starting to be seen as only one possibility among many others. Thus, according to the same author, adolescence is clearly a period during which social organisations are questioned and current values are considered as one possibility among others (Lehalle, 2006).

As for identity transitions, self-concept, defined by Wigfield and Wagner (2005) as individuals' beliefs about and evaluations of personal characteristics, roles, abilities, and relationships, is particularly noteworthy. During adolescence, self-concept changes from relatively concrete attributes thought in specific domains (i.e., physical, cognitive, academic, or social) to a more inclusive, general, varied, and abstract attributes thought in a variety of domains (Cole & Cole, 2001). Hence, adolescents start to perceive themselves as being able to exhibit different characteristics or abilities and perform different roles, upon different contexts and within different relationships, with the inherent challenge being to integrate this multiplicity of "identities" into a unified, coherent, stable, and valuable self. This integration process will allow adolescents to develop their identity, defined by Wigfield and Wagner (2005) as individuals' general sense of themselves and their psychological reality that includes many different beliefs and attitudes about the self. Yet, and as stated by Schulenberg et al., (1997), in the course of the normative developmental challenge of exploring their identities, adolescents may be at greater risk for engaging in non-conventional behaviours that may put their well-being at risk.

Considering affiliative transitions, perhaps the most distinct challenge is the movement towards a more autonomous functioning from parents and towards a closer relationship with peers. According to Beckert (2007), adolescents' autonomy "is often considered in a tripartite conceptualization of independence implicating an ability to act autonomously, to feel autonomously, and to think autonomously" (p. 579). Acting autonomously requires adolescents to achieve an active and independent functioning including self-governance, self-regulation of behavior, and decision-making (Sessa & Steinberg, 1991). Feeling autonomously requires adolescents to stop seeing their parents as the omnipotent figures to which they turn for help and advice in most situations (Goossens, 2006), to adopt less idealized images of them, relinquishing some of the childish dependencies on parents (Steinberg & Silverberg,

1986), and acquiring a greater control of their emotional lives (Goossens, 2006). Thinking autonomously requires adolescents to make informed and independent decisions, to express educated and appropriate opinions, to weight the influence of others on their own thinking, to consider consequences, and to self-evaluate their cognitive abilities (Beckert, 2007). As adolescents become older, they are more willing to openly disagree with their parents and less supportive of parental authority over several aspects of their personal lives, which, in turn, can lead to an increase in conflicts (Fulgini, 1998).

While developing a more autonomous relationship with their parents, adolescents are faced with the challenge of developing a more close relationship with their peers in order to fulfill the basic social needs that, according to Sullivan (1953), are tenderness, companionship, acceptance, intimacy, and sexuality. Several changes occur within peer affiliation, one of which being the reasons for affiliation: while children seem to choose for friends other children with whom they share common activities and that they admire, adolescents seem to choose friends with whom they share interests and that they consider to be genuine people (Bigelow & La Gaipa, 1975). Besides adopting new criteria for choosing friends, adolescents start to interact more with their peers, their peer group increases in size, members from the opposite gender are included, friendships and other close relationships become more intense, and guidance and control from adults decrease (Brown, 1990). As Simons-Morton, Chen, Hand, and Haynie (2008) stated, adolescence is a "period when self control develops gradually and unevenly while adolescents experience greater independence from parents, increasing influence from peers and normative influences, and opportunities to engage in behavior independent from direct adult supervision" (p. 5).

As for achievement transitions, it should be noted that, as stated by Flammer and Alsaker (2006), today's life requires a great amount of knowledge, skills, and experience. Hence, achievement has become a watchword and, whether in formal, informal, or non-formal educational environments, children and adolescents are faced with several situations where they are supposed to engage and succeed. Within industrialized countries, school has become mandatory and extended to 12 years. In Portugal, across these 12 years of schooling, children and adolescents face three cycle transitions (i.e., 1<sup>st</sup> educational to 2<sup>nd</sup> educational cycle, 2<sup>nd</sup> educational to 3<sup>rd</sup> educational cycle, and 3<sup>rd</sup> educational to secondary school) to which achievement is crucial. In fact, as noted by Langenkamp (2009), one of the most important

elements of a successful school transition is academic performance and, as stated by Schulenberg and Maggs (2001), transitions to new educational settings require major adaptations. As put by Grills-Taquechel, Norton, and Ollendick (2010) "students are faced with the challenges of managing new friendships and peer groups, navigating a new school and a different class schedule, and receiving more difficult schoolwork." (p. 505). According to Cullen and Robles-Pina (2009) school transitions imply changes at physical (e.g. attending school in a different building), structural (e.g. switching teachers and classrooms), and contextual level (e.g. exposure to unfamiliar peers, stricter discipline policies, decreased teacher-student personalization). Additionally, school transitions mark the change from being the oldest among peers to being the youngest (Grills-Taquechel et al., 2010) and, making the situation even more difficult, within a completely new context. Despite being unquestionable opportunities for children and adolescents' development, school transitions may also be associated with a set of negative outcomes such as decrease in motivation (Eccles et al., 1993); decrease in self-esteem, in self-concept of ability for academic subjects and sport (Wigfield, Eccles, Mac Iver, Reuman, & Midgley, 1991); decrease in the perceived support from school staff (Seidman, Allen, Aber, Mitchell, & Feinman, 1994); decrease in the number of mutual friends (Kingery & Erdley, 2007); and increase in the unauthorized absenteeism (Choi, 2012).

Since adolescents are faced with the challenges of being able to think abstractly; consider other values besides the ones adopted by conventional institutions and their own families; see their parents as real persons with their weaknesses and strengths; explore their identities and increasingly take responsibility for themselves; achieve an active and independent functioning and acquire a greater control of their emotional lives; and make informed and independent decisions, they are on the way to becoming responsible and adjusted adults. As stated by Jackson and Schulenberg (2013), developmental transitions can "be interpreted as both a crisis in terms of escalating health risks and as an opportunity for positive development and health improvement" (p.9). If it is true that not all forms of risk-taking are necessarily deviant (Pharo, Sim, Graham, Gross, & Hayne, 2011); and that heightened risk-taking during adolescence is likely to be normative, biologically driven, to some extent inevitable (Steinberg, 2008), and adaptive in an evolutionary sense (Ellis et al. 2012), it is no less true that, in some cases, risk behaviours might compromise adolescents health, defined as a state of complete physical, mental, and social well-being (WHO, 1948).

### **Risk Behaviours Among Adolescents.**

Adolescence has been described by many (Chick & Reyna, 2012; Johnson, Sudhinaraset, & Blum, 2010; Ellis et al., 2012; Pharo et al., 2011; Reyna & Farley, 2006; Steinberg, 2007) as a developmental period of increased risk-taking as risky behaviours are more frequent during adolescence than in other developmental stages. For example, Steinberg (2004) found that adolescents were more likely than both children and adults to abuse alcohol, use illicit substances, have unprotected sex, and to commit antisocial acts.

Thereby, some of the most studied risk behaviours among adolescents are alcohol use, including binge drinking; smoking; cannabis and other illegal substance use; fighting; delinquency; weapon carrying; suicidal thoughts and suicide attempts; risky sexual activity; and teenage pregnancy (Hibell et al., 2012; WHO, 2012). According to the WHO (2011), every year 2.6 million young people aged 10 to 24 die mostly due to preventable causes, many more suffer from illnesses which jeopardize their growth and development to their full potential, and an even greater number still engage in behaviours that compromise their current and future state of health. In fact, along with early pregnancy and child birth, HIV infection, malnutrition, mental health, violence, and injuries, smoking and harmful drinking are, according to the WHO (2011), the main health issues affecting young people. The relevance of smoking and harmful drinking in particular, and substance use in general, is even greater when considering that most of the above mentioned health issues affecting young people are frequently associated with substance use. According to the EMCDDA (2008a), adolescent substance use is not a disorder that exists in isolation, but just one in an array of problems that adolescent may encounter.

Summarizing, as Lindberg et al.(2000) put it, “the most serious threats to the health and safety of adolescents and young adults are preventable. They result from such risk-taking behaviors as fighting, substance abuse, suicide, and sexual activity rather than from illnesses. These behaviors have harmful, even deadly, consequences.” In fact, and as stated by Cheinet al., (2011), many experts agree that preventable behaviours present the greatest threat to the well-being of young people in industrialized societies.

### **Substance Use Among Adolescents.**

Data from the 2011 European School Survey Project on Alcohol and Other Drugs (ESPAD) survey (Hibell et al., 2012), within a sample of more than 100.000 16 years old students from 36 European countries, showed that alcohol, cigarettes, and cannabis were the substances with the highest lifetime, last 12 months, and last 30 days prevalence of use. The same pattern was consistently found for Portuguese young people across several national (Feijão, Lavado, & Calado, 2011; Feijão, 2011; Balsa, 2013) and international studies (Hibell et al., 2012; WHO, 2012).

Data from the 2011 National Study on Alcohol, Tobacco, and Drugs (ECATD) survey (Feijão et al., 2011) show that almost three-quarters (71%) of Portuguese adolescents had drunk alcohol at some point in their lives, just less than two-thirds (63%) had drunk over the past 12 months, and over two-fifths (44%) over the past 30 days. Regarding tobacco, over two-fifths (43%) had smoked at some point of their lives, one-third (33%) had smoked over the past 12 months, and one-fifth (20%) over the past 30 days (Feijão et al., 2011). For cannabis, data show that just less than one-sixth (15%) had used cannabis at some point in their lives, just over one-tenth (13%) had used it over the past 12 months, and less than one-tenth (7%) over the past 30 days (Feijão et al., 2011). For cocaine, data show that just a few (2%) had used at some point in their lives, however no data on past 12 months nor on the past 30 days was made available from the 2011 ECATD survey (Feijão et al., 2011). By comparing the last two waves from the ECADT (2007; 2011) it is possible to conclude that from 2007 to 2011 there was (a) a decrease in the prevalence of alcohol use, with lifetime use decreasing by 8%, past 12 months use by 7% and past 30 days use by 7%; (b) a 4% decrease in lifetime prevalence of tobacco use, but a 2% increase for use in the past 30; (c) an increase in the prevalence of cannabis use, with lifetime prevalence increasing by 2%, past 12 months use by 4% and past 30 days use by 1%; and (d) a stabilization of lifetime cocaine use (i.e., 2%) (Feijão et al., 2007; Feijão et al., 2011). From these data it is possible to conclude that while all types of drinking have been decreasing over the last years, all types of cannabis use have been increasing. Although lifetime smoking has decreased, the prevalence of regular smoking has increased. Lifetime prevalence of cocaine use has remained stable.

Data from the Portuguese sample of the 2011 ESPAD survey, assessing 1.965 Portuguese students have shown that, by the age of 16, 71% have drunk alcohol, 43% have smoked tobacco, and 16% have smoked cannabis at least once in their lives (Hibell et al., 2012). The lifetime prevalence for other substances (i.e., amphetamines, anabolic steroids, cocaine, ecstasy, GHB, heroin, LSD, and magic mushrooms) was equal or lower than 3% (Hibell et al., 2012). Even though the majority of adolescents who experiment with substances do not become problem users “the use of any psychoactive substance in this age group is of concern as the brain and other organs are still developing during adolescence, and exposure to toxic substances may cause damage, though it might only appear later in life.” (EMCDDA, 2009c).

Comparing data collected among Portuguese adolescents with that for adolescents from EU Member States, data from the 2011 ESPAD survey show that Portuguese adolescents report a lower lifetime prevalence for tobacco (43% for Portuguese adolescents; 54% for EU average) and alcohol (71% for Portuguese adolescents; 87% for EU average), but similar lifetime prevalence for cannabis (16% for Portuguese adolescents; 17% for EU average) and cocaine (3% for Portuguese adolescents; 2% for EU average) (Hibell et al., 2012). Data on past 30 days prevalence show that Portuguese adolescents report a similar prevalence for tobacco (29% for Portuguese adolescents; 28% for EU average) and cannabis (9% for Portuguese adolescents; 7% for EU average), but a slightly lower prevalence for alcohol (52% for Portuguese adolescents; 57% for EU average) (Hibell et al., 2012). Thus, when compared with the EU average, Portuguese adolescents report lower lifetime smoking and lifetime drinking prevalence and similar lifetime prevalence for cannabis and cocaine. Past 30 days prevalence indicates similar prevalence for tobacco and cannabis and higher for drinking.

Substance use is one among several risk behaviours that adolescents, through the developmental process, may engage in and that might represent a threat to their well-being. In a broader sense, substance use may compromise adolescents' health. Adolescents' physical well-being may be affected by substance use through a range of conditions that vary according to the substance (or combination of substances) used. Alcohol, for instance, besides affecting every organ in the drinker's body, can impair brain function and motor skills in cases of intoxication. Heavy use can increase the risk of certain cancers, stroke, and liver disease (NIDA, 2012a). Moreover, it can serve as a gateway to tobacco, cannabis, and other illicit substance use (Kirby & Barry, 2012). Heavy alcohol use during adolescence is a particular

cause of concern given that, as stated by Crews et al. (2007), it “disrupts cortical development altering higher executive functions in a manner that promotes continued impulsive behavior, alcohol abuse and risk of alcohol dependence.” (p.196). As for tobacco, it increases the risk of lung cancer, emphysema, bronchial disorders, and cardiovascular diseases (NIDA, 2012b) and can serve as a gateway to alcohol and cannabis use (Graves, Fernandez, Shelton, Frabutt, & Willford, 2005). Smoking among adolescents is a particular cause of concern given that addiction is established more quickly for adolescents than for adults as the duration of smoking and the number of cigarettes needed to establish addiction is lower for the former (Prokhorov et al., 2006). Additionally, as found by Georgiades and Boyle (2007), individuals who initiate tobacco use as adolescents, even if they successfully stop smoking, continue to be at elevated risk for poorer physical health and fewer years of education. Regarding cannabis, even though some studies have shown that adolescents who use cannabis occasionally and in modest doses do not seem to show specific health or social problems (Engels & Bogt, 2001), other studies have shown that cannabis use is not only a risk factor for mental disorders (Degenhardt & Hall, 2006; Moore et al., 2007), but also a cause of impairment on neurocognitive functions such as attention, working memory, verbal memory and comprehension, perceptual reasoning, processing speed, or learning (Bava et al., 2010; Meier et al., 2012; Schweinsburg et al., 2008). In fact, some studies have shown that even after cannabis use cessation, neuropsychological functioning is not fully restored (Bolla, Brown, Eldreth, Tate, & Cadet, 2002; Meier et al., 2012). Further, cannabis use also increases the risk for subsequent use of other illicit substances (Cox, Zhang, Johnson, & Bender, 2007).

As for mental well-being, research shows that substance use is associated with lower levels of life satisfaction (Georgiades & Boyle, 2007), depression (Mason et al., 2007), mental health problems such as schizophreniform disorder (Arseneault et al., 2002), psychosis (Moore et al., 2007), as well as suicidal ideation (Ortin et al., 2012). By compromising adolescents’ physical and mental well-being, substance use may hinder adolescents from achieving the developmental transitions they are supposed to, negatively affecting their social well-being, increasing the vulnerability inherent to this developmental stage. Indeed, several studies have shown that substance use, besides increasing the risk of substance abuse (Degenhardt et al., 2010; MacPherson et al., 2010; Tucker et al., 2005) and polysubstance use (Ellickson, Tucker, Klein, & Saner, 2004), is also associated with other problematic outcomes such as

school absenteeism and poor academic achievement (Ellickson et al., 2003), school drop-out (Degenhardt et al., 2010), reckless driving (Delhomme et al., 2012), aggressive behaviour (Unger et al., 2003), delinquency (Mason et al., 2007), and stealing (Tucker et al., 2005).

An issue deserving particular interest among those studying adolescent substance use is early initiation. Researchers have shown that the earlier adolescents initiate the use of substances not only the greater the risk for becoming involved in several other problem behaviours (Ellickson et al., 2003; Tucker et al., 2005) but also the greater the impairment and decline in neurocognitive functions (Meier et al., 2012), the higher the probability of substance use later in life and the greater the difficulties in reducing or ceasing substance use (von Sydow et al., 2002), even if they succeed in reducing their use during adolescence (Tucker et al., 2005).

Another relevant issue regarding adolescent substance use is that of poly-substance use (i.e., the use of at least two different psychoactive substances), which has already been observed in many substance-using populations and tends to increase the risks of adverse health effects (EMCDDA, 2009c). As reported by the EMCDDA (2009c), 73% of all last month poly-substance-using 16 year old students reported the use of both alcohol and cigarettes, 20% reported the use alcohol and/or cigarettes plus cannabis, and 3.5% reported the use of alcohol and/or cigarettes, plus cannabis, plus at least other illicit substance.

Data from the 2006 Health Behaviour in School-Aged Children (HBSC) from the WHO study assessing 4.877 Portuguese students, as reported by Matos (2008), have shown that tobacco and alcohol use were related to other risk behaviours and negative health outcomes such as unhealthy dieting, higher physical and psychological complaints, lower school bonding, lower self-rated life satisfaction, substance using peers, and sexual intercourse under the influence of substances. Additionally, smoking was related to lower levels of physical activity, lower self-rated school achievement, and conflicts with parents. Cannabis use was related with unhealthy dieting patterns, psychological complaints, and lower self-rated life satisfaction.

The health effects of tobacco, alcohol, and illicit substance consumption are apparent not only on the individual, but also at the societal level (Hibell et al., 2012). For society, the cost of having some of its youngest members using and abusing substances is not only in terms of the direct costs of health care, mental health, substance treatment services, and juvenile crime



rates (Graves et al., 2005), but also in terms of the indirect costs of having society members of productive age with an impairment in their ability to be active and participative within society.

### **Substance Use Theories.**

Over the last decades, a great level of knowledge has been accumulated on substance use, specifically among young people. Dozens of theories have been developed to describe, understand, and predict experimental substance use as well as the progression from experimental use to regular use, abuse, and dependence. Several attempts were undertaken to aggregate and categorize theories (Becoña, 2003; Hawkins, Catalano, & Miller, 1992; Petraitis, Flay, & Miller, 1995) into cognitive theories, social influence theories, and comprehensive social theories.

### ***Cognitive theories.***

Cognitive theories emphasize the role of cognitive variables such as knowledge, attitudes, beliefs, and expectations associated with substance use. According to these models, individuals act according to their intentions, and since individuals have information on the negative consequences of substances, they would not intend to and will not use them. Two classic examples are the theory of reasoned action (Ajzen & Fishbein, 1980), and the theory of planned behaviour (Ajzen, 1988)

The theory of reasoned action states that experimental substance use is determined by adolescents' intention to engage in substance-specific behaviours. This intention is, in turn, determined by adolescents' attitudes towards their own experimental use, which are based on the expected costs and benefits from substance use and on the affective value that adolescents attribute to these costs and benefits and by adolescents' beliefs about the social norms regarding substance use. Therefore, behaviour is predicted by intention and adolescents intend to act and decide upon their own values and consider the norms of others. Accordingly, adolescents who (a) expect positive outcomes as a consequence of substance use as well as lower risks; (b) value these outcomes more than the expected costs; (c)

overestimate the prevalence of substance use among peers and adults; and (d) believe that friends and family members endorse substance use, are at greater risk for substance use.

The theory of planned behaviour emerges as a revision of the theory of reasoned action, where it is argued that adolescents' perceived ease or difficulty of performing behaviours associated with substance use will directly affect their substance use intentions and behaviours. The decision to engage in substance-specific behaviours, besides being determined by attitudes and beliefs about social norms, is also determined by perceived behavioural control. According to this theory, adolescents who consider themselves to be able to perform behaviours associated with substance are at greater risk of substance use.

### ***Social influence theories.***

Social influence theories emphasize the role of social factors, such as parents, peers, and the media, on influencing adolescents' behaviours. Two classic examples are the social learning theory (Akers, 1977; Akers, Knohn, Lanza-Kaduce, & Radosevich, 1979; Akers & Cochran, 1985) and the social cognitive-learning theory (Bandura, 1977; 1982; 1986).

The social learning theory claims that substance use originates with adolescents' involvement with substance-using role models whose behaviours are observed and imitated by adolescents and, in turn, reinforced by the role models. Adolescents' expectations of positive social and physiological consequences might be largely social during the experimental stage of use and might become largely physiological over the subsequent stages of use. According to this theory, adolescents who expect more personal benefits than costs from substance use are at greater risk of substance use.

The social cognitive-learning theory presupposes that adolescents acquire their beliefs about substance use through their role models, especially parents and close friends. Exposure to parents and peers who uses substances will shape substance-specific beliefs by shaping adolescents' expectations about social, personal, and physiological outcomes of substance use. These role models can also shape adolescents' self-efficacy regarding substance use by providing opportunities for adolescents to acquire the knowledge and the skills necessary either to feel able to use substances (i.e. use self-efficacy), or to feel able to resist social pressure to use substances (i.e. refusal self-efficacy). According to this theory, adolescents

who (a) have substance use role models; (b) feel able to obtain and use substances; and (c) feel less able to resist social pressure to use substances, are at greater risk of substance use.

### ***Comprehensive social theories.***

The comprehensive social theories introduced the views that some factors may increase the proneness to engage in risk behaviours (i.e. risk factors) while other factors may decrease such proneness (i.e., protective factors). These approaches argued that there is a common set of risk factors associated with several developmental risk-behaviours like delinquency, reckless driving, unprotected sex, or substance use. Two classic examples are the problem-behaviour theory (Jessor & Jessor, 1977; Jessor, Donovan, & Costa, 1991) and the social development model (Hawkins & Weis, 1985).

According to the problem-behaviour theory, problematic behaviours are seen as the result of the interaction between the individual and its environment. The core causes within the environment are attachment to family and peers and the substance-specific behaviours of family members and peers. According to this theory, adolescents who (a) are unattached to their parents; (b) are closer to their peers; (c) have substance-using peers; (d) seek independence from parents; (e) believe that their parents and/or peers approve substance use; (f) have low self-esteem; (g) feel they have little to risk through deviant behaviours; (h) have an external locus of control; (i) devalue academic achievement; (j) have low expectations for academic achievement; (k) are tolerant towards deviant behaviours; and (l) believe that the benefits outweigh the costs, are at greater risk of substance use.

The social development model proposes that emotional attachment to substance using peers is a primary cause of adolescents' substance use. The influence that families, schools, and peers have on adolescents' behaviours shifts developmentally, with parents having the greatest influence over the pre-school years, teachers over the preadolescent years, and peers over adolescence. According to this theory, adolescents who (a) had few opportunities for a rewarding interaction at home and school; (b) had few interpersonal and academic skills for successful interactions at home and school; and (c) had received little reinforcement during their interactions with parents and teachers, are at greater risk of substance use.

Despite the possible differences between theories explaining substance use and other risky behaviours among young people, they all identify factors that contribute to making adolescents either more prone (i.e., risk factors) or less prone (i.e., protective factors) to engage in non-conventional behaviours, such as substance use. As stated by Cleveland, Feinberg, Bontempo, and Greenberg (2008), it seems consensual that “the etiology of substance use is multifactorial and likely involves complex interplay among genetic, psychological, and social determinants” (p.158). However, as highlighted by Sloboda, Glantz, and Tarter (2012), “the diversity of substance use behaviors, the variation in substance use patterns, and their associated social and health consequences challenge the notion of a single explanatory approach that would apply to all individuals in all cultures” (p. 944).

### **Risk and Protective Factors for Substance Use Among Adolescents.**

According to Corrigan, Loney, Videka and Brown (2007), “the field of substance abuse prevention has evolved towards a risk and protective factor paradigm in explaining the onset and escalation of adolescent substance use” (p. 17). The term risk factors, stemming from the field of epidemiology has been used to refer to a set of “variables associated with a high probability of onset, greater severity, and longer duration of major mental health problems” (Coie et al. 1993, p. 1013). By studying risk factors associated with substance use, researchers were able to conclude that not all individuals who were exposed to significant risk factors developed substance use problems, raising interest in knowing the variables that kept individuals from experimenting with and abusing substances. These variables, known as protective factors, refer to the “conditions that improve people’s resistance to risk factors and disorder” (Coie et al., 1993, p. 1013) and that may reduce the likelihood of risk behaviours and buffer the negative effects of risk factors (Schulenberg and Maggs, 2001).

Over the past few decades much effort has gone into identifying and categorizing risk and protective factors associated with substance use and other health-compromising behaviours which, in Schulenberg and Maggs’ opinion (2001), has resulted in an overwhelming array of relevant individual and contextual factors, suggesting that the great majority of risk and protective factors have been identified.

### **Topologies for Risk and Protective Factors.**

Several authors have proposed topologies to organize knowledge on risk and protective factors. One of these attempts was undertaken by Hawkins et al. (1992) who, following an overview of the evidence available on substance abuse, classified risk factors into individual/interpersonal factors and contextual factors. Within the individual/interpersonal category, these authors included factors such as family substance behaviour and attitudes, poor and inconsistent family management practices, low bonding to family, academic failure, low degree of commitment to school, association with substance using peers, attitudes favorable to substance use, and early onset of substance use. Within the contextual category, they highlighted factors such as laws and norms favorable toward use, availability of substances, and extreme economic deprivation.

Another attempt came from Petraitis et al. (1995) who, following a review of the existing theories of experimental substance use, developed a 3 x 3 matrix of risk factors in which each factor was classified according to the type of influence (i.e., social and interpersonal influence, cultural and attitudinal influence, and intrapersonal influence) and the level of influence exerted on substance use (i.e., proximal influences, which include variables that are the most immediate precursors of substance use; distal influences, which are relatively indirect causes of substance use, mediated by more proximal variables; and ultimate influences, which refer to broad and exogenous factors that are beyond individuals' control and that gradually put them at long-term risk for substance use). Factors such as beliefs that important others support substance use, expected costs and benefits from substance use, attitudes towards substance use, and determination to use substances were considered as proximal factors; factors like substance-specific attitudes and behaviours of role models, weak commitment to conventional values, school, and religion, and weak academic skills, were considered as distal factors; and factors such as unconventional values from parents and peers, availability of substances, and sensation-seeking, were considered as ultimate factors.

Swadi (1999) has made another contribution by classifying risk factors into constitutional factors, environmental factors, and life events. Constitutional factors included personality attributes, aggression and anti-social behaviour, psychopathology, previous substance use, and genetic factors. Environmental factors included peer group influence, parental substance

use, and family relationships and dynamics. Lastly, as life events increase the risk for substance use, Swadi highlighted the role of teenage pregnancy, unwanted pregnancy, high rates of bereavement, and sexual victimization.

In 2004, Wright and Pemberton, using data from the 1999 National Household Survey on Substance Abuse (NHSDA) classified factors into community, family, peer/individual, and school domain. Within community domain, they included factors such as neighborhood substance use approving adults, substance use prevalence estimates, and accessibility to substances, whereas within the family domain, they have included substance use parental approval, parental support, and parental monitoring. Within the peer/individual domain, the authors included aggressive behaviour, peer approval, prevalence estimates, risk perception, and attitudes towards substance use. Finally, the school domain included factors such as perceived norms and laws, commitment to school, and average grades.

In a more recent attempt, O'Connell, Boat, and Warner (2009) organized risk factors according to the context they occur (i.e., individual, family, school and peers, and neighborhood and community) and the developmental periods they onset (i.e., preconception and prenatal, infancy, early childhood, middle childhood, adolescence, and young adulthood). Genetic predisposition and prenatal alcohol exposure were identified as preconceptional and prenatal risk factors, while difficult temperament, cold and unresponsive mother behaviours, and parental modeling of substance use were considered early childhood relevant factors. Factors such as poor impulse control, sensation seeking, anxiety, depression, early persistent problem behaviours, parent-child conflict, low parental warmth, parental favorable attitudes toward substance use, inadequate supervision or monitoring, school failure, low commitment to school, deviant peer group, favorable peer attitudes toward substance use, laws and norms favorable to substance use, accessibility, and availability of substances were highlighted as middle childhood relevant factors. As for adolescence relevant factors, these authors have included behavioural disengagement coping, negative emotionality, conduct disorder, favorable attitudes toward substances, early substance use, and antisocial behaviour. Lastly, factors such as lack of commitment to conventional adult roles, antisocial behaviour, and substance-using peers were considered young adulthood relevant factors.

Summarizing, risk and protective factors, either for initiating substance use or to progress from use to abuse, occur within individuals and the contexts where they interact (i.e., family, school, peers, and community), exert different types of influence (i.e., proximal, distal, and ultimate) on the decision to use substances, and become most relevant at different developmental periods (i.e., prenatal, early childhood, middle childhood, adolescence, and young adulthood).

### **Dynamics of Risk and Protective Factors.**

Without nullifying the attempts to integrate the knowledge on risk and protective factors, more recently, research has moved into the study of the complex dynamics of these factors, within individuals, over time, and across contexts.

Firstly, risk and protective factors are not equally relevant. As found by Ostaszewski and Zimmerman (2006) with a sample of 850 students, risk factors tend to be much stronger predictors and explain a higher variance in adolescent problem behaviours than protective factors. Cleveland et al. (2008) reached the same conclusion using data from the 2005 Pennsylvania Youth Survey from a sample of 91,778 adolescents, by showing that when both risk and protective factors were included in the same statistical model, risk factors were more closely related to lifetime and recent substance use than protective factors.

Secondly, the domains where risk and protective factors occur are not equally relevant. As Cleveland, Feinberg, Bontempo, and Greenberg (2008) study has also shown, individual risk factors (e.g. favorable attitudes towards substance use, low perceived risks of substance use, and social skills) and peer risk factors (e.g. friends' delinquent behaviour and friends' use of substances) were most closely related to adolescent substance use, whereas family risk factors (e.g. parental favorable attitudes to alcohol, tobacco and other substance use, and family history of antisocial behaviour) were less strongly correlated with substance use. These authors have also found that among the protective factors, even though family and school factors were also important, the community domain displayed the strongest protection effect.

Thirdly, risk and protective factors do not apply equally to all individuals. Cleveland, Collins, Lanza, Greenberg, and Feinberg (2010) using data from the 2005 Pennsylvania Youth Survey with a sample of 93,884 students, found that the effects of protective factors differed according to the combination of individual risk. Hence, when compared with adolescents with low levels

of individual risk, those showing high levels of individual risk benefited less from having a positive familiar and community context, suggesting that extreme levels of individual risk may undermine some of the protective effects. In fact, as highlighted by Schulenberg and Maggs (2001), "very few (if any) risk and protective factors can be viewed as being universal in the sense that they apply equally to all individuals" (p. 9).

Fourthly, the relevance of risk and protective factors for substance use vary across human development. As noted by Cleveland et al. (2008), family and community factors were more relevant for younger cohorts, whereas peer and school domains were more relevant for older adolescents. Cleveland, Feinberg, and Jones (2012) went further and found that whereas the effects of family protective factors decreased over adolescence, the effects of family risk factors remained fairly consistent over this developmental period. These authors also found that the influence of peer risk factors increased in early grades and peaked 15 and 16 years old, but highlighted that despite peer influences being strong, both individual and family risk factors have shown important and unique contributions to both initiation and regular use that were not accounted for by peer influences.

Risk and protective factors should therefore, not be seen as universal or dichotomous, but instead as dynamic processes that vary among individuals and across the contexts where they develop, as well as within individuals over their development and through situations. From the moment individuals interact with an environment that, as Abadi, Shamblen, Thompson, Collins and Johnson (2011) highlighted, is constantly changing, risk and protection are also changing. The risk and protection paradigm has been an important approach to the etiology of substance use and abuse and, according to Sloboda, Glantz, and Tarter (2012), "facilitates the prediction of risk from a broad mosaic of factors and indices" (p.947).



### **Intrapersonal Risk and Protective Factors.**

From the interpersonal factors that research has associated with adolescent substance use, this study focuses on risk perception, expectancies (i.e., expected problems and expected benefits), attitudes, and intention to use.

#### ***Risk perception.***

Despite, as stated by Mayock (2005), risk being "a central discourse among those that surround young people, in general, and young substance users, in particular" (p.349), it "is often conceptualized as involving danger, loss of control, 'trouble', and probable harm; it carries strong negative connotations and is rarely publicly discussed in terms of pleasurable or positive rewards" (Mayock, 2005, p.354). However, adolescent risk behaviours can also be seen as normative, biologically driven, and to some extent, inevitable (Steinberg, 2008), as well as allowing major adolescent developmental transitions such as the urge for exploring new domains away from home (Spear, 2007) and the experimentation of adult habits (Engels & ter Bogt, 2001). Regarding substance use specifically, Engels and ter Bogt, (2001) found that, when compared with abstainers, adolescents who drank or smoked cannabis not only had a greater attachment and a more supportive relationship with their friends, but were also more socially competent in their relationships.

Whether leading to undesirable or desirable consequences, as Lundborg and Lindgreen (2002) have highlighted, it is the perceived risk, rather than the real risk, that individuals take into account within their decisions. According to these authors, perceived risk is a weighted average of prior beliefs, individual experience, and direct information transfer (Lundborg & Lindgreen, 2002). Regarding prior beliefs, researchers have found that adolescents tend to overestimate the risks of becoming an alcoholic (Lundborg & Lindgreen, 2002) or developing smoking-related lung cancer (Lundborg & Lindgreen, 2004). Additionally, a study conducted by Gerking and Khaddaria (2012) found that perceived risks of smoking had a deterrence effect only among adolescents who thought that they would find it difficult to quit and that health-damaging effects of tobacco were more immediate. Perceived risk has also been shown to be associated with the substance use experience: research has shown that, when compared with non-users, smokers (Leeuw, Engels, Vermulst, & Scholte, 2008; Tomar & Hatsukami, 2007), drinkers (Miller, Chomcynova, & Beck, 2009), and cannabis users (Kilmer,

Hunt, Lee, & Neighbors, 2007) perceive substance use as being less risky. Furthermore, regular users, when compared with experimental users, perceive lower risks associated with substance use (Apostolidis, Fieulaine, Simonin, & Rolland, 2006; Chomynova, Miller, & Beck, 2009; Swaim, 2003). Hence, as noted by Kilmer et al. (2007), risk perception seems to be a protective factor for abstainers. Regarding direct information transfer, it seems important to consider not only the information *per se*, but also the channel used to transmit it. Thus, in a study aimed at analysing the influence of information sources on the development of risk perception, Gil-Lacruz and Gil-Lacruz (2010) found that the sources that appear to be more effective in informing young people were experts from state organisations, followed by parents and siblings, mass media, talks and seminars, and teachers. Conversely, information provided by addicted people and publications led to a decrease in perceived risks associated with substance use.

Research has also shown that factors such as gender and age also influence perceived risk. Several studies have shown that females are more likely than males to perceive substance use as having greater risks (Gil-Lacruz & Gil-Lacruz, 2010; Johnston, O'Malley, Bachman, & Schulenberg, 2011; Substance Abuse and Mental Health Services Administration (SAMHSA), 2009). However, Lundborg and Andersson (2008) have shown that gender differences might be belief-specific, finding that whereas girls perceive the smoking mortality risk as significantly higher than boys, boys perceive the addictiveness of tobacco as significantly higher than girls. As for age, even though some studies point to a decrease in risk perception as adolescents get older (Lundborg, 2007; Lundborg & Lindgren, 2002), data from the SAMHSA (2009) suggests that this only happens for alcohol and cannabis, while the perceived risk for tobacco remains stable and that for cocaine, heroin, and LSD increases with increasing age.

Even though adolescence is commonly viewed as a developmental period in which risk is underestimated, Reyna and Farley (2006), following a thorough review of scientific evidence on risk taking, concluded that, like adults, adolescents tend to overestimate important risks. Infact, and even though both adolescents and adults estimate their own risks as lower than those of their peers (Reyna & Farley, 2006), adolescents, especially younger adolescents, are extremely aware of the risks and their vulnerability to them (Goldberg, Halpern-Felsher, & Millstein, 2002) and indeed perceive themselves as more vulnerable to risks than adults perceive themselves to be (Reyna & Farley, 2006).

### ***Attitudes.***

Attitudes are generally viewed as "representing people's global evaluative responses to other people, places, products, issues, ideas, activities, and objects" (Priester & Petty, 2001, p. 19) and have been measured through a range of variables that can be grouped into cognitive, emotional, and behavioural domains. Substance use attitudes have been measured using (a) cognitive variables such as risk perception (Järvinen & Østergaard, 2011), perceived consequences (Lancaster & Hughes, 2013), and normative beliefs (Lintonen & Konu, 2003); (b) emotional variables such as subjective norms (Hohman, Crano, Siegel, & Alvaro, 2013) and substance use approval (Vaughan, Steinfeldt de Dios, & Kratz, 2011) and (c) behavioural variables such as intention to use (Puente, Gutiérrez, Abellán, & Lopez, 2008).

Despite the differences in measuring attitudes, research has consistently shown that adolescents who hold more positive attitudes towards substance use are more likely to report drinking (Jiménez, Bernal, Ruiz, Díaz, & Martin, 2009; Roek, Spijkerman, Poelen, Lemmers, & Engels, 2010; Vaughan et al., 2011), smoking (Bosson, Maggiori, Gygax & Gay, 2012; Epstein, Botvin, & Spoth, 2003; Otten, Harakeh, Vermulst, Van den Eijnden, & Engels, 2007), and using cannabis (Alvaro et al., 2013; Malmberg et al., 2012; O'Callaghan & Joyce, 2006). However, and as highlighted by Johnston et al. (2006), attitudes can be at quite different levels for the various substances and often trend quite differently over time.

Regarding alcohol, research has shown that between the age of five to ten, children report mostly negative attitudes and, with increasing age, attitudes become increasingly positive (Bridges et al., 2003; Dunn & Goldman, 1996; Schell, Martino, & Ellickson, Collins, & McCaffrey, 2005). However, like adults, children hold negative as well as positive attitudes and are aware both of the attractive features and harmful effects of drinking and, with increasing age, both positive and negative expectancies increase (Bekman, Goldman, Worley, & Anderson, 2011; Cameron, Stritzke, & Durkin, 2003; Donovan, Molina, & Kelly, 2009).

As for tobacco, attitudes develop before youth smoke (Lorenzo-Blanco, Bares, and Delva, 2012). Freeman, Brucks, and Wallendorf (2005) found that as early as age seven, children already reported attitudes towards smoking and perceived that others felt that smoking made them look and feel cool and helped them fit in, whereas by the age of 10 many believed that smoking could help to reduce stress and negative mood states. Piko (2001) analysed several

types of smoking attitudes and found that, as adolescents get older, they tend to emphasize more favorable characteristics of cigarette use and to report less disagreement with regard to smoking. At the same time though, they become more focused on the unfavorable consequences of smoking that they would like to avoid and become more worried about the harmful effects of smoking. Besides, smoking behaviour itself may also have an impact on the development of attitudes, "indicating that adolescents adapted their attitudes to their behaviours: adolescents who smoked might have considered cigarette use a less harmful and bad habit than they did before they started to smoke" (Leeuw et al., 2008, p. 1718).

Research has also shown that attitudes towards cannabis become more positive with increasing age as well as with increasing cannabis use experience (Hohman et al., 2013; Johnston, O' Malley, Bachman, & Schulenberg, 2011; Willner, 2001). For instance, O'Callaghan and Joyce (2006) found that, compared with non-users, cannabis users believed more strongly that cannabis would help them fit in with their friends, feel relaxed, forget their worries, and enjoy themselves. Moreover, as pointed out by Roy, Wibberley, and Lamb (2005), attitudes towards cannabis have been changing and indeed, some researchers have found that attitudes towards cannabis are more positive than those towards alcohol (Willner, 2001) or even tobacco (Akre, Michaud, Berchtold, & Suris, 2009).

As for cocaine, according to Bridges et al. (2003), less is known about age-related changes in children's attitudes. However, research shows that as children age, their beliefs about the long-term health consequences of cocaine use become more accurate and differentiated, which leads to negative attitudes and negative intentions to use it (Bridges et al., 2003; Sigelman, Weir, Davies, & Silk, 2002). In fact, as found by Bridges et al. (2003), students in 6<sup>th</sup> grade (i.e., 11 to 12 years old) held more negative attitudes towards cocaine than did students from primary school.

Despite the association between attitudes and substance use, Barkin, Smith, and DuRant (2002) found that only 10% of students reported viewing substance use as "grown-up," "cool," "a way to have more fun," or to "make more friends". According to these authors, this may indicate that "it is not so much the image of being "cool" that drives adolescents to use substances, but the idea that everyone else is doing it and they do not want to be left out of what "normal" adolescents do" (p.453).

### ***Expectancies.***

“Substance use expectancies are defined as beliefs regarding the anticipated effects from using substances that affect when and how much an individual engages in substance use” (Hayaki et al., 2010, p. 995). While positive expectancies are thought to be associated with increased substance use (Aarons, Brown, Stice, & Coe, 2001; Buckner & Schmidt, 2008; Clark, Ringwalt & Shamblen, 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001; Kristjansson, Agrawal, Lynskey, & Chassin, 2012), negative expectancies are thought to decrease substance use (Jones, Corbin, & Fromme, 2001; Kristjansson et al, 2012; Leigh & Stacy, 2004; Lundahl & Lukas, 2007).

In order to play a role in the etiology of substance use, expectancies have to be developed in the first place through indirect sources, such as the perceived effects of substances on others. As mentioned by Leventhal and Schmitz (2006), exposure to substance-using models in peers, family members, and the media is likely to contribute to the development of substance use expectancies before personal experience with substances.

In fact, research has shown that expectancies can be identified well before children have experimented with alcohol (Dunn & Yniguez, 1999), tobacco (Freeman et al., 2005), cannabis (Schafer & Brown, 1991), or cocaine (Jaffe & Kilbey, 1994). Between the age of 8 and 12, there is an increase in both positive and negative expectancies on alcohol (Bekman et al., 2011), tobacco (Freeman et al., 2005), cannabis (Willner, 2011), and cocaine (Sigelman, Weir, Davies, & Silk, 2002), but negative effects are perceived as more likely than positive ones (Dunn & Goldman, 1996; Lee, Maggs, Neighbors, & Patrick, 2011; O’Connor, Fite, Nowlin, & Colder, 2007).

However, from 12 years onwards, even though there is no transition from negative to positive expectancies and adolescents still hold negative alongside with positive expectancies (Cameron et al., 2003), the expected benefits begin to be seen as more likely and the expected costs as less likely for alcohol (O’Connor et al., 2007), tobacco (Chassin, Presson, Rose, & Sherman, 2001), cannabis (Alfonso & Dunn, 2007), but not for cocaine (Sigelman et al., 2002).

Several hypotheses can be argued to explain why expected benefits begin to be more emphasized than negative ones. With increasing age, children become more exposed to

substances and to people who use substances without manifesting adverse consequences (Clark et al., 2011). Besides, while children are more likely to activate negative effects, adolescents, due to the emergence of ambivalent views, tend to activate both positive and negative information (Cameron et al., 2003).

Regarding alcohol, several studies (Cameron et al., 2003; Goldberg et al., 2002; Schell et al., 2005) have shown that adolescents, despite reporting more positive and negative expectancies, emphasize positive expectancies as the dominant characteristics of alcohol effects. According to Goldberg et al. (2002), one possible explanation for this emphasis is the fact that, when adolescents drink, they experience mainly positive effects which contrasts with the usually negative messages they receive about drinking. Therefore, “the failure to experience even minor negative outcomes, combined with the unexpected experience of positive outcomes, may cause the benefits to loom large and the risks to lose influence in adolescents’ decision making” (Goldberg et al., 2002, p.482). Besides, adolescents “may value positive consequences so highly that they are willing to suffer with a number of negative consequences to experience the subjective positive consequences” (Lee et al., 2011, p. 92).

Although some expectancies span different substances, others may be substance-specific: Positive expectancies of drinking include social disinhibition, enhanced functioning, sexual arousal and tension reduction, whereas negative perceptions include sickness, sadness, sleepiness and aggressive behavior (Cable & Sacker, 2007, Jones et al., 2001, Lee et al., 2011). As for tobacco, positive expectancies include reinforcement and weight control, whereas the negatives include negative health effects (Copeland et al., 2007). For cannabis, positive expectations are relaxation, social and sexual facilitation, and cognitive enhancement whereas the negatives are cognitive impairment and physical effects (Aarons et al., 2001; Buckner & Schmidt, 2008; Kristjansson et al., 2012). As for cocaine, positive expectancies include euphoria, increased energy, enhancement of abilities, and tension reduction, and negative expectancies include depression, paranoia, anxiety, antisocial and aggressive behaviours, and decrements in the sexual performance (Jaffe & Kilbey, 1994; Lundahl & Lukas, 2007; Schafer & Brown, 1991).

### ***Intention to use.***

As stated by Hohman et al. (2013), the theory of planned behaviour describes the relationship between attitudes, intentions, and behaviour, defending that behavioural intentions are the best predictors of an action, being a function of attitudes, subjective norms, and perceived behavioural control. Therefore, according to this theory, the person is more likely to intend to use substances if they (a) hold positive attitude towards substance use; (b) have a high perception that others approve substance use; and (c) perceive behavioural control over refusing substances as low. Hence, as stated by Hohman et al. (2013), intentions mediate the relationship between attitudes, perceived behavioural control, subjective norms, and behaviour.

In fact, research confirms assumptions advocated by the theory of planned behaviour. Several studies have found that adolescents holding positive attitudes toward substance use (Alvaro et al., 2013; Barkin et al., 2002; Hampson, Andrews, Barckley, & Severson, 2006; Hohman et al., 2013; O'Callaghan & Hannon, 2003), who perceive substance use as normative among their peers and parents (Andrews, Hampson, Barckley, Gerrard, & Gibbons, 2008; Gritz et al., 2003; Hampson et al., 2006; Hipwell et al., 2005; Hohman et al., 2013; Simons-Morton, 2002), and who consider themselves to be less able to refuse substances (Barkin et al., 2002; Conner, Sandberg, McMillan, & Higgins, 2006; Hohman et al., 2013; Tucker, Ellickson, & Klein, 2003; O'Callaghan & Hannon, 2003) are more likely to report higher intention to use substances.

Higher intentions are, in turn, associated with higher drinking (Andrews, Tildesley, Hops, Duncan, & Severson, 2003; Andrews et al., 2008; Barkin et al., 2002), smoking (Andrews et al., 2003; Booker, Gallaher, Unger, Ritt-Olson, & Johnson, 2004; Vitória, Salgueiro, Silva, & De Vries, 2011), and illicit substance use (Alvaro et al., 2013; Barkin et al., 2002; Hohman et al., 2013). However, the relationship between these variables and intention to use may not be as linear as supposed. For instance, Hohman et al. (2013) found that peers' substance use approval played a significant role in adolescents' intentions to use only when adolescents held ambivalent attitudes, suggesting that adolescents are most likely to be influenced by peers when they hold both positive and negative attitudes towards substance use.

Moreover, Sutherland and Shepherd (2002) found that intention to use differs according to substance use experience and that among non-drinkers, the percentage that intended to start drinking increased with increasing age (i.e., from 6% among 11 years olds up to 48% among 16 year olds), as did the percentage of drinkers who believed they will continue to drink within a year (i.e., from 70% among 11 year olds up to 95% among 16 year olds). As for intention to smoke, Sutherland and Shepherd found that over three-quarters of non-smokers (83%) believed they would not start smoking within the next year, an intention that remained stable across age. However, among smokers, the proportion that intended to quit smoking decreased as adolescents grew older (i.e., from 26% among 11 years old to 8% among 16 year olds) indicating that smokers seemed to accept, from young age, that they will be smokers, at least for the next year (Sutherland & Shepherd, 2002). Moreover, as shown by Mazanov and Byrne (2009) smokers were likely to continue smoking irrespective of their intention. Regarding illicit substances, this study showed that, among non-users, the intention to use increased with increasing age (i.e., from 1% of 11 years old to 7% among 16 years old), as did the percentage of current users of illicit substances who intended to continue to use within a year (i.e., from 61% of 13 years olds up to 78% of 16 years old) (Sutherland & Shepherd, 2002).

Furthermore, Trucco, Colder, Bowker, and Wieczorek (2011) focused on adolescents' social goals and susceptibility to peers influence and found that perceived peer drinking approval was associated with strong intentions to drink among adolescents who value feeling close with others and developing friendships, which might indicate that adolescents may view drinking as a means of connecting with others, and increasing belongingness to a peer group that approves alcohol use. Additionally, these authors found that perceived peer smoking approval was associated with strong intentions to smoke among adolescents who value appearing confident, independent, and dominant (Trucco et al., 2011).

Current research is going further and showing that intention to use substances is also associated with other variables including perceived access to substances (Zamboanga, Ham, Van Tyne, & Pole, 2011), negative expectancies (Hipwell et al., 2005), anticipated regret of becoming a user (Conner et al., 2006), beliefs about quitting substance use (Smith, Bean, Mitchell, Speizer, & Fries, 2007), sibling approval (Brown et al., 2010), parental and peer subjective and descriptive norms related with substance use (Vitória et al., 2011), and parental and peer substance use disapproval (Sawyer & Stevenson, 2008).



### **Interpersonal Risk and Protective Factors.**

From the interpersonal factors that research has associated with adolescent substance use, this study focuses on parents, peers, school, and health-related quality-of-life.

#### ***Parents.***

As stated by Nash, McQueen, & Bray (2005), "family interactions, processes, and parenting practices are recognized as significant influences on adolescent development, behaviour, and particularly on substance use" (p.19). Overall, studies of the relationship between family and adolescent substance use have shown that adolescents who perceive their parents as being warm (Lac, Alvaro, Crano, & Siegel, 2009), bonded (Mahabee-Gittens, Xiao, Gordon, & Khoury, 2013), involved in their lives (Ryan, Jorm, & Lubman, 2010), as monitoring (Moore, Kothwell, & Segrott, 2010) and controlling their activities (Graves et al., 2005), as establishing clear rules (Callas, Flynn, Worden, 2004), and as having a good communication pattern (Ryan, Jorm, Lubman, 2010) are less likely to engage in substance use. Interestingly, Montgomery, Fisk, & Craig (2008) have noted that, when compared with adolescents who perceived their parents as authoritative or authoritarian, those who perceived their parents as permissive or neglectful have not only shown the highest prevalence for all substances, but also started using substances at a younger age.

Parental substance use approval is another variable that has been linked with adolescent substance use. Indeed, several studies have shown that adolescents are more likely to drink (Abar, Abar, & Turrisi, 2009; Bahr, Hoffman, & Yang, 2005; Eitle, 2005; Nash et al., 2005), smoke (Bahr et al., 2005; Berg, Choi, Kaur, Nollen, & Ahluwalia, 2009; Ellickson, Tucker, & Klein, 2008; Sargent & Dalton, 2001), and use illicit substances (Bahr et al., 2005; Olsson et al., 2003; Wright & Pemberton, 2004) if they anticipate that their parents would have more tolerant attitudes towards use. Data from the SAMSHA (2009) had even shown that higher likelihood of substance use was observed not only among adolescents who anticipate that their parents would neither approve nor disapprove but also among those who thought that their parents would somewhat disapprove of their substance use when compared with adolescents who anticipate their parents would be strongly disapproving. In a review of the literature, Allen, Donohue, Griffin, Ryan, and Turner (2003) examined 81 studies about the influence of parents on substance use of their children and found that this influence was higher

for tobacco, followed by alcohol, illicit substances other than cannabis, and lastly cannabis, meaning that parental influence depends on the substance.

Regarding perceived parental approval of alcohol, Eitle (2005) found that adolescents who perceive their parents as being strongly disapproving not only drank less and reported fewer problems associated with alcohol use, but also had fewer friends who drank and approved of drinking and showed greater self-efficacy for refusing alcohol than adolescents who perceived their parents as being merely disapproving. Furthermore, as shown by Abar (2009), adolescents whose parents allowed them to have relatively high levels of drinking in high school were more likely to engage in riskier drinking behaviours than those whose parents permitted relatively low levels of drinking. Moreover, parents' complete disapproval was more protective than approving alcohol consumption, as adolescents with more permissive parents drank more and experienced more negative consequences from drinking (Abar, 2009). One interesting finding regarding perceived parental approval of tobacco use was reported by Bahr et al. (2005) who found that parental attitudes and siblings' smoking behaviour were the most important family variables with each doubling the risk of adolescent cigarette smoking. Similarly, Sargent and Dalton (2001) found that adolescents reporting stronger parental disapproval of smoking were less likely to smoke and that this effect was maintained over time regardless of parental smoking behavior. Moreover, when both parents strongly disapproved of smoking, the effect of peer smoking was reduced as well. Regarding cannabis use, Bahr et al. (2005) found that even though the strongest family variable was having a cannabis using sibling, tolerant parental attitudes and knowing adults who use cannabis were also important risk factors for adolescent cannabis use.

However, the role of parental disapproval seems to lose influence as adolescents get older. As shown by Sawyer and Stevenson (2008), parental disapproval was a stronger predictor of substance use intentions for sixth graders; but for eighth graders peer disapproval was the strongest predictor. Still, despite the strongest effect of peer approval among eighth graders, parent approval was still a significant factor (Sawyer & Stevenson, 2008). As shown by Allen et al. (2003), the influence of parents and peers may differ according to the substance as peer influence seems to be stronger for "minor" substances such as cannabis, but family influence seems to be stronger for "harder" substances such as LSD or heroin.

### **Peers.**

According to Mason, Mennis, Linker, Bares, and Zaharakis (2013), "peers contribute uniquely and independently from family factors in the socialization process and are considered one of the primary engines of development for children" (Introduction, para.1). As Duarte, Escario, and Molina (2011) have stated, "as children reach adolescence, they begin to spend more time with their friends, away from the supervision of their parents, and hence the peer group becomes their most important social reference" (p.90). Research indicates that adolescents are more likely to engage in a particular behaviour when they perceive that their peers will also undertake that behaviour or, at least, accept it (Sawyer & Stevenson, 2008).

Regarding substance use, researchers have consistently shown a strong relationship between adolescents' substance use and their peers substance use by showing that adolescents are more likely to drink (Bahr et al., 2005), smoke (Rumpold et al., 2006; Trucco et al., 2011), and use cannabis (Ali, Amialchuk, & Dwyer, 2011; Mayet, Legleye, Chau, Falissard, 2010) and other illegal substances (Eitle, 2005; Fujimoto & Valente, 2012) if their peers do. However, as demonstrated by Allen et al. (2003) within a literature review of 364 studies assessing peer influence, the overall influence of peers, despite positive, is not uniform across substances: peer influence was higher for tobacco, followed by cannabis, other illicit substances, and lastly alcohol. It was relatively stable for other illicit substances and alcohol, but increasing as children get older for tobacco and cannabis.

Moreover, research has shown that adolescents' substance use is also influenced by peers' approval of substance use, with adolescents being more likely to drink (Fleming, Catalano, Haggerty, & Abbott, 2010; Mason et al., 2013), smoke (Fleming, Catalano, Haggerty, Abbott, 2010; Zaleski, & Aloise-Young, 2013), use cannabis (Hohman et al., 2013; Mason et al., 2013) and other illicit substances (Fleming et al., 2010; Sawyer & Stevenson, 2008) if they perceive their peers as approving or even as indifferent to their substance use. Interestingly, Mason et al. (2013) have found that adolescents thought that their closest friends would be more disapproving of their cigarette use, followed by their alcohol use, and lastly cannabis use.

Moreover, peer influence seems to differ according to several other variables, such as gender and age. For example, when compared with males, females seem to be more susceptible to friends' influence on substance use (Mason et al., 2013), even though they report greater

perceived disapproval from parents and peers (Mrug & McCay, 2012). Regarding age, older students perceive their friends as less disapproving of substance use than younger students (Johnston et al., 2011) which, according to Mrug and McCay (2012), is related to the increasing prevalence of substance use with increasing age and greater acceptability of substance use among older adolescents.

Even though research has consistently shown that when family variables are considered, peers are the strongest predictor of adolescent substance use (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011), several studies have shown that certain family characteristics may attenuate the relationship between substance using peers and adolescents' substance use (Bahr et al., 2005; Mrug & Windle, 2009; Nash et al., 2005). For instance, Nash et al. (2005) found that a positive family environment was associated with reduced numbers of peers and friends who drink alcohol, less perceived approval from friends to drink alcohol, increased self-efficacy for refusing alcohol, decreased stress, and lower drinking and associated problems.

It has been widely assumed that one of the main reasons why young people use substances is the influence of peer pressure (McIntosh, MacDonald, & McKeganey, 2006). Indeed, as argued by Haller, Handley, Chassin, and Bountress (2010), the relationship between adolescents' and their peers' substance use is explained by influence processes in which peers model adolescents' substance use behaviours, provide adolescents with opportunities for substance use, and encourage adolescents' positive attitudes towards substance use. However it may also be explained by selection processes, meaning that adolescents who use substances associate with peers who are similar to them in attitudes and behaviours towards substance use which has been shown in several studies (De Vries, Candel, Engels, & Mercken, 2006; Mercken, Steglich, Sinclair, Holliday, & Moore, 2012; Poulin, Kiesner, Pedersen, & Dishion, 2011). Even though, in Simons-Morton and Chen's opinion (2006), the literature to date does not appear to provide clear evidence about the relative contributions of influence and selection processes, several studies have found that both play an important role in explaining substance use among adolescents (Dishion & Owen, 2002; Mercken et al., 2012; Simons-Morton & Chen, 2006).

### **School.**

As highlighted by Henry, Stanley, Edwards, Harkabus, and Chapin (2009), "several decades of research have demonstrated that a student's experiences at school and adjustment to school can exert both positive and negative influences on their development" (p. 236). According to Fleming et al. (2010), two school variables have been consistently associated with problem behaviour: academic achievement and bonding to school.

For academic achievement, previous studies have shown that students with poor academic performance are more likely to drink (Bergen, Martin, Roeger, & Allison, 2005; Diego, Field, & Sanders, 2003; Kostelecky, 2005), smoke (Bryant, Schulenberg, O'Malley, Bachman, & Johnston, 2003; Cox, et al., 2007; Ellickson et al., 2008), use cannabis (Bryant et al., 2003; Cox, et al., 2007; Rumpold et al., 2006), and cocaine (Jeynes, 2002). Indeed, Sutherland and Shepherd (2001) found that among 11–16 year olds, perceived academic achievement ranked third in importance, after concurrent substance use and having been in trouble with police, as a predictor for substance use.

Several researchers have contributed to the understanding of the relationship between adolescent substance use and academic achievement. Some researchers foresee academic problems as a risk factor that precedes substance use initiation, and argue that substances may be a response to perceived poor academic achievement (Ellickson et al., 2004; Fothergill, Ensminger et al., 2008; Sutherland & Shepherd, 2001). Diego et al. (2003) have also found that from a set of three variables (i.e., academic achievement, popularity, and depression) academic achievement accounted for the greatest proportion of variance in alcohol, cannabis, and cocaine use and the second highest proportion for smoking.

Besides, as mentioned by Cox et al. (2007), "poor academic performers may be more likely than high achievers to skip school, have disciplinary problems, and/or associate with deviant peers, and this may create a social structure that encourages substance use" (p. 110). In fact, within a longitudinal study of familial alcoholism across three generations, Haller et al. (2010) demonstrated that adolescents with lower academic achievement were, indeed, more likely to affiliate with substance use promoting peers. Other researchers have highlighted the impact of substance use on academic achievement by showing that students who use substances have poorer academic achievement as a consequence of substances' impact on

the developing adolescent brain but also as a consequence of a negative interference with school attendance, study habits, and completion of school assignments (Haller et al. 2010; Jeynes, 2002; King, Meehan, Trim, & Chassin, 2006).

In a study assessing the relationship between adolescent patterns of substance use and their academic achievement, Jeynes (2002) demonstrated that when all the substances assessed were considered, cigarette smoking, being drunk, and being under the influence of alcohol while at school were the most consistent statistically significant variables. In fact, "the effects of considerable alcohol consumption appeared to have the greatest impact on adolescent academic achievement" (Jeynes, 2002, p. 28). Additionally, students who use substances also report more negative perceptions of school (Sobeck, Abbey, Agius, Clinton, & Harrison, 2000), less school interest (Bryant et al., 2003), more behavioural problems at school (Ellickson, Tucker, & Klein, 2001), higher school dropout (Townsend, Flisher & King, 2007), and less likelihood of obtaining a college degree (Haller et al., 2010).

As for school bonding, several studies have mentioned its implications for students' academic achievement, showing that students who like their schools and feel satisfied with their schools are more likely to perform better academically (Bryan et al., 2012; Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; Ladd, Buhs, & Seid, 2000). Bryan et al. (2012), within a study examining the effects of school bonding on academic achievement, found that attachment to school (i.e., how much the student likes school and sense of fairness) and school involvement (i.e., extracurricular activities and club involvement) had significant effects on academic achievement and that other aspects of school bonding (i.e., attachment to teachers and school commitment) may have indirect effects on academic achievement. Moreover, research has shown that students reporting lower connectedness to school are more likely to drink (Dever et al., 2012; Henry et al., 2009; Maddox & Prinz, 2003), smoke (Bryant et al., 2003; Catalano et al., 2004), and use illicit substances (Catalano et al., 2004; Dever et al., 2012), and even that low connectedness predicts substance misuse at the age of 19 (Fleming et al., 2010).

### ***Health-related quality-of-life.***

Quality-of-life has been defined “as a multidimensional, subjective construct that captures an individual’s satisfaction with life in areas of personal importance” (Becker, Curry, & Yang, 2009, p. 482) that has been conceptualized from an objective and a subjective perspective, the first focused on external conditions that contribute to quality-of-life (e.g. income levels, access to health services) and the second focused on individuals’ internal judgments of specific life domains (e.g. satisfaction with family, school, friends) (Zullig, Valois, Huebner, Oeltmann, & Drane, 2001). Overall, research has shown that lower quality-of-life is related to numerous unhealthy outcomes, including substance use. Several studies report that the lower the quality-of-life the higher the prevalence of drinking (Matos, 2008; Kuntsche & Gmel, 2004; Phillips-Howard, et al., 2010), smoking (Dunn, 2011; Matos, 2008; Piko, Luszczynska, Gibbons, & Teközel, 2005), cannabis use (Dunn, 2011; Fergusson & Boden, 2008; Matos, 2008), and cocaine use (Thatcher, Reininger, & Drane, 2002; Zullig et al., 2001).

Regarding specific life domains, research has consistently indicated that the higher level of family satisfaction, namely with parental support and positive relationship with parents, the higher the quality-of-life (Flouri & Buchanan, 2002; Gilman & Huebner, 2006; Suldo & Huebner, 2006). Parental support emerges in several studies (Antaramian, Huebner, & Valois, 2008; Piko & Hamvai, 2010; Suldo & Huebner, 2004) as one of the strongest pathways through which parenting influences quality-of life. Yet, and regardless of parental relation characteristics, satisfaction with family relations seems to decrease as adolescents get older (Goldbeck, 2007; Suldo & Huebner, 2004).

As for school domain, some studies have found that school satisfaction is one of the quality-of-life domains typically showing the lowest score (Gilman, Huebner, & Laughlin, 2000; Phillips-Howard et al., 2010; Suldo, Shaffer, Riley, 2008) and, with increasing age, perceptions of school environment become even lower (WHO, 2012). This is a major concern considering evidence showing links between students’ happiness with their schooling and their global life satisfaction (Natvig, Albrektsen, & Qvarnstrøn, 2003; Piko & Hamvai, 2010; Suldo et al., 2008). Further, students who feel happy at school report more positive school experiences, a greater frequency of structured extracurricular activities participation, and higher grade point average (Gilman & Huebner, 2006), and are more likely to engage in classroom-appropriate

behaviours, namely treat their teachers and colleagues with respect, do their best to learn, and work cooperatively with other students (Parish & Parish, 2005). Complementarily, one of the quality-of-life domains towards which adolescents report a higher level of satisfaction is the one related with friends (Gilman & Huebner, 2006; Goldbeck, Schmitz, Besier, Herschbach, & Henrich, 2007; Ma & Huebner, 2008) and there seems to be no significant variations according to gender or age (Goldbeck et al., 2007; Jozefiak, Larsson & Wichstrøm, 2009). However, as shown by the WHO (2012), “having three or more close friends of the same gender decreases between ages 11 and 15, possibly because of increases in intimacy of friendships” (p.204).

Another construct that has been associated with quality-of-life is leisure activities. Leisure activities are important, not only because they are associated with well-being and mental health (Fletcher, Nickerson, & Wright, 2003; Larson 2000; Leversen, Danielsen, Birkeland, & Samdal, 2012), but also because, as stated by Leversen et al. (2012), “participation in leisure activities may provide adolescents with unique developmental opportunities for socialization and learning” (p. 1589) and may be associated more specifically with satisfaction of competence and relatedness that, according to these authors, seem to be the most important psychological needs for adolescents’ life satisfaction.

Regarding physical activity as a leisure activity, several studies have found a positive association with life satisfaction (Paupério, Corte-Real, Dias, & Fonseca, 2012; Ussher, Owen, Cook, & Whincup, 2007; Valois, Zullig, Huebner, & Drane, 2004). In fact, Field, Diego, and Sanders (2001) found that students with a high level of exercise had better relationships with their parents, were less depressed, and had higher grade point averages than students with a low level of exercise. However, regarding the relationship between sports and substance use itself, research has consistently found a negative relationship with tobacco (Melnick, Miller, Sabo, Farrell, & Barnes 2001; Metzger, Dawes, Mermelstein, & Wakschlag, 2011), cannabis (Dever et al., 2012; Terry-McElrath, O'Malley, & Johnston, 2011), and cocaine use (Darling,2005; Field, 2001) but several studies have reported a positive relationship with alcohol use (Darling, 2005; Dever et al., 2012; Paupério et al., 2012). One hypothesis mentioned by Dever et al. (2012) to explain this positive relationship is that adolescents who enjoy taking risks self-select into sports and end up joining a peer network where others also enjoy risk taking, including substance use.



### **Sociodemographic Risk and Protective Factors.**

From the socio-environmental factors that research has associated with adolescent substance use, this study focuses on age, gender, family structure, life events, nationality, socio-economic status (SES), and perceived accessibility.

#### **Age.**

As stated by Duan, Chou, Andreeva, and Pentz (2009), "a common pattern observed in the consumption of cigarettes, alcohol, and marijuana is that it occurs gradually in elementary and middle school, accelerates in late middle and high school, continues to increase during young adulthood, and gradually stabilizes or decreases in the midemerging adulthood" (p.454). Accordingly, data from the 2011 ECATD survey (Feijão, Lavado, & Calado 2011) showed that among Portuguese adolescents, tobacco, alcohol, and cannabis increased steadily and consistently from age 13 to 18 years: For alcohol, 36.5% of 13 years old reported lifetime use and 12.6% past 30 days use, while prevalence among 18 years old was 90.6% and 70.1% respectively; for tobacco, while by the age of 13, 16.9% reported lifetime use and 5.3% past 30 days use, prevalence rose to 60.5% and 33.5% respectively by the age of 18; for cannabis, by the age of 13, 2.3% of adolescents reported lifetime use and 0.7% past 30 days use whereas by the age of 18 prevalence rose to 29.7% and 15.7% respectively. Research has shown that early substance use is associated with negative consequences: early smoking is associated with increased use over time (Tucker et al., 2003), greater risk of becoming a heavy smoker (Hughes, Hughes, Atkison, Bellis, & Smallthwaite, 2010), and of become addicted (Breslau, Fenn, & Peterson, 1993); early drinking is associated with increased stress-reactive drinking (Dawson, Grant, & Li, 2007), heavy drinking (Blomeyer et al., 2011), and alcohol use disorders (DeWit, Adlaf, Offord, & Ogborne, 2000; Hingson, Heeren, & Winter, 2006); early cannabis use is associated with increased consumption over time (Siqueira, Diab, Bodian, & Rolnitzky, 2001), abuse and dependence (Chen, Storr, & Anthony, 2009), and enduring psychosocial impairment (Hicks, Iacono, & McGue, 2010). Overall, early users are more likely to report academic problems, illicit substance use (Ellickson et al., 2003), greater difficulties in quitting (von Sydow et al., 2002), and are at higher risk for poor outcomes even if they reduced their use during adolescence (Tucker et al., 2005). Further, earlier age of onset of use of one substance predicts the earlier age of onset of other substance use (Ciairano, Molinengo, Bonino, Miceli, & van Schuur, 2009).

### **Gender.**

Even though some studies have found some significant gender differences for substance use (DeWit, Offord, & Wong, 1997; Eitle, 2005; Siciliano et al., 2012), others have not found such differences (Guo, Hill, Hawkins, Catalano, & Abbott, 2002; Wang, Simons-Morton, Farhart, & Luk, 2009; Weinstein & Mermelstein, 2013). Data from the 2011 ESPAD survey for Portuguese adolescents showed that, like in many surveyed countries, there was a significant gender difference in past 30 days alcohol use and the amount of alcoholic beverages consumed, with boys consuming more alcoholic drinks and more often than girls (Hibell et al., 2012). However, unlike most surveyed countries where drunkenness episodes were typically more frequent among boys, no significant gender differences were found for Portuguese adolescents (Hibell et al., 2012). Concerning binge drinking, like most surveyed countries, in Portugal, prevalence was significantly different among boys and girls, with boys showing a significantly higher prevalence of drinking 5 or more drinks in one occasion than girls (Hibell et al., 2012). This is in agreement with the fact, reported by Johnston et al. (2006), that with increasing age there is also an increase in dangerous drinking behaviours that become progressively more frequent among boys than girls.

Regarding tobacco, data from the 2011 ESPAD survey also showed that in Portugal, like in most surveyed countries, there were no significant gender differences for past 30 days smoking (Hibell et al., 2012). However, and even though girls seem to be consistently surrounded by more smokers in their social environments (Branstetter, Blosnich, Dino, Nolan, & Horn, 2012), boys seem to be more likely to initiate smoking at an earlier age (WHO, 2012) and to reflect greater nicotine uptake and dependence (Branstetter et al., 2012). As for cannabis use, data from the 2011 ESPAD survey found a statistically significant gender difference for Portugal where, like in most surveyed countries, boys had a higher prevalence of past 30 days use (Hibell et al., 2012). Moreover, and even though, according to Piontek, Kraus, Legleye and Bühringer (2011) more research is needed to fully understand the nature of gender differences, research has shown that boys to have a higher risk for abuse (von Sydow et al. 2002) and to be less likely to quit using (DeWit et al., 1997).

### ***Family structure.***

By establishing a context in which family processes unfold, family structure is related to adolescent health and well-being (Brown & Rinelli, 2010). According to the Leite (2004), the sharp rise in divorce rates in the past decades has led to the common practice of forming a new family through a new marriage or by living with a new partner which has led to new familiar typologies. Overall, research has shown that, when compared with adolescents from intact families (i.e., living with both parents), those living in single families (i.e., living with one parent) and blended families (i.e., living with one parent and a step-parent) are more likely to drink (Crawford & Novak, 2008; Gil-Lacruz & Gil-Lacruz, 2010), smoke (Brown & Rinelli, 2010; Lundborg, 2007), and use cannabis (Georgiades & Boyle, 2007; Rumpold et al., 2006) as well as to have a problematic substance use (Barret & Turner, 2005; Hemovich, Lac, & Crano, 2011).

The differences in substance use across family structures seem not to be due to the structure *per se*, but to the different processes occurring within the family. Even though understanding on the mechanisms underlying this relationship is still limited (Broman, Li, & Reckase, 2008), in Eitle's opinion (2005), "the major explanations proffered for why family structure is associated with adolescent substance focus on the following factors: resource deprivation, mobility, and parental attachment" (p.965).

According to the resource deprivation argument, "single parents would be less effective at supervising and disciplining their children than would be two parent families because they have less time, energy, and one less set of eyes to watch over their children" (Eitle, 2005, p.965). Additionally, "owing to the pressure of financial exigencies (e.g. the need to work long hours or to hold multiple jobs), it seemed plausible to assume that single parents, on average, would be less able to monitor their children consistently and intensively" (Hemovich et al., 2011, p.260). This argument finds support in studies (Barret & Turner, 2005; Gil, Vega, & Biafora, 1998; Suh, Schütz, & Johanson, 1996) showing that the presence of an additional relative living in the household of a single parent decreases the risk of substance use. Still, other studies (Barret & Turner, 2005; Eitle, 2005) have shown that the benefits from having an extra adult in the household of a single parent do not occur for adolescents living in blended families.

A commonly used argument to explain the higher prevalence of substance use among blended families has to do with mobility. Some studies (Eitle, 2005; Hoffman & Johnson, 1998) have shown that blended families show high levels of family mobility which, as argued by Hoffman and Johnson (1998), is thought to disrupt adolescent development by dissolving friendships and peer networks and weakening social and community ties that may result in a higher association with substance use. Yet, as highlighted by Crawford and Novak (2008), neither decreased economic resources nor increased residential mobility seems to account for substantial amounts of the variability in substance use behaviors across family types.

Instead, Crawford and Novak (2008) argue that differences in patterns of parent-child interaction may provide a better explanation for the higher levels of substance use found among adolescents residing with single and blended families. In fact, several studies have shown that, when compared with intact families, single parent-child relationships tend to be characterized by (a) poorer interactions (Amato, 2000), (b) lower levels of monitoring (Hemovich et al., 2011), (c) lower maternal knowledge (Wang et al., 2009), and (d) lower levels of parental control and support (Brown & Rinelli, 2010), whereas parent-child relationships within blended families tend to have (a) lower parental attachment (Kierkus & Baer, 2002), (b) lower maternal knowledge (Wang et al., 2009), and (c) lower levels of monitoring (Demuth & Brown, 2004), all well-known risk factors for substance use. It should however be highlighted that, as mentioned by Hemovich and Crano (2009), following the dissolution of high-conflict marriages, the resulting single dynamic may be a preferable environment for children and adolescents to achieve an appropriate emotional development and prevent dysfunctional problems.

Despite the considerable amount of studies that have suggested that adolescents from non-intact families have more negative outcomes, such as substance use, than those of intact families, according to Paxton, Valois, and Drane (2007), this relationship is inconsistent at best. These authors suggest that these inconsistencies are related to the fact that many studies have not accounted for confounding factors such as SES, have not recognized differences between single parent and divorced families, or between single mother and single father families, and have focused on broad categories such as intact versus non-intact categories.

### ***Stressful life events.***

As highlighted by Booker et al. (2007), “adolescence is a period of great change, including an increase in the perception of the number and severity of stressors that must be dealt with on a daily basis” (p.1522). Stressful life events are described by Low et al. (2012) as “discrete quantifiable circumstances that can have severe negative impact” (p.1). Considering that high emotional stress has been associated with the impairment of self-control (Lee, Storr, Jalongo, & Martins, 2012), the relationship between stressful life events and risk behaviours has been particularly studied. In Windle's opinion (2000), younger adolescents who experience frequent stress may have not developed appropriate coping skills yet, and therefore be more prone to use immature or negative coping styles such as withdrawal, avoidance, or distraction with substance use.

In fact, several studies have reported an association between stress and drinking, consistently showing that adolescents reporting major negative life events also report higher frequency of drinking (Dawson et al., 2007), higher amount of alcohol intake (Blomeyer et al., 2011), higher frequency of heavy drinking (Dawson, Grant, & Ruan, 2005), and higher drinking problems (Windle, 2000). In fact, as shown by Dawson et al. (2007), as the number of stressful life events increased so does the amount of alcohol consumed, particularly among individuals who had started drinking before age 14, which may indicate that early drinking induces a preference for drinking in stressful situations as a strategy to cope with stress and unpleasant emotions.

Regarding smoking, research has shown that adolescents who report higher levels of stress also report higher lifetime smoking (Low et al., 2012), greater escalation over time, (Weinstein & Mermelstein, 2013), and greater intention to smoke in the next year (Booker et al., 2004). As for cannabis, researchers have found that adolescents who experience negative life events are more likely to use and to have a higher consumption of cannabis (Butters, 2002; Low et al., 2012). However, as found by Siqueira et al. (2001), experimenters and frequent cannabis users do not report greater perceived stress which, according to the authors, can be accounted for by the physiologic effects of frequent marijuana use that contribute to gradual distancing and alienation from the daily reality.

### ***Nationality.***

Current research reveals that the relationship between race/ethnicity and substance use is complex (Watt & Rogers, 2007). Previous studies have shown mixed findings when examining the relationship between substance use and race/ethnicity, SES, or family structure which may be explained by the inter-correlation between these variables (Paxton et al., 2007). Indeed, according to Watt and Rogers (2007), economic and social disadvantages, such as poverty, and unemployment, characterize the conditions in which most minority youth live.

Research from the United States has consistently shown that Caucasians generally report the highest levels of substance use, followed by Hispanics whereas African Americans and Asians report the lowest (Guo et al 2002; Johnston et al., 2011; Nishimura, Hishinuma, Else, Goebert, & Andrade, 2005; Watt, 2004). When compared with adolescents from just one ethnic group, adolescents from multiple ethnicities report higher prevalence of substance use (Jackson & LeCroy, 2009; Wu, Woody, Yang, Pan, & Blazer, 2011).

Several arguments can be used to explain this lower substance use prevalence among adolescents from minority groups and overall, a number of studies have shown that cultural pride and ethnic identity seems to decrease the likelihood to engage in substance use (Marsiglia, Kulis, & Hecht, 2001; Wallace & Fisher, 2007). Additionally, according to Unger et al. (2004), cultural specific values and attitudes are worth considering. While the higher prevalence among Hispanics might be associated with machismo, a traditional Hispanic value that prescribes differentiated gender roles, suggesting that male adolescents may use alcohol, tobacco, and other substances as a way of asserting their masculinity, the lower prevalence among Asians might be associated with filial piety, a common value among Asian cultures that is characterized by a sense of obedience to parents, the duty to provide financial and emotional support to parents, and to avoid behaviours that would disgrace the family name.

Because adolescents, as stated by Unger et al. (2004), "are exposed to differing sets of cultural norms in their interactions with peers and family members, it is important to understand the influence of those cultural norms and the cultural contexts on adolescents' decisions about substance use" (p.1781). However, according to these authors, although a considerable amount of research has been done, the extent to which these posited risk and protective factors generalize across cultural contexts is not completely understood.

## **SES.**

Research on SES and adolescents' health outcomes is sparse and presents some inconsistencies (Hamilton, Noh, & Adlaf, 2009). While some studies have found that adolescents from a low SES are more likely to use substances (Georgiades & Boyle, 2007; Gil-Lacruz & Gil-Lacruz, 2010; Humensky, 2010), others have not found any significant relationship (Brown & Rinelli, 2010; Wagner, Ritt-Olson, Soto, & Unger, 2008). These inconsistencies may be related to the inter-correlation between SES, race/ethnicity, and family structure (Wang et al., 2009) as well as to different indicators used to measure SES (Legleye, Janssen, Beck, Chau, & Khlaf, 2011).

In a literature review, Hanson and Chen (2007) concluded that low SES adolescents were at greater risk for smoking, but not for drinking or cannabis use. The greater risk for smoking can be related with low SES adults having a higher smoking prevalence and, therefore, being more likely to model smoking on their children, as well as low SES adolescents having a greater experience of negative life events (Glasscock, Andersen, Labriola, Rasmussen, & Hansen, 2013; Stronks, van de Mheen, Looman, & Mackenbach, 1998) which put them at greater risk for smoking. The absence of higher risk for alcohol and cannabis use might be due to the fact that alcohol and cannabis use are more strongly influenced by peers than by family SES (Hanson & Chen, 2007). Still, other studies have shown that, from the moment they initiate substance use, low SES adolescents are more prone to develop problematic substance use (Humensky, 2010; Lundborg, 2007; von Sydow et al., 2002).

Conversely, other studies have shown that adolescents from a higher SES are more likely to drink (Gil-Lacruz & Gil-Lacruz, 2010), smoke (Hughes et al., 2010), use cannabis (Legleye, Beck, Khlaf, Peretti-Watel, & Chau, 2012) and cocaine (Humensky, 2010), which can be related to greater financial resources that allow a higher access to substances (Humensky, 2010). However, Hanson and Chen (2007) within their literature review, found that this association did not consistently emerge across studies and state that "high SES remains a protective factor in adolescent substance use behaviors" (p.278) which is consistent with evidence showing that adolescents from high SES are less likely to engage in hazardous or harmful substance use (Hamilton et al., 2009; Legleye et al., 2011; Legleye et al., 2012).

### ***Perceived accessibility.***

As mentioned by Harrison et al. (2000), it is generally accepted that successful efforts to prevent substance use, besides focusing on demand reduction, must also focus on supply reduction by limiting adolescents' access to substances. Indeed, supply reduction is a major component of substance policies in Europe (EMCDDA, 2012b) and several studies have shown that higher perceived accessibility is associated with higher prevalence of alcohol (Durant et al., 2008; Komro, Maldonado-Molina, Tobler, Bonds&Muller, 2007), tobacco, (Cummings, Hyland, Perla, & Giovino, 2003; Hublet et al., 2009; Williams & Mulhall, 2005), and cannabis (Coffey, Lynskey, Wolfe, & Patton, 2000).

Adolescents have access to substances from a variety of commercial (e.g. convenience stores, vending machines) and social (e.g. peers, family) sources but, as shown by Harrison et al. (2000), less than 10% of adolescents use exclusively commercial sources while more than 80% of drinkers and more than 50% of smokers rely exclusively on social sources. The most common social source for both cigarettes and alcohol are older friends, followed by family (Dent, Grube, & Biglan, 2005; Storvoll, Pape, & Rossow, 2008; Williams & Mulhall, 2005), with access to tobacco through family members reaching a prevalence of up to 28% and for alcohol up to 51% (Harrison et al., 2000). As for illicit substances, most adolescents report a combination of social sources and purchasing from people they know (Harrison et al., 2000). The source of choice seems to be related to age and experience of use since younger and less experienced adolescents tend to report more access through social sources, such as siblings and friends, and older and more experienced adolescents more access through commercial sources (Hughes et al., 2010; Storvoll et al., 2008; Williams & Mulhall, 2005). Even though it is clear that most adolescents start accessing substances first through social sources with commercial sources beginning to be used more often when use becomes more regular, legal measures focus on restricting access to commercial sources. In Portugal, at the time of this study, the legal framework on alcohol established that the sale of alcohol to young people under 16 years old was prohibited (Decreto-Lei 9/2002). However, preliminary data from the 2011 ECATD survey (Feijão et al., 2011) have shown that the mean age for the first alcoholic drink is 13 years old, well below the minimum age to purchase alcoholic beverages. Moreover, data from the 2011 ESPAD survey (Hibell et al., 2012) have shown that less than one-quarter of 16 years old Portuguese adolescents (22%) report an off-premise purchase of alcoholic



beverages during the past 30 days, which still lies quite below the European average (37%). As in most European countries, in Portugal, beer and spirits are the alcoholic beverages most purchased and wine the least (Hibell et al., 2012). Regarding on-premise purchase, just less than half of 16 years old Portuguese adolescents (49%) report having consumed alcoholic beverages in bars and discos during the last 30 days, which is slightly above the European average (45%) (Hibell et al., 2012). Again, and like most European countries, spirits and beer are the most purchased beverages (Hibell et al., 2012). In Portugal, in April 2013, a more restrictive law was approved (Decreto-Lei 50/2013) which increased the minimum age for acquiring spirits to 18 years of age, even though the minimum age for acquiring all other alcoholic beverages remained at 16 years.

As for tobacco, the legal framework in Portugal establishes that tobacco selling to young people under 18 years old is prohibited (Lei 37/2007) but preliminary data from the 2011 ECATD survey (Feijão et al., 2011) have shown that the mean age for the first cigarette is 16 years of age, which is below the minimum age to purchase tobacco.

Regarding cannabis and other illegal substances, the Portuguese legal framework on substances changed in 2000 with the adoption of a new legal framework (Lei 30/2000), which decriminalized the use of illicit substances and related acts, but maintained the status of illegality of these behaviours, as well as of all illicit substances included in the relevant United Nations Conventions. Even though cannabis is an illegal substance, data from the 2011 ESPAD survey have shown that almost one-third of Portuguese adolescents (30%) consider that accessing cannabis is fairly easy or very easy, which is similar to the average for European countries (29%) (Hibell et al., 2012). Moreover, preliminary data from the 2011 ECATD survey (Feijão et al., 2011) have shown that the mean age for cannabis use onset is 17 years old.

Even though some studies show a decrease in smoking (Cummings et al., 2003) and drinking prevalence (Dent et al., 2005) as a consequence of limiting commercial access to substances, the question about its impact on prevalence is still controversial. According to Harrison et al. (2000), the potential effect of policy controls on adolescent access to substances "is limited and, though essential, these controls will not be sufficient unless balanced with methods that target availability through social sources" (p. 46).

## **Substance Use Prevention Interventions for Adolescents**

### **Substance Use Prevention.**

As stated by Romano and Hage (2000), "very few would disagree that it is better to prevent a problem than to correct it. Prevention applies regardless of the problem domain, be it cardiovascular disease, school failure, depression, drug abuse, or automobile breakdown" (p. 734). The substance use phenomena encloses two distinct concepts: the concept of substance and the concept of use. That is to say that for a person to decide to use substances, there has to be substances available and reachable. Hence, tackling the question of substance use usually comprises one approach on the availability of substances (i.e., the supply reduction approach) and one on the decision to use substances (i.e., the demand reduction approach). According to the United Nations Office on Drugs and Crime (UNODC) (2004), supply reduction strategies aim to limit the access and availability of licit substances in certain contexts and disrupt the production and supply of illicit drugs, whereas demand reduction strategies aim to reduce the desire and willingness to obtain and use substances and to prevent, reduce, or delay the uptake of substances.

To Harrison et al. (2000), it is generally accepted that successful efforts to prevent substance use must focus on demand reduction, by reducing adolescents' willingness to use substances, but also on supply reduction, by restraining adolescents' access to substances. However, according to Kulis et al. (2007), efforts to ameliorate substance use among young people have focused overwhelmingly on demand reduction, generally by attempting to inhibit or delay the onset of substance use. Indeed, it seems reasonable to argue that an adolescent's decision to experiment with substances is, in a relative sense, a free choice. This is because, as claimed by the main substance use theories, along with individual factors that might contribute to the decision to try a given substance (e.g. sensation seeking, low refusal skills, poor impulse control), there are contextual factors operating within adolescents' families, peers, schools, and communities that are not under adolescents' control, and sometimes not even under adolescents' influence, yet still contribute to adolescents' decision to experiment with substances. Regardless of freedom of choice, the behavioural basis of substance use onset makes substance use potentially preventable.

However, as often happens within social and human sciences, concepts' definitions are not always linear, being the case for the definition of prevention. The American Psychological Association (APA) Concise Dictionary of Psychology (2009) defines prevention as "behavioral, biological, or social interventions intended to reduce the risk of disorders, diseases, or social problems for both individuals or entire populations" (p. 392). This definition mentions primary, secondary, and tertiary prevention, concepts coined by Caplan (1964) in his definition of prevention. According to the APA Concise Dictionary of Psychology (2009), primary prevention is defined as "research and programmes, designed for and directed to nonclinical populations at risk, that seek to promote and lay a firm foundation for mental, behavioral, or physical health so that psychological disorders, illness, or disease will not develop" (p. 394). Secondary prevention refers to "interventions for individuals or groups that demonstrate early psychological or physical symptoms, difficulties or conditions (i.e., subclinical-level problems) which is intended to prevent the development of more serious dysfunction or illness" (p. 450, APA Concise Dictionary of Psychology, 2009). Tertiary prevention refers to "intervention and treatment for individuals and groups with already established psychological or physical conditions, disorders, or diseases. Tertiary prevention includes attempts to minimize negative effects, prevent further disease or disorder related to complications, prevent relapse, and restore the highest physical or psychological functioning possible" (p. 518, APA Concise Dictionary of Psychology, 2009). Even though the concepts of primary, secondary, and tertiary are still used, according to the EMCDDA (2008b), this classification has been replaced by that of universal, selective, and indicated forms of prevention. Hence, universal activities target the entire population (e.g. all the students within a school), selective activities target groups of people considered to be at increased risk for substance abuse but not yet showing signs of it (e.g. young offenders), and indicated activities are directed not at groups, but rather at individuals already affected by other types of problem behaviour (EMCDDA, 2008b).

Another question regarding substance use prevention refers to the purposes of interventions. In Midford's opinion (2009), most prevention interventions aim to achieve some form of abstinence. The EU Drugs Strategy in effect (i.e., the EU Drugs Strategy 2013–2020) states that the objectives of prevention are to measurably reduce of substance use; delay the age of onset; and prevent and reduce problem substance use, dependence, and health and social risks and harms associated with substance use. More recently, Burkhart and Simon (in press)

have claimed that the challenge of prevention is not solely to prevent substance use or to delay initiation, but instead to help young people to adjust their behaviour, capacities, and well-being in several fields of their lives such as living conditions, social norms, interaction with peers, social status and opportunities, and their own personality traits.

### **Substance Use Prevention Models.**

As Catalano, Kosterman, Hawkins, Newcomb, and Abbott (1996) have stated, "theory provides a basis for the design of approaches" (p. 14). Yet, compared with the vast literature on theories explaining substance use (Becoña, 2003; Hawkins et al., 1992; NIDA, 1980; O'Connell et al., 2009; Petraitis et al., 1995; Swadi 1999; Wright & Pemberton, 2004) and despite the several theoretical approaches that substance use prevention has encompassed over the last five decades, literature on substance use prevention models is relatively scarce.

To Olaio (2001), "before the 1960s, it's hard to see the existence of a model which would supply a solid theoretical base to the interventions developed in the context of primary prevention" (p. 23). Indeed, as stated by Midford (2009), substance use by young people has become a major community concern in most western industrialized nations since the 1960s. From the 1960s onwards, the few references addressing theoretical approaches to substance use prevention (Becoña, 2003; Canning, Millward, Raj, & Warm, 2004; Flay, 2000; Gorman, 1996; Jones, Sumnall, Witty, McVeigh, & Bellis, 2006a; Midford, 2009; Olaio, 2001; Pruitt, 1993; Romano & Hage, 2000) seems to point to the existence of three main approaches: the informative model; the affective education model; and the social influence model.

Overall, and as stated by Flay (2000), the focus of prevention programmes "has moved from information to affective approaches, and then to social skills and correction of normative beliefs. They have also changed in terms of the domains of influence, from being largely classroom-based to including parents, using the mass media, and involving community" (p. 862). In Portugal, as reported by Dias (2007) within a review of the Portuguese legal-political facts from 1970 until 2004, there was also a shift from an information-based to a social skills approach along with a shift from a predominantly school-based setting to more diverse settings for the delivery of substance use prevention interventions.



### ***The informative model.***

The informative model, named by Flay (2000) as the first generation of preventive approaches, was the basis for the first substance use prevention interventions (Becõna, 2003). According to Gorman (1996), "during the early 1960s to the early 1970s, programmes were knowledge based and concerned primarily with imparting factual information about drug effects and drug use" (p. 506). In Portugal, the same occurred although a few years later: as reported by Dias (2007), it was not until the late 1970s that substance use prevention started to assume a more relevant role within the Portuguese national drug strategy, mainly through information-based strategies, mostly implemented within school curricula. The informative model, still used today (Olaio, 2001), presupposes that adolescents do not have enough knowledge on the negative effects of substances (Becõna, 2003) and that providing adolescents with such knowledge is sufficient to lead them to make the rational decision of not using substances (Olaio, 2001). Therefore, interventions based on this model seek to increase adolescents' awareness on substances and to increase their knowledge on the health and social consequences of substance use (Jones et al., 2006a). Pruitt (1993) have identified two sets of information-based approaches: early versions that included scare tactics, half-truths, and persuasive techniques aimed to induce fear (e.g. self-disclosure sessions performed by ex-addicts) and later versions where accurate information on substances is given (e.g. lectures on substances by health professionals) but still assuming that the more knowledge adolescents get, the more inclined they will be to avoid use. As shown by several studies (Booth, Zhang, & Kwiatkowski, 1999; White & Pitts, 1998) even though this prevention approach has, in some cases, influenced knowledge and attitudes, it has not been found to change substance use behaviour. Indeed, as stated by Canning et al. (2004), "the expected linear causal link between knowledge, attitudes and behaviour has not, however, been established" (p. 10). In fact, some informative interventions may even contribute to increased substance use by boosting curiosity and enhancing knowledge about how to identify, obtain, and use substances (Flay, 2000). Despite the lack of effectiveness and the evidence of possible iatrogenic effects, strategies based on the informative model are still part of preventive approaches in many European countries (EMCDDA, 2011a), including Portugal (IDT, IP National Report, 2012) which, as pointed out by Burkhart (2011), is explained by their ease of implementation and dissemination.

### ***The affective model.***

The affective model followed the informative model and was, according to Gorman (1996), the most widely used approach during the early 1970s to early 1980s. In Portugal, as reported by Dias (2007), during the 1980s there was a shift in approach to substance use prevention, which became integrated into the broader perspective of mental health and was considered a priority area within substance use. Interventions started to focus on the development of personal and social skills and on parenting skills and Portugal was even considered to be at the forefront of the implementation of school-based substance use prevention interventions at the 11<sup>th</sup> International Conference on Prevention and Treatment of Drug Addiction that was held in Vienna in 1987 (Dias, 2007). This model, named by Flay (2000) as the second generation of preventive approaches, adopted a slightly broader stance than the informative model by focusing on "broader issues of personal development thought to be important in the etiology of drug use" (p. 506, Gorman, 1996). Overall, this model presupposed that, in order to change substance use behaviours and attitudes, it is necessary to change the potential affective mediators that contribute to adolescents' substance use. This model focused extensively on the individual and was based on the assumption that psychological factors placed adolescents at risk for substance use (Pruitt, 1993). Therefore, affective educational approaches aimed to reduce substance use by increasing self-esteem, self-understanding, and self-acceptance (Jones et al., 2006a), mainly through activities such as values clarification, decision-making process, and alternative leisure activities (Gorman, 1996; Jones et al, 2001; Olai, 2001). The focus on self-esteem, self-understanding, and self-acceptance might be related to the fact, highlighted by Jones et al. (2006a), that many professionals seem to believe intuitively that there is a causal connection between self-esteem and substance use even though there is lack of evidence to support that claim. In Olai's opinion (2001), the inclusion of values clarification activities within substance use prevention interventions might be based on the assumption that substance use is a consequence of a system of values that is not well defined. The inclusion of decision-making skills activities, in turn, might be based on the premise that it is not possible to eradicate substances from our societies, the most effective approach would be to help adolescents to develop decision-making skills which enable them to take alternatives and consequences into consideration when deciding whether to use substances or not.

### ***The social influence model.***

The social influence model followed the affective model and, in Gorman's opinion (1996), has dominated since the early 1980s. This model, largely based on the social learning theory and considered by Flay (2000) as the third generation of preventive approaches, represented a large step forward in the prevention field by acknowledging the role of interpersonal factors on adolescents' substance use. In Portugal, this broader view on prevention occurred over the 1990s, when substance use prevention was encompassed within the frame of health education and interventions became increasingly a priority for schools and families (Dias, 2007). As stated by Canning et al. (2004), the social influence model is based on the premise that social pressures entice adolescents to use substances, and thus adolescents need to develop refusal skills and receive normative education about substance use. Overall, as stated by Midford (2009), the aim of the social influence model is to make adolescents aware of the social influences towards substance use and to equip them with the skills to resist it. According to Gorman (1996), there are two basic types of social influence interventions: those based on a refusal skills approach and those based on a social skills approach. The refusal skills approach, also called the social resistance skills approach, recognizes the role of several social influences including the direct modeling of substance use behaviour and social pressure from peers, along with persuasive advertising and media portrayals encouraging alcohol, tobacco, and other substance use (Botvin & Griffin, 2004). Therefore, this approach aims to enable adolescents to recognize, cope with, or avoid situations where they will be pressured by their peers to use substances (Jones et al., 2006a). The social skills approach conceives substance use as "a socially learned and functional behavior that is the result of interplay between social and personal factors" (p. 215, Botvin & Griffin, 2004) through social learning processes such as modeling, imitation, and reinforcement. According to the social skills approach, adolescents with poor personal and social skills are more vulnerable to influences that promote substance use and more motivated to use substances as an alternative to more adaptive coping strategies (Botvin, 2000). Therefore, a social skills approach focuses on teaching generic social and personal skills, such as decision-making, interpersonal communication, assertiveness, and coping with anxiety and anger, along with resistance skills (Botvin & Griffin, 2004).



### **Type of Intervention.**

As stated by Toumbourou et al. (2007), "traditional classification of prevention approaches includes primary, secondary, and tertiary strategies. Primary prevention aims to reduce risks and prevent new cases, secondary prevention seeks to limit harm in the early stages of a disorder, and tertiary prevention treats the long-term sequelae and consequences of the disorder" (p. 1393). However, in 1994, the United States Institute of Medicine, based on the level of risk of the groups targeted with interventions, proposed the concepts of universal, selective, and indicated prevention, as a complementary typology for classifying prevention approaches. More recently, the concept of environmental prevention was added to this typology and this has already been integrated into the EMCDDA's Prevention Profiles<sup>3</sup>.

Each of these typologies cover different target groups, with different aims, within different contexts, using different strategies, and are differently disseminated. Data from the Exchange on Drug Demand Reduction Action (EDDRA)<sup>4</sup>([www.emcdda.europa.eu](http://www.emcdda.europa.eu)) show that, from 236 substance use prevention interventions targeting young people registered in this database, around two-thirds (68%) were universal, just less than one-quarter (24%) were selective, only a few (5%) were indicated, and even less (3%) were environmental. From the 20 Portuguese interventions targeting young people registered in the EDDRA database, over half (55%) were indicated and the rest were universal. There were no Portuguese environmental or indicated prevention interventions registered.

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<sup>3</sup>The EMCDDA's Prevention Profiles provide information on the level of implementation of different prevention measures in 30 European countries. Each prevention profile presents a structured overview of environmental, universal, selective, and indicated prevention measures implemented in each country, based on data provided by the 'Reitox network' using structured questionnaires that are filled in by experts in each country. Data currently presented in the EMCDDA Prevention Profiles relates to 2010.

<sup>4</sup>The EDDRA is the EMCDDA's online database of evaluated interventions in drug demand reduction implemented in EMCDDA member countries. Entries are submitted to the EDDRA by national focal points and only projects that reach minimal evaluation requirements are included. Even though EDDRA does not reflect the overall number of existing projects within one country, it still provides an alternative measure of its prevention culture in systematically designing and evaluating interventions.

### ***Environmental prevention.***

Environmental prevention is aimed at altering the immediate cultural, social, physical, and economic environments in which people make their choices about substance use (Burkhart, 2011). It is based on the premise that changes in alcohol and illegal substances environments, distribution, accessibility, and patterns of social use may reduce demand, influence risk perception, and shift the acceptance of nonuse to the norm (Gorman et al., 2004).

The underlying assumption of environmental prevention is that the decision to use substances, besides being based on intrapersonal variables, is also influenced by factors in the environment where individuals spend their lives. Accordingly, "because substance use is viewed as a product of the overall system, the rationale of environmental prevention strategies is to target the community or society at large rather than attempting to persuade people individually to change their behaviour " (p. 89, Burkhart, 2011).

Burkhart (2011) identifies three types of environmental strategies: (a) macro strategies which comprise supranational and national legislation regulatory of taxation, restrictions on sales and advertising, labeling, or minimum purchasing age; (b) meso strategies which aim to restrict availability and reduce harm associated with substance use settings through local strategies such as legislation to reduce public nuisance, alcohol and tobacco bans in schools, and conditional event licensing; and (c) microstrategies within family environments such as norms and education styles. Hence, as noted by Burkhart and Simon (in press), environmental prevention strategies often entail coercive measures including determining legal age and tobacco bans, which are effective but often resisted in some sectors of the population.

Perhaps one of the most resisted measures has been the prohibition of smoking in public places, a measure that, since 2004, has spread rapidly and is currently implemented by the majority of EU Member States (Simon & Burkhart, in press). In Portugal, legislation restricting smoking in public places, prohibiting advertising and establishing the minimum legal age to purchase as 18 years (Lei 37/2007) entered into force in 2007. Interestingly, comparison of data from three waves of the National Survey on Drugs in the General Population (INCSPPP) (Balsa, Farinha, Nunes, & Chaves, 2002; Balsa, Vital, Urbano, & Pascueiro, 2009; Balsa et al., 2013) shows that from 2007 onwards there was a decrease in smoking prevalence, corresponding with the year this legislation was enacted.

Establishing a minimum legal age for purchase has also been described as an effective measure for alcohol control. According to Toumbourou et al. (2007), there is substantial evidence of effectiveness for the enforcement of minimum age legislation to purchase alcohol, mainly if compliance with regulations is checked. Yet, as highlighted by Simon and Burkhart (in press), advances in environmental prevention of alcohol use have been less visible and strategies implemented by EU Member States have been mostly persuasive approaches (e.g. campaigns) with fewer environmental strategies (e.g. regulation, taxation or legislation). Therefore, proposals of minimum pricing for alcohol and legislation on alcohol promotion are being debated in several European countries (Burkhart, 2011) along with a continuous pressure to establish a minimum age of 18 for selling and serving alcohol (Simon & Burkhart, in press). Verily, Portugal is slowly evolving in that direction by recently approving a Decree-Law (Decreto-Lei 50/2013) that increases to 18 years the minimum age for purchasing spirits, even though the minimum age for acquiring all the other alcoholic beverages remains at 16 years.

Despite targeting predominantly legal substances such as alcohol and tobacco, in Burkhart's opinion (2011) environmental prevention it is an important approach for the whole prevention field because early and frequent use of alcohol and tobacco is, in many countries, associated with polydrug illicit substance use. Moreover, as highlighted by Faggiano (2011), by changing norms, "environmental prevention can increase substantially the impact of prevention at the level of population. School policies and smoke-free homes can, for example, reduce the social pressure around the adolescents, and increase the effect of schools interventions" (p. 102).

Concerning the implementation of environmental strategies in Portugal, as reported in the prevention profile posted on the EMCDDA website ([www.emcdda.europa.eu](http://www.emcdda.europa.eu)), there are: full smoking bans in schools, both for students and teachers; extensive school policies framing students' consumption and dealing illicit substances, extensive development of substance use prevention community plans, extensive formal and institutional community networks offering broad and coordinated services such as social welfare, housing, and family mediation; but limited community support, involvement and empowerment systems, limited training in prevention and empowerment for community groups, limited youth drop-in centres offering recreational facilities and counseling service, limited mobile teams for young people, and limited offer of alternative activities.

### ***Universal prevention.***

Universal prevention addresses an entire population within a particular setting. The overall underlying assumptions of universal prevention are that almost anyone can benefit from prevention efforts with a health promotion orientation; that the risk for initiating substance use is equal for all individuals within the population; and that participants have never used substances. Hence, the aim of universal prevention is to deter or to delay the onset of substance use by providing all necessary information and skills for people to decide against substance use (EMCDDA, 2011).

Universal prevention can be delivered within broader settings such as schools or communities, or smaller settings such as families. According to Burkhart and Simon (in press), in Europe at least, universal prevention takes place predominantly in schools because they facilitate access to the largest target populations. Indeed, over three-quarters (74%) of the universal prevention interventions registered at EDDRA database from the EMCDDA included school-based activities.

Within a Cochrane review, Foxcroft and Tsertsvadze (2011c) concluded that "in school settings, universal prevention typically takes the form of alcohol awareness education, social and peer resistance skills, normative feedback, or development of behavioural norms and positive peer affiliations. Prevention programmes can be either specific curricula delivered as school lessons, or classroom behaviour management programmes" (p. 3). In Portugal, substance use prevention is part of the school curricula and approached within health promotion and education in school subjects such as Sciences, Biology, and Civic Education (IDT, IP National Report, 2011).

As reported by the EMCDDA (2011a), non-evidence-based activities (e.g. stand-alone information provision about substances, drug information days, or external expert visits) appear to be the most common universal strategies delivered within schools in several countries. In Portugal, as reported in the prevention profile posted at the EMCDDA website, even though there is limited provision of lectures by ex-users or experts, there is an extensive provision of other activities considered unlikely to be beneficial (e.g. extracurricular activities, drug information days and activities, visits of law enforcement agents to schools, school-based

stand-alone information provision, and non programme-based approaches where teachers freely deliver prevention-related contents on an ad hoc basis).

Family-based prevention is another widely utilized approach in universal prevention (EMCDDA, 2011b). Even though, as stated by Griffin, Samuolis, and Williams (2011), the focus of universal family-based interventions varies somewhat with the age of the target child, Foxcroft and Tsertsvadze (2011b) concluded that it "typically takes the form of supporting the development of parenting skills including parental support, nurturing behaviours, establishing clear boundaries or rules, and parental monitoring" (p. 3).

Usually, universal parenting skills training interventions include four to eight sessions of two to three hours each (UNODC, 2009) and comprise sessions for the parents or sessions with parents and children together (Griffin et al., 2011). With children, social and peer resistance skills, behavioural norms, and positive peer affiliations (Foxcroft & Tsertsvadze, 2011b) as well as the development of skills to reduce aggressive or antisocial behaviors (Griffin et al., 2011) can also be addressed.

As noted, family-based prevention interventions do not typically focus exclusively on the prevention of one behaviour, but rather are designed to target a range of health behaviours among young people (Foxcroft & Tsertsvadze, 2011b). Still, in Europe, only 11 countries reported full or extensive provision of family meetings to the EMCDDA, with the focus of most of these interventions being information provision and intensive coaching and training for families offered only on a limited basis (EMCDDA, 2011a).

In Portugal, there are nine universal interventions targeting young people currently registered in the EDDRA database and six universal manualised interventions that have addressed personal skills such as decision making, coping, and goal setting. One of these interventions, called "Me and others", was developed by the IDT, IP, targets young people aged 10 to 18 years and focuses on promoting healthy development by covering subjects relevant to adolescence such as sexuality, diet habits, violence, exercise, school dropout, and substance use (IDT, IP National Report, 2010). "Me and others" is being implemented across various educational settings and the latest evaluation suggests an increase in variables such as time management, social competence, intellectual flexibility, leadership, emotional control, proactive behaviours, and self-confidence among participants that might be due to the

programme (IDT, IP National Report, 2012). However, more accurate conclusions on the effects of this intervention cannot be taken, as no control group was included in the evaluation design.

As noted by Simon and Burkhart (in press), there has been an aversion to the standardisation inherent in manualised interventions in Europe, resulting in a reduced number of manualised interventions implemented in European countries. However, a recent publication of the EMCDDA (2013) on the adaptation and implementation of prevention programmes from North America to European countries, mentions three examples of manualised interventions (i.e., the Good Behaviour Game, the Communities That Care, and the Strengthening Families Programme) considered to be innovative and effective in preventing a range of behaviours including substance use.

Europe has also taken its first steps towards original manualised interventions with "Unplugged", a programme developed, implemented, and evaluated by experts in seven European countries with a basic curriculum of 12 one-hour interactive sessions, delivered by class teachers to 12 to 14 year-old students (Van Der Kreeft et al., 2009). According to Simon and Brukhart (in press), "Unplugged" is, to date, the only multi-site randomised controlled trial on substance use prevention in Europe. It has indicated persistent positive effects over 18 months for alcohol abuse and cannabis use in a cluster-randomised trial involving 7.079 pupils aged 12 to 14 years in seven European countries (Faggiano et al., 2010).

Overall, and as stated by Foxcroft and Tsertsvadze (2011a), "universal prevention interventions are best when the risk factors for development of a problem are not easy to identify, are diffuse in the population, and are not easily targeted by an intervention" (p. 3). Besides, as highlighted by the same authors, universal prevention is indicated whenever most of the problems arising within a population come from those showing lower levels of risk and not those showing the highest levels of risk (i.e., the so called prevention paradox) (Foxcroft & Tsertsvadze, 2011a). Nevertheless, as argued by Griffin, Botvin, Nichols, and Doyle (2003), universal prevention programmes may be ineffective for high-risk youth who may require selective interventions or even indicated interventions that target those already engaging in substance use.

### ***Selective prevention.***

Selective prevention targets specific subgroups within a given population. The underlying assumptions of selective interventions are that the risk for using substances vary within population subgroups; that these groups can be identified through personal and social characteristics, and that these groups benefit from an intervention that targets specific risk factors, instead of universal risk factors. Therefore, as pointed by Burkhart and Simon (in press), prior to providing the intervention, the vulnerability pattern of a given target group has to be assessed.

Usually, groups in need of selective prevention are identified based on their personal characteristics, mainly demographic; the characteristics of their families, particularly parents; and the characteristics of the social environments they live in. Accordingly, some of the most commonly recognized vulnerable groups are students from vocational schools, early school drop-outs, or students with history of academic failure; young people living with substance using or neglectful relatives, living in disadvantaged families, or living with relatives with criminal justice problems; young people living in deprived neighbourhoods, in care institutions, or homeless; and minority groups or immigrants. As pointed by Burkhart and Simon (in press), the higher vulnerability of these groups stems from social exclusion, lack of opportunities, and less-nurturing family or community environments. Even though substance use may be more likely to occur within these vulnerable groups (EMCDDA, 2008a), "it is not possible to draw conclusions on the vulnerability of any individual in these groups" (p. 19, EMCDDA, 2011b).

Like universal prevention, the aim of selective prevention is to delay or prevent the onset of substance use (EMCDDA, 2012b) and it can be delivered within broader settings, such as schools or communities, or smaller settings, such as families. However, considering that many vulnerable young people live in social exclusion situations and, therefore, may not be attending schools, settings such as communities and families are of particular relevance for selective prevention. In Europe, over two-thirds (65%) of the selective prevention interventions registered at EDDRA database from the EMCDDA included community-based activities and there has been an increase in the provision of interventions targeting vulnerable families, particularly socially disadvantaged families with substance use problems (EMCDDA, 2010).

As for the content of selective prevention, even though information is scarce, the most common selective interventions emphasize information, awareness-raising and counselling (EMCDDA, 2011a). In Burkhart and Simon's opinion (in press), the effective components in selective prevention within school settings, but also outside, seem to be practically the same as in universal prevention. However, as found by Lammers et al. (2011) when conducting a meta-analysis of school-based substance use prevention interventions, selective interventions have generally shown higher effects than universal interventions. The same seems to be applicable to family-based selective prevention. As found by Bröning et al. (2012) within a comprehensive systematic review to identify and summarise evaluations of selective preventive interventions in childhood and adolescence, when compared with universal youth-only substance abuse prevention programmes, selective family-focused prevention interventions have shown effects up to nine times greater.

According to the EMCDDA (2010) evidence of effectiveness of selective interventions is still limited, perhaps because of the variability regarding outcome measures (Bröning et al., 2012) and the difficulty of implementing experimental evaluation designs (EMCDDA, 2010). As a result, and even though all forms of intervention (i.e., school-based, community-based, and family-based interventions) have shown valuable results (Bröning et al., 2012), evidence for the effectiveness of selective prevention is currently limited (Burkhart & Simon, in press), especially for school-based programmes (Bröning et al., 2012). Conversely, the success of family-based interventions is clearer and there is preliminary evidence of effectiveness especially if interventions target both parents and children, address parenting and family skills training components, and are delivered over more than ten weeks (Bröning et al., 2012).

Another interesting question regarding selective prevention has been raised by several researchers (Cho, Hallfors, & Sánchez, 2005; Poulin, Dishion, & Burraston, 2001) who have found possible iatrogenic effects when vulnerable young people are grouped together in selective interventions. As explained by Cho et al. (2005), clustering high-risk young people "provides a consistent opportunity to affiliate and bond with deviant peers" (p. 371). As explained by Burkhart and Simon (in press), when members of a selective group model each other's problem behaviour, they are reinforcing the belief that their deviant behaviour is normal and that the surrounding social environment is not, therefore worsening problem behaviour. As found by Poulin et al. (2001), iatrogenic effects can last up to three years following



intervention. Alternatively, instead of aggregating vulnerable youth and targeting them selectively, they can be integrated within an universal approach that, as shown by Griffin et al. (2003), can be effective with selective populations at decreasing substance use at the one-year follow-up among youth at high risk.

In Portugal there are 11 selective prevention interventions targeting young people currently registered in the EDDRA database. As reported on the EMCDDA website, the provision of selective interventions to young offenders and young people in socially disadvantaged neighbourhoods is extensive; the provision to young people in care institutions, with substance abusing family members, living with social disadvantaged parents, living within families with high conflict and negligence is limited; the provision to early school leavers, students with academic problems, ethnic groups, and families with criminal justice problems is rare.

A particularly selective intervention for substance use in Portugal that is worth mentioning is the Operational Plan of Integrated Responses (PORI). The PORI, the major intervention programme from the IDT, IP, is intended to provide an integrated framework for the design of interventions in the field of addictive behaviours at a national, regional, and local level (IDT, IP National Report, 2008). Its implementation started with a national needs assessment undertaken by the IDT, IP in collaboration with 754 local organisations (IDT, IP National Report, 2011) in order to identify the most vulnerable Portuguese territories and prioritise them for funding. From a total of 163 identified territories (IDT, IP National Report, 2007), 51 were considered priorities and served as a base for IDT, IP calls for tender. Overall, 130 interventions received funding from the IDT, IP, from which over half (62 interventions) were prevention interventions (IDT, IP National Report, 2012). The purposes of PORI are to increase knowledge on substances; to build a comprehensive network of integrated responses in the domain of prevention, dissuasion, treatment, and harm reduction; to increase the scope, accessibility, effectiveness, and efficiency of interventions; and to contribute to the quality of interventions by reinforcing the scientific and methodological programme components (IDT, National Report, 2007). According to data available on the EMCDDA website, over 2011, the preventive measures undertaken within the PORI targeted nearly 56.400 people mainly through awareness raising, information activities, and educational interventions.

### ***Indicated prevention.***

Indicated prevention targets individuals within a given population. The overall underlying assumptions of indicated interventions are that the risk for using or abusing substances is different across individuals belonging to a given population; individuals with greater risk of using or abusing substances can be identified through early signs of substance use or related behaviours; and these individuals benefit from a tailored intervention that targets their personal risk and protective factors, instead of universal risk factors.

As highlighted by the EMCDDA (2009b), indicated prevention is a relatively new branch of prevention, which is reflected not only in the limited literature on this subject (Hillebrand & Burkhart, 2009) and the implementation of indicated interventions, but even in the heterogeneity of the definition of the target group. While according to NIDA (2003), indicated interventions are designed for people already experimenting with substances, for the EMCDDA (2009b) indicated prevention targets individuals showing risk factors for developing substance abuse later in life (e.g. school failure, conduct disorder, aggressive behaviour, attention deficit or hyperactivity disorder, antisocial behaviour, or substance-using parents) and who might be showing early signs of substance use. In either case, the aim of indicated interventions is not to stop initiation or use, but to prevent, or at least delay, the progression to dependence and to prevent more risky patterns of substance use (EMCDDA, 2009b).

Even though these at-risk children can be referred to indicated interventions through parents, social workers, pediatricians, or courts (EMCDDA, 2009b), as stated by Simon and Burkhart (in press), school settings have become crucial for identifying vulnerable children and adolescents. In fact, as noted by these authors, while in 2004 only five EU Member States reported full or extensive availability of early identification of students with behavioural or substance use related problems, this number had more than doubled by 2010. However, in Portugal, as reported in the prevention profile posted at the EMCDDA website, the provision of school-based early detection mechanisms of students showing risk behaviours related to substance use is still limited.

After being referred to indicated prevention interventions, children and adolescents are usually targeted with some sort of brief and manualised intervention focused on reinforcing self-esteem and stimulating positive interactions and, in some cases, including family intervention such as

parent training (EMCDDA, 2009b). According to the EMCDDA (2012b), in most European countries, indicated prevention continues to be based on the provision of counselling to young substance users. These brief interventions consist of a few one-to-one counseling sessions, usually delivered by trained health professionals or social workers after an assessment of substance use problems (Burkhart & Simon, in press). The sessions are normally based on the technique of motivational interviewing, which is a non-confrontational and empathetic approach, sensitive to the participant's ambivalence toward change (Grenard et al., 2007). Reflection on substance use and its consequences considering the individual's values and goals is promoted (McCambridge & Strang, 2004), and active listening and feedback are used to support decision making and goals setting regarding substance use (Burkhart & Simon, in press).

Adolescents targeted with motivational interviewing not only report higher readiness to change their substance use (Grenard et al., 2007), but have also reduced their level of smoking, drinking, cannabis using (McCambridge & Strang, 2004), as well as other illicit substance use (Peterson, Baer, Wells, Ginzler, & Garret, 2006). A particularly encouraging finding reported by McCambridge and Strang (2004) was that those most at risk generally showed the most beneficial changes in their substance use behaviours after the motivational interviewing.

Data regarding the implementation of indicated interventions in the EU show that there is a common lack of evidence-based and well established interventions; indicated interventions differ widely between countries; there is some misclassification regarding what is indicated prevention; and most interventions were set up without any evaluation or provided insufficient information on evaluation (EMCDDA, 2009a). Therefore, the EMCDDA (2009b) points out that new interventions for at-risk groups neglected until now, such as children in foster care or children placed in institutions, should be developed; instruments used to screen vulnerable individuals, either in schools, families, or work context, must be harmonized across Europe; and high quality standards interventions should be disseminated and implemented in other countries.

### **Setting of Intervention.**

Substance use prevention can be delivered within many contexts. As stated by Cuijpers (2003), most interventions designed to prevent alcohol, tobacco, and illegal substances use are conducted in schools, but others are delivered within families and communities.

Each of these intervention settings (i.e., community, school, and family) cover different target groups, with different aims, using different strategies, and are differently disseminated. Data from the EDDRA database from the EMCDDA shows that, from the 236 substance use prevention interventions targeting young people registered in this database, just over one-third (35%) were community-based, an equal proportion (35%) were school-based, one-quarter (25%) were multi-setting, and just a few (4%) were family-based. In Portugal, of the 20 interventions registered in EDDRA database and targeting young people, over one-third (40%) were community-based, an equal proportion (40%) were multicomponent, less than one-sixth (15%) were school-based, and just a few (5%) were family-based.

### **School.**

As Chapman, Buckley, Sheehan, and Shochet (2013) have stated, the school social context is critical in shaping adolescents' behaviour and, as Canning et al. (2004) have noted, the school setting has been the main focus for substance use prevention in young people. Even though, historically, school-based prevention has aimed to change student knowledge, attitudes, and behaviour, schools are now being recognized as more than just places for delivering prevention interventions and both substance use education and school contexts measures are important components of school-wide health promotion in Europe (Evans-Whipp et al., 2004).

The UNODC (2004) has contributed to the planning of school-based programme by defining guiding principles such as the need to emphasize learning outcomes, environmental factors, and collaborative partnerships; address drug-related learning outcomes in the context of the health curriculum, linked to other health issues that impact on students' lives; create a school environment conducive to achieving educational outcomes and building productive partnerships; develop collaborative partnerships for decision-making; use interactive teaching and learning methods; develop responsive and inclusive educational interventions for the prevention of substance abuse; train teachers in substance abuse prevention education as a

way to enhance the impact and sustainability of substance abuse prevention interventions; design interventions, strategies, and resources in order to support the teacher, to help achieve drug-related learning outcomes, and to contribute to the long-term improvement of the school environment; regularly evaluate prevention interventions and their outcomes in order to provide evidence of their worth and to improve the design of future interventions; and develop collaboratively and widely publicize policies and procedures for managing drug-related incidents at schools.

In fact, the existence of school policies regarding substance use, the extent to which these policies are enforced, along with teachers' behaviours and expectations towards students substance use, all influence students' perceptions of social approval of substance use. Thus, if these aspects of the school environment remained unchanged, any change in students' attitudes, normative beliefs, social skills, or substance use behaviour will perish over time (Flay, 2000). In Burkhart's opinion (2011), there appears to be a growing awareness about the importance of the school environment considering that, in 2010, seven EU Member States reported that their objective in school-based prevention was to create protective school environments. In fact, as recently reported by the EMCDDA (2011a), almost all EU Member States have reported total smoking bans in all schools and a majority of countries have reported full or extensive provision of illicit substance policies in schools. In Portugal there is a full smoking ban in school for students and teachers and extensive school policies framing students' consumption and dealing with illicit substances (EMCDDA, [www.emcdda.europa.eu](http://www.emcdda.europa.eu)). However, in Europe, the actual level and quality of implementation of school-based environmental strategies is unknown and evaluations are very rare (Burkhart, 2011).

Schools have been seen as an appropriate and convenient context to reach large numbers of school-aged children (Soole, Mazerolle, & Rombouts, 2008) and consequently most school-based prevention interventions are universal interventions (Cuijpers, 2003). Even though, according to the EMCDDA (2008b), using the school context with this purpose represents "a failure to exploit its full potential in terms of addiction prevention" (p. 125), the fact is that "school-based measures seldom address the school context. In most cases they are concerned with individual factors. In other words, 'school' is to be understood as the context for delivery of prevention that addresses individuals" (p. 60, EMCDDA, 2008b).

As for the most usual content included in school-based interventions, Foxcroft and Tsertsvadze (2011a), based on analysis of 20 randomized control trials, concluded that "in school settings, prevention programming typically aims to foster decision making skills amongst young people, either through raising awareness of harms, or through skill-based curricula which help young people to understand and develop skills to resist social influences, such as peer pressure" (p.3). The EMCDDA (2011b), based on monitoring information on the contents of school-based substance use prevention interventions implemented in EU member states, concluded that "non-evidence-based activities (e.g. stand-alone information provision about drugs, drug information days, external 'expert' visits, theatre workshops) appear to be the most common" (p. 20).

Regarding the target group, many substance use prevention interventions are delivered to middle school or junior high school students because this is usually when youth begin to experiment with substances (Griffin et al., 2003). However, as suggested by the NIDA (2003), substance use prevention should start sooner, given that early intervention on risk factors associated with later substance use often has a greater impact by moving the child away from problems and toward positive behaviours. One of the principles for prevention planning is to ground prevention interventions in theory and needs assessment. Therefore, considering target group characteristics such as child age and level of development, the NIDA (2003) has defined age-specific content to be addressed within prevention interventions. For elementary school-age children, prevention interventions should focus on skills such as self-control, emotional awareness, communication, social problem-solving, and academic support, especially in reading. For middle or junior high and high school students, prevention interventions should focus on skills such as study habits and academic support, communication, peer relationships, self-efficacy and assertiveness, substance use resistance skills, reinforcement of anti-drug attitudes, and strengthening personal commitments against substance abuse (NIDA, 2003).

Even though the overall effectiveness of universal school-based prevention had been repeatedly questioned (EMCDDA, 2010), several reviews have shown that certain interventions can be effective in preventing substance use. A Cochrane review carried out by Thomas and Perera (2007) covered randomized controlled trials of behavioural interventions in schools to prevent smoking. Based on analyses of 23 trials, the authors concluded that, even

though it is difficult to exclude a beneficial effect of information about tobacco alone, there is little evidence available to support this type of intervention. Conversely, there are well-conducted randomized controlled trials to test the effects of interventions based on the social influence approach, with half of these studies reporting that the intervention group smoked less than the control group (Thomas & Perera, 2007). It should be noted, however, that the highest quality and longest trial included in this review found no long-term effects either at school-leaving or later follow-up (Thomas & Perera, 2007).

Another contribution came from a Cochrane review undertaken by Foxcroft and Tsertsvadze (2011c) examining the effectiveness of universal school-based programmes in preventing alcohol misuse. The authors included 53 studies in their review, and even though most were cluster randomised, the reporting quality of trials was poor. Thus, and considering the extensive heterogeneity across interventions, populations, and outcomes, the authors summarised the results only qualitatively. From 11 studies targeting alcohol use, six showed some evidence of effectiveness, whereas the three targeting cannabis, alcohol, and/or tobacco showed inconsistent results. From 39 studies evaluating interventions that were not substance-specific, 14 reported significantly greater reductions in alcohol use. From this, the authors concluded that there was no easily discernible pattern in characteristics that would distinguish trials with positive results from those with no effects (Foxcroft & Tsertsvadze, 2011c).

Faggiano et al. (2005) conducted a Cochrane review to evaluate the effectiveness of school-based interventions in preventing or reducing illicit substance use. The authors included 29 randomized control trials which were divided according to the underlying type of preventive model (i.e., knowledge-based, affective-based, and skills-based). Even though none of the studies satisfied all the quality criteria of the review, the authors were able to conclude that knowledge-based interventions increased knowledge on substances but less than affective programmes; affective-based interventions improved decision-making skills and knowledge on substances; and skills-based interventions significantly improved knowledge on substances, decision-making skills, self-esteem, and peer pressure resistance, being the only type of intervention effective in reducing cannabis and other illicit substance use (Faggiano et al, 2005).

### ***Family.***

As highlighted by the UNODC (2009), "supportive families are essential to raising socially, mentally and physically healthy and well-adjusted children and preventing later adolescent problems" (p. 1) and, for that reason, families are a particularly relevant setting for prevention. As highlighted by Foxcroft and Tsertsvadze (2011b), family-based prevention programmes do not focus exclusively on the prevention of one behaviour, but rather are designed to impact on a range of health behaviours among young people. Thus, and considering the importance of parenting behaviours on adolescent substance use, a variety of family-based prevention programmes have been developed. According to Griffin et al., (2011), "these interventions can be classified as either universal programmes primarily addressing parent and family skills training and education, or selected and indicated programmes that include brief family therapy or in-home visitation and family support models" (p. 320).

In general, and regardless of being universal, selective, or indicated, family-based prevention interventions aim to strengthen protective factors by teaching parents better family communication skills, developmentally appropriate discipline styles, firm and consistent rule enforcement (NIDA, 2003), nurturing and supporting behaviours, and parental monitoring skills (Foxcroft & Tsertsvadze, 2011b). As for substance use specifically, these programmes focus on enhancing parenting skills for developing, discussing, and enforcing family policies on substance use (Griffin et al., 2011). Family-based interventions may also address children's skills, such as prosocial skills, skills to reduce aggressive or antisocial behaviors (Griffin et al., 2011), self-control (Koning, van den Eijnden, Engels, Verdurmen, & Vollebergh, 2010), social and peer resistance skills, behavioural norms, and positive peer affiliations (Foxcroft & Tsertsvadze, 2011b).

Therefore, within a typical session, parents and their children attend separate training groups and, at the end, come together as a family to practice the skills learned (UNODC, 2009). Indeed, having family sessions jointly with parents and their offspring seems to be a key structure and interventions targeting both parents and their offspring show greater effects on substance use outcomes than interventions targeting either separately (Koning et al., 2009; Winters, Fahnhorst, Botzet, Lee, & Lalone, 2012).

Besides this key feature, the EMCDDA (2008b) has identified other characteristics of effective family-based interventions such as providing a comprehensive intervention that starts at an



early age, continues throughout life, addresses numerous risk factors and protective factors and embraces several settings; relying on an empirically confirmed theoretical basis; focusing on the promotion of positive parent-child interaction, training in the social-reinforcement and constructive discipline; using interactive training methods, mediator training, and material tailored to stages of development; taking into account cultural and community context; providing sufficient treatment and follow-up; and including evaluation.

The UNODC (2009) has added to the field by developing a set of guidelines for family skills training programmes that highlight the need for interventions to be grounded on theory and on needs assessment; be matched to the level of risk and also to the age and level of development of children; be adequate in terms of intensity and duration; use interactive activities with groups of no more than 8-12 families; provide parents with the skills and opportunities to strengthen positive family relationships and family supervision and monitoring, and assist them in communicating family values and expectations; focus resources on recruiting and retaining families, including reaching them at important transition points; be chosen on the basis of its level of evidence of effectiveness; be adapted to meet the cultural and socio-economic needs of the target population through a well-resourced, careful and systematic process if replicated in a different community from that in which it was developed; provide adequate training and ongoing support for carefully selected staff; and include strong and systematic monitoring and evaluation components.

Over recent years, several attempts have been undertaken to provide further evidence on the effectiveness of family-based interventions in reducing substance use among children and adolescents. Petrie, Bunn, and Byrne (2007), based on a systematic review of 20 controlled studies of parenting interventions to prevent tobacco, alcohol, or illicit substance abuse in children younger than 18, noted that statistically significant reductions in alcohol use were found in six out of 14 studies, reductions in illicit substance use in five out of nine studies, and reductions in tobacco use in nine out of 13 studies. Based on these findings, the authors concluded that family-based interventions can be effective in preventing or reducing substance use and that the most effective appeared to emphasize active parental involvement and the development of skills in social competence, self-regulation, and parenting. It should be noted, however, that increases in tobacco, alcohol, and illicit substance use were reported in three

interventions. According to the authors, "morework is needed to investigate further the changeprocesses involved in such interventions andtheir long-term effectiveness" (p. 177).

In the same year, Thomas, Baker, and Lorenzetti conducted a Cochrane review to assess the effectiveness of interventions to help family members strengthen non-smoking attitudes and promote non-smoking by children and other family members. The authors found nine high quality family-based studies for inclusion in the review. Four out of these nine studies had reported significant positive effects at short andlong-term follow-up, while four studies found no effects and one reported negative results on the smoking status of children who reported no use of tobacco at baseline (Thomas, Baker, &Lorenzetti, 2007).

In order to summarise the current evidence on the effectiveness of universal family-based interventions on alcohol use among young people, Foxcroft and Tsertsvadze (2011b) conducted a Cochrane systematic review. Based on the assessment of 12 parallel-group trials the authors considered interventions to be quite heterogeneous and the quality of trials to be poor. For these reasons, they summarised data only qualitatively and indicated that nine of the 12 trials showed some evidence of medium and longer term effectiveness compared to a control or other intervention group. Foxcroft and Tsertsvadze (2011b) concluded that the effects of family-based prevention interventions are small but generally consistent and also persistent into the medium to longer term.

As for illicit substances, Gates, McCambridge, Smith, and Foxcroft (2009) conducted a Cochrane review to summarise evidence on the effectiveness of illicit substance use prevention interventions targeting young people delivered in non-school settings. Within this review four types of intervention were included: motivational interviewing or brief intervention; education or skills training; family interventions; and multicomponentcommunity interventions. According to the authors, many studies had methodological flaws, especially high levels of loss to follow-up and due to the insufficient number of eligible studies, no firm conclusions could be drawn. Out of the 17 studies included, three studies on family interventions suggested beneficial effects in preventing cannabis use.

### ***Community.***

Even though school setting has been the main focus for substance use prevention in young people (Canning et al., 2004), "schools are only one channel through which to reach young people, and they cannot be expected to affect all of the influences on adolescent substance use" (p. 762, Cheon, 2008). As claimed by Holder (2000), substance use occurs largely within community contexts and is part of routine community life, and thus substance use must be considered in the context of the community.

In fact, according to Cuijpers (2003), "the increasing popularity of community interventions is the result of the growing consensus among scientists and practitioners that the combination of several interventions at different levels is more effective than individual interventions" (p. 14). However, in Cheon's opinion (2008), until recently less attention has been paid to community-based interventions and few studies have evaluated community-based interventions on youth substance use problems. According to VanderWaal, Powell, Therry-McElrath, Bao, and Flay (2005), this lack of effectiveness studies is, in part, due to the complexity of co-occurring variables that exist in community-based interventions. As noted by Brown et al. (2013), "in recent years, researchers and practitioners seeking to promote adolescent well-being and prevent behavioral health problems have recognized that establishing community-wide change in the environments that affect adolescent behavioral health requires the participation of all stakeholders who influence the lives of young people" (Introduction section, para. 1).

According to Holder (2000), community-based interventions can be classified as using a traditional approach or an environmental approach. According to this author, traditional approaches view communities as catchment areas where high-risk groups can be approached and engaged, leaving those outside the targeted groups unaffected, and focus mostly on demand reduction. Conversely, environmental approaches view communities as systems and highlight the need to change the existing social, economic, and cultural structures within the community that provide the context in which substance use occurs (Holder, 2000).

The EMCDDA (2008b) has classified community-based prevention interventions into cross-system interventions (i.e., when interventions entail numerous components involving systems such as school, family, or media) or collaborative interventions (i.e., when networks of

organisations and individuals who are committed to pursuing a specific aim within their community are involved). According to the EMCDDA (2008b), most community-level interventions are cross-system interventions. Jones et al. (2006a) conducted a review of community-based interventions to reduce substance misuse among vulnerable young people that included four systematic reviews and 96 primary studies. Data from this review allowed the authors to conclude that the most commonly delivered activities were youth interventions; case management interventions; employment skills interventions; counselling and therapy-based interventions; community mobilisation interventions; family therapy-based interventions; multicomponent interventions; and school-based interventions comprising skills-based interventions and counselling and therapy-based interventions. Cheon (2008) has also confirmed this focus on a more traditional approach after analysing 12 community-based prevention interventions and concluding that most interventions (i.e., eight out of 12) took place in school and community settings and employed skillsdevelopmentstrategies aimed at increasing youth resiliency and only a few (i.e., four out of 12) were comprehensive community-wide interventions.

Therefore, according to the EMCDDA (2008b), most community-based interventions are aimed at increasing resilience indeprived and marginalised neighbourhoods by improvingthe general social environment and increasingcommunity cohesion and group identity. In order to achieve this goal, prevention interventions work at the community level with civic, religious, law enforcement, and other government organisations (Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001) and acombined set of activities is organized in specific regions or towns, targeting adolescents, as well as their parents and other people and organisations (Cuijpers, 2003). In fact, one of the prevention principles held by NIDA (2003) is that community-based prevention interventions that combine two or more effective components, such as family-based and school-based components, can be more effective than a single-component programme.

Some efforts have also been made to systematize information on features associated with community-based effectiveness, maintenance, and sustainability. For instance, Holder (2000) highlighted the need to take into account local values and culture in community-based interventions design and implementation, purposefully involve the community, and get the support of community leaders. Cheon (2008), has added to this question by emphasizing the need to have clearly articulated goals; target at-risk youth with age and developmental level

appropriate intervention; incorporate community-wide or community-school settings; provide structured alternative activities; deliver social-behavior education; and use peer leadership and mentoring strategies, family involvement, community mobilization, and media advocacy.

Over recent years several attempts have been undertaken to provide evidence on the effectiveness of community-based interventions in reducing substance use among children and adolescents. One of these attempts was carried out by Sowden and Stead (2008) who conducted a Cochrane review assessing the effectiveness of community interventions for preventing smoking in young people. From the 17 controlled trial studies included in this review, three studies reported differences in attitudes, perceived positive consequences, intention to smoke, and smoking prevalence, allowing the author to conclude that there is limited support for the effectiveness of community interventions in helping prevent the uptake of smoking in young people (Sowden & Stead, 2008).

Another attempt came from Foxcroft, Ireland, Lister-Sharp, Lowe, and Breen (2003) who undertook a Cochrane systematic review on the effectiveness of preventive interventions for alcohol misuse in young people that included studies on three large-scale community-based interventions. One intervention was associated with a reduction in alcohol related crashes and a reduction in the number of retail outlets selling alcohol to underage buyers. Another was associated with a decrease in the number of arrests for drinking and driving among youth. The third reported a significant decrease in drinking behavior while the intervention was ongoing, but not afterwards.

Jones et al. (2006b) have added to this field by undertaking a review on interventions delivered in community settings designed to prevent or delay substance use in vulnerable young people. Based on the analyses of 222 studies, these authors noted that, even though improvements in substance use knowledge and attitudes have been reported, most interventions did not produce a reduction in substance use behaviours beyond the immediate post-intervention assessment phase, thus it was difficult to draw conclusions from the studies reviewed.

### ***Multicomponent programmes.***

According to Tobler (2000), preventive "approaches that are not supported by concomitant changes in the community and family will not be able to counter the myriad of pro-drug

influences experienced by today's youth" (p. 269). Likewise, in Adelman and Taylor's opinion (2003), "substance abuse prevention is best pursued as an integrated part of a comprehensive, multifaceted continuum of interventions" (p. 346) as "the committed involvement of school, family, and community is essential in maximizing intervention implementation and effectiveness" (p. 346). Indeed, it is becoming more common for effective substance use prevention interventions to be conducted in several settings through multisetting or multicomponent interventions (NIDA, 2003).

The added value of these interventions in preventing substance use has been the subject of research. Flay (2000) compared the effectiveness of exclusively school-based interventions with school-based interventions combined with either environmental change, parental training, community projects, or mass media initiatives. Based on the analyses of the most known studies, the author concluded that while there was evidence that parent training, mass media, and community-wide interventions can be effective, there is little evidence of the added effects of any of these approaches over and above the effects of the school-based interventions with which they are often combined (Flay, 2000). According to Flay (2000), "this disappointing result is mostly because most study designs did not allow for separate estimates of school curricula and any added components. The few studies that would have allowed for such estimates were either too small, or found no differential effects" (p. 878).

Tobler et al. (2000) have added to this question by undertaking a meta-analysis of 207 school-based interventions that performed random assignment to intervention and control groups. They concluded that the average effect size from all available studies of system-wide prevention interventions (i.e., interventions that either address the school system or constitute multicomponent cross-system interventions) was statistically significant.

Loveland-Cherry (2000) has also added to this field by conducting research on community-based multicomponent interventions that included family-based components. Based on the analyses of 13 studies, the author concluded that studies tended to indicate short-term effectiveness but fewer long-term results (Loveland-Cherry, 2000).

Sowden and Stead (2008) made another contribution, which took the shape of a Cochrane review on the effectiveness of cross-system projects designed to prevent the uptake of smoking. Based on the analyses of 17 controlled trial studies, the authors declared that there

is some evidence that coordinated multicomponent community interventions can reduce smoking prevalence among young people and that they do so more effectively than single strategies alone (Sowden & Stead, 2008). A year later, Gates et al. (2009) conducted a Cochrane systematic review to summarise evidence on preventive interventions delivered in non-school settings to prevent or reduce use of illicit substances by young people. From the 17 studies included, only five were multicomponent community interventions, which according to the authors was not a representative sample. Further, interventions were too different and many studies had methodological drawbacks, especially high levels of loss to follow-up. Even though no firm conclusions could be drawn on whether non-school based interventions prevent or reduce illicit substance use by young people, the authors argued that multicomponent community interventions seem to have no strong effects on illicit substance use.

More recently, Foxcroft and Tsertsvadze (2011a) conducted a Cochrane review to synthesize evidence on the effectiveness of universal multicomponent prevention interventions in preventing alcohol misuse in school-aged children up to 18 years of age. Twenty parallel-group trials were included in this review, from which only 25% reported adequate methods of randomisation and 5% adequate allocation concealment. Given the heterogeneity across interventions, populations, and outcomes, the authors summarised results only qualitatively and reported that 12 out of the 20 trials had shown some evidence of effectiveness compared to a control or other intervention group, with effects lasting from three months up to three years (Foxcroft & Tsertsvadze, 2011a). Out of the 12 interventions showing some evidence of effectiveness, seven allowed the assessment of the additional benefit of multiple versus single component interventions from which only one had clearly demonstrated a benefit of components delivered in more than one setting. Based on these results, Foxcroft and Tsertsvadze (2011a) concluded that there is some evidence that multicomponent interventions for alcohol misuse prevention in young people can be effective but that there is little evidence that these interventions are more effective than interventions with single components.

### **Type of Components.**

Substance use prevention interventions integrate a wide range of activities and use a wide range of strategies, varying according to the theoretical approach underlying the

intervention, the type of intervention, the setting where the intervention is being delivered, and the target group addressed by the intervention.

Several authors have proposed topologies to classify preventive interventions, mainly based on the focus of these interventions. One of these attempts was undertaken by Pruitt (1993) that, based on the analyses of substance use prevention curricula in schools, classified interventions into five categories: interventions focused on knowledge change; interventions focused on attitude change; interventions focused on knowledge and attitude change; interventions focused on peer relationships; and interventions focused on alternatives to substance use. Interventions addressing attitude change emphasize intrapersonal growth, social growth, values clarification, and decision making, whereas interventions that focus on peer relationships target both interpersonal (e.g. peer interaction, social skills, and social competence), and intrapersonal factors (e.g. enhancement of self-esteem, coping skills, and decision-making skills) (Pruitt, 1993). Interventions that focus on alternatives to substance use, besides promoting positive activities for adolescents to engage in instead of using substances, also promote activities designed to increase personal competence (e.g. reading skills, job skills) or even to increase sense of personal control (Pruitt, 1993).

Tobler et al. (2000), a few years later, classified prevention activities into five categories, in a similar way as Pruitt (1993): knowledge; affective; peer-based; knowledge plus affective; and alternatives to substance use. The author stressed that knowledge strategies address the effects of substance use and are set out in order to build negative attitudes toward substances, whereas affective strategies address factors such as self-esteem or self-awareness building based on the assumption that psychological factors place people at risk of substance use. Strategies combining knowledge and affective interventions are aimed at providing values and building decision-making patterns. Within peer-based strategies issues such as refusal skills and social life skills are developed, based on the assumption that peer pressure can lead to substance use, while strategies promoting alternatives to substance use encourage alternative activities or those aimed at enforcing control abilities.

Rovira (2001) has made another contribution by classifying substance use prevention strategies into five categories: strategies centered on information dissemination, highlighting their negative effects; strategies centered on the supply of alternatives to substance use,



including alternatives for leisure time; strategies focusing on affective components such as self-esteem, attitudes, and beliefs related to substance use; strategies based on social influence, promoting peer pressure resistance skills; and strategies promoting general skills.

As for the content of substance use prevention interventions, Hansen, Dusenbury, Bishop, and Derzon (2007) conducted a systematic evaluation and rated content manuals from 48 substance use prevention interventions that were listed as model and effective by SAMHSA, and were on the USA National Registry of Effective Programmes and Practices. Based on a content analysis, these authors identified 23 thematic areas grouped into four components: motivation and disposition to use substances, personal competence, and interpersonal or social skills, and social environmental characteristics (Hansen et al., 2007). Within the motivation and disposition to use substances component, issues typically approached were anti-drug attitudes, beliefs about consequences, commitment to not use or reduce use, normative beliefs, and values incongruence, whereas within the personal competence component the issues addressed usually were academic skills, decision-making skills, emotional self-regulation, goal-setting skills, and self-esteem (Hansen et al., 2007). As for the interpersonal or social skills component themes such as assertiveness, resistance skills, media literacy, communication skills, social problem-solving skills, and social skills were addressed as a way to teach how to deal with social influence (Hansen et al., 2007). Components designed to change social and environmental characteristics addressed issues such as availability, access, enforcement, alternatives to substance use, school bonding, classroom management, positive school environment, family management, positive home environment, parental monitoring, positive peer affiliation, and peer support.

As noted by Pruitt (1993), very few interventions involve only one approach. According to this author, most interventions included provision of information alongside with values clarification, decision-making and problem-solving skills, and self-awareness (Pruitt, 1993). Moreover, as concluded by Hansen et al. (2007), there was no content included in all programmes although subjects such as beliefs about consequences, decision-making skills, and attitudes were among those included more often, whereas parental monitoring, opportunities for associating with positive peers, positive alternatives, improving classroom management, access, availability, and enforcement were among those less included.

According to the IDT, IP National Report(2011), some of the most delivered components by prevention interventions implemented within the PORI approached were life skills training, informative sessions on substances, leisure activities, and teacher training.

### ***Life skills training.***

According to the WHO (2003), "life skills are abilities for adaptive and positive behaviour that enable individuals to deal effectively with the demands and challenges of everyday life" (p. 3). Thus, as stressed by Botvin (2000), poor personal and social skills, or life skills, are believed to increase adolescents' susceptibility to substance use, among other risk behaviours. Thereby, as reported by NIDA (2003), the majority of research-based prevention interventions in schools include life skills training. Most life skills interventions integrate a general competence enhancement component that are designed to teach generic skills that can be applied in many areas of adolescents' lives (Griffin & Botvin, 2010) and address subjects such as communication, interrelationships skills, critical and creative thinking, decision making and problem solving, self-awareness, empathy, and coping with stress and emotions (Bühler, Schröder, & Silbereisen, 2008).

In Griffin and Botvin's opinion (2010), the "most effective competence-enhancement programs teach personal and social skills and emphasize the application of general skills to situations related to substance use as well as how they are used in other important situations" (p. 7). Additionally, most life skills interventions include a specific component addressing social resistance skills (Botvin, 2000), information about substances, value clarification, and norm education (Bühler et al., 2008).

Life skills training has been consistently identified as one of the most effective components in preventing substance use (Cuijpers, 2002; Faggiano et al., 2005; EMCDDA, 2008b; Jones et al., 2006a; White & Pitts, 1998). Botvin and Griffin (2004), based on studies conducted by their research group (Griffin, Scheier, Botvin, & Diaz, 2001; Griffin, Epstein, Botvin, & Spoth, 2001), have added to knowledge on the effectiveness of life skills training by concluding that life skills protect adolescents from substance use by increasing psychological well-being, reducing positive expectancies regarding the social benefits of substance use, and increasing refusal assertiveness.

One of the most extensively and rigorously evaluated programmes is Life Skills Training (LST), a multicomponent competenceenhancementbased preventive intervention programme (Botvin & Griffin, 2004) that consists of three major components. The first component is designed to teach students a set of general self-management skills, such as decision-making, problem-solving, skills for identifying, analysing, and resisting media influences, and self-control skills for coping with anxiety and anger (Botvin & Griffin, 2004). The second component focuses on general social skills and is designed to improve interpersonal skills, including how to overcome shyness, how to give and receive compliments, how to initiate social interactions, skills related to dating, and assertiveness (Botvin & Griffin, 2004). The third component focuses on information and skills that are specific to substance use and is designed to promote substance use resistance skills, anti-drug attitudes, and anti-drug norms (Botvin & Griffin, 2004). Studies assessing the results of LST have demonstrated an effect on knowledge, attitudes, and expectations (Botvin, Griffin, Paul, & Macaulay, 2003). They have also shown a decrease in the prevalence of drinking (Botvin, Griffin, Diaz, & Ifill-Williams, 2001), smoking (Botvin et al., 2003), and use of illicit substances (Botvin, 2000). Further, research indicates that these effects can last for up to six years (Botvin et al., 2000) and be obtained with high-risk populations (Griffin et al., 2003). However, there is some evidence that skills may work differently depending on the substance in question. While communication skills do not seem to contribute to reducing cigarette or cannabis use, they may contribute to an increase in intentions to use alcohol (Stephens et al., 2009).

### ***Information sessions.***

In Karlsson's opinion (2008), the most common approach to substance use prevention among adolescents is to inform them about the risks associated with substances, assuming that, if adolescents are informed, they will decide rationally not to use substances. However, research has shown that, even if providing information can increase knowledge and make attitudes towards substance use more negative, it does not decrease intention to use substances or use itself (Botvin, 2000; Michaelidou, Dibbb, & Ali, 2010; Tobler et al., 2000). However, according to the EMCDDA (2009a), the most recent reports confirm that informative sessions constitute the main approach in universal prevention in all EU Member States. Within informative

sessions, some of the most frequent components are long term physiological effects of substances; short term social and behavioral effects of substances; the influence that media and social groups exert on substance use; and substance use prevalence among youth (Tobler et al., 2000). These issues can be approached in three ways: information sessions can be fear-arousing, provide half-truths and include scare tactics, or they can include factual information about the effects and risks associated with substance use (Pruitt, 1993).

An interesting issue related to information provision was raised by Lundborg and Lindgreen (2002) who found that adolescents, contrary to what was expected, overestimated the risks of becoming an alcoholic and that, following an informative session on the actual risks of alcohol use, adolescents' risk perception decreased. Therefore, the authors concluded that providing accurate information about substance use may not be the optimal educational policy as it may increase the risk of substance use (Lundborg & Lindgreen, 2002).

More recently, Krank, Ames, Grenard, Schoenfeld, and Stacy (2010), within a study aimed at assessing the impact of information statements on the accessibility of alcohol outcome expectancies, found that merely being exposed to statements on alcohol effects increased the recall of such information even when participants were told that these contents were myths (Krank et al., 2010). Even more disturbing, the authors found that myth statements explicitly stating that the content was not true actually increased the likelihood that the content was reported as a fact (Krank et al., 2010). Based on these findings, the authors concluded that some information provided with good intentions may in fact produce counterproductive effects.

### ***Leisure activities.***

Participation in leisure activities is important for the psychological development of adolescents given that, as stated by Eccles, Barber, Stone, and Hunt (2003) it links adolescents to "a set of similar peers, provides shared experiences and goals, and can reinforce friendships between peers and relationships with adults" (p. 874). Moreover, as affirmed by Leversen et al. (2012), "the positive processes of psychological need satisfaction, and especially the need for competence and relatedness, experienced in the leisure activity domain thus seem to be beneficial for adolescents' wellbeing" (p. 1588).

Leisure activities can be described as a way to offer young people opportunities to engage in activities that occupy their unstructured time, develop pro-social skills or knowledge, or involve them in the community (VanderWaal et al., 2005). They can be structured (i.e., activities organized by adults around specific social or behavioural goals such as involvement in sports leagues or scouting activities) or unstructured (i.e., activities arising more spontaneously such as engagement in social interactions with peers or siblings or play activities) (Fletcher et al., 2003).

There is growing evidence demonstrating that participation in leisure activities is positively related with academic achievement (Fredricks & Eccles 2006) and academic competence (Kristjansson, James, Allegrante, Sigfusdottir, & Helgason, 2010) and negatively related with aggression, antisocial behavior, and crime (Rhodes & Spencer, 2005). More specifically, engagement in sports is associated with higher levels of psychosocial maturity, social competence (Fletcher et al., 2003), and emotional regulation (Larson, Hansen, & Moneta, 2006).

There is also evidence that participation in supervised leisure time activities, such as organized sports, confers protection against drinking (Kristjansson et al., 2010), smoking (VanderWaal et al., 2005), and illicit substance use (Peretti-Watel & Lorente, 2004) an effect that can last up to 12 months (Fredricks & Eccles, 2006; Werch, Moore, DiClemente, Bledsoe, & Jobli, 2005). Moreover, as shown by Thorlindsson and Bernburg (2006), peer groups formed on the basis of leisure activities can have a deterrence effect on substance use even if adolescents have close contact with substance-using peers.

### ***Teacher training.***

Teachers are in the position to provide children with frequent opportunities to practice new skills and, therefore, promote children's positive development and generalization of positive skills (Han & Weiss, 2005). Hence, and even though not having specific training to implement prevention interventions (Harthun, Dustman, Reeves, Hecht, & Marsiglia, 2008), teachers have been considered the logical candidates for delivering prevention interventions to students (Kealey, Peterson, Gaul, & Dinh, 2000). However, as highlighted by Harthun et al. (2008), "it is counterproductive to thrust a teacher into the role of prevention specialist without first

equipping them with the knowledge, experience, and validation needed to be proficient" (p. 438).

Training constitutes an important opportunity for teachers to develop and practice interactive teaching strategies (EMCDDA, 2008b) and is a known characteristic of effective school-based substance use prevention interventions (NIDA, 2003; UNODC, 2004). The relevance for training is even more evident when considering that teachers may believe themselves to have the appropriate level of comfort to approach prevention subjects even without previous experience in teaching prevention curricula (Harthun, et al., 2008).

According to the UNODC (2004), some of the objectives of teacher training should be to: increase knowledge about the facts associated substance use; increase the repertoire of methods for delivering prevention interventions; increase competence, confidence, and commitment towards prevention; assist teachers in planning, developing, and implementing prevention programmes; promote the use of interactive teaching methods; and train teachers to identify students who may experience substance use problems and to reference them.

Studies assessing the impact of teachers' training have shown that, after receiving training, teachers are more likely to implement the curriculum fully and with integrity (Ringwalt et al., 2003) and are more likely to use effective content and delivery methods (Ennett et al., 2003), a well-known determinant for a programme's success. By not preparing teachers to deliver substance use education, there is an increasing risk that teachers will abdicate their educational responsibilities and turn over the delivery of substance use education classes to other agents, such as police officers (Tupper, 2008).

### **Best Practices.**

#### ***School-based: "Unplugged".***

An example worth mentioning within school-based interventions is "Unplugged", a manualised school-based prevention intervention that is, to date, the only multi-site randomized controlled trial on prevention in Europe (Simon & Brukhart, in press). "Unplugged" is a school-based curriculum implemented by teachers that was developed, implemented, and evaluated by a cross-disciplinary group of experts in the frame of the European Drug Abuse Prevention

trial (Faggiano, Richardson, Bohrn, Galanti, & EU-Dap Study Group, 2007). It is based on a comprehensive social influence approach and aims to delay the onset of tobacco and cannabis use and of alcohol abuse among school students aged 12 to 14 (Faggiano et al., 2010). The programme was implemented during the 2004-05 school year in seven European countries (i.e., Sweden, Italy, Belgium, Spain, Germany, Greece, and Austria), targeting a total of 3,547 students aged 12 to 14 years. Students were randomly allocated to one out of three formats (i.e., class curriculum alone, class curriculum complemented by peer-led sessions, and class curriculum complemented by parental education) and then compared with a control group of 3,532 students (Faggiano et al., 2007).

The classroom curriculum consists of 12 one-hour interactive sessions, delivered weekly by classroom teachers who attended a three-day training course (Faggiano et al., 2007). These 12 sessions are organized into three blocks: the first block of sessions (units 1 to 4) is designed to provide adolescents with knowledge on tobacco, alcohol, and illicit substances; the second block (units 5 to 8) is designed to address social skills, such as effective communication, interpersonal relationship skills, and self-awareness and normative education; and the third block (units 9 to 12) is designed to focus on intrapersonal skills such as refusal skills, assertiveness, critical thinking, coping strategies, goal setting, decision making, and problem solving (Caria, Faggiano, Bellocco, Galanti, & EU-Dap Study Group, 2011). The added component of peer-led sessions consisted of seven short class meetings lasting for 15 to 20 minutes, held by two students selected by each class and flanking the core programme lessons (Van der Kreeft et al., 2009). The added component of parental education consisted of three evening interactive workshops for parents, conducted by an expert and lasting for two to three hours addressing issues on child and adolescent development, changes within families with children and adolescent offspring, and parenting styles (Van der Kreeft et al., 2009).

Even though the fidelity of implementation during the experimental phase was moderate (Van der Kreeft et al., 2009), studies assessing the programme's outcomes have shown that three months after intervention, significant reductions in daily smoking and episodes of drunkenness in the past 30 days, and marginal statistical significance for reductions in cannabis use in the past 30 days were observed (Faggiano et al., 2008). Despite being successful in preventing baseline non-smokers or sporadic smokers from moving onto daily

smoking, "Unplugged" was not effective in helping baseline daily smokers to reduce or stop smoking (Faggiano et al., 2008). At the 18 months follow-up, persistent positive effects were found for alcohol abuse and cannabis use but not for smoking (Faggiano et al., 2010).

The effectiveness of "Unplugged" has recently been recognized within in a Cochrane review synthesizing evidence on the effectiveness of universal school-based programmes in preventing alcohol misuse (Foxcroft & Tsertsvadze, 2011c), with the programme considered as an effective policy and practice option. Indeed, "Unplugged" has recently been implemented in the Czech Republic with significantly reduced rates of smoking and less frequent smoking, drunkenness, cannabis use, and use of any illicit substance having been reported (Gabrhelik et al., 2012).

***Family-based: "Strengthening Families Programme" (SFP).***

According to the EMCDDA (2013), an example of an innovative and effective substance use prevention intervention is the SFP, a manualised selective family-based programme developed by Karol Kumpfer and associates in 1983 in Utah in the USA. As described by Kumpfer, Alvarado, Tait, and Whiteside (2007), "SFP is an evidence-based, 14-session parenting and family skills training programme widely implemented as a substance abuse prevention programme for diverse families" (p. 160). The intervention "involves groups of approximately 4 to 12 parents in a Parent Skills Training Group in the first hour of each weekly session while their children attend a separate Children's Skills Training group. In the second hour the families are split into two multifamily Family Skills Training groups, each run by two group leaders. Families practice strengthens their skills of observation, monitoring, therapeutic play, communication, and effective discipline. After the programme's 14 sessions, reunion sessions are recommended at 6 and 12 months to help maintain intervention gains" (p. 160, Kumpfer et al., 2007). Later on, a shorter seven-session universal prevention version of the SFP for low-risk families with children aged 10 to 14 years, named the Iowa Strengthening Families Programme 10-14 years, was developed (Molgaard & Spoth, 2001).

Several studies have demonstrated the effectiveness of SFP (Kumpfer, Alvarado, & Whiteside, 2003) and its Iowa version (Molgaard & Spoth, 2001) with effects still identifiable up to 6-year follow-up (Spoth, Redmond, Shin, & Azevedo, 2004). One study on the effectiveness of SFP,



undertaken by Kumpfer, Whiteside, Greene, and Allen (2010), is particularly worth mentioning as it summarises research outcomes from a quasi-experimental, 5-year statewide study with over 1.600 high-risk families and compares outcomes including effect sizes for the four different age versions of SFP (i.e., 3-5, 6-11, 10-14, and 12-16 years). From this study, the authors concluded that all of the outcome variables (i.e., positive parenting, parent involvement, parenting skills, family organization, family cohesion, family communication, parent supervision, parenting efficacy, family conflict, parent and child alcohol and drug use, children's overt aggression, covert aggression, concentration problems, impulsivity, depression, and sociability) for the four programmes were statistically significant, except criminal behavior and hyperactivity in the older group (i.e., 10 to 16 year-olds).

The SFP was recognized by NIDA as an example of research-based drug abuse prevention interventions and as a model programme by the Substance Abuse and Mental Health Services Administration (SAMSHA). Moreover, the Iowa Strengthening Families Programme has recently been identified as an effective intervention in two Cochrane reviews, one aimed at identifying effective family-based interventions preventing alcohol misuse (Foxcroft & Tsertsvadze, 2011b) and another one identifying effective interventions for preventing illicit substance use (Gates et al., 2009).

The SFP has been successfully adapted and implemented for European countries such as Germany (Stolle, Stappenbeck, Wendell, & Thomasius, 2011), Italy (Ortega, Giannotta, Latina, & Ciairano, 2012), Ireland (Kumpfer, Xie, & O'Driscoll, 2012) and United Kingdom (Allen, Coombes, & Foxcroft, 2007). The EMCDDA (2013) report that other European countries such as Greece, Spain, the Netherlands, Poland, Portugal, Slovenia, and Sweden are also adapting and implementing the SFP. From these adaptation experiences, "European implementers consider that the SFP can feasibly be successfully adopted in Europe with populations that are socially and culturally different from those in the US" (p. 26, EMCDDA, 2013). Indeed, as stated by the EMCDDA (2013), cultural differences do not compromise effectiveness provided that key structures of the programme, such as the family sessions of parents and children together, are kept; material is adapted to the target group; and an adequate workforce is allocated to the programme.



### ***Community-based: "Communities That Care" (CTC).***

According to the EMCDDA (2013), an example of innovative and effective substance use prevention interventions is CTC, a community-based programme developed by David Hawkins and Richard Catalano in Seattle, Washington. As described by Brown et al. (2009), it is "a manualised prevention service delivery system that mobilizes communities to adopt a science-based framework that focuses on empirically identified risk and protective factors to prevent adolescent health and behavior problems" (p. 2).

CTC is guided theoretically by the Social Development Model (Hawkins & Weis, 1985) and is aimed at reducing levels of substance use and delinquency through the selection of interventions tailored to a community's specific profile of risk and protection (Brown et al., 2009). As described by Hawkins et al. (2008a), the implementation of CTC requires the involvement of community leaders and a community prevention coalition to plan and implement a set of tested interventions, structured into five phases.

As described by Hawkins et al. (2008a), phase 1 includes the assessment of attitudinal and organizational characteristics of community members, leaders, and organisations thought to influence the mobilization process and the identification of important individuals and organisations necessary to initiate CTC; in Phase 2 the CTC is presented to the community through a training event where roles and responsibilities of the key leaders (who are expected to hold the community prevention board and staff accountable for planning and carrying out CTC) are defined; in Phase 3, the CTC board assesses youth problem behaviours, risk and protective factors, and community resources and prioritizes risk and protective factors in order to identify gaps in existing policies, interventions, and services that address the identified prioritized factors; in Phase 4, the CTC board defines measurable objectives regarding the reduction of the prioritized risk factors, the enhancement of protective factors, and the reduction of substance use and delinquency, and develops a plan to bridge gaps in existing services through implementation of tested, effective policies and interventions; in Phase 5, the chosen preventive interventions are implemented by members selected by the community prevention boards who receive training and technical assistance from programme staff to ensure high-quality implementation, being implementation monitored by the CTC community prevention board and agency supervisors. Over this last phase, the CTC board also engages local media,

generates public support, and motivates community members to take part in the new preventive interventions.

From the several studies that have shown the efficacy of CTC (Feinberg, Greenberg, Osgood, Sartorius, & Bontempo, 2007; Feinberg, Jones, Greenberg, Osgood, & Bontempo, 2010; Hawkins et al., 2008a; Kuklinski, Briney, Hawkins, & Catalano, 2012), one is particularly worth mentioning (Hawkins et al. 2008b) as it is the first randomized controlled trial on CTC which tracked 4,407 youth from 5<sup>th</sup> grade up to 8<sup>th</sup> grade belonging to 24 communities implementing CTC. Data from this study have shown significant effects by the end of 8<sup>th</sup> grade on alcohol, cigarette, and smokeless tobacco use and delinquent behaviour; and on the prevalence of current alcohol use, binge drinking, and different delinquent acts in the past year. Other studies (Brown, Hawkins, Arthur, Briney, & Abbott, 2007; Brown, Hawkins, Arthur, Briney, & Fagan, 2011; Rhew, Brown, Hawkins, & Briney, 2013) have also shown that, when compared with control communities, those implementing CTC exhibit greater levels of adoption of a science-based approach to prevention; greater collaboration on prevention activities 1.5 years after implementation, higher levels of desired funding for prevention activities 6.5 years after implementation, and greater growth in community norms against adolescent drug use during the course of the study.

According to the EMCDDA (2013), in Europe there have been CTC feasibility trials in the United Kingdom (Bannister & Dillane, 2005) and the programme is currently being implemented in Germany, the Netherlands (Jonkman, Junger-Tas, & Van Dijk, 2005) and Croatia (Bašić, Šlehan, & Grozić-Živolić, 2008). Overall, the European implementers of CTC "believe it is feasible for it to be implemented in their countries in different contexts" (EMCDDA, 2013, p. 31).

### **Evaluation of Prevention Interventions.**

For Hillebrand and Burkhart (2009), the increasingly growing demand for accountability of interventions in public health has boosted efforts that determine which type of preventive approaches are effective in achieving substance demand reduction. Programme evaluation is the tool that allows this judgment on efficacy to be made (Midford, 2000) as "the knowledge that arises from an evaluation can be used to decide how to improve an intervention, whether

to expand it or to abandon it altogether and to draw lessons to design future interventions or to improve existing interventions" (p. 12, EMCDDA, 2012a).

As defined by the EMCDDA (2012a), "evaluating a prevention intervention means systematically collecting, analysing and interpreting information about how the intervention works, with which effects and for whom, by the rigorous use of scientific social research methods, to judge the merit and value of an intervention." Although consensus about the need for programme evaluation is high, there is still a disagreement about the most suitable evaluation approaches (EMCDDA, 2012a). However, the literature on evaluation consistently mentions planning evaluation, process evaluation, and outcome evaluation, as evaluation components that should be considered when assessing a prevention intervention.

Planning evaluation assesses the process of planning the intervention and includes the definition of the problem that is to be prevented, the associated needs, the group that is going to be targeted, the goals that are to be achieved, the methods that are going to be used, and existing resources (EMCDDA, 1998). Of the EU prevention interventions registered in EDDRA database from the EMCDDA, just a few (3%) performed a programme planning evaluation, similar to the percentage (5%) of Portuguese prevention interventions that have included this type of evaluation.

Process evaluation, in turn, is intended to assess what was done, based on what was planned (UNODC, 2004). It assesses the implementation of the programme by addressing its quality and usefulness, the reach and coverage, the acceptance of the intervention by participants, the implementation fidelity, and the use of resources (EMCDDA, 2011b). Despite the importance of process evaluation, McGrath, Sumnall, McVeigh, and Bellis (2006), within a review of reviews on substance use prevention among young people, concluded that many prevention interventions evaluations did not include a process evaluation to examine whether interventions were delivered correctly. Moreover, even when this assessment was made, quality was poor. This is a cause of concern, even more when considering evidence showing that prevention interventions are often not strictly implemented according with what was planned (Gottfredson & Gottfredson, 2002; Ringwalt et al., 2003) and that poor fidelity, in turn, can lead to loss of effectiveness (Fagan & Mihalic, 2003). Data from EDDRA database show that, although over three-quarters (83%) of the EU prevention interventions registered in this

database have included process evaluation, less than half (45%) of the Portuguese prevention interventions have comprised this type of evaluation.

Outcome evaluation gathers information with the aim of determining whether or not the intervention has achieved its goals (Lilja, Wilhelmsen, Larsson, & Hamilton, 2003), and is an essential tool for deciding whether a particular intervention is worth continuing, adapting, or discarding (EMCDDA, 2012a). Besides assessing whether the goals of the intervention were achieved, outcome evaluation should also determine what were the most relevant and significant results and compare them with results from other studies (EMCDDA, 2012a). If any changes have occurred from before the intervention is implemented to after implementation, outcome evaluation should be able to demonstrate that the changes identified are the result of the intervention itself (UNODC, 2004).

Above and beyond considering the positive effects from an intervention, outcome evaluation should also consider if there any negative effects were caused by intervention (EMCDDA, 2012a). When the results of the outcome evaluation are different from expected, data from the process evaluation are very useful in determining what may have been the cause of such changes in the outcomes (UNODC, 2009) as well as understanding how the programme can be improved in the future (EMCDDA, 2011b). Although just less than two-thirds (61%) of the EU prevention interventions registered in the EDDRA database (2013) have included outcome evaluation, just over one-third (35%) of the Portuguese prevention interventions have comprised this type of evaluation.

Data collected within these types of evaluation help to distinguish useful interventions from ineffective ones and, most importantly, from counterproductive interventions. As emphasized by the EMCDDA (2012a), distinguishing effective from ineffective not only improves the level of knowledge on prevention, but also serves as a basis for policymakers and those financing projects to decide which projects to support. According to Holder (2001), "all prevention programmes should be required to demonstrate at a minimum the feasibility of effectiveness before any funds are committed to them" (p. 11).

In Europe, even though prevention interventions are now being systematically monitored by the majority of Member States (EMCDDA, 2009a), prevention effectiveness remains poorly researched (EMCDDA, 2010) and very few prevention interventions have actually been

evaluated (EMCDDA, 2012b). Several reasons can explain this lack of consistent evaluation, one being the fact that prevention interventions are frequently crosscutting and multicomponent, thus it is difficult to establish the causal mechanisms by which an intervention achieves change (Sanderson, 2003). Additionally, many prevention interventions cannot be investigated with rigorous scientific methods due to ethical considerations (Hillebrand & Burkhardt, 2009). Another interesting question regards the measures used to determine prevention interventions' effectiveness and, according to the UNODC (2004), a common mistake is to consider substance use alone as a measure of success of prevention interventions. Indeed, as reported by the EMCDDA (2008b), "in most cases, the effectiveness of intervention is measured through short-term, statistically highly coincidental but not necessarily practically relevant changes in consumption variables" (p. 128). Moreover, still according to the EMCDDA (2008b), "making consumption the only yardstick for effectiveness is more than questionable, particularly in relation to sample groups for prevention measures, where by definition the number of consumers is small and patterns of consumption are not stable" (p. 128). Thus, this agency recommends that evaluation of substance use prevention interventions should include measurement of change in risk factors and protective factors proven to be predictors for subsequent abuse and dependency (EMCDDA, 2008b).

### **Quality of Prevention Interventions.**

Substance use prevention is seen, particularly by lay audiences, as informing young people about the effects of substance use and, even worse, as warning young people about the dangers of using substances (EMCDDA, 2011b). This is based on the assumption that, if young people are well informed about the risks of using substances, they will rationally decide not to use them (Karlsson, 2008). In fact, both the EU Drugs Strategy (2005-2012; 2013-2020) and the National Plan Against Drugs and Drug Addiction 2005-2012 (Plano Nacional Contra a Droga e as Toxicodependências 2005-2012) have identified, for the prevention domain, the need to increase information about substances and the risks associated with their use, despite there being no evidence showing that providing information on substances' effects alone has an impact on substance use behaviour (EMCDDA, 2008c). Conversely, there is robust evidence showing that the most effective prevention interventions are those targeting

significant risk and protective factors at the individual, family, and community levels (Carney & Myers, 2012; Cuijpers, 2002; Gottfredson & Wilson, 2003; Griffin & Botvin, 2010; Midford, 2009; Springer et al., 2004; UNODC, 2004, 2009; WHO, 2002).

Nevertheless, Hansen et al. (2007), following a systematic analysis of 48 substance use prevention interventions listed as model and effective by SAMHSA and on the USA National Registry of Effective Programmes and Practices, concluded that there was little to suggest that prevention interventions were theory driven and that most prevention interventions were "an amalgam of approaches that fit several theoretical notions of the programme developer but that are independent of formal theories" (p. 358). In Europe, the scenario seems to be similar, as according to the EMCDDA (2011b) "the overall predominance of interventions in Europe that lack, or have only a weak, evidence base, as well as the weak implementation of prevention in general are striking" (p. 43).

The predominant preventive approaches are often lacking a strong evidence base and, in some cases, include activities that may even be counterproductive, such as drugs information days, external lecturers, and visits by police agents (EMCDDA, 2008c). Moreover, even though manualised interventions are more likely to have been pre-tested to confirm the validity of their theory base and to have been evaluated to avoid iatrogenic effects and to prove efficacy (EMCDDA, 2013), very few EU Member States have implemented this type of sophisticated intervention (Simon & Burkhart, in press). Indeed, the development and implementation of manualised interventions require specific know-how, technical procedures, quality control, proof of effectiveness, and proof of absence of harm (Burkhart, 2011), implying considerable investment and high developmental costs (Simon & Burkhart, in press). This may explain why most EU Member States continue to implement informative approaches that are cheap and easy to produce and disseminate (Burkhart, 2011).

According to Burkhart (2011), "the EMCDDA's data collection during the last five years concerning the provision of different types of interventions in the EU does not indicate that there has been a major shift of prevention in Europe towards more evidence-based interventions, with the exception of some Member States and for specific interventions" (p.88). Nonetheless, some progress has been made towards a greater consolidation of prevention science: EU Member States are increasingly monitoring interventions and delivering data on



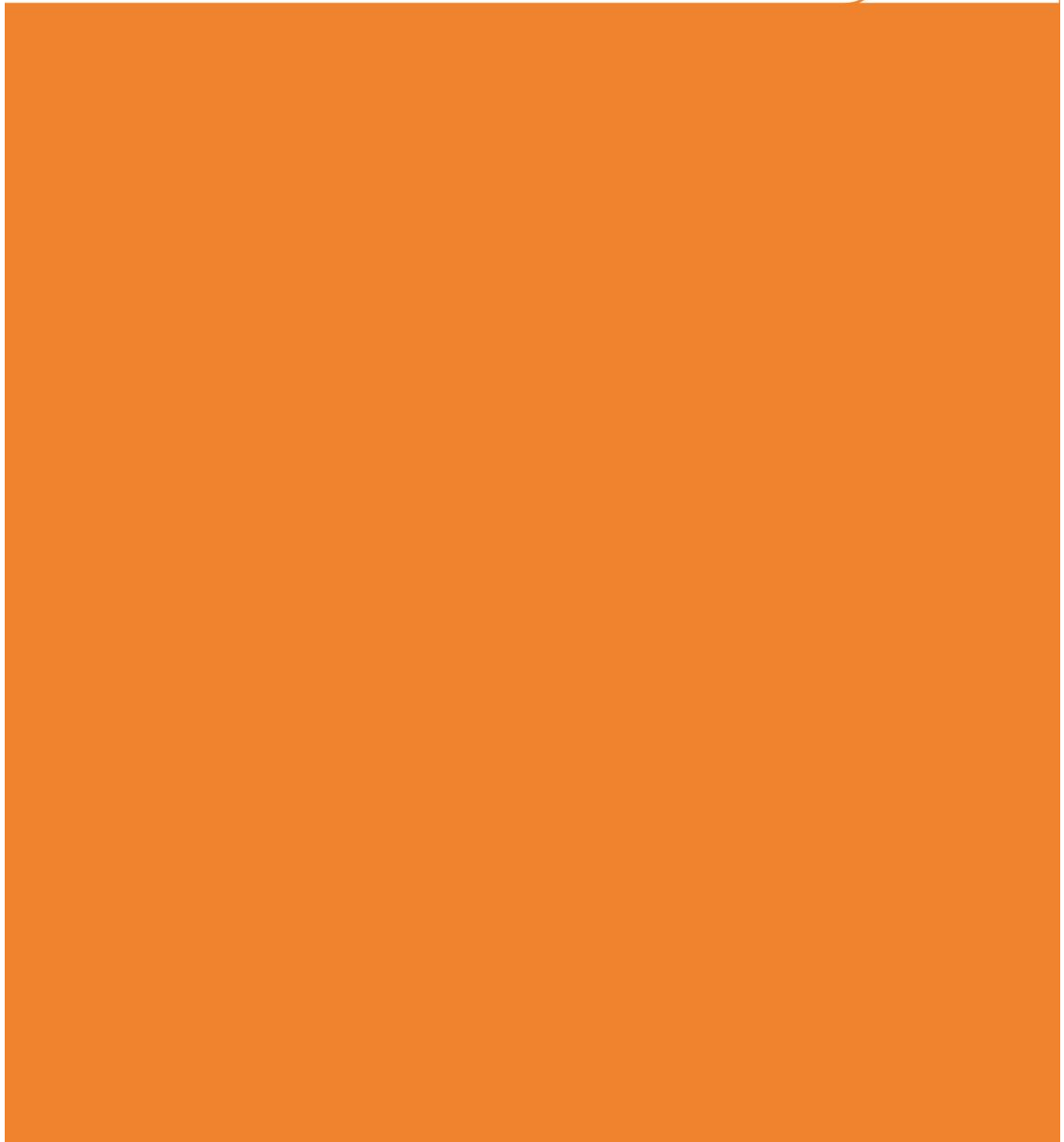
the content and availability of interventions (EMCDDA, 2007) and currently half of EU Member States have reported efforts to develop substance use prevention quality standards (EMCDDA, 2011b).

As for Portugal, since it was, in 2006, considered by EMCDDA as lacking strategies to provide common quality criteria, standards, and technical advisory services at the local level; lacking support for schools or communities in developing school policies; lacking adequate implementation of prevention interventions; and assuring only minimum quality criteria, it started to develop certification processes to guarantee the quality of interventions and the efficient use of resources from public budgets (EMCDDA, 2008c) and made an effort to register evaluated prevention practices in the EDDRA database. Currently, Portugal, along with Ireland, ranks fourth among countries with the most practices registered, with 20 interventions. Of these 20 interventions, more than half (60%) were classified as level 1 (i.e., accomplished the minimum criteria to enter the database: having been evaluated previously, having a theory base clearly related to its objectives, providing clear evaluation indicators related to the objectives and initial situation, presenting a clear description of the evaluation design, and being implemented for at least one year); less than one-third (30%) were classified as level 2 (i.e., considered promising projects); and one-tenth (10%) were classified as level 3 (i.e., considered top level projects).

In an attempt to improve European substance use prevention practice, the EMCDDA (2011b), has launched a publication prepared by several highly respected experts from EU Member States and international organisations, aimed at bridging the gaps between science, policy and practice. This publication provides quality standards for substance use in Europe by establishing a set of principles for conducting high quality substance use prevention by addressing quality assurance, adequacy of content, process of the intervention, and evaluation processes (EMCDDA, 2011b). According to these standards, prevention interventions should be relevant (i.e., focused on fulfilling the needs of participants, while making reference to relevant policy); ethical (i.e., ensuring voluntary participation and providing real benefits for participants); evidence-based (i.e., making use of the best available scientific evidence); effective (i.e., achieving set goals and objectives without causing harm); and feasible (i.e., achievable within available resources, and marked by a logical and coherent approach) (EMCDDA, 2011b).

As emphasized by the EMCDDA (2011b), quality "standards and their reinforcement through funding requirements are not only needed to improve the effectiveness of prevention but, above all, they are ethically necessary to guarantee that no harm is done through preventive interventions, which in most cases have not even been asked for by the target population" (p. 43). Indeed, iatrogenia, is an important question largely ignored within the prevention domain. According to Werch and Owen (2002), negative effects from interventions are hardly evaluated, described, analysed, interpreted, and published due to the lack of standardised evaluation procedures, the focus on process evaluation and on efficacy indicators, and even the authors' and publishers reluctance to publish about negative effects. However, the fact is that even well-intended and well-planned interventions can sometimes have harmful instead of preventive effects, namely the increasing of consumption levels, particularly in alcohol use (Moos, 2005; Werch and Owen, 2002) and in the case of high-risk youth (Cho at al., 2005; Handwerk, Field, & Friman, 2000; Foxcroft, Lister-Sharp, & Lowe, 1997; Mager, Milich, Harris, & Howard, 2005; Poulin et al., 2001; Rhule, 2005). Understanding how and why these negative and unintended outcomes occur is an important issue for increasing the efficacy of prevention intervention.

## METHOD



Being this a research aimed to evaluate the impact of substance use prevention interventions among Portuguese adolescents identified by a governmental agency (i.e., the IDT, IP) as in need of substance use prevention interventions, 15 non-governmental agencies delivering substance use prevention interventions were engaged in this research and asked to collect data on the adolescents participating in their prevention interventions before, during and post intervention. Data collected before interventions (i.e., at the pre-test) were analysed within a specific study (i.e., study 1) which was aimed to (a) examine substance use patterns; (b) identify proximal, distal, and ultimate variables associated with substance use; (c) determine the differential effect of proximal, distal, and ultimate variables on substance use; and (d) recognize risk and protective factors for substance use. The variables that study 1 demonstrated to be significantly associated with substance use among the sample of adolescents assessed were included within a following study (i.e., study 2) in order to (a) assess interventions' effects on proximal and distal variables; (b) evaluate interventions' effects on substance use; (c) determine which prevention approaches are effective in changing risk factors for substance use; and (d) examine any iatrogenic effects from interventions.

### **Recruitment**

Non-governmental Portuguese agencies implementing substance use prevention interventions were the first unit of recruitment, through which it was possible to access the sample: adolescents aged between 12 and 18 years old targeted with substance use prevention interventions. Contact with non-governmental Portuguese agencies implementing substance use prevention interventions was mediated by the IDT, IP.

### **IDT, IP Engaging.**

The starting point for establishing a partnership with the IDT, IP, was the presentation of this research to its Executive Board in September 2007. Having considered it relevant and consonant with the Institute's mission, the Executive Board gave permission for the research to be presented to the Community Intervention Department, which is the central structure responsible for all matters related to substance use prevention. Thus, the research was presented to the Community Intervention Department Coordinator in October 2007, who

considered it to be in line with the Department's objectives and suggested the research could assess substance use prevention interventions funded within the PORI<sup>5</sup> national plan from the IDT, IP. This identified geographic areas with the greatest need for interdisciplinary substance use interventions, and invited non-governmental agencies in these areas to bid for funding to implement such measures. In November 2007 the research was presented to the team responsible for coordinating the PORI at a central level. As PORI was being regionally implemented, the PORI Coordinating Team suggested that the research should be presented to the IDT, IP Regional Delegations who would decide on their availability and interest to collaborate. From the end of 2007 until July 2008, the PORI working group disseminated the list of priority territories and opened three calls for funding within the domain of substance use prevention. Over July 2008, all the five IDT, IP Regional Delegations (Northern, Center, Lisbon and Tagus Valley, Alentejo, and Algarve) integrating these calls for funding were contacted with the purpose of scheduling a meeting to present this research proposal. In September 2008, meetings were conducted with each of the Regional Delegations and their Technical Support Teams (NAT), responsible for monitoring the PORI implementation at a regional level. All Regional Delegations gave permission to access the call for funding application forms submitted within their region. The IDT, IP Centers of Integrated Responses (CRI), the local units responsible for monitoring the implementation of the PORI prevention interventions, were also considered important to involve in the research. Hence, the Directors and the Prevention Unit Coordinators from the CRI responsible for monitoring the substance use prevention interventions under contest were invited to attend general meetings where the aims of this research, the procedures, and the instruments for data collection were presented. These meetings were held from December 2008 through to March 2009.

Overall, along the process of engaging the IDP, IP in this research, 15 meetings were conducted, involving 55 health professionals from the IDT central and regional structures. Figure 1 illustrates the IDT, IP engaging process.

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<sup>5</sup> PORI is the major intervention programme from the IDT, IP, being intended to provide an integrated framework for the design and funding of interventions in the field of addictive behaviours at a national, regional, and local level.

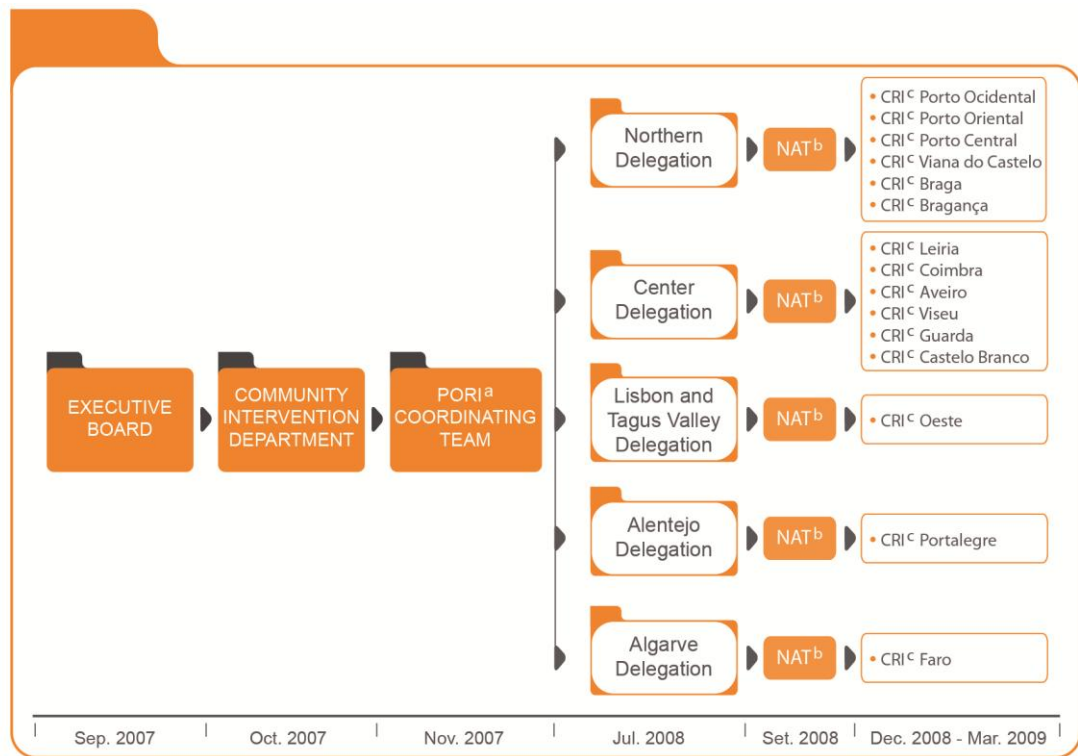


Figure 1. Flowchart of the IDT,IP Engaging Process. <sup>a</sup>Operational Plan of Integrated Responses (PORI). <sup>b</sup>Technical Support Teams (NAT). <sup>c</sup>Centers of Integrated Responses (CRI).

### Agency Involvement.

Due to the different timeframes of the three calls for funding within the PORI, it took from October 2008 to February 2009 to have access to 38 substance use prevention interventions application forms in order to choose those eligible for integrate this research. Therefore, from the 38 substance use prevention interventions application forms analyzed, 32 were selected according to the following criteria: (a) representing one of the main paradigms, theories and/or strategies underpinning substance use prevention interventions; (b) targeting at least 30 adolescents aged 12 to 18; (c) having a multidisciplinary team; and (d) not having started the intervention with the target-group.

From November 2008 to February 2009, programme leaders from the 32 selected interventions were contacted by phone to briefly present this research proposal. All programme leaders expressed their interest in receiving a summary of the research by e-mail (Appendix A). Two weeks after receiving the summary, programme leaders were again contacted by phone and, having confirmed interest in participating in the research, an

invitation to attend a meeting to present the procedures and the instruments for data collection was sent by e-mail (Appendix B).

Between December 2008 and March 2009, 12 meetings were held to cover the leaders from the 32 agencies. Within these meetings, programme leaders were informed about the need to collect pre-test data, repeat data collection for at least two further temporal measurement points, and have a minimum sample of 30 adolescents aged from 12 to 18 years old.

Following these meetings, programme leaders were given a deadline of two weeks to confirm whether their agencies fitted the requirements and were indeed interested in taking part in this research. Out of the 32 selected agencies, ten (31.25%) dropped-out: two agencies (6.25%) due to a lack of human resources needed to assure data collection and eight (25.00%) due to subsequent modifications in their applications resulting in them being unable to reach the minimum sample size of 30 adolescents.

For each of the remaining 22 agencies, an individual meeting was held with programme leaders and members of staff participating in data collection. This meeting aimed to identify which specific substance use prevention activities would be assessed within the research, as well as to train staff on the questionnaire administration. A copy of the materials needed for data collection and ethical and legal consent to administer the questionnaire was given to programme leaders. These meetings started in January 2009 and finished in May 2009 and were held at agencies' facilities for a better understanding of the context where interventions were going to be implemented.

Although all agencies collected data according to the questionnaire administration protocol, out of the 22 agencies, seven (31.81%) were excluded from this research for not accomplishing with data collection requirements: two agencies (9.09%) were not able to accomplish a minimum of two temporal measurement points and five (22.73%) did not reach the minimum sample size of 30 adolescents.

Overall, along the process of engaging agencies, 34 meetings were held, involving 68 prevention staff. Figure 2 illustrates agencies involvement process.

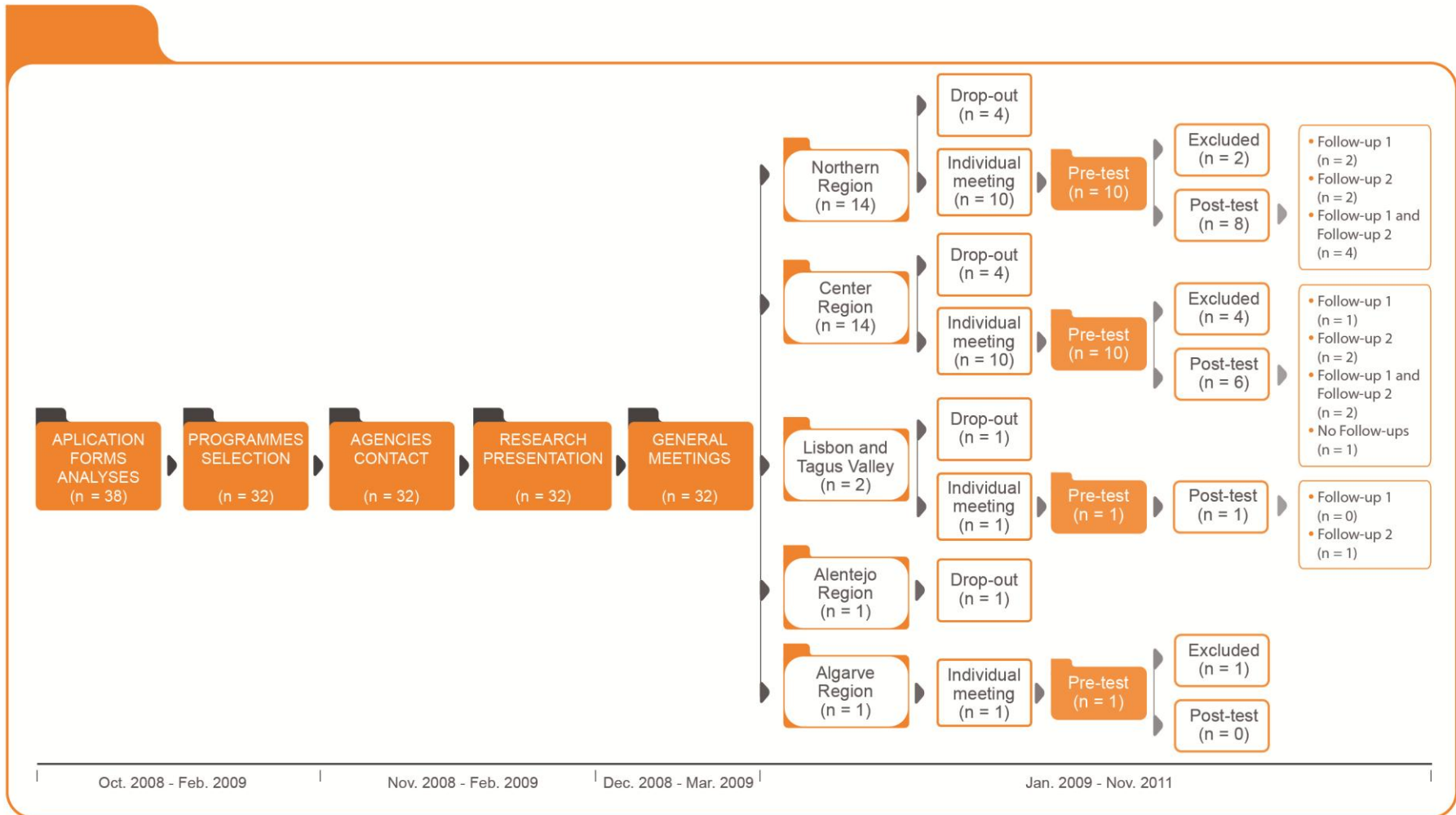


Figure 2. Flowchart of Agencies Involvement Process.



Overall, 15 agencies completed all data collection requirements. These agencies were geographically located in three regions of mainland Portugal: eight agencies (53.33%) in the Northern region, six agencies (40.00%) in the Center region, and one agency (6.66%) in the Lisbon and Tagus Valley region, as presented in Table 1.

Table 1  
*Agencies' Geographic Location*

<b>Agencies</b>	<b>Region</b>	<b>District</b>	<b>Council</b>
Agency 1	North	Viana do Castelo	Viana do Castelo
Agency 2	North	Bragança	Mirandela
Agency 3	North	Braga	Braga
Agency 4	North	Braga	Famalicão
Agency 5	North	Porto	Matosinhos
Agency 6	North	Porto	Gondomar
Agency 7	North	Porto	Trofa
Agency 8	North	Porto	S. João da Madeira
Agency 9	Center	Coimbra	Figueira da Foz
Agency 10	Center	Coimbra	Figueira da Foz
Agency 11	Center	Guarda	Covilhã
Agency 12	Center	Guarda	Gouveia
Agency 13	Center	Viseu	Viseu
Agency 14	Center	Leiria	Leiria
Agency 15	Lisbon and Tagus Valley	Santarém	Santarém

### **Ethical and Legal Consent**

Ethical approval was requested from Liverpool John Moores University Research Ethics Committee, which gave full and unconditional approval to the research (Appendix C). Given the personal nature of the themes under assessment, permission was also asked to the National Commission on Data Protection (CNPD), the national structure responsible for controlling personal data collection and assuring full compliance with Portuguese legislation. Permission was given by the CNPD under the requirement of obtaining informed consent from parents or legal guardians for children under the age of 16 years, or from adolescents older than 16 years of age themselves (Appendix D).

Permission was also asked of the Portuguese Agency for Innovation and Curricula Development from the Ministry of Education (DGIDC), the national structure responsible for allowing data collection within schools. Considering the sensitive nature of the questions, permission was granted under the commitment of obtaining informed consent from parents or legal guardians (Appendix E).

It was agreed that programme leaders would be responsible for obtaining informed consent from parents or legal tutors, given that their agencies were the structures with the closest links to them. A passive consent procedure was suggested, as a way to reduce case loss and the costs associated with active consent. However, programme leaders were free to decide on the type of consent. To assure that all relevant information was included, a standard informed consent form for legal guardians (Appendix F) was sent to all programme leaders, who were told to complete it by including a brief description of their interventions. This standard consent form included information on the purpose of the research, the instruments to be used, the themes being assessed by these instruments, the confidential nature of the data collected, the voluntary nature of participating in this research, how to contact the research team, and the deadline for parents or legal guardians to withdraw their children from this research.

As questionnaires were to be delivered within schools, the headmasters of participating schools were also asked permission for administering the questionnaires. From the 36 schools invited to participate in the research, one school (2.78%) did not allow the questionnaire to be administered and was excluded from the research. Finally, adolescents were informed that completion of the questionnaire was completely voluntary and that they could, at any stage, withdraw from the research.

### **Research Design**

As illustrated in Figure 3, the research used a quasi-experimental design with data collected at multiple time measurement points within the case group and a control group. The data collected resulted in two studies: Study 1 aimed to identify risk and protective factors for substance use through a cross-sectional research design using the pre-test data collected within the case group; and study 2 aimed to assess interventions' effects on proximal and distal variables, as well as on substance use behaviours among adolescents, using a quasi-experimental research design with five temporal measurement points. Study 2 uses data from both cases and the matched control group and focuses on those variables identified as being significantly associated with adolescents' substance use in study 1.

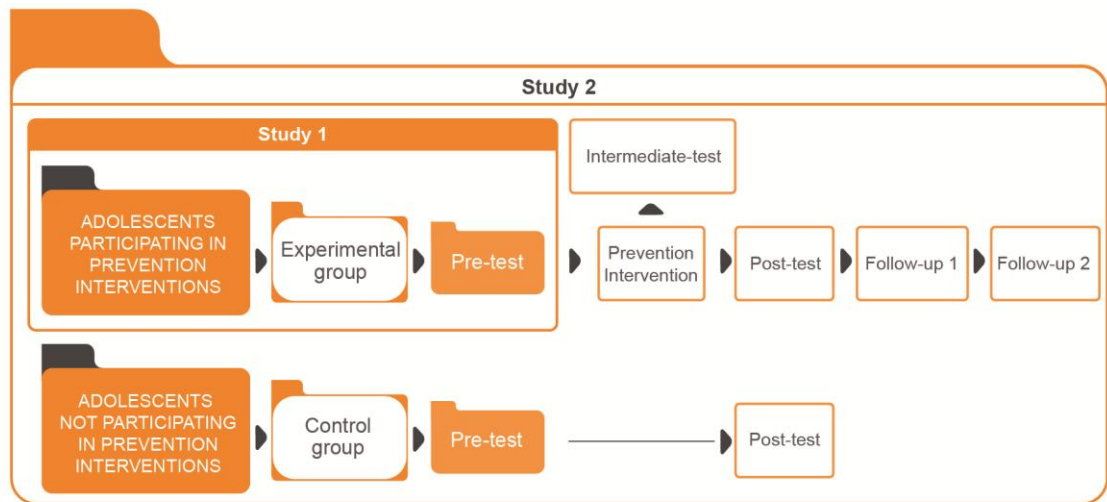


Figure 3. Schematic Presentation of the Overall Research Design.

The pre-test for cases took place before interventions were implemented and for controls, within an equivalent timeframe. For cases, the intermediate-test occurred half way through the interventions' implementation with the exact moment defined by programme leaders according to each intervention's specific chronogram. There was no intermediate assessment for the control group, because this measurement point aimed specifically to identify early indicators for intervention outcomes. The post-test took place immediately after interventions ended and was intended to assess short-term effects following intervention. For controls, this measurement point took place within an equivalent timeframe. In order to assess whether there were any effects that were only apparent in the short term, and whether effects decrease over time, a follow-up assessment was conducted. This study integrated two follow-up assessments six and 12 months after interventions ended.

Because interventions had different time lines, it was not possible to establish consistent dates for each measurement point to be put in place. Hence, each programme leader scheduled the measurements points accordingly to the chronogram of the activity being assessed.

Identification of adolescents across the five measurement points was essential so that a within-subject analysis, designed for comparison over time, would be possible. Considering the sensitive nature of the themes under assessment, it was also important to preserve participants' anonymity. Thus, identification codes were used to track adolescents over the

multiple measurement points without identifying adolescents by their full names, with staff instructed to assign a unique alphanumeric identification code to each student.

### **Sampling Procedures**

For study 1, programme leaders were instructed to deliver the questionnaire to all adolescents taking part in the activities assessed in this research, as long as they met the inclusion criteria. From the 2,645 adolescents approached for the pre-test, 13 (0.49%) refused to fill in the questionnaire and for that reason, were withdrawn from this research; 51 questionnaires (1.93%) were considered unusable and discarded from the database (see section "Data Analyses", subsection "Data cleaning"). The final sample for study 1 integrated 2,581 cases.

For subsequent measurement points for study 2, programme leaders were instructed to deliver the questionnaire to all adolescents taking part in the activities being assessed in this study, as long as they met the inclusion criteria and had filled in the questionnaire at the pre-test measurement point. From the 1,596 cases approached at the post-test measurement point, none refused to fill in the questionnaire; 215 questionnaires (13.47%) were considered unusable and discarded from the database (see section "Data Analyses", subsection "Data cleaning"). The final sample for study 2 integrated 1,381 cases.

Given that none of the agencies had initially included a control group, programme leaders were asked to recruit a control group with a minimum size of one third of their case group. Controls needed to match the sociodemographic characteristics of the case group with adolescents selected according to the same criteria. To prevent the effect of contamination between the case and controls, programme leaders were instructed to, whenever possible, set control groups outside the schools where interventions were taking place, as long as it did not jeopardize matching the sociodemographic characteristics of the case group. Where there were no other schools suitable for use as controls, programme leaders were authorized to collect data within the same school where interventions were taking place. From the 15 agencies undertaking this research, 11 (73%) were able to find a control group: four (36.36%) outside the schools intervened; and seven (63.63%) within the intervention schools. From the 567 controls approached at the pre-test measurement point, none refused to fill in the questionnaire; 192 questionnaires (33.87%) were considered unusable and discarded from the

database (see section "Data Analyses", subsection "Data cleaning"). At the post-test measurement point, from the 442 controls approached, none refused to fill in the questionnaire; 67 questionnaires (15.16%) were considered unusable and discarded from the database (see section "Data Analyses", subsection "Data cleaning"). The final sample for controls integrated 375 controls.

## **Participants**

Participants in study 1 and study 2 were adolescents that were participating in substance use prevention interventions; enrolled in regular, vocational, general, or academic studies; aged 12 to 18 years; in the classroom on the days of the surveys; and willing to fill in the questionnaire used to collect data. Adolescents with learning disorders or severe physical disabilities were not included.

As shown in Table 2, study 1 included 2.581 adolescents from which 1.401 were boys (54.28%) and 1.180 were girls (45.72%). The mean age was 14 years, with an interquartile range of 4. Almost all adolescents (92.49%) were Portuguese, were living within an intact family (72.30%), had experienced a stressful life event (e.g. death of a relative, relocation, failing an exam) within the previous six months (79.13%), and over half had a medium SES (66.14%).

Study 2 included the 1.381 adolescents that had accomplished with at least two time points from study 1 plus an additional sample of 375 adolescents to constitute a control group. Adolescents included in the control group were regular students that were not participating in any substance use prevention intervention, who were aged 12 to 18 years, were present in the classroom on the days of the surveys, and were willing to fill in the instruments used to collect data. As shown in Table 3, in the case group, there were 777 boys (56.26%) and 604 girls (43.74%), with a mean age of 13 years and an interquartile range of 4. Almost all adolescents (93.05%) were Portuguese, around three-quarters were living within an intact family (72.30%), had experienced a stressful life event within the previous six months (76.12%), and over two-thirds had a medium SES (67.13%). In the control group there were 206 boys (54.93%) and 169 girls (45.01%), with a mean of 14 years old, an interquartile range of 3. Almost all adolescents (95.46%) were Portuguese, around three-quarters were living within an intact

family (77.60%), had experienced a stressful life event within the previous six months (77.40%), and over half had a medium SES (60.00%). The comparison of cases and controls on sociodemographic variables showed no significant differences regarding gender ( $\chi^2 = 0.21$ ,  $p = 0.645$ ), nationality ( $\chi^2 = 2.60$ ,  $p = 0.101$ ), and life events ( $\chi^2 = 0.26$ ,  $p = 0.6212$ ). However, significant differences were found on age ( $\chi^2 = 51.18$ ,  $p < 0.001$ ), SES ( $\chi^2 = 30.13$ ,  $p < 0.001$ ), and family structure ( $\chi^2 = 24.84$ ,  $p < 0.001$ ). Therefore, when compared with controls, significantly more cases were younger, had a lower SES, and were living within non-intact families.

Table 2  
Sociodemographic Profile of Participants in Study 1

Variables	Categories	n	%
Gender	Male	1401	54.28
	Female	1180	45.72
Age	12 years	700	27.12
	13 years	510	19.76
	14 years	323	12.51
	15 years	271	10.50
	16 years	345	13.37
	17 years	253	9.80
	18 years	179	6.94
Nationality	Portuguese	2352	92.49
	Other	191	7.51
SES	Low	350	13.56
	Medium	1707	66.14
	High	324	12.55
	Unknown	200	7.75
Family structure	Intact	1866	72.30
	Single	374	14.49
	Extended	57	2.21
	Blended	148	5.73
	Institution	42	1.63
Stressful life events	No	526	20.87
	Yes	1994	79.13

Table 3  
Sociodemographic Profile of Participants in Study 2

Variables <sup>a</sup>	Categories	Cases		Controls		$\chi^{2a}$	<i>p</i> <sup>b</sup>
		n	%	n	%		
Gender	Male	777	56.26	206	54.93	0.21	0.645
	Female	604	43.74	169	45.07		
Age	12 years	454	32.88	101	26.93	51.18	< 0.001
	13 years	242	17.52	83	22.13		
	14 years	149	10.79	66	17.60		
	15 years	136	9.85	64	17.07		
	16 years	193	13.76	36	9.60		
	17 years	127	9.20	16	4.27		
Nationality	Portuguese	1271	93.04	336	95.46	2.69	0.101
	Other	95	6.96	16	4.54		
SES	Low	172	12.46	27	7.20	30.13	< 0.001
	Medium	927	67.13	225	60.00		
	High	184	13.32	86	22.93		
	Unknown	98	7.10	37	9.87		
Family structure	Intact	1033	74.80	291	77.60	24.84	< 0.001
	Single	189	13.69	35	9.33		
	Extended	30	2.17	6	1.60		
	Blended	77	5.58	18	4.80		
	Institution	17	1.23	0	0.00		
Stressful life events	No	321	23.88	80	22.60	0.26	0.612
	Yes	1023	76.12	274	77.40		

<sup>a</sup>Chi Square Test. <sup>b</sup>*p*-value.

## Measures and Covariates

To identify variables associated with substance use and assess the outcomes of substance use prevention interventions, data needed to be gathered on substance use behaviour and variables that the literature review showed to be correlated with substance use. Variables were grouped into four sets of variables: (1) proximal variables; (2) health-related quality-of-life variables; (3) sociodemographic variables; and (4) substance use behaviour variables. The number of variables collected within each set differs from the pre-test to the post-test because Questionnaire 1 (the questionnaire used in the pre-test; Appendix G) assessed more variables than Questionnaire 2 (the questionnaire used in the post-test; Appendix H). Therefore, only variables that were maintained in Questionnaire 2 are included in study 1 and study 2 data analyses. Even though not included in either study, the excluded variables are mentioned at the bottom of the respective section in this methods section.

### Proximal Variables.

*Risk perception.* This question assesses to what extent adolescents perceive substance use as being a health hazard by asking them to indicate how risky it is to use with tobacco, alcohol, cannabis, ecstasy, and cocaine use, by choosing one out of four choices, ranging from 1 (*no risk to health*) to 4 (*great risk to health*).

*Attitudes.* This question determines whether adolescents have a negative, a neutral, or a positive attitude towards substance use by asking adolescents their level of agreement with a set of sentences about tobacco, alcohol, cannabis, ecstasy, and cocaine use. Adolescents were asked to choose one out of five choices ranging from 1 (*strongly agree*) to 5 (*strongly disagree*) to express their opinion on each sentence.

*Expected problems.* This question addresses the extent to which adolescents expect negative outcomes from substance use by asking them to indicate, from a set of negative consequences associated with tobacco, alcohol, cannabis, ecstasy, and cocaine use, whether they expect each consequence to happen to them as a consequence of use, choosing one out of three choices (*yes; no; or do not know*).



*Expected benefits.* This question examines to what extent adolescents expect positive outcomes from substance use by asking them to indicate, from a set of positive consequences associated with tobacco, alcohol, cannabis, ecstasy, and cocaine use, whether they expect each consequence to happen to them as a consequence of use, choosing one out of three choices (*yes; no; or donot know*).

*Perceived accessibility.* This question assesses adolescents' ease of access to substances by asking them how easy would be for them to buy tobacco, alcohol, cannabis, ecstasy, and cocaine, by choosing one out of five choices, ranging from 1 (*very easy*) to 5 (*very difficult*).

*Best friend's use.* This question is meant to assess whether adolescents' best friends have ever used the substances assessed within this research. Adolescents were asked to indicate their best friend's tobacco, alcohol, cannabis, ecstasy, and cocaine use experience, choosing one out of six choices, ranging from 1 (*never used*) to 6 (*uses every day*).

*Perceived best friend's substance use approval.* This question explores adolescents' perceptions about best friends' approval of substance use by asking adolescents to indicate the reaction they expected their best friends would have if knowing that they were using tobacco, alcohol, cannabis, ecstasy, or cocaine, choosing one out of four choices, ranging from 1 (*would approve*) to 4 (*would not approve and would stop being my friend*).

*Perceived parental substance use approval.* This question addresses adolescents' perceptions about parental approval of substance use by asking adolescents to indicate the reaction they expected their parents would have if knowing that they were using tobacco, alcohol, cannabis, ecstasy, or cocaine, choosing one out of four choices, ranging from 1 (*would not mind*) to 4 (*would not approve and would prohibit me from using it*).

At the pre-test measurement point data were also gathered on perceived knowledge about substances; estimated peers' substance use prevalence; and substance use refusal skills.

### **Health-Related Quality-of-Life Items.**

*Fitness.* This question assesses adolescents' perceived level of fitness by asking them whether they have felt good and shape by choosing one out of five choices, ranging from 1 (*not at all*) to 5 (*extremely*).

*Energy.*This question explores adolescents' perceived level of energy by asking them whether they have felt full of energy by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

*Sadness.*This question examines adolescents' perceived level of sadness by asking them whether they have felt sad by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

*Loneliness.* This question determines adolescents' perceived level of loneliness by asking them whether they have felt lonely by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

*Time for oneself.*This question assesses adolescents' perceptions on time for themselves by asking them whether they have had enough time for themselves by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

*Enjoying leisure activities.*This question examines adolescents' opportunities for doing liking activities by asking them whether they were able to do liking activities in their leisure times by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

*Sense of being treated fairly by parents.*This question explores adolescents' perceptions of being treated fairly by parents by asking them whether they have felt their parents had treated them fairly by choosing one out of five choices,ranging from 1 (*not at all*) to 5 (*extremely*).

*Fun with friends.*This question determines adolescents' opportunities to have fun with friends by asking them whether they had fun with their friends by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

*Sense of being a good student.*This question addresses adolescents' perceptions of being a good student by asking them whether they considered themselves to have been a good student by choosing one out of five choices,ranging from 1 (*not at all*) to 5 (*extremely*).

*Ability to pay attention at school.* This question explores adolescents' ability to pay attention at school by asking them whether they were able to pay attention at school by choosing one out of five choices,ranging from 1 (*never*) to 5 (*always*).

When answering these items, adolescents were asked to think about the previous week.

At the pre-test measurement point data were also gathered on variables assessing physical well-being; psychological well-being; self perception; autonomy; parental relation and home life; financial resources; peers and social support; and school environment.

### **Sociodemographic Variables.**

*Gender.* This question determines adolescents' gender by asking them to choose one out of two choices (*boy or girl*).

*Age.* This question examines adolescents' age by asking them to choose one out of seven choices, ranging from 1 (*twelve years old*) to 7 (*eighteen years old*).

*Nationality.* This question assesses adolescents' nationality by asking them to choose one out of six choices (*Portuguese; Brazilian; native from African countries; native from Eastern European countries; native from Asian countries; or other nationality*).

*Father's achieved school level.* This question explores adolescents' SES by asking them to indicate the school level achieved by their fathers, choosing one out of eight choices (*never attended school; 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> grade; 5<sup>th</sup> or 6<sup>th</sup> grade; 7<sup>th</sup>, 8<sup>th</sup> or 9<sup>th</sup> grade; 10<sup>th</sup>, 11<sup>th</sup>, or 12<sup>th</sup> grade; vocational school; university; or unknown*).

*Mother's achieved school level.* This question explores adolescents' SES by asking them to indicate the school level achieved by their mothers, choosing one out of eight choices (*never attended school; 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> grade; 5<sup>th</sup> or 6<sup>th</sup> grade; 7<sup>th</sup>, 8<sup>th</sup> or 9<sup>th</sup> grade; 10<sup>th</sup>, 11<sup>th</sup>, or 12<sup>th</sup> grade; vocational school; university; or unknown*).

*Family structure.* This question assesses adolescents' family structure by asking them to indicate with who they were living with, choosing all that apply (*mother; father; stepmother; stepfather; brothers or sisters; grandparents; other relatives; or institution*).

*Stressful life events.* This question explores the occurrence of stressful life events over the last six months, by asking adolescents to indicate, from a list of 21 life events identified through literature review as being of relevance for teenagers (i.e. *serious disease or accident of a family member, death of a family member, death of a friend, death of the favorite pet, arresting of a family member, increase of arguments between parents, increase in arguments with parents, parents divorce or separation, father or mother re-marriage, father or mother job loss,*

*relocation, change of school, failure in one or more subjects, failure in an important test or exam, problems with teacher or principal, school drop-out, problems with the police, increase of arguments with girlfriend or boyfriend, broke up with girlfriend or boyfriend, problems with friends, and pregnancy of a close girlfriend*), which have happened to them, by choosing one out of two choices (*yes or no*). Considering that some events (e.g. relocation), depending on individuals' subjective experience, could be perceived either as positive or as negative, adolescents were asked to indicate, for each occurred life event, the impact on their lives had been positive or a negative, by choosing one out of two choices (*positive impact or negative impact*).

At the pre-test measurement point data were also gathered on school attendance; school level; fathers' nationality; and mothers' nationality.

#### **Substance Use Behaviour Variables.**

*Lifetime use.* This question assesses adolescents' lifetime substance use by asking them to indicate if they have ever used tobacco, alcohol, cannabis, ecstasy, cocaine, LSD, amphetamines, GHB, heroin, magic mushrooms, ketamine, inhalants, body builders, sedatives, anxiolytics, and antidepressants, choosing one out of two choices (*yes or no*).

*Age of onset.* This question examines, for adolescents who have ever used tobacco, alcohol, cannabis, ecstasy, or cocaine, the age of onset by asking them to indicate how old were they when they first used each substance, choosing one out of six choices, ranging from 1 (*11 years old or younger*) to 6 (*16 years or older*).

*Last 12 months use.* This question examines, for adolescents who have ever used LSD, amphetamines, GHB, heroin, magic mushrooms, ketamine, inhalants, body builders, sedatives, anxiolytics, or antidepressants, the prevalence of use over the last 12 months by asking them to indicate how often have they used each substance over the last 12 months, choosing one out of seven choices, ranging from 1 (*never*) to 7 (*40 or more times*).

*Current use.* This question assesses, for adolescents who have ever used tobacco, alcohol, cannabis, ecstasy, or cocaine, whether they have continued to use by asking them to indicate

if they were currently using any of these substances, choosing one out of two choices (*yes* or *no*).

*Last 30 days use.* This question assesses, for adolescents currently using tobacco, alcohol, cannabis, ecstasy, or cocaine, whether they have used recently by asking them to indicate if they had used any of these substances within the last 30 days, choosing one out of two choices (*yes* or *no*).

*Last seven days use.* This question assesses, for adolescents currently using tobacco, alcohol, cannabis, ecstasy, or cocaine, whether they have used recently by asking them to indicate if they had used any of these substances within the last seven days, choosing one out of two choices (*yes* or *no*).

*Pattern of use.* This question explores, for adolescents currently using tobacco, alcohol, cannabis, ecstasy, or cocaine, whether they have become regular users by asking them to indicate how often they use, choosing one out of three choices (*every day*; *every weekend*; or *only on special occasions*).

*Average amount of substance used per day.* This question explores, for adolescents currently using tobacco, alcohol, cannabis, or cocaine, the heaviness of use by asking them to indicate the average amount used per day. The number of answer choices varied according to the substance: for tobacco, adolescents were asked to choose one out of eight choices, ranging from 1 (*less than one cigarette*) to 8 (*more than 30 cigarettes*); for alcohol, adolescents were asked to indicate the amount of beer, wine, white drinks, and alcoholic cocktails, choosing one out of five choices, ranging from 1 (*zero*) to 5 (*more than nine units*); for cannabis, adolescents were asked to choose one out of five choices, ranging from 1 (*less than one 'spliff'*) to 5 (*more than nine 'spliffs'*); for ecstasy, adolescents were asked to choose one out of three choices, ranging from 1 (*one to two pills*) to 3 (*more than five pills*); and for cocaine, adolescents were asked to choose one out of four choices, ranging from 1 (*less than a quarter of gram*) to 4 (*more than one gram*).

*Intention to use.* This question explores adolescents' intention to use substances within the next 12 months. Adolescents who have never used were asked to indicate whether they intend to start using; those who were using were asked to indicate whether they intend to continue to use;

and those who have quit using, were asked to indicate whether they intend to start using again, choosing one out of three choices (*maybe; maybe no; or donot know*).

### **Instruments**

Data on the above mentioned variables were collected through a set of three instruments: 1) the Substance Use Prevention Interventions Outcomes and Impact Evaluation Questionnaire (SUPPOIEQ); 2) the Attitudinal Scale for Alcohol, Tobacco and Illicit Drugs (ASATID) (Carvalho, 1986); and 3) the KIDSCREEN (Ravens-Sieberer et al., 2008). These three instruments, presented below in detail, were compiled into a single questionnaire to facilitate the administration procedure, designed in Teleform software for optical reading to facilitate data entering.

Two versions of the questionnaire were developed: The first version (Appendix G) comprised a first version of the SUPPOIEQ (SUPPOIEQ-1), the ASATID, and the KIDSCREEN-52 and was used in the pre-test and intermediate-measurement points. The second version (Appendix H) was a shorter version of Questionnaire 1, also comprising the SUPPOIEQ (SUPPOIEQ-2), the ASATID, and the KIDSCREEN-10 and being used in the post-test and follow-up measurement points.

### **SUPPOIEQ.**

The SUPPOIEQ is a self-report questionnaire, specifically developed for this research, that aimed to assess proximal and sociodemographic variables related with substance use. A questionnaire was developed due to no suitable questionnaire having been found that assessed the intended variables.

The development of SUPPOIEQ was based on three sources: 1) the Evaluation Instrument Bank (<http://www.emcdda.europa.eu/eib>), which is an online archive of freely available instruments for evaluating drug-related interventions, developed by the EMCDDA; 2) the ESPAD (<http://www.espad.org/>), which is the largest cross-national research project on adolescent substance use that collects comparable data on substance use in European countries; and 3) the European Drug Addiction Prevention Trial (EU-DAP)

(<http://www.eudap.net/>), which is an European research-action project, aimed at contributing to evidence concerning the effectiveness of substance use prevention programs in Europe.

Two versions of the SUPPOIEQ were developed: a longer version used in the pre-test and intermediate-measurement points (SUPPOIEQ-1) and a shorter version used in the post-test and follow-up measurement points (SUPPOIEQ-2). The decision to develop a second version of the SUPPOIEQ (SUPPOIEQ-2) was based on staff reports that some adolescents were using the questionnaire's structure to unduly skip questions.

To assure the SUPPOIEQ legibility, a pilot test was undertaken with a group matching the sociodemographic characteristics of the participants in this research. Two pilot administrations were undertaken, targeting 20 adolescents (10 boys and 10 girls) aged from 11 to 18 years, attending the 5<sup>th</sup> to 11<sup>th</sup> grades. After filling in the questionnaire, adolescents were asked to take part in a focus group to discuss questionnaire's comprehensibility and internal structure. All the suggestions made were taken into account and the questionnaire modified accordingly. Then, the derived version was reviewed by four experts in substance use prevention and research methodology, four substance use prevention programme leaders, and two coaches in the substance use prevention field.

The SUPPOIEQ questionnaire comprises closed-ended questions related to substance use and sociodemographics. Only closed-ended questions were used with the aim of limiting the time required for completion and thus increasing questionnaire completion levels, particularly given the length of the questionnaire. For each question, adolescents were asked to choose one out of a variable number of answer choices.

A concern underlying the development of this questionnaire was the protection of adolescents from being exposed to subjects they were not aware of and non-relevant to their substance use experience. For that reason, it was decided to organize the questionnaire into substance-specific sections and to include answer filters at the beginning of sections assessing illicit substances. These checked whether adolescents knew what substances were and whether they had ever used them. Adolescents answering *no* to any answer filters were instructed to skip to the next section, assessing a different substance.

The substance-specific sections start with less sensitive questions (e.g. questions addressing risk perception) and move on to more sensitive questions (e.g. questions asking about

substance use experience). The questionnaire ends with a section assessing sociodemographic variables, based on the assumption that these questions require less cognitive effort to answer; thus placing them at the end may be a suitable strategy to mitigate the impact of the questionnaire's length on reliability of answers.

The cover contained information for informed consent, namely information on the purpose of the research; the themes being assessed; the voluntary and confidential nature of the research; and contact details for the research team. Information included on the cover also asked adolescents to answer thoughtfully. Guidelines on how to fill in a questionnaire designed for optical reading and confidentiality re-assurance were also included. Given the importance of adolescents' attitudes towards the questionnaire, both the cover and the questionnaire were designed by a professional designer.

#### ***SUPPOIEQ-1.***

The SUPPOIEQ-1 has 90 closed-ended questions about substance use, 52 questions about health-related quality-of-life, and 10 questions about sociodemographics. The questions about substances are grouped within six substance-specific sections assessing tobacco, alcohol, cannabis, ecstasy, cocaine, and other substances. The decision on what substances should be assessed was based on the current substance use prevalence in Portugal reported within the 2007 INCSPPP survey, indicating higher prevalence rates for tobacco, alcohol, cannabis, ecstasy, and cocaine (Balsa et al., 2009). Considering the lower prevalence of LSD, amphetamines, GHB, heroin, magic mushrooms, ketamine, inhalants, body builders, sedatives, anxiolytics, and antidepressants (Balsa et al., 2009), it was decided to group these into one section for other substances and to assess only lifetime use and last 12 months use. Depending on the reading level and on substance use experience, the SUPPOIEQ-1 can take up to 30 minutes to complete.

#### ***SUPPOIEQ-2.***

The SUPPOIEQ-2 has 56 closed-ended questions about substance use, 10 questions about health-related quality-of-life, two questions about sociodemographics, and three questions



about the interventions delivered to be filled in by programmes' staff. The questions about substances are grouped within five substance-specific sections assessing tobacco, alcohol, cannabis, cocaine, and other substances.

The questions about interventions includes (a) one question to assess the type of activities the adolescents have been involved and, for each activity, the level of exposure; (b) one question to assess the involvement of students' parents or legal guardians in parental training; and (c) one question to assess the involvement of students' teachers in teachers training.

Considering that the decision to develop a second version of the SUPPOIEQ (SUPPOIEQ-2) was based on staff reports pointing to answer filters being unduly used by adolescents to skip questions, the number of filters was reduced: filters placed at the beginning of the cannabis and cocaine sections were removed, as along with filters following questions assessing current use for tobacco, alcohol, cannabis, and cocaine. Suitable answer choices for non-users were added to these questions. The decision to remove the filters placed at the beginning of sections assessing cannabis and cocaine was based on the high percentage of adolescents that were aware of cannabis (65.12%) and cocaine (80.01%) at the pre-test measurement point. Nevertheless, and still taking into account the need to protect adolescents that had never used a particular substance, answer filters following questions assessing lifetime use were kept. Overall, nine out of the 11 answer filters were eliminated.

Even though the major purpose of developing a second version of the SUPPOIEQ had been to prevent questions from being unduly skipped, the opportunity was also taken to reduce the length of the questionnaire in order to maintain compliance by reducing the number of proximal and sociodemographic variables; eliminating the ecstasy section; and combining answering options on expected problems and benefits. Hence, the proximal variables considered redundant or least interesting (i.e., perceived knowledge about substances, peers' substance use prevalence, and substance use refusal skills) were eliminated. Sociodemographic variables considered less likely to change over time (i.e., father's achieved school level, mother's achieved school level, and familiar structure) or not changeable at all (i.e., nationality, father's nationality, and mother's nationality) were eliminated as well. Although, according to these criteria, the variable *gender* could have been removed, it was decided to maintain it given the high prevalence of missing values (13.39%) at the pre-test measurement point, which could

have been due to the question having been placed at the bottom of the page. To mitigate this issue, the *gender* question was moved to the top of the page. Additionally, sociodemographic variables whose re-assessment was not needed (i.e., school attendance, school level, and stressful life events) were eliminated. Although the variable *age* could also have been eliminated, it was decided to maintain it given the high prevalence of missing values (8.21%) at the pre-test measurement point, which could have been due to adolescents under twelve years old or above eighteen years old having no suitable answer option. Considering this, options for *younger than twelve* and *older than eighteen* were added.

The decision to eliminate the ecstasy section was based on the percentage of adolescents (54.53%) stating not knowing ecstasy in the pre-test questionnaire, that could have been due to the inability to associate the spoken word *ecstasy* to its written form, which being the case, would bias data.

For questions on the expected problems and benefits of substance use, the decision on which answering options could be combined was based on a multifactorial analysis. This analysis consistently grouped within Factor 1 the majority of options related to having problems (i.e., *to have problems with parents*, *to have problems within school*, *to have problems with friends*, and *to have problems with the police*) and within Factor 2 the options related to having benefits (i.e., *to have more friends*, *to be more popular*, *to have more fun*, *to feel more confident*, *to feel more secure*, *to feel more relaxed*). The remaining options (i.e., *to become addicted*, *to have a hangover*, *to have money problems*, *to feel sick*, *to forget problems*, *to do something regrettable*, and *to have better grades*) were not consistently grouped within one factor, and so were excluded from combination.

Other than these changes, the structure of the questionnaire was kept the same: sections assessing variables related to substance use were placed first and that assessing sociodemographics placed at the end; the substance specific sections started with less sensitive questions and ended up with questions assessing substance behaviour. As the cover contained information for informed consent and this consent needed to be obtained for all measurement points, the cover was kept the same. Depending on reading level and substance use experience, the SUPPOIEQ-2 can take up to 20 minutes to complete.

### **ASATID.**

The ASATID, a self-report scale developed by Jorge Negreiros Carvalho (1986), is aimed at assessing attitudes towards the use of alcohol, tobacco, and illicit substances. The decision to use the ASATID to assess attitudes was based on the fact that it is an instrument developed in Portuguese and suitable for the age range under assessment in this research.

The original scale contains 24 statements addressing substance use, with adolescents asked to indicate their level of agreement to each statement using a five-point Likert scale (*strongly agree; agree; neither agree nor disagree; disagree; strongly disagree*). The scale starts with eight sentences addressing tobacco, followed by eight sentences addressing alcohol, and ends with eight sentences addressing illicit substances as a whole. Considering the specific aims of this research, permission was asked and given by the author of the ASATID to adapt the original scale by (a) dividing the original scale by substances and placing each subscale within the respective substance-specific section; (b) eliminating the sentences considered non relevant to this research; and (c) adapting the sentences addressing illicit substances into specific sentences for cannabis, ecstasy, and cocaine. Accordingly, the adapted version of the ASATID has six sentences to assess attitudes towards tobacco, eight to assess attitudes towards alcohol, five to assess attitudes towards cannabis, five to assess towards ecstasy, and five to assess towards cocaine. Depending on reading level, the ASATID can take up to 15 minutes to complete.

### **KIDSCREEN.**

The KIDSCREEN is a standardised self-report questionnaire aimed at assessing, among children and adolescents aged from eight to 18, health-related quality-of-life as a multidimensional construct, covering physical, emotional, mental, social, and behavioural components of well-being. It was developed by the KIDSCREEN group within the European project *Screening and Promotion for Health-related Quality-of-life in Children and Adolescents: An European Public Health Perspective* (Ravens-Sieberer et al., 2008). It is the first instrument assessing quality-of-life that was developed simultaneously in several countries and tested in a large representative sample of children and adolescents. Later on, the KIDSCREEN was translated and adapted to the Portuguese population by Margarida Gaspar de Matos' team

from the Faculdade de Motricidade Humana, Universidade Técnica de Lisboa (Gaspar & Matos, 2008).

The decision to use the KIDSCREEN was based on it being an instrument developed and tested in large European Health Surveys that has been translated and adapted to the Portuguese population, is suitable for the age range under assessment in this research, and has psychometric properties ranging from 0.76 to 0.89(Gaspar & Matos, 2008). Permission to use the KIDSCREEN was given both by the European KIDSCREEN Group Collaboration Center and the KIDSCREEN Portuguese Contact Point. The latter monitored the process of compiling the KIDSCREEN under the same document as the SUPPOIEQ and the ASATID. The two existing versions of the KIDSCREEN (i.e., the KIDSCREEN-52 and the KIDSCREEN-10) were used in this research.

#### ***KIDSCREEN-52.***

This version of the KIDSCREEN starts with three closed-ended questions addressing sociodemographic variables, followed by 52 items assessing health-related quality-of-life which are to be answered using a five-point Likert-scale to indicate frequency(ranging from 1 (*never*) to 5 (*always*))or intensity(ranging from 1 (*not at all*) to 5 (*extremely*)), depending on the item. These 52 items can be grouped into ten dimensions: physical well-being, psychological well-being, moods and emotions, self-perception, autonomy, parental relationships and home life, financial resources, peers and social support, school environment, and social acceptance. When answering these items, adolescents are asked to think about their last week as a recall period. The Cronbach's Alpha for the KIDSCREEN-52 ranges between 0.76 and 0.89 (Gaspar & Matos, 2008). Depending on reading level, the KIDSCREEN can take up to 20 minutes to complete.

#### ***KIDSCREEN-10.***

This version of the KIDSCREEN starts with three closed-ended questions addressing sociodemographic variables, followed by 10 items assessing health-related quality-of-life which

are to be answered using a five-point Likert-scale to indicate frequency(ranging from 1 (*never*) to 5 (*always*))or intensity(ranging from 1 (*not at all*) to 5 (*extremely*)), depending on the item.

These items assess adolescents' fitness, energy, sadness, loneliness, time for itself, liking leisure activities, sense of being treated fairly by parents, fun with friends, sense of being a good student, and ability to pay attention at school. When answering these items, adolescents are asked to think about their last week. The Cronbach's Alpha for the KIDSCREEN-10 is .82 (Gaspar & Matos, 2008). Depending on the reading level, the KIDSCREEN-10 can take up to 5 minutes to complete.

### **Data Collection Procedures**

Given the number of agencies participating in this research, as well as their geographic dispersion, data collection had to be undertaken by agencies' staff so that accomplishing all the measurement points within interventions' chronograms would be feasible. Thus, a first version of a standardised methodological protocol (Appendix I) was developed for which the 68 staff members administering the questionnaires received training. This protocol contained information on the following, described below: the coding procedures; the seating procedures; instructions for participants; materials distribution; and materials storage.

### **Coding Procedures.**

Staff were instructed to create an identification code for each student prior to administering the questionnaires. This code, with a maximum length of 15 digits, included the initials of the agency; the school where the questionnaire was going to be delivered; the class or group attended by the participant; and the participant's full name. The code had to be registered on the first page of the questionnaire prior to its administration.

Even though the student's full name was not used for identification, the use of full initials makes adolescents identifiable and therefore questionnaires could not be considered entirely anonymous. To mitigate this, programme leaders were instructed to securely store and not share the correspondence between students' full names and their alphanumeric codes.

Concomitantly, staff were instructed to explain to adolescents the coding purposes and procedures as a way to prevent loss of confidence in data security procedures.

### **Seating Procedures.**

For administering the questionnaires to groups, staff were instructed to seat adolescents in alphabetical order, from back to front, left to right and to leave missing places unoccupied.

### **Instructions for Participants.**

Staff were instructed to read out loud the instructions from the questionnaire's cover, stressing the voluntary and confidential nature of the research and highlighting the themes assessed. They were also asked to warn adolescents not to write any identifiable information on either the questionnaire or the envelope, and to stress the importance of answering thoughtfully.

As the alphanumeric code had already been registered on the front page of questionnaires, staff were instructed to explain to adolescents that their full initials were part of the code to enable the questionnaires to be matched across measurement points. Instructions on how to fill in an optical reading questionnaire were given and demonstrated, as along with instructions on how to answer to questions with answer filters which instructed non-users to skip questions.

Staff were told to end the questionnaire administration session as soon as the last student finished filling in the questionnaire, after which they should instruct adolescents to put the questionnaire inside the envelope, personally seal it, and wait for staff to collect it. As the questionnaire was to be group-administered and the time needed for completion depended not only on reading level, but also on substance use experience, it was important to minimize the risk that those taking a longer time to complete the questionnaire would be perceived as substance users by other adolescents or even by staff. Further, when adolescents finished filling in the questionnaire, there was a risk that they may start to disturb those who were still completing it. For both reasons, staff were asked to choose a distraction task (e.g. a drawing, an essay, or a word-search puzzle) and to instruct adolescents to take the distraction task

sheet out of the envelope as soon as they finished filling in the questionnaire and to perform the task until the end of the questionnaire administration.

#### **Materials Distribution.**

Materials were distributed following the same order used to seat adolescents to ensure matching between adolescents and the coded questionnaires. The questionnaires were placed on the table along with an unmarked A4 size envelope, into which adolescents were instructed to seal the completed questionnaire. Inside this envelope was a word-search sheet or a blank sheet, depending on the distraction task chosen.

#### **Materials Storage.**

Staff were instructed to store questionnaires along with the respective administration report sheet and to send them back to the research team.

#### **Data Collection Monitoring**

Data collection were monitored by a monitoring visit to at least one administration session per agency during the pre-test measurement point and a standardised administration report (Appendix J) which agencies were asked to fill in after each administration session. The first data collection sessions were highly monitored in order to assess implementation fidelity of the administration protocol and whether changes to this protocol were needed. As a result of this monitoring, staff realized that adolescents had difficulties answering the question addressing stressful life events. This input motivated the development of a new version of the administration protocol (Appendix K) in which staff were instructed to explain and exemplify how adolescents should answer this question. This new administration protocol was therefore used in all measurement points other than the pre-test.

The standardised administration reports provided information about the measurement point, the agency administering the questionnaires, the place where questionnaires were administered, the number of questionnaires administered, the time needed for completion, the date of administration, the questions raised during administration, the occurrence of any disturbances noticed during the administration, and the fidelity of implementation of the administration

protocol. Analysis of the administration reports showed that the average time taken to complete questionnaire 1 was 65 minutes and 43 minutes for questionnaire 2. Even though staff reported that adolescents perceived the questionnaire as long and repetitive, no student refused to fill in the questionnaire because of its length. During questionnaire administration, adolescents asked 163 questions to staff: 45 (27.61%) about the interpretation of concepts such as *justice*, *hangover*, *perceived accessibility*, *possession*, *legalization*, and *public places*; 40 (24.54%) about double answering; 22 (13.50%) about substance use experience; 22 (13.50%) about substances themselves; 17 (10.43%) about the question assessing life events; 14 (8.59%) about answer filters; and 3 (1.84%) about confidentiality. Disturbances during data collection were reported in 10 (2.55%) out of 392 applications, but there is no reason to assume that these disturbances compromised the quality of collected data.

Based on the administration reports, the monitoring visits, and informal feedback from programme leaders, it seems reasonable to conclude that the administration protocol was well implemented across agencies and that there were no occurrences that might have jeopardized questionnaire administration.

### **Data Collection**

Across all the measurement points, the 15 agencies that met data collection requirements administered a total of 7,996 questionnaires: 3,212 at the pre-test; 1,606 at the intermediate-test; 2,038 at the post-test; 549 at the follow-up 1; and 591 questionnaires at the follow-up 2. The administration took place in classroom settings for 7,822 questionnaires (97.82%) and in community center settings for 174 questionnaires (2.18%). Table 4 presents the raw number of questionnaires administered to the case and the control groups by agency at each measurement point.



Table 4  
*Raw Number of Questionnaires Administered by Agency*

Agencies	Pre-test		Intermediate-test		Post-test		Follow-up 1		Follow-up 2		Total <sup>c</sup>		
	Cases	Controls	Cases	Control	Cases	Control	Cases	Control	Cases	Control	Cases	Control	All
Agency 1	293	93	268	0	268	50	0	0	77	30	906	173	1079
Agency 2	55	22	43	0	49	23	5	0	0	0	152	45	197
Agency 3	824	153	250	93	368	116	237	0	0	0	1679	362	2041
Agency 4	127	0	43	0	121	0	0	0	103	0	394	0	394
Agency 5	31	18	35	0	35	18	16	0	18	3	135	39	174
Agency 6	112	109	91	0	51	69	51	0	14	0	319	178	497
Agency 7	87	70	82	45	75	65	0	0	19	0	263	180	443
Agency 8	76	19	76	0	36	20	40	0	36	0	264	39	303
Agency 9	61	0	38	0	28	0	0	0	15	0	142	0	142
Agency 10	50	18	50	0	50	18	18	0	0	0	168	36	204
Agency 11	39	30	0	0	17	29	0	0	0	0	56	59	115
Agency 12	269	0	139	0	130	0	102	0	81	0	721	0	721
Agency 13	77	24	26	0	72	24	54	26	54	22	283	96	379
Agency 14	468	0	327	0	253	0	0	0	88	0	1136	0	1136
Agency 15	76	11	0	0	43	10	0	0	31	0	150	21	171
<b>Total 1<sup>a</sup></b>	<b>2645</b>	<b>567</b>	<b>1468</b>	<b>138</b>	<b>1596</b>	<b>442</b>	<b>523</b>	<b>26</b>	<b>536</b>	<b>55</b>	<b>6768</b>	<b>1228</b>	<b>7996</b>
<b>Total 2<sup>b</sup></b>	<b>3212</b>		<b>1606</b>		<b>2038</b>		<b>549</b>		<b>591</b>		<b>7996</b>		

<sup>a</sup>Total number of questionnaires administered to cases and controls by agency. <sup>b</sup>Total number of questionnaires administered to cases and controls by measurement point. <sup>c</sup>Total number of questionnaires administered by agency by measurement point.

Questionnaires were administered within different time periods, starting in January 2009 and ending in December 2011. As shown in Table 5, most pre-test data collection sessions occurred in the second semester of 2009, most intermediate-test sessions during the first trimester of 2010, most post-test sessions by the end of the second trimester of 2010, most follow-up 1 sessions by the end of 2010, and most follow-up 2 sessions near the end of the first semester of 2011.

Table 5  
*Questionnaire Administering Chronogram by Agency*

Agencies	2009												2010												2011												
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Agency 1											1			2	3																5						
Agency 2												1		2	3								4														
Agency 3	1											2			3												4										
Agency 4	1													2	3																5						
Agency 5												1			2			3										4					5				
Agency 6												1		2									3						4						5		
Agency 7												1		2	3																5						
Agency 8			1													2							3								5						
Agency 9							1							2	3																	5					
Agency 10												1			2																				4		
Agency 11												1					3																				
Agency 12															2			3															5				
Agency 13												1		2				3									4						5				
Agency 14												1					2													3							5
Agency 15																		3															5				

Note. Number 1 represents pre-test measurement point. Number 2 represents intermediate-test measurement point. Number 3 represents post-test measurement point. Number 4 represents follow-up 1 measurement point. Number 5 represents follow-up 2 measurement point.

### Prevention Interventions

The overall objective of the prevention interventions assessed in this research was to prevent substance use among vulnerable adolescents. As specific objectives, most interventions aimed to (a) develop social skills, self-esteem, self-concept, and autonomy; (b) promote adaptive drugs-related attitudes, knowledge, and behaviours; (c) promote healthy life styles; (d) increase the range of healthy leisure activities; (e) decrease deviant behaviours; (f) decrease social interaction problems; (g) reduce school dropout and school failure; and (h)

improve family bonding. Table 6 presents, for each agency, the components delivered in order to achieve this objectives.

Table 6  
*Delivered Components by Agency*

Agencies	Delivered components							
	Social skills training	Information about substances	Educational and leisure activities	Teachers training	Individual support	Peer-to-peer activities	Preventive campaigns	Parental training
Agency 1	x	x		x				
Agency 2	x	x	x		x	x	x	
Agency 3	x	x	x	x	x	x	x	
Agency 4	x			x				
Agency 5	x	x	x	x	x	x		x
Agency 6	x	x						
Agency 7	x							
Agency 8	x	x	x			x	x	
Agency 9	x	x						
Agency 10	x	x	x					
Agency 11	x							
Agency 12	x			x				
Agency 13	x		x	x	x			
Agency 14	x	x	x	x	x	x	x	
Agency 15	x	x	x	x	x		x	
<b>Total</b>	<b>15</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>6</b>	<b>5</b>	<b>5</b>	<b>1</b>

The four most common components were social skills training, which was implemented by all agencies; informative sessions about substances, that were implemented by two-thirds of agencies (66.67%); teacher training, that was delivered by just over half of agencies (53.33%); and leisure activities, that were been put in place by just less than half of agencies (46.67%). Individual support was delivered by over one-third of agencies (40.00%), peer-to-peer activities and prevention campaigns by one-third (33.33%), and parental training by only one agency (6.67%)

As for prevention interventions' content, duration, quantity, and frequency of exposure, social skills training sessions were implemented bi-weekly and addressed themes such as assertiveness, communication, conflict and emotion management, decision-making, frustration resistance, healthy life-styles, self-concept, self-esteem, self-control, moral norms, motivation, peer pressure resistance, problem solving, risk-taking, social norms, and tolerance. These training activities ranged from seven to 30 hours, lasting on average for 19 hours, distributed across 15 sessions.

Information sessions were jointly implemented with social skills training and provided information on tobacco, alcohol, cannabis, as well as other substances if requested by adolescents. These information sessions ranged from one to 10 hours, lasting on average five hours, distributed over three sessions.

Educational and leisure activities included activities such as football, table tennis, referees training, dance, gymnastics, workshops on music, cinema, paints, handcraft, graffiti, photography, theatre, taekwondo, and volunteering. These activities were variable in their duration, quantity, and frequency of exposure.

Individual support activities included psychosocial or psychological support delivered by programmes' staff to adolescents with learning disabilities, behavioural problems, or showing signs of substance use, flagged by teachers. This support was variable in its duration, quantity, and frequency of exposure.

Peer-to-peer activities consisted mostly of community volunteering and collaboration in substance use prevention activities promoted by agencies. These activities were variable in their duration, quantity, and frequency of exposure.

Preventive campaigns were put in place on commemorative days like the World Day Against Drugs and Drug Addiction, the World Day Against Tobacco, the World Day Against AIDS, or the World Youth Day. Adolescents participated in these activities by distributing preventive materials. These activities were variable in their duration, quantity, and frequency of exposure.

Parental training sessions were implemented weekly and addressed themes such as child development, parent-child bonding, conflict management, healthy life-styles, and family-school relationships. These training activities lasted for 30 hours distributed across 15 sessions.

Teachers training sessions were implemented weekly and addressed themes such as adolescence, assertiveness, behavioural problems, bullying, communication, community structures for adolescents, conflict management, substance use prevention intervention implementation learning theories, psychoactive substances, risk and protective factors, stress management, substance use, and warning signs. These training activities ranged from six to 24 hours, lasting on average for 16 hours, distributed across three sessions.

Most interventions (86.67%) were delivered in school settings, within classrooms and a few (13.33%) in community settings, within groups.

As for staff, teams ranged from two to five members, almost all (95.65%) with a degree in educational sciences, first grade teaching, psychology, social work, social animation, sociology, or sports. More than half (54.35%) of staff implementing these interventions had no specific training nor former experience in substance use prevention or in addictive behaviours.

A more detailed description for each prevention intervention can be found in Appendix L providing information on the specific purposes, the activities assessed, the target group, the setting where the prevention intervention was delivered, the staff that implemented the prevention intervention, and the setting where controls was collected.

### **Data Analyses**

Data analyses included data cleaning, data editing, statistical tests, and statistical software, each described below in detail.

#### **Data Cleaning.**

The process of data cleaning included the identification of unusable questionnaires and the identification of low quality data. Unusable and low data quality questionnaires were discarded from the database.

Questionnaires were considered unusable if improperly coded or missing information about gender. Improperly coded questionnaires could not be matched along the measurement points, an essential methodological feature for this research, while gender information was considered critical for performing advanced statistical analyses. Additionally, given that only one-third (i.e., five agencies) of the agencies undertaking this research managed to accomplish both follow-ups, it was decided to merge follow-up 1 and 2 into a single measurement point. Therefore, questionnaires from follow-up 1 were eliminated from the database whenever questionnaires from both follow-up 1 and follow-up 2 were available.

Questionnaires were considered low quality whenever (a) the response rate to core items was lower than 50%; (b) there was a highly repetitive answering pattern; or (c) there was an

inconsistent answering pattern. A repetitive answering pattern was considered whenever the student (a) gave the same answer (other than neither agree nor *disagree*) to all items within the question assessing attitudes towards tobacco, alcohol, cannabis, ecstasy, or cocaine; and (b) reproduced this repetitive pattern for at least two out of the five substances. An inconsistent answering pattern was considered whenever the student (a) indicated an age of onset for tobacco, alcohol, cannabis, ecstasy, or cocaine use higher than their current age; and (b) reproduced this incongruent pattern in at least two out of the five substances. The decision on how many questions with repetitive answering pattern or with inconsistent answering pattern could be accepted took into account the least case loss.

Additionally, the questionnaires administered at the intermediate-measurement point were discarded and the substance-specific ecstasy section was eliminated. The decision to discard intermediate questionnaires was based on staff reports pointing to some adolescents unduly skipping questions, which may have biased data. The decision to eliminate the ecstasy variables was based on the high percentage of adolescents (54.5%) stating not being aware of what ecstasy was, which was considered a consequence of the inability to associate the spoken word *ecstasy* to its written form, which may have biased data.

Through data cleaning, 266 unusable questionnaires (out of 3212 questionnaires) were eliminated from the pre-test database, from which 51 had been filled out by cases and 215 by controls; 282 unusable questionnaires (out of 2038 questionnaires) were eliminated from the post-test database, from which 215 had been filled in by cases and 67 by controls. After data cleaning, the pre-test database for study 1 integrated 2.581 cases<sup>6</sup>; the database for study 2 integrated 1.381 cases and 375 controls.

Overall, from the 7.996 administered questionnaires, 2.108 (26.36%) were discarded, mostly due to the exclusion of the intermediate measurement point questionnaires, followed by the exclusion of follow-up 1 questionnaires. For improper coding, missing gender, repetitive or inconsistent answering pattern and low response rate, discarding was lower than 1% each. Despite varying according to agency, the percentage of valid questionnaires ranged from 63.04% to 100%. Table 7 summarises the number and percentage of administered, discarded, and valid questionnaires by agency and criteria for discarding.

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<sup>6</sup>From the original sample of 2.645 cases, 13 refused to fill in the questionnaire and 51 were discarded.

Table 7  
*Criteria for Questionnaires' Discarding by Agency*

Agencies	N <sup>a</sup>	Improper codification		Missing gender		Double follow-up		Intermediate-test		Repetitive answering		Inconsistent answering		Low response		Total <sup>f</sup>		Valid N <sup>g</sup>	
		n <sup>b</sup>	% <sup>c</sup>	n <sup>b</sup>	% <sup>c</sup>	n <sup>b</sup>	% <sup>c</sup>	n <sup>b</sup>	% <sup>c</sup>	n <sup>b</sup>	% <sup>c</sup>	n <sup>b</sup>	% <sup>c</sup>	n <sup>b</sup>	% <sup>c</sup>	n	%	n	%
Agency 1	1079	10	0.93	0	0	12	1.1	294	27.2	9	0.83	2	0.19	2	0.2	329	30.49	750	69.51
Agency 2	197	0	0	0	0	0	0	44	22.3	2	1.02	0	0	0	0	46	23.35	151	76.65
Agency 3	2041	0	0	0	0	0	0	343	16.8	4	0.2	0	0	0	0	347	17	1694	83.00
Agency 4	394	0	0	4	1	0	0	45	11.4	0	0	0	0	0	0	49	12.44	345	87.56
Agency 5	174	0	0	0	0	22	13	34	19.5	2	1.15	0	0	0	0	58	33.33	116	66.67
Agency 6	497	6	1.21	17	3.4	7	1.4	111	22.3	0	0	0	0	5	1	146	29.38	351	70.62
Agency 7	443	0	0	0	0	0	0	128	28.9	4	0.9	0	0	0	0	132	29.8	311	70.20
Agency 8	303	0	0	0	0	36	12	76	25.1	0	0	0	0	0	0	112	36.96	191	63.04
Agency 9	142	0	0	0	0	0	0	38	26.8	4	2.82	0	0	6	4.2	48	33.8	94	66.20
Agency 10	204	12	5.88	0	0	0	0	50	24.5	5	2.45	0	0	0	0	67	32.84	137	67.16
Agency 11	115	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115	100.00
Agency 12	721	0	0	0	0	80	11	147	20.4	12	1.66	0	0	1	0.1	240	33.29	481	66.71
Agency 13	379	0	0	0	0	53	14	74	19.5	0	0	0	0	10	2.6	137	36.15	242	63.85
Agency 14	1136	0	0	21	1.8	0	0	358	31.5	8	0.7	0	0	1	0.1	388	34.15	748	65.85
Agency 15	171	0	0	0	0	0	0	0	0	5	2.92	2	1.17	2	1.2	9	5.263	162	94.74
<b>Total 1</b>	<b>7996</b>	<b>28<sup>d</sup></b>	<b>0.35<sup>e</sup></b>	<b>42<sup>d</sup></b>	<b>0.5<sup>e</sup></b>	<b>210<sup>d</sup></b>	<b>2.63<sup>e</sup></b>	<b>1742<sup>d</sup></b>	<b>21.79<sup>e</sup></b>	<b>55<sup>d</sup></b>	<b>0.69<sup>e</sup></b>	<b>4<sup>d</sup></b>	<b>0.05<sup>e</sup></b>	<b>27<sup>d</sup></b>	<b>0.3<sup>e</sup></b>	<b>2108<sup>d</sup></b>	<b>26.36<sup>e</sup></b>	<b>5888</b>	<b>73.67</b>

<sup>a</sup> Number of administered questionnaires. <sup>b</sup> Number of discarded questionnaires per criteria. <sup>c</sup> Percentage of discarded questionnaires per criteria. <sup>d</sup> Total number of discarded questionnaires per criteria. <sup>e</sup> Percentage of discarded questionnaires within the total number of questionnaires administered. <sup>f</sup> Number and percentage of discarded questionnaires. <sup>g</sup> Number and percentage of valid questionnaires after discarding.

### **Data Editing.**

Data editing included calculating total scale scores; imputing missing values; correcting double answering; recoding into new variables; and creating new variables. All these procedures, described below, were executed through standardised Statistical Package for the Social Sciences (SPSS) syntaxes.

#### ***Calculating total scale scores.***

A total mean score was calculated for each of the ASATID subscales (i.e., alcohol, tobacco, cannabis, and cocaine). These subscales scores were then clustered into three categories (i.e., negative, neutral, and positive) to facilitate score interpretation.

A total mean scale score, combining the 10 items of the KIDSCREEN-10, was calculated and then converted into a standardised score from 0 to 100 to facilitate comparison with data collected within European studies.

Both total mean scores were calculated after negatively worded items were reversed.

#### ***Imputing missing values.***

Missing values have been imputed whenever adolescents indicated that they were not aware of what a particular substance was and therefore have not answered any of the subsequent questions about that substance. Missing values on lifetime use were substituted by answer choice *no*, as it is logical to assume that if they do not know what a particular substance is, they have not used it.

Missing values have also been imputed for age given the importance of this variable for performing advanced statistical analyses. Values have been imputed in 348 (5.51%) out of 6.313 valid questionnaires. For matched questionnaires (52.61%) the values imputed were calculated based on the age imputed on their matching questionnaires and considering the interventions' chronograms. For the unmatched questionnaires (39.89%) and those questionnaires with missing age at all measurement points (7.50%), the calculation of the imputed value was based on the classroom mean age.



### ***Correcting double answering.***

Whenever respondents selected more than one answer option on any continuous variable, answers were corrected according to the following criteria: if double answers were in the same direction (e.g. *strongly agree* and *agree*), the least extreme value (e.g. *agree*) was validated; if the double answers were in opposite directions (e.g. *strongly agree* and *strongly disagree*), none of the answers were validated and a missing value was used.

### ***Recoding into new variables.***

For better analysis of the data, the following categorical variables were recoded.

*Risk perception.* The *no risk* category was combined with the *slight risk* category and labeled *low risk*.

*Attitudes.* A sum score was calculated from the original ordinal 5 point Likert-scale variables assessing attitudes towards tobacco, alcohol, cannabis, and cocaine. This sum score was then used as a basis for creating a categorical variable for attitudes with three categories (i.e., *negative*, *neutral*, and *positive*). As the number of items per subscale was different between tobacco, alcohol and all the other substances, different ranges were used for each substance. For tobacco, given that the subscale includes six items, the first category (i.e. *negative*) includes sum scores ranging from 0 to 13, the second category (i.e. *neutral*) includes sum scores ranging from 14 to 21, and the third category (i.e. *positive*) includes sum scores ranging from 22 to 35. For alcohol, the subscale includes eight items, with the first category (i.e. *negative*) including sum scores ranging from 0 to 16, the second (i.e. *neutral*) including sum scores ranging from 17 to 24, and the third (i.e. *positive*) including sum scores ranging from 25 to 40. For cannabis, and cocaine, subscales include five items, and the first category (i.e. *negative*) includes sum scores ranging from 0 to 9, the second (i.e. *neutral*) includes sum scores ranging from 10 to 15, and the third (i.e. *positive*) includes sum scores ranging from 16 to 25.

*Perceived accessibility.* The category *very easy* was combined with the category *easy* and labeled *easy* and the category *difficult* was combined with the category *very difficult* and labeled *difficult*.

*Best friends' substance use.* The category *uses every weekend* was combined with the category *uses every day* and labeled *regular user*.

*Intention to use.* Answers given to questions assessing intention to start using, maintain use, and restart using were combined and the value with the highest frequency observed was assumed. In case of a tie, the value assumed was the one given to the question assessing intention to start using, as it is the first of the set of three.

*Stressful life events.* The original variable was recoded into a dichotomous variable, where yes was imputed whenever the option *positive* or *negative* had been marked for a specific life event.

*Nationality.* The categories *Brazilian*, *native from African countries*, *native from Eastern European countries*, *native from Asian countries*, or *other nationality* were combined and labeled *other nationalities*.

*Father's achieved school level.* The categories *never attended school* and *1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> grade* were combined and labeled *low educational level*; categories *5<sup>th</sup> or 6<sup>th</sup> grade, 7<sup>th</sup>, 8<sup>th</sup> or 9<sup>th</sup> grade, 10<sup>th</sup>, 11<sup>th</sup>, or 12<sup>th</sup> grade* and *vocational school* were combined and labeled *medium educational level*.

*Mother's achieved school level.* The categories *never attended school* and *1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, or 4<sup>th</sup> grade* were combined and labeled *low educational level*; categories *5<sup>th</sup> or 6<sup>th</sup> grade, 7<sup>th</sup>, 8<sup>th</sup> or 9<sup>th</sup> grade, 10<sup>th</sup>, 11<sup>th</sup>, or 12<sup>th</sup> grade* and *vocational school* were combined and labeled *medium educational level*.

*Family structure.* As the question to assess family structure allowed multiple answering, answers were clustered into the categories of *intact*, *single*, *extended*, *blended*, and *institution*. The criteria for clustering were the following: it was considered an intact family whenever the student lived with both parents, regardless of being living with siblings, grandparents or other relatives as well; it was considered a single family whenever the student lived with one of the parents, regardless of living with siblings, grandparents or other relatives; it was considered an extended family whenever the student lived with grandparents and/or other relatives, regardless of being living with siblings; and it was considered a blended family whenever the student lived with one of the parents and a stepmother or stepfather, regardless of being living with siblings, grandparents or other relatives as well.

### ***Creating new variables.***

For better analyses of the data, the following additional variables were created.

*Regular use.* This variable was derived from answers to the question assessing pattern of use: if the answer was *every day* or *on weekends*, this variable assumed the value *yes*; and if the answer was *only on special occasions*, this variable assumed the value *no*.

*Level of use.* This variable was derived from answers to the question assessing lifetime use, current use, and regular use: if the answer to lifetime use was *no*, this variable assumed the value *non-user*; if the answer to lifetime use was *yes*, this variable assumed the value *lifetime user*; if the answer to current use was *yes*, this variable assumed the value *current user*; if the answer to regular use was *yes*, this variable assumed the value *regular user*.

*Lifetime use of prescribed substances.* This variable combined answers given to questions assessing lifetime use of sedatives, anxiolytics, and antidepressants. If the answer to at least one of these prescribed substances was *yes*, this variable assumed the value *yes*.

*Lifetime use of other substances.* This variable combined answers to questions assessing lifetime use of ecstasy, LSD, amphetamines, GHB, heroin, magic mushrooms, ketamine, inhalants, and body builders. If the answer to at least one of these other substances was *yes*, this variable assumed the value *yes*.

*Last 12 months use of prescribed substances.* This variable combined answers given to questions assessing last 12 months use of sedatives, anxiolytics, and antidepressants. If the answer to at least one of these prescribed substances was other than *no*, this variable assumed the value with the highest frequency observed.

*Last 12 months use of prescribed substances.* This variable combined answers given to questions assessing last 12 months use of ecstasy, LSD, amphetamines, GHB, heroin, magic mushrooms, ketamine, inhalants, and body building substances. If the answer to at least one of these other substances was other than *no*, this variable assumed the value with the highest frequency observed.

*SES.* This variable was derived from answers to questions assessing father's and mother's achieved school level: a low achieved school level was coded as a low SES; a medium achieved school level was coded as a medium SES; and a high achieved school level was

coded as a high SES. As adolescents were asked about both their father and their mother, the value assumed was the highest one.

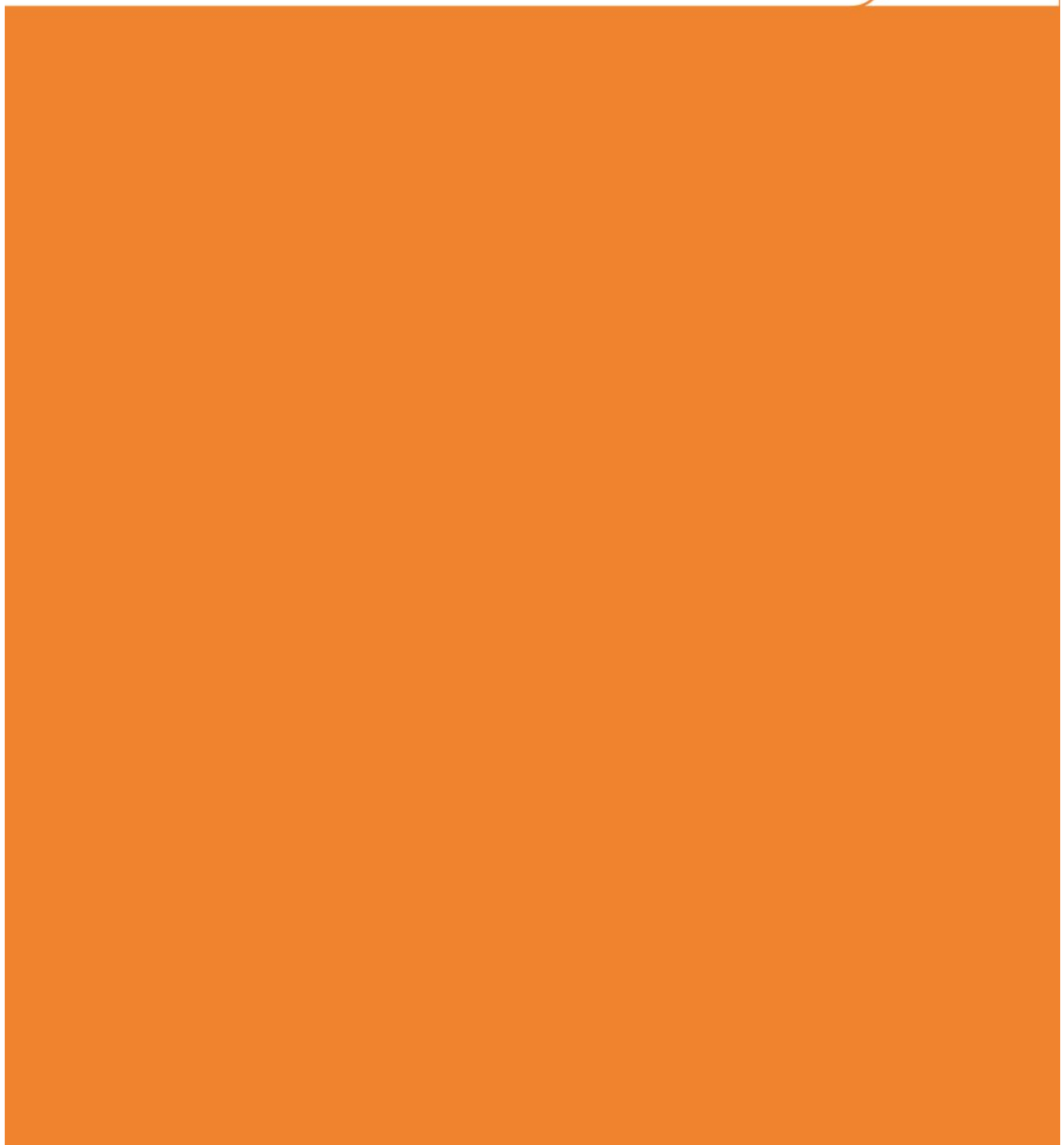
### **Statistical Tests.**

Several types of statistical tests were used, depending on the purpose of the analyses as well as on the nature of the data being used. Thus, whenever the purpose of the analyses was to explore the relationship among categorical variables, the Chi Square Test for Independence was used, while whenever the purpose was to explore differences between non-related groups on a continuous variable, the test used was the Independent Sample T-Test. For testing the independent contribution of factors, the chosen test was Binary Logistic Regression as the dependent variables were dichotomous. Whenever the purpose was to compare paired samples across two or more measurement points, the Wilcoxon Signed Rank Test was used. A Chi Square Test was used to examine if the case and the control groups differed in ratios of individuals changing or retaining reported views or behaviours between the two periods. For determining a statistically significant result, the significance level used across all statistical tests was 0.05.

### **Statistical Software**

The statistical software used was the SPSS statistics version 21.

**STUDY 1**



This chapter presents the results and the discussion for study 1, a study aimed to (a) examine substance use patterns; (b) identify proximal, distal, and ultimate variables associated with substance use; (c) determine the differential effect of proximal, distal, and ultimate variables on substance use; and (d) recognize risk and protective factors for substance use. Data were collected among 2,581 adolescents identified as in need of substance use prevention interventions. For a better reading, this chapter is divided into two sections: a first section presenting the results; and a second section presenting the discussion of the main findings.

## **Results**

This section presents the two types of analyses, each presented in a specific sub-section: a descriptive analyses for the sets of variables under assessment in this research; and an association analyses testing the relationships between the independent and the dependent variables considered in this research.

### **Descriptive Analyses.**

This section presents a descriptive analyses for three sets of variables: 1) proximal variables; 2) health-related quality-of-life items; and 3) substance use behaviour variables. The set for proximal variables include data on seven variables<sup>7</sup>: 1) risk perception; 2) attitudes; 3) expected problems; 4) expected benefits; 5) perceived accessibility; 6) best friend's substance use; and 7) perceived parental substance use approval. The set for health-related quality-of-life variables presents the answers to the 10 items comprising the KIDSCREEN-10: 1) fit; 2) energy; 3) sadness; 4) loneliness; 5) time for oneself; 6) enjoying leisure activities; 7) being treated fairly by parents; 8) having fun with friends; 9) being a good student; and 10) ability to pay attention at school. The mean value and the respective standard deviation are presented for each item, as well as for an overall variable combining the answers given to the 10 items. The set for substance use behaviour variables includes data on five variables: 1) lifetime use; 2) age of onset; 3) current use; 4) regular use; and 5) intention to use.

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<sup>7</sup>Due to the overlap with best friend's substance use behaviour, data on perceived best friend's substance use approval were not included as it could bias advanced statistical analyses.

### ***Proximal variables.***

*Risk perception*(see Table 20)is meant to assess to what extent adolescents perceive substance use as being a health hazard. Results show that about three-quarters of respondents thought that using tobacco (74.26%), cannabis (77.29%), and cocaine (81.97%) was high risk. However, just less than half of respondents (45.89%) said that using alcohol was high risk.

Comparing the percentages for high risk categories across substances, cocaine was considered the most harmful substance, and alcohol the least. A higher percentage of adolescents stated that cannabis use has low risk to health (3.35%) when compared with the percentage of adolescents stating that smoking has a low risk to health (1.94%).

*Attitudes towards substances*(see Table 20) were assessed to determine whether adolescents hold negative, neutral, or positive attitudes towards substance use. Data show that around half of adolescents reported negative attitudes towards tobacco (57.65%), cannabis (42.38%), and cocaine (50.10%). However, just over one-third (38.32%) reported negative attitudes towards alcohol.

Comparing across substances, tobacco was the substance for which most adolescents expressed a negative attitude, while alcohol was the one for which least adolescents expressed such attitude. As for positive attitudes, alcohol was the substance for which more adolescents expressed a positive attitude (13.25%), followed closely by cannabis (12.32%).

Table 8 presents the eight items composing the *attitudes towards drinking* subscale: approximately one-third of adolescents (33.59%)said that drinking in public places should be banned and just less than half that drunk drivers should be arrested (48.28%);more than half disagreed that alcohol helps you to make friends (55.44%) and that it is easier to communicate after drinking (63.46%);more than half considered that alcohol selling and consumption should be prohibited to minors (62.53%) and thought that drinking is a problem even if it increases well-being (67.14%); around three-quarters agreed that schools should teach adolescents responsible drinking behaviour (73.19%) and considered drinking as a health hazard (81.67%).

Table 8  
*Attitudes Towards Drinking*

Items	Categories	n <sup>a</sup>	%
Drinking is not a problem if it makes a person feel better	Disagree	1733	67.14
	Neither agree nor disagree	649	25.15
	Agree	199	7.71
It is easier to relate to other people after a few drinks	Disagree	1638	63.46
	Neither agree nor disagree	535	20.73
	Agree	408	15.81
Drinking in public places should be prohibited	Disagree	882	34.17
	Neither agree nor disagree	832	32.24
	Agree	867	33.59
Drunk drivers should be arrested	Disagree	518	20.07
	Neither agree nor disagree	817	31.65
	Agree	1246	48.28
Drinking alcoholic beverages is harmful to health	Disagree	119	4.61
	Neither agree nor disagree	354	13.72
	Agree	2108	81.67
Alcohol selling and consumption should be prohibited to minors	Disagree	489	18.95
	Neither agree nor disagree	478	18.52
	Agree	1614	62.53
Alcohol consumption can help making friends	Disagree	1431	55.44
	Neither agree nor disagree	679	26.31
	Agree	471	18.25
Schools should implement activities targeting responsible drinking behaviour	Disagree	168	6.51
	Neither agree nor disagree	524	20.30
	Agree	1889	73.19

<sup>a</sup>n = 2581

Table 9 presents the six items comprising the *attitudes towards smoking* subscale: over one-third of adolescents (44.29%) thought that tobacco selling should be prohibited; over half (55.13%) did not perceive smokers as having stronger personalities than non-smokers and considered smoking an inappropriate way to try to manage anxiety(58.43%);two-thirds (65.59%) thought that smoking a couple of cigarettes a day was still a matter of concern and just over three-quarters (77.02%) agreed with smoking bans in enclosed spaces; over three-quarters of adolescents (80.63%) did not consider smokers to be more stylish than non-smokers.



Table 9  
*Attitudes Towards Smoking*

Items	Categories	n <sup>a</sup>	%
Smokers have a stronger personality	Disagree	1423	55.13
	Neither agree nor disagree	825	31.96
	Agree	333	12.90
It should be prohibited to smoke in closed spaces	Disagree	325	12.59
	Neither agree nor disagree	268	10.38
	Agree	1988	77.02
Smokers are more stylish	Disagree	2081	80.63
	Neither agree nor disagree	329	12.75
	Agree	171	6.63
Tobacco selling should be prohibited	Disagree	670	25.96
	Neither agree nor disagree	768	29.76
	Agree	1143	44.29
Smoking is a wrong way to calm down	Disagree	444	17.20
	Neither agree nor disagree	629	24.37
	Agree	1508	58.43
Smoking a couple of cigarettes a day is not a problem	Disagree	1693	65.59
	Neither agree nor disagree	534	20.69
	Agree	354	13.72

<sup>a</sup>n = 12581

Table 10 presents the five items comprising the *attitudes towards cannabis use* subscale: less than one-third (27.15%) of adolescents thought that cannabis users should be arrested and over half (61.76%) disagreed with legalization; and around three-quarters thought that case use of cannabis is a health hazard (73.61%), that cannabis use is a problem even if it helps a person to feel better (79.28%), and that cannabis is harmful to health (85.17%).

Table 10  
*Attitudes Towards Cannabis Use*

Items	Categories	n <sup>a</sup>	%
Smoking cannabis is not a problem if it makes a person feel better	Disagree	1358	79.28
	Neither agree nor disagree	217	12.67
	Agree	138	8.06
Even casual use of cannabis is harmful to health	Disagree	206	12.03
	Neither agree nor disagree	246	14.36
	Agree	1261	73.61
Cannabis use should be legalized	Disagree	1058	61.76
	Neither agree nor disagree	328	19.15
	Agree	327	19.09
Cannabis is not harmful to health	Disagree	1459	85.17
	Neither agree nor disagree	118	6.89
	Agree	136	7.94
Cannabis users should be arrested	Disagree	601	35.08
	Neither agree nor disagree	647	37.77
	Agree	465	27.15

<sup>a</sup>n = 1713

Table 11 presents the five items composing the *attitudes towards cocaine use* subscale: results show that over one-third of adolescents (36.58%) were of the opinion that cocaine users should be arrested and just over two-thirds (67.51%) that cocaine should not be legalized; and over three-quarters considered that even an casual use of cocaine is a health hazard (80.35%), that cocaine use is as a problem even if it helps a person to feel better (84.19%), and that, overall, cocaine is harmful to health (86.33%).

Table 11  
*Attitudes Towards Cocaine Use*

Items	Categories	n <sup>a</sup>	%
Taking cocaine is not a problem if it makes a person feel better	Disagree	1731	84.19
	Neither agree nor disagree	220	10.70
	Agree	105	5.11
Even an casual use of cocaine is harmful to health	Disagree	192	9.34
	Neither agree nor disagree	212	10.31
	Agree	1652	80.35
Cocaine use should be legalized	Disagree	1388	67.51
	Neither agree nor disagree	339	16.49
	Agree	329	16.00
Cocaine is not harmful to health	Disagree	1775	86.33
	Neither agree nor disagree	109	5.30
	Agree	172	8.37
Cocaine users should be arrested	Disagree	466	22.67
	Neither agree nor disagree	838	40.76
	Agree	752	36.58

<sup>a</sup>n = 2056

Questions on *unexpected problems* (see Table 20) examined the extent adolescents expect negative outcomes from using substances. Results show that over three-quarters of adolescents expected problems from tobacco (81.75%), cannabis (92.76%), and cocaine (93.82%), but just less than half (48.43%) expected problems from drinking. While tobacco was the substance towards which more adolescents expected problems, alcohol was the least.

Table 12 presents the four items comprising the *expected problems from drinking* subscale: data show that most adolescents did not know whether negative outcomes would happen to them as a consequence of drinking with more than half did not knowing if drinking would lead to problems with parents (75.94%), within school (63.93%), or with the police (61.49%). Having problems with peers was the most expected negative outcome from drinking (27.59%).

Table 12  
*Expected Problems From Drinking*

Items	Categories	n <sup>a</sup>	%
Problems within school	No	533	20.65
	Do not know	1650	63.93
	Yes	398	15.42
Problems with police	No	408	15.81
	Do not know	1587	61.49
	Yes	586	22.70
Problems with parents	No	335	12.98
	Do not know	1960	75.94
	Yes	286	11.08
Problems with peers	No	885	34.29
	Do not know	984	38.12
	Yes	712	27.59

<sup>a</sup>n = 2581

Table 13 presents the three items comprising the *expected problems from smoking* subscale: data show that just over three-quarters (77.84%) of adolescents anticipated problems with parents, over one-third (44.56%) within school, and less than one-third (28.75%) with peers.

Table 13  
*Expected Problems From Smoking*

Items	Categories	n <sup>a</sup>	%
Problems within school	No	759	29.41
	Do not know	672	26.04
	Yes	1150	44.56
Problems with parents	No	291	11.27
	Do not know	281	10.89
	Yes	2009	77.84
Problems with peers	No	1071	41.50
	Do not know	768	29.76
	Yes	742	28.75

<sup>a</sup>n = 2581

Table 14 presents the four items comprising the *expected problems from cannabis use* subscale: data indicate that almost all adolescents (90.31%) expected problems with parents, over three-quarters with the police (79.68%) and within school (75.25%), and just over half (53.88%) problems with peers.

Table 14  
*Expected Problems From Cannabis Use*

Items	Categories	n <sup>a</sup>	%
Problems within school	No	169	9.87
	Do not know	255	14.89
	Yes	1289	75.25
Problems with police	No	93	5.43
	Do not know	255	14.89
	Yes	1365	79.68
Problems with parents	No	44	2.57
	Do not know	122	7.12
	Yes	1547	90.31
Problems with peers	No	332	19.38
	Do not know	458	26.74
	Yes	923	53.88

<sup>a</sup>n = 1713

Table 15 presents the four items composing the *expected problems from cocaine use* subscale: data indicate that most adolescents expected negative outcomes with almost all (92.07%) expecting problems with parents, over three-quarters problems with the police (82.54%), and within school (81.27%), and over half (64.01%) problems with peers.

Table 15  
*Expected Problems From Cocaine Use*

Items	Categories	n <sup>a</sup>	%
Problems within school	No	95	4.62
	Do not know	290	14.11
	Yes	1671	81.27
Problems with police	No	69	3.36
	Do not know	290	14.11
	Yes	1697	82.54
Problems with parents	No	27	1.31
	Do not know	136	6.61
	Yes	1893	92.07
Problems with peers	No	253	12.31
	Do not know	487	23.69
	Yes	1316	64.01

<sup>a</sup>n = 2056

Questions on *expected benefits* (see Table 20) examined to what extent adolescents expect positive outcomes to happen to them as a consequence of substance use. Results indicate that around half of adolescents were not sure about the positive outcomes of tobacco (46.61%), cannabis (42.50%), and cocaine (50.44%), whereas for alcohol over half of adolescents (59.82%) expected benefits from use. Alcohol was considered the most advantageous substance (59.82%) and cocaine the least (25.05%).

Table 16 presents the five items comprising the *expected benefits from drinking* subscale: results indicate that more than half of adolescents did not expect to have more friends (68.15%), to be more popular (66.41%), or to feel more confident (59.99%) as a consequence of drinking. Feeling more relaxed (35.18%) was the most expected benefits from drinking.

Table 16  
*Expected Benefits From Drinking*

Items	Categories	n <sup>a</sup>	%
To have more friends	No	1759	68.15
	Do not know	186	7.21
	Yes	636	24.64
To feel more relaxed	No	1252	48.51
	Do not know	421	16.31
	Yes	908	35.18
To have more fun	No	1002	38.82
	Do not know	770	29.83
	Yes	809	31.34
To be more popular	No	1714	66.41
	Do not know	180	6.97
	Yes	687	26.62
To feel more confident	No	1525	59.09
	Do not know	198	7.67
	Yes	858	33.24

<sup>a</sup>n = 2581

Table 17 presents the five items comprising the *expected benefits from smoking* subscale: more than half of adolescents did not expect to have more friends (66.25%), to be more popular (65.87%), to feel more confident (63.89%), or to have more fun (60.44%), as a consequence of smoking. Feeling more relaxed was the most expected positive outcome from smoking (20.73%).

Table 17  
*Expected Benefits From Smoking*

Items	Categories	n <sup>a</sup>	%
To have more friends	No	1710	66.25
	Do not know	701	27.16
	Yes	170	6.59
To feel more relaxed	No	979	37.93
	Do not know	1067	41.34
	Yes	535	20.73
To have more fun	No	1560	60.44
	Do not know	750	29.06
	Yes	271	10.50
To be more popular	No	1700	65.87
	Do not know	642	24.87
	Yes	239	9.26
To feel more confident	No	1649	63.89
	Do not know	779	30.18
	Yes	153	5.93

<sup>a</sup>n = 2581

Table 18 presents the five items comprising the *expected benefits from cannabis use* subscale: more than half of adolescents did not expect to have more friends (69.35%), to be more popular (64.45%), or to feel more confident (53.30%) as a consequence of cannabis use. Feeling more relaxed (25.51%) was the most expected positive outcome from cannabis use.

Table 18  
*Expected Benefits From Cannabis Use*

Items	Categories	n <sup>a</sup>	%
To have more friends	No	1188	69.35
	Do not know	408	23.82
	Yes	117	6.83
To feel more relaxed	No	597	34.85
	Do not know	679	39.64
	Yes	437	25.51
To have more fun	No	721	42.09
	Do not know	616	35.96
	Yes	376	21.95
To be more popular	No	1104	64.45
	Do not know	474	27.67
	Yes	135	7.88
To feel more confident	No	913	53.30
	Do not know	634	37.01
	Yes	166	9.69

<sup>a</sup>n = 1713

Table 19 presents the five items composing the *expected benefits from cocaine use* subscale: results indicate that more than half of adolescents did not expect to have more friends (69.46%), to be more popular (61.92%), or to feel more confident (51.56%) as a consequence of cocaine use. Feeling more relaxed (45.57%) was the most expected positive consequence from cocaine use.

Table 19  
*Expected Benefits From Cocaine Use*

Items	Categories	n <sup>a</sup>	%
To have more friends	No	1428	69.46
	Do not know	519	25.24
	Yes	109	5.30
To feel more relaxed	No	782	38.04
	Do not know	937	45.57
	Yes	337	16.39
To have more fun	No	910	44.26
	Do not know	851	41.39
	Yes	295	14.35
To be more popular	No	1273	61.92
	Do not know	665	32.34
	Yes	118	5.74
To feel more confident	No	1060	51.56
	Do not know	827	40.22
	Yes	169	8.22

<sup>a</sup>n = 2056

*Perceived accessibility*(see Table 20) is meant to assess adolescents' ease of access to substances. Results indicate that around three-quarters of adolescents perceived accessing to tobacco (79.11%) and alcohol (82.10%) to be easy or fairly easy, whereas less than half considered cannabis (46.02%) as easy or fairly easy to obtain and over one-third (37.26%) considered cocaine as easy or fairly easy to obtain. Comparing perceived accessibility across substances, alcohol was the substance considered to be the most accessible and cocaine the least.

*Best friend's substance use* (see Table 20) is meant to assess the extent to which adolescents' best friends use substances. Data show that half of best friends have never used tobacco (51.49%), around three-quarters have never used cannabis (74.14%) or cocaine (87.99%), but only around one-third (36.34%) have never tried alcohol. Comparing percentages across substances, the percentage of never users was highest for cocaine and

lowest for alcohol; tobacco was the substance with the highest percentage of quitters (11.97%) but also the substance with the highest proportion of regular users (13.91%).

*Perceived parental substance use approval*(see Table 20) explores adolescents' perceptions on parental approval of substance use. Data indicate that when asked about how they anticipate their parents would react if knowing about their substance use, prohibition was the most prevalent anticipated reaction and approximately one-third of adolescents expected their parents would punish them as a reaction to the use of any of these four substances. Comparing percentages across substances, cocaine was the substance evoking the highest prevalence of prohibitive reaction from parents (70.66%), while alcohol was the substance evoking the lowest (48.36%).



Table 20  
*Descriptives for Proximal Variables Regarding Tobacco, Alcohol, Cannabis, and Cocaine*

Variables	Categories	Alcohol		Tobacco		Cannabis		Cocaine	
		n	%	n	%	n	%	n	%
		n=2576		n=2576		n=1700		n=2041	
Risk perception	Low	168	6.52	50	1.94	57	3.35	31	1.52
	Medium	1226	47.59	613	23.80	329	19.35	337	16.51
	High	1182	45.89	1913	74.26	1314	77.29	1673	81.97
		n=2581		n=2581		n=1713		n=2056	
Attitudes	Negative	989	38.32	1488	57.65	726	42.38	1030	50.10
	Neutral	1250	48.43	1020	39.52	776	45.30	917	44.60
	Positive	342	13.25	73	2.83	211	12.32	109	5.30
		n=2581		n=2581		n=1713		n=2056	
Expected problems	No	164	6.35	219	8.49	29	1.69	20	0.97
	Do not know	1167	45.22	252	9.76	95	5.55	107	5.20
	Yes	1250	48.43	2110	81.75	1589	92.76	1929	93.82
		n=2581		n=2581		n=1713		n=2056	
Expected benefits	No	565	21.89	571	22.12	372	21.72	504	24.51
	Do not know	472	18.29	1203	46.61	728	42.50	1037	50.44
	Yes	1544	59.82	807	31.27	613	35.79	515	25.05
		n=2576		n=2570		n=1682		n=2021	
Perceived accessibility	Easy	1327	51.51	1286	50.04	279	16.59	233	11.53
	Fairly easy	788	30.59	747	29.07	495	29.43	520	25.73
	Difficult	461	17.90	537	20.89	908	53.98	1268	62.74
		n=2581		n=2581		n=1713		n=2056	
Best friend's substance use	Never user	938	36.34	1329	51.49	1270	74.14	1809	87.99
	Quiter	165	6.39	309	11.97	94	5.49	34	1.65
	Occasionally user	947	36.69	309	11.97	129	7.53	29	1.41
	Regular user	180	6.97	359	13.91	42	2.45	8	0.39
	Unknown	351	13.6	275	10.65	178	10.39	176	8.56
		n=2554		n=2542		n=1660		n=2004	
Perceived parental approval	Indifference	168	6.58	35	1.38	11	0.66	11	0.55
	Disapproval	478	18.72	311	12.23	45	2.71	20	1.00
	Punishment	673	26.35	705	27.73	497	29.94	557	27.79
	Prohibition	1235	48.36	1491	58.65	1107	66.69	1416	70.66

### ***Health-related quality-of-life items.***

Health-related quality-of-life was assessed through a set of 10 items. Table 21 presents the answers given to each item, the mean value and respective standard deviation for each health-related quality-of-life item as well as for the overall variable combining the 10 items.

Data show that around three-quarters of adolescents stated that they had fun with their friends (77.83%) and reported low levels of loneliness (76.24%); around two-thirds considered their parents to treat them highly fairly (69.12%), and felt highly fit and in shape (66.35%); over half reported that they had plenty of time for themselves (64.14%), reported low levels of sadness (64.04%) and high levels of energy (63.98%), had plenty of opportunities to do enjoyable activities in their leisure times (62.97%), and felt highly able to pay attention at school (57.90%); and over one-third (39.24%) considered themselves to be very good adolescents.

Considering the mean values for all the items, results show that loneliness ( $M = 83.91$ ,  $SD = 20.87$ ) was the item with the closest value to a high level of health-related quality-of-life whereas school environment was the item furthest away ( $M = 66.79$ ,  $SD = 19.46$ ). The combination of the 10 items shown in the overall variable of health-related quality-of-life indicates that over three-quarters of adolescents (68.68%) report a high level of health-related quality-of-life.

Table 21  
*Health-Related Quality-of-Life Items and Overall Variable*

Items	Categories	n	%	M <sup>a</sup> (SD) <sup>b</sup>
		n=2565		
Fitness	Low	198	7.72	77.91 (19.77)
	Moderate	665	25.93	
	High	1702	66.35	
		n=2560		
Energy	Low	212	8.28	77.09 (19.79)
	Moderate	710	27.73	
	High	1638	63.98	
		n=2547		
Sadness	Low	1631	64.04	76.66 (20.22)
	Moderate	692	27.17	
	High	224	8.79	
		n=2546		
Loneliness	Low	1941	76.24	83.91 (20.87)
	Moderate	405	15.91	
	High	200	7.86	
		n=2549		
Time for oneself	Low	278	10.91	77.36 (21.52)
	Moderate	636	24.95	
	High	1635	64.14	
		n=2541		
Enjoying leisure activities	Low	393	15.47	76.26 (23.34)
	Moderate	548	21.57	
	High	1600	62.97	
		n=2529		
Being treated fairly by parents	Low	259	10.24	79.08 (21.80)
	Moderate	522	20.64	
	High	1748	69.12	
		n=2535		
Having fun with friends	Low	157	6.19	83.72 (19.73)
	Moderate	405	15.98	
	High	1973	77.83	
		n=2543		
Being a good student	Low	384	15.10	66.79 (19.46)
	Moderate	1161	45.65	
	High	998	39.24	
		n=2537		
Ability to pay attention at school	Low	268	10.56	72.80 (18.98)
	Moderate	800	31.53	
	High	1469	57.90	
		n=2581		
<b>Health-related quality-of-life<sup>c</sup></b>	Low	68	2.65	77.15 (12.73)
	Moderate	735	28.67	
	High	1761	68.68	

<sup>a</sup> Mean. <sup>b</sup> Standard deviation. <sup>c</sup> This variable combines the answers given to the ten items presented above.

### ***Substance use behaviour variables.***

Table 22 presents the descriptive statistics for substance use behaviour variables for each of the substances being assessed in this study (i.e., tobacco, alcohol, cannabis, and cocaine). *Lifetime use* (see Table 22) assesses whether adolescents have ever used each of the substances included in this study. Data indicate that over half of adolescents had never used tobacco (60.17%) and almost all had never used cannabis (90.68%) or cocaine (98.24%). The figure is different for alcohol, given that over half of adolescents (56.84%) had already drunk at some point of their lives.

*Age of onset* (see Table 22) examines, for adolescents that have ever used a given substance, the age of first use. Results indicate that for alcohol, most of adolescents that ever tried alcohol had their first drinks at eleven 11 old or younger (20.74%) with alcohol uptake levels reducing with increasing age; for smoking, 11 years or younger was the age at which most adolescents started to use (23.20%) with tobacco uptake levels reducing with increasing age; for cannabis, ages 15 and 16 years appeared to be the peak for initiation (both with 26.81%) while for cocaine, the peak appeared to be 16 years or older (44.44%). Thus, comparing substances, tobacco and alcohol showed the earliest age of onset (11 years old or younger), followed by cannabis (15 and 16 years or older), and cocaine (16 years old or older).

*Current use* (see Table 22) determines, for adolescents who have ever used a given substance, whether they continued to use it and were using that substance at the time of completing the questionnaire, whereas *regular use* identifies adolescents who were using a given substance at least weekly. Results show that, of adolescents that had ever used tobacco, just less than half (45.92%) continued to smoke and of these, over three-quarters (79.78%) smoked on a regular basis; over half of adolescents who had ever drunk alcohol (57.28%) continued to drink and, of these, over one-third drank on a regular basis (41.80%); a similar pattern occurred for cannabis use, with just over half of adolescents (53.42%) that had ever used cannabis continuing to use it of which just less than half reported using cannabis on a regular basis (49.60%); regarding cocaine use, over half (61.36%) of lifetime users did not continue to use it but from those who did, just over half (52.94%) used cocaine on a regular basis. Comparing the percentages for current use across substances, alcohol showed the highest proportion of lifetime users that had become current

users (57.28%), followed closely by cannabis (53.42%). When comparing percentages for regular use, tobacco had a prominent place, with the majority of current users reporting smoking on a regular basis (79.78%).

*Intention to use*(see Table 22)assesses adolescents' intentions to use a given substance: adolescents who had never used were asked about their intention to start using; adolescents who were using were asked about their intention to continue to use; and adolescents who had quit using were asked about their intention to start using again, all within the next 12 months. Results indicate that most adolescents did not intend to use substances: over half (56.32%) did not intent to smoke, just less than three-quarters did not intend to use cannabis (73.15%), and over three-quarters did not intend to use cocaine (82.33%). The exception to this trend was alcohol, given that just over one-third (34.75%) did not express an intention to drink (see Table 22). When comparing percentages across substances, cocaine was the substance towards which most adolescents expressed no intention to use, while alcohol was the substance towards which most adolescents expressed intention to use.

Table 22  
*Descriptives for Substance Use Behaviour Variables*

Variables	Answer	Alcohol		Tobacco		Cannabis		Cocaine	
		n	%	n	%	n	%	n	%
Lifetime use	No	n=2560		n=2561		n=2554		n=2561	
	Yes	1105	43.16	1541	60.17	2316	90.68	2516	98.24
Age of onset <sup>a</sup>		n=1437		n=1013		n=235		n=45	
	11 years or younger	298	20.74	235	23.20	10	4.26	6	13.33
	12 years	253	17.61	222	21.92	25	10.64	2	4.44
	13 years	252	17.54	160	15.79	27	11.49	6	13.33
	14 years	273	19.00	159	15.70	47	20.00	2	4.44
	15 years	215	14.96	135	13.33	63	26.81	9	20.00
Current use <sup>b</sup>		n=1421		n=1006		n=234		n=44	
	No	607	42.72	544	54.08	109	46.58	27	61.36
	Yes	814	57.28	462	45.92	125	53.42	17	38.64
Regular use <sup>c</sup>		n=799		n=455		n=125		n=17	
	No	465	58.20	92	20.22	63	50.40	8	47.06
	Yes	334	41.80	363	79.78	62	49.60	9	52.94
Intention to use		n=2046		n=2088		n=1147		n=1285	
	No	711	34.75	1176	56.32	839	73.15	1058	82.33
	Yes	573	28.01	196	9.39	57	4.97	16	1.25
	Don't know	762	37.24	716	34.29	251	21.88	211	16.42

<sup>a</sup>Age of onset is limited to lifetime users. <sup>b</sup>Current use is limited to lifetime users. <sup>c</sup>Regular use is limited to current users.

*Prescribed substances.*

Table 23 presents the descriptive statistics for lifetime use of prescribed substances, and use over the last 12 months. Data on the use of prescribed substances indicates that almost all adolescents had never used antidepressants (95.69%), sedatives (91.23%), or anxiolytics (89.78%); from those adolescents who had ever used antidepressants, just over one-quarter (26.85%) had not used over the last 12 months and from those who had used over the last 12 months, just less than one-quarter (22.22%) reported having used on one or two occasions; of those who had ever used sedatives, one-quarter (25.00%) had not used over the last 12 months and of those who had used over the last 12 months, over one-third (38.18%) reported having used on one or two occasions; of those adolescents who had ever used anxiolytics, just less than one-sixth (13.23%) had not used over the last 12 months and of those who had used over the last 12 months, over one-third (37.35%) reported having used on one or two occasions.

Analyzing the overall variable of lifetime use of prescribed substances (see Table 23), it can be seen that the vast majority of adolescents (86.10%) have not used these types of substances, but of those who have used them, less than one-third (20.57%) reported not having used them over the last 12 months; from those adolescents who have used over the last 12 months, one-third (33.71%) have used on one or two occasions.

Table 23  
*Lifetime Use and Number of Occasions of Use Over the Last 12 Months for Prescribed Substances*

Substances	Lifetime use	n	%	Number of occasions of use over the last 12 months												
				0		1-2		3-5		6-9		10-19		20-39		>40
		n=2510														
Sedatives	No	2290	91.23	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	220	8.77	55	25.00	84	38.18	33	15.00	14	6.36	13	5.91	10	4.55	11
		n=2514														
Anxiolytics	No	2257	89.78	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	257	10.22	34	13.23	96	37.35	42	16.34	26	10.12	18	7.00	19	7.39	22
		n=2508														
Antidepressants	No	2400	95.69	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	108	4.31	29	26.85	24	22.22	14	12.96	6	5.56	12	11.11	10	9.26	13
		n=2518														
Lifetime use of prescribed substances <sup>a</sup>	No	2168	86.10	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	350	13.90	72	20.57	118	33.71	54	15.43	27	7.71	21	6.00	24	6.86	34

<sup>a</sup>This variable combines the answers given to the items presented above.



*Other substances.*

Table 24 presents descriptive statistics for lifetime use of other substances, and use over the last 12 months. Data on the use of other substances show that, overall, lifetime use was lower than 3% for each illicit substance assessed: LSD (2.66%), inhalants (2.55%) and amphetamines (2.34%) were the substances with the highest prevalence of use; of those adolescents who had ever used LSD, just over one-quarter (26.87%) had not used over the last 12 months and of those who had used over the last 12 months, over one-third (41.79%) reported having used on one or two occasions; of those who had ever used inhalants, over one-third (40.63%) had not used over the last 12 months and of those who had used over the last 12 months, just over one-sixth (18.75%) reported having used on one or two occasions; of those who had ever used amphetamines, just over one-third (35.59%) had not used over the last 12 months and of those who had used over the last 12 months, just over one-quarter (27.12%) reported having used on one or two occasions.

Analyzing the overall variable of lifetime use of other substances (see Table 24), it can be seen that almost all adolescents (93.27%) have not used these types of substances, but of those who have used them, just less than one-third (31.77%) reported not having used them over the last 12 months; of those adolescents who have used over the last 12 months, one-quarter (25.29%) have used on one or two occasions.

Table 24  
*Lifetime Use and Number of Occasions of Use Over the Last 12 Months for Other Substances*

Substances	Lifetime use	n	%	Number of occasions of use over the last 12 months												
				0		1-2		3-5		6-9		10-19		20-39		>40
		n=2511														
Anabolic steroids	No	2488	99.08	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	23	0.92	11	47.83	1	4.35	0	0.00	2	8.70	3	13.04	0	0.00	6
		n=2517														
Amphetamines	No	2458	97.66	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	59	2.34	21	35.59	16	27.12	10	16.95	4	6.78	3	5.09	3	5.09	2
		n=2510														
GHB	No	2480	98.81	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	30	1.20	11	36.67	8	26.67	3	10.0	3	10.0	1	3.33	2	6.67	2
		n=2507														
Heroin	No	2461	98.17	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	46	1.83	21	45.65	9	19.57	2	4.35	3	6.52	3	6.52	3	6.52	5
		n=2510														
Inhalants	No	2446	97.45	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	64	2.55	26	40.63	12	18.75	6	9.38	6	9.38	5	7.81	4	6.25	5
		n=2505														
Ketamine	No	2477	98.88	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	28	1.12	11	39.29	5	17.86	4	14.29	1	3.57	1	3.57	0	0.00	6
		n=2520														
LSD	No	2453	97.34	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	67	2.66	18	26.87	28	41.79	8	11.94	6	8.96	3	4.48	1	1.49	3
		n=2509														
Magic mushrooms	No	2463	98.17	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	46	1.83	19	41.30	12	26.09	6	13.04	3	6.52	3	6.52	0	0	3
		n=2526														
Lifetime use of other substances <sup>a</sup>	No	2356	93.27	-	-	-	-	-	-	-	-	-	-	-	-	-
	Yes	170	6.73	54	31.77	43	25.29	19	11.18	21	12.35	11	6.47	9	5.29	13

<sup>a</sup>This variable combines the answers given to the items presented above.

## Association Analyses.

This section presents the results of the analyses testing associations between three sets of independent variables (i.e. proximal variables, health-related quality-of-life items, and sociodemographic variables), with three dependent variables (i.e. lifetime use, current use<sup>8</sup>, and regular use<sup>9</sup>). To facilitate reading, this section is divided into four sub-sections: a first sub-section regarding tobacco, a second regarding alcohol, a third regarding cannabis, and a fourth regarding cocaine. In each sub-section data are presented on the univariate analyses and on the multivariate analyses. Within the univariate analyses, the Chi Square Test for Independence was used whenever the purpose of the analyses was to explore the relationship among categorical variables, while the Independent Sample T-Test was used whenever the purpose was to explore differences between non-related groups on a continuous variable. The independent variables which were significantly associated with the dependent variables in the univariate analyses were then used in the multivariate analysis and entered into binary logistic regression models, aimed at further assessing significant associations after controlling for covariates. For testing the independent contribution of factors, the chosen test was Binary Logistic Regression as the dependent variables were dichotomous.

### **Drinking.**

#### *Univariate analyses.*

##### *Proximal variables*<sup>10</sup>.

Table 25 presents data from the univariate analyses between proximal variables and lifetime, current<sup>11</sup>, and regular drinking<sup>12</sup>. Results showed that *alcohol risk perception* was associated with lifetime ( $\chi^2 = 110.20$ ,  $p < 0.001$ ), current ( $\chi^2 = 23.37$ ,  $p < 0.001$ ), and regular drinking ( $\chi^2 = 14.77$ ,  $p = 0.001$ ). Figures were similar for lifetime, current, and regular drinking: adolescents who considered that drinking has low risks to health showed the highest lifetime (75.90%), current (60.98%), and regular (58.11%) drinking prevalence. Hence, adolescents who perceived drinking as having high risks to health had the lowest prevalence of lifetime

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<sup>8</sup>Data on current use is limited to adolescents that had ever used the substance in question.

<sup>9</sup>Data on regular use is limited to adolescents that were currently using the substance in question.

<sup>10</sup>See Table 25.

<sup>11</sup>Data on current drinking is limited to adolescents that had ever drank.

<sup>12</sup>Data on regular drinking is limited to current drinkers.

(46.07%), current (49.15%), and regular (34.12%) drinking prevalence. Overall, the less alcohol was perceived as dangerous to health, the greater the prevalence of lifetime drinking, the current drinking among lifetime drinkers, and the regular drinking among current drinkers.

Regarding *attitudes towards drinking*, data showed an association with lifetime ( $\chi^2 = 388.22$ ,  $p < 0.001$ ), current ( $\chi^2 = 133.69$ ,  $p < 0.001$ ), and regular drinking ( $\chi^2 = 48.48$ ,  $p < 0.001$ ). Despite different percentages, trends were similar for lifetime, current and regular drinking: adolescents holding negative attitudes towards drinking showed the lowest lifetime (34.38%), current (35.67%), and regular (20.18%) drinking prevalence. Equally, adolescents holding positive attitudes showed the highest lifetime (88.30%), current (81.48%), and regular (57.81%) drinking prevalence. On the whole, the more favorable attitudes were towards drinking, the greater the lifetime drinking, the current drinking among lifetime drinkers, and the regular drinking among current drinkers.

*Expected problems from drinking* were associated with lifetime ( $\chi^2 = 84.21$ ,  $p < 0.001$ ), current ( $\chi^2 = 49.23$ ,  $p < 0.001$ ), and regular drinking ( $\chi^2 = 24.23$ ,  $p < 0.001$ ). The highest lifetime (90.24%), current (84.51%), and regular (61.74%) drinking prevalence was seen among adolescents who did not expect negative outcomes as a consequence of drinking. Accordingly, the lowest lifetime (56.62%), current (52.71%), and regular (35.69%) drinking prevalence was seen in adolescents who expected such negative outcomes. Overall, the less alcohol was perceived as leading to negative consequences, the higher the lifetime drinking, the current drinking among lifetime drinkers, and the regular drinking among current drinkers.

Regarding *expected benefits from drinking*, data showed an association with lifetime ( $\chi^2 = 146.97$ ,  $p < 0.001$ ), current ( $\chi^2 = 64.70$ ,  $p < 0.001$ ), and regular drinking ( $\chi^2 = 15.63$ ,  $p < 0.001$ ). The highest lifetime (81.36%), current (74.80%), and regular (51.26%) drinking prevalence was found in adolescents who were not sure about the positive outcomes as a consequence of drinking. The lowest lifetime (47.23%) and regular (36.15%) drinking prevalence was seen among adolescents that did not expect drinking to lead to positive outcomes. For current drinking, the lowest prevalence (50.44%) was seen in adolescents that did expect such positive outcomes. It is interesting to highlight that just less than half (47.23%) of those expecting none of the examined benefits from drinking had decided to drink at some point of their lives. Another interesting finding is that over three-quarters (81.36%) of adolescents who

were not sure about the positive outcomes of drinking had still decided to drink at some point of their lives. Overall, the more alcohol was perceived as leading to positive consequences, the greater lifetime drinking, the current drinking among lifetime drinkers, and the regular drinking among current drinkers.

*Perceived accessibility to alcoholic drinks* was associated with lifetime ( $\chi^2 = 211.69, p < 0.001$ ), current ( $\chi^2 = 59.21, p < 0.001$ ), and regular drinking ( $\chi^2 = 34.16, p < 0.001$ ). Adolescents that perceived alcoholic drinks as easy to get had greater lifetime (69.70%), current (64.41%), and regular (48.15%) drinking prevalence. On the other hand, those who considered accessing alcoholic drinks to be difficult showed lower lifetime (33.33%), current (35.37%), and regular (17.31%) drinking prevalence. On the whole, the more alcohol was perceived as accessible, the higher the lifetime drinking, the current drinking among lifetime drinkers, and the regular drinking among current drinkers.

Results regarding *best friend's drinking behaviour* show an association with lifetime ( $\chi^2 = 998.74, p < 0.001$ ), current ( $\chi^2 = 247.76, p < 0.001$ ), and regular drinking ( $\chi^2 = 102.63, p < 0.001$ ). Adolescents whose best friends' had never drank reported the lowest lifetime drinking prevalence (20.45%). Even though the highest lifetime drinking prevalence was associated with best friends who drink regularly (90.56%), those whose best friends had quit drinking still reported a considerably higher drinking prevalence (63.64%). For current and regular drinking, the lowest prevalence was associated with best friends that had quit drinking (26.00% and 15.38% respectively), while the highest was with best friends who drank regularly (84.38% and 78.52% respectively). Of lifetime drinkers, over half (63.64%) continue to drink despite their best friends having quit drinking. In short, the more the higher the best friends' experience with alcohol, the greater the lifetime drinking, the current drinking among lifetime drinkers, and the regular drinking among current drinkers.

*Perceived parental drinking approval* was also associated with lifetime ( $\chi^2 = 474.78, p < 0.001$ ), current ( $\chi^2 = 230.92, p < 0.001$ ), and regular drinking ( $\chi^2 = 55.40, p < 0.001$ ). The figures were again similar for lifetime, current, and regular drinking: adolescents expecting their parents to be indifferent to their drinking showed the highest lifetime (95.24%), current (85.16%), and regular (57.14%) drinking prevalence. On the other hand, expecting parents to prohibit drinking was associated with the lowest lifetime (39.61%), current (37.15%), and regular drinking

prevalence (22.22%). Globally, the less parents were perceived as being against drinking, the higher the lifetime, current, and regular drinking prevalence of their children.

To summarise, lifetime drinking, current drinking among lifetime drinkers, and regular drinking among current drinkers were negatively associated with perceiving drinking as risky and expecting problems from drinking, but positively associated with holding positive attitudes towards alcoholic drinks, expecting benefits from drinking, perceiving alcoholic drinks as accessible, having best friends who drink, expecting best friends to approve drinking, and expecting parents not to be disapproving of drinking.

Table 25  
*Association Between Proximal Variables and Lifetime, Current, and Regular Drinking*

Variables	Categories	Lifetime Drinking				Current Drinking <sup>a</sup>				Regular Drinking <sup>b</sup>			
		n	%	$\chi^{2c}$	p <sup>d</sup>	n	%	$\chi^{2c}$	p <sup>d</sup>	n	%	$\chi^{2c}$	p <sup>d</sup>
Drinking risk perception	Low	166	75.90	n = 2555				123	60.98	n = 1419			
	Medium	1219	64.64	110.20	<0.001	767	62.45	23.37	<0.001	470	43.40	14.77	0.001
	High	1170	46.07					529	49.15	n = 799			
Attitudes towards alcoholic drinks	Negative	983	34.38	n = 2560				328	35.67	n = 1421			
	Neutral	1235	65.99	382.22	<0.001	796	57.16	133.69	<0.001	448	38.84	48.48	<0.001
	Positive	342	88.30					297	81.48	n = 799			
Expected problems from drinking	No	164	90.24	n = 2560				142	84.51	n = 1421			
	Do not know	1158	52.33	84.21	<0.001	596	56.04	49.23	<0.001	331	41.39	24.23	<0.001
	Yes	1238	56.62					683	52.71	n = 799			
Expected benefits from drinking	No	559	47.23	n = 2560				255	52.55	n = 1421			
	Do not know	472	81.36	146.97	<0.001	377	74.80	64.70	<0.001	277	51.26	15.63	<0.001
	Yes	1529	52.78					789	50.44	n = 799			
Perceived accessibility to alcoholic drinks	Easy	1320	69.70	n = 2557				902	64.41	n = 1420			
	Fairly easy	781	48.91	211.69	<0.001	371	48.52	59.21	<0.001	179	29.05	34.16	<0.001
	Difficult	456	33.33					147	35.37	n = 798			
Best friend's drinking behaviour	Never user	929	20.45	n = 2560				184	27.72	n = 1421			
	Quitter	165	63.64					100	26.00				
	Occasional user	941	88.95	998.74	<0.001	824	67.97	247.76	<0.001	549	37.34	102.63	<0.001
	Regular user	180	90.56					160	84.38				
	Unknown	345	46.38					153	27.45	n = 799			
Perceived parental drinking approval	Indifference	168	95.24	n = 2536				155	85.16	n = 1413			
	Disapproval	478	90.79					426	79.34	n = 796			
	Punishment	668	55.24	474.78	<0.001	361	45.98	230.92	<0.001	164	32.93	55.40	<0.001
	Prohibition	1222	39.61					471	37.15				

<sup>a</sup>Data on current drinking is limited to adolescents that had ever drank. <sup>b</sup>Data on regular drinking is limited to current drinkers. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.

*Health-related quality-of-life items*<sup>13</sup>.

Table 26 presents data from univariate analyses between health-related quality-of-life items and the overall health-related quality-of-life variable and lifetime, current<sup>14</sup>, and regular drinking<sup>15</sup>. Results show that *fitness* was associated with lifetime drinking ( $t = 7.85, p < 0.001$ ) and with current drinking ( $t = 2.51, p = 0.012$ ), but not with regular drinking ( $t = 0.66, p = 0.511$ ). The level of fitness was lower among lifetime and current drinkers when compared with non-drinkers. The level of *energy* was associated with lifetime ( $t = 7.00, p < 0.001$ ), current ( $t = 3.44, p = 0.001$ ), and regular drinking ( $t = 2.63, p = 0.009$ ) and compared with non-drinkers, lifetime, current, and regular drinkers expressed lower levels of energy.

*Sadness* was associated with lifetime drinking ( $t = 8.93, p < 0.001$ ), but not with current drinking ( $t = 0.89, p = 0.376$ ), nor with regular drinking ( $t = -0.65, p = 0.513$ ). Results indicate that lifetime drinkers reported higher levels of sadness when compared with non-drinkers. Regarding *loneliness*, data showed an association with lifetime drinking ( $t = 5.88, p < 0.001$ ), but not with current ( $t = 0.09, p = 0.927$ ), nor with regular drinking ( $t = 0.12, p = 0.901$ ). Hence, lifetime drinkers reported higher levels of loneliness than non-drinkers.

Data on *having time for oneself* was associated with lifetime ( $t = 6.82, p < 0.001$ ) and current drinking ( $t = 2.62, p = 0.009$ ), but not with regular drinking ( $t = -0.26, p = 0.793$ ). So, lifetime and current drinkers reported having more time for themselves than non-drinkers. With respect to *enjoying leisure activities*, data showed an association with lifetime drinking ( $t = 5.95, p < 0.001$ ), but not with current ( $t = 1.93, p = 0.054$ ), nor with regular drinking ( $t = 0.54, p = 0.592$ ). When compared with non-drinkers, lifetime drinkers considered to have to less leisure activities to their liking.

Regarding *being treated fairly by parents*, results show an association with lifetime ( $t = 7.51, p < 0.001$ ) and current drinking ( $t = 2.60, p = 0.009$ ), but not with regular drinking ( $t = 1.63, p = 0.104$ ). When compared with non-drinkers, lifetime drinkers felt less often that their parents treated them fairly. As for *having fun with friends*, data showed no association with lifetime ( $t = 1.63, p = 0.104$ ), current ( $t = -1.77, p = 0.077$ ), nor with regular drinking ( $t = -0.08, p = 0.937$ ).

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<sup>13</sup>See Table 26.

<sup>14</sup>Data on current drinking is limited to adolescents that had ever drank.

<sup>15</sup>Data on regular drinking is limited to current drinkers.



Considering *being a good student*, there was an association with lifetime ( $t = 10.13, p < 0.001$ ) and regular drinking ( $t = 3.12, p = 0.002$ ), but not with current drinking ( $t = 0.72, p = 0.471$ ). Results show that lifetime and regular drinkers considered themselves to be worse students than non-drinkers did. *Ability to pay attention at school* showed an association with lifetime ( $t = 13.01, p < 0.001$ ), current ( $t = 5.73, p < 0.001$ ), and regular drinking ( $t = 2.90, p = 0.004$ ). When compared with non-drinkers, all types of drinkers considered themselves to be less able to pay attention at school.

As for the overall variable combining *health-related quality-of-life* items, data indicated an association with lifetime ( $t = 12.05, p < 0.001$ ) and with current drinking ( $t = 3.13, p = 0.002$ ), but not with regular drinking ( $t = 1.66, p = 0.097$ ). Results indicate that lifetime and current drinkers reported a lower level of health-related quality-of-life when compared with non-drinkers.

To summarise, lifetime drinking was negatively associated with higher levels of fitness and energy, increased time for oneself, having plenty opportunities for enjoying leisure activities, being treated fairly by parents, being a good student, being able to pay attention at school, and overall health-related quality-of-life, but positively associated with higher levels of sadness and loneliness. Current drinking among lifetime drinkers was negatively associated with higher levels of fitness and energy, increased time for oneself, being treated fairly by parents, being able to pay attention at school, and overall health-related quality-of-life. Regular drinking among current drinkers was negatively associated with higher levels of energy, being a good student, and being able to pay attention at school.

Table 26  
 Association Between Health-Related Quality-of-Life Items and Lifetime, Current, and Regular Drinking

Items	Use	Lifetime Drinking				Current Drinking <sup>a</sup>				Regular Drinking <sup>b</sup>			
		n	M <sup>c</sup> (SD <sup>d</sup> )	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD <sup>d</sup> )	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD <sup>d</sup> )	t <sup>e</sup>	p <sup>f</sup>
Fitness	No	1100	81.36 (19.08)	7.85	<0.001	602	76.81 (19.28)	2.51	0.012	462	74.55 (20.01)	0.66	0.511
	Yes	1444	75.24 (19.83)										
Energy	No	1098	80.15 (19.42)	7.00	<0.001	601	76.71 (20.37)	3.44	0.001	461	74.49 (18.88)	2.63	0.009
	Yes	1441	74.66 (19.71)										
Sadness	No	1090	80.70 (19.49)	8.93	<0.001	597	74.14 (20.59)	0.89	0.376	462	72.90 (20.06)	-0.65	0.513
	Yes	1436	73.55 (20.25)										
Loneliness	No	1090	86.66 (20.27)	5.88	<0.001	598	81.87 (20.88)	0.09	0.927	460	81.96 (20.93)	0.12	0.901
	Yes	1435	81.77 (21.06)										
Time for oneself	No	1091	80.62 (20.44)	6.82	<0.001	601	76.54 (21.51)	2.62	0.009	460	73.22 (21.72)	-0.26	0.793
	Yes	1437	74.79 (21.92)										
Enjoying leisure activities	No	1087	79.36 (22.41)	5.95	<0.001	600	75.17 (23.57)	1.93	0.054	457	73.04 (23.76)	0.54	0.592
	Yes	1433	73.82 (23.72)										
Being treated fairly by parents	No	1089	82.77 (21.59)	7.51	<0.001	589	77.89 (21.40)	2.60	0.009	460	75.78 (21.38)	1.63	0.104
	Yes	1420	76.27 (21.46)										
Having fun with friends	No	1086	84.44 (20.37)	1.63	0.104	599	82.20 (20.70)	-	0.077	457	84.07 (18.07)	-0.08	0.937
	Yes	1429	83.15 (19.20)										
Being a good student	No	1089	71.20 (19.58)	10.13	<0.001	600	64.00 (18.27)	0.72	0.471	458	65.11 (18.02)	3.12	0.002
	Yes	1433	63.45 (18.63)										
Ability to pay attention at school	No	1086	78.25 (18.32)	13.01	<0.001	600	71.93 (17.34)	5.73	<0.001	456	67.89 (18.54)	2.90	0.004
	Yes	1430	68.66 (18.32)										
<b>Health-related quality-of-life<sup>g</sup></b>	No	1103	80.51 (12.55)	12.05	<0.001	604	75.75 (12.10)	3.13	0.002	462	74.31 (12.01)	1.66	0.097
	Yes	1447	74.55 (12.23)										

<sup>a</sup>Data on current drinking is limited to adolescents that had ever drank. <sup>b</sup>Data on regular drinking is limited to current drinkers. <sup>c</sup>Mean. <sup>d</sup>Standard Deviation. <sup>e</sup>Independent Sample T-Test. <sup>f</sup>p-value. <sup>g</sup>This variable combines the answers given to the ten items presented above.

### *Sociodemographic variables*<sup>16</sup>.

Table 27 presents data from univariate analyses between sociodemographic variables and lifetime, current<sup>17</sup>, and regular drinking<sup>18</sup>. Results show that *age* was positively associated with lifetime ( $\chi^2 = 752.16, p < 0.001$ ), current ( $\chi^2 = 149.51, p < 0.001$ ), and regular drinking ( $\chi^2 = 37.95, p < 0.001$ ). Notwithstanding the different percentages, the pattern was similar for lifetime and current drinking: 12 year old adolescents showed the lowest lifetime drinking prevalence (23.81%) and 17 year old showed the highest prevalence (91.30%), whilst 12 year old lifetime drinkers showed the lowest current drinking prevalence (24.68%) and 17 year old lifetime drinkers the highest (71.93%). For regular drinking, 12 year olds showed the lowest prevalence (10.81%), whereas 18 years olds showed the highest (50.00%). Overall, as age increased, so did lifetime, current drinking among lifetime drinkers, and regular drinking among current drinkers.

Considering *gender*, data showed that it was associated with regular drinking ( $\chi^2 = 20.01, p < 0.001$ ), but not with lifetime ( $\chi^2 = 2.39, p = 0.123$ ) or current drinking ( $\chi^2 = 0.00, p = 0.960$ ). Male current drinkers reported a higher prevalence of regular drinking (48.76%) when compared to females (33.05%).

*Nationality* showed an association with regular drinking ( $\chi^2 = 5.91, p = 0.015$ ), but not with lifetime ( $\chi^2 = 3.76, p = 0.052$ ) or current drinking ( $\chi^2 = 0.36, p = 0.550$ ). Among current drinkers, adolescents from nationalities other than Portuguese reported a higher prevalence for regular drinking (56.25%) than Portuguese adolescents (40.61%).

Regarding *SES*, there was an association with lifetime drinking ( $\chi^2 = 59.77, p < 0.001$ ), but not with current ( $\chi^2 = 4.29, p = 0.232$ ) or regular drinking ( $\chi^2 = 3.65, p = 0.302$ ). Adolescents from a low SES had highest lifetime drinking prevalence (67.93%), while those reporting not knowing their status were associated with the lowest (36.18%).

*Family structure* was associated with lifetime ( $\chi^2 = 32.41, p < 0.001$ ) and current drinking ( $\chi^2 = 13.16, p = 0.022$ ), but not with regular drinking ( $\chi^2 = 2.42, p = 0.788$ ). Adolescents living within extended families reported the highest lifetime drinking prevalence (71.43%), whereas

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<sup>16</sup>See Table 27.

<sup>17</sup>Data on current drinking is limited to adolescents that had ever drank.

<sup>18</sup>Data on regular drinking is limited to current drinkers.

adolescents living within intact families reported the lowest (53.51%). As for current drinking, the highest prevalence (60.74%) was seen among adolescents living within single families, while the lowest (33.33%) was with institutionalized adolescents.

*Stressful life events* showed an association with lifetime ( $\chi^2 = 97.68, p < 0.001$ ) and current drinking ( $\chi^2 = 7.59, p = 0.006$ ), but not with regular drinking ( $\chi^2 = 3.11, p = 0.078$ ). Adolescents who had experienced stressful life events within the previous six months had a higher lifetime (61.83%) and current drinking prevalence (58.76%), when compared with those who have not experienced such events (37.74% and 48.19%, respectively).

In summary, lifetime drinking was associated with older age, lower SES, living within an extended family, and having experienced stressful life events. Current drinking among lifetime drinkers was associated with older age, living within a single family, and having experienced stressful life events. Regular drinking among current drinkers was associated with older age, being male, and being from a nationality other than Portuguese.

Table 27  
 Association Between Sociodemographic Variables and Lifetime, Current, and Regular Drinking

Variables	Categories	Lifetime Drinking				Current Drinking <sup>a</sup>				Regular Drinking <sup>b</sup>			
		n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>
		n = 2560				n = 1421				n = 799			
Age	12 years	693	23.81			158	24.68			37	10.81		
	13 years	506	38.93			193	41.45			79	25.32		
	14 years	319	60.82			189	46.56			87	31.03		
	15 years	267	80.52	752.16	<0.001	208	63.46	149.51	<0.001	130	41.54	37.95	<0.001
	16 years	344	84.88			290	69.31			197	48.73		
	17 years	253	91.30			228	71.93			161	49.07		
	18 years	178	90.45			155	70.97			108	50.00		
Gender	Male	1393	58.22			790	57.34			445	48.76		
	Female	1167	55.18	2.39	0.123	631	57.21	0.00	0.960	354	33.05	20.01	<0.001
Nationality	Portuguese	2336	56.34			1284	57.55			724	40.61		
	Other	187	63.64	3.76	0.052	117	54.70	0.36	0.550	64	56.25	5.91	0.015
SES	Low	343	67.93			229	55.02			122	44.26		
	Medium	1697	58.34			964	58.71			557	39.86		
	High	321	49.84	59.77	<0.001	158	56.33	4.29	0.232	88	50.00	3.65	0.302
	Unknown	199	36.18			70	47.14			32	43.75		
Family structure	Intact	1850	53.51			966	58.07			550	40.36		
	Single	372	65.86			242	60.74			146	46.58		
	Extended	56	71.43			38	39.47			15	40.00		
	Blended	147	65.99	32.41	<0.001	93	56.99	13.16	0.022	51	41.18	2.42	0.788
	Institution	42	66.67			27	33.33			8	37.50		
	Other	93	59.14			55	52.73			29	48.28		
Stressful life events	No	522	37.74			193	48.19			91	50.55		
	Yes	1978	61.83	97.68	<0.001	1193	58.76	7.59	0.006	688	40.84	3.11	0.078

<sup>a</sup>Data on current drinking is limited to adolescents that had ever drank. <sup>b</sup>Data on regular drinking is limited to current drinkers. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.

### *Multivariate analyses.*

The multivariate analysis was performed for lifetime, current, and regular drinking using the variables that the univariate analyses have shown to be associated with lifetime, current<sup>19</sup>, and regular<sup>20</sup> drinking.

### *Lifetime drinking.*

The independent variables found to be significantly associated with lifetime drinking were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. The results from the binary logistic regression model for lifetime drinking have been split into two tables<sup>21</sup> (Table 28.1 and Table 28.2), the first presenting data on the proximal variables and the second on sociodemographic variables.

Table 28.1 presents data from the binary logistic regression analyses for the association between lifetime drinking and proximal variables. After controlling for covariates, *expected problems from drinking* was not significantly associated with lifetime drinking.

Despite data showing that *drinking risk perception* was significantly associated with lifetime drinking ( $p = 0.029$ ), the odds of drinking at some point in life were not significantly different between adolescents considering alcohol as having medium or high risks to health and those considering alcohol as having low risk. Compared to adolescents holding negative *attitudes towards alcohol*, the odds of being a lifetime drinker were significantly higher among those holding positive ( $AOR^{22} = 3.32, p < 0.001$ ) or even neutral attitudes ( $AOR = 1.54, p = 0.001$ ).

Results for *expected benefits from drinking* show that the odds of drinking at some point in life were not significantly different between adolescents who did not expect positive outcomes from drinking and those either expecting benefits from drinking or not being sure. Further, with respect to *perceived accessibility to alcoholic drinks*, adolescents that considered accessing alcohol to be difficult had significantly reduced odds of lifetime drinking ( $AOR = 0.60, p = 0.001$ ) compared with those considering accessing alcoholic drinks to be easy. The odds for

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<sup>19</sup>Data on current drinking is limited to adolescents that had ever drank.

<sup>20</sup>Data on regular drinking is limited to current drinkers.

<sup>21</sup>No data is presented on *health-related quality-of-life* because after controlling for covariates it ceased to be significantly associated with lifetime drinking.

<sup>22</sup>Adjusted Odds Ratio.

adolescents considering access to alcoholic drinks to be fairly easy were not significantly different from those thinking access to be easy.

For *best friend's drinking behaviour*, the odds of drinking at some point in life were significantly higher among adolescents who did not know whether their best friends drank alcoholic drinks ( $AOR = 2.55, p < 0.001$ ), whose best friends' had quit drinking ( $AOR = 4.23, p < 0.001$ ), or whose best friends' were occasional drinkers ( $AOR = 9.80, p < 0.001$ ), or regular drinkers ( $AOR = 6.65, p < 0.001$ ) than among adolescents whose best friends had never drank alcoholic drinks.

Regarding *perceived parental drinking approval*, there were significantly lower odds of being a lifetime drinker among adolescents expecting their parents to prohibit ( $AOR = 0.24, p = 0.001$ ) or to punish ( $AOR = 0.28, p < 0.001$ ) alcohol consumption compared to those adolescents expecting their parents to be indifferent. The odds for adolescents expecting their parents to be disapproving were not significantly different from those expecting their parents to be indifferent.

Table 28.1  
*Binary Logistic Regression for Lifetime Drinking - Proximal Variables*

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Drinking risk perception	Low				0.029
	Medium	1.17	0.70	1.96	0.555
	High	0.84	0.49	1.43	0.515
Attitudes towards alcoholic drinks	Negative				<0.001
	Neutral	1.54	1.19	1.99	0.001
	Positive	3.32	2.01	5.49	<0.001
Expected problems from drinking	No				
	Do not know	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
Expected benefits from drinking	Yes				0.049
	No				0.056
	Do not know	1.49	0.99	2.24	0.767
Perceived accessibility to alcoholic drinks	Yes	0.96	0.72	1.28	
	Easy				0.006
	Fairly easy	0.82	0.63	1.06	0.132
Best friend's drinking behaviour	Difficult	0.60	0.44	0.82	0.001
	Never user				<0.001
	Quitter	4.23	2.83	6.32	<0.001
	Occasional user	9.80	7.13	13.48	<0.001
Perceived parental drinking approval	Regular user	6.65	3.65	12.12	<0.001
	Unknown	2.55	1.87	3.48	<0.001
	Indifference				<0.001
Perceived parental drinking approval	Disapproval	0.59	0.25	1.39	0.230
	Punishment	0.28	0.12	0.63	0.002
	Prohibition	0.24	0.11	0.54	0.001

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

Table 28.2 presents data from the binary logistic regression analyses for the association between lifetime drinking and sociodemographic variables<sup>23</sup>. After controlling for covariates, *family structure* was not significantly associated with lifetime drinking.

For *age*, compared to adolescents aged 12, the odds drinking at some point in life were significantly higher among adolescents aged 14 (*AOR* = 2.45, *p* <0.001), 15 (*AOR* = 3.71, *p* <0.001), 16 (*AOR* = 2.64, *p* <0.001), 17 (*AOR* = 4.75, *p* <0.001), and 18 years (*AOR* = 6.20, *p* <0.001). The odds for 13 year old adolescents were not significantly different from those for 12 year old adolescents.

As for *SES*, the odds of being a lifetime drinker were significantly lower among adolescents not aware of their *SES* (*AOR* = 0.50, *p* = 0.013) than among those from a lower *SES*. The odds among adolescents from a high or medium *SES* were not significantly different from those for adolescents from a low *SES*. Data regarding *stressful life events* show that, compared to adolescents that had not experienced a stressful live event within the previous six months, those that had experienced such life events had significantly increased odds of drinking at some point in live (*AOR* = 2.80, *p* <0.001).

Table 28.2  
Binary Logistic Regression for Lifetime Drinking - Sociodemographic Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years				<0.001
	13 years	1.24	0.91	1.70	0.169
	14 years	2.45	1.73	3.49	<0.001
	15 years	3.71	2.40	5.75	<0.001
	16 years	2.64	1.69	4.12	<0.001
	17 years	4.75	2.70	8.37	<0.001
	18 years	6.20	3.17	12.12	<0.001
SES	Low				<0.001
	Medium	1.33	0.94	1.90	0.107
	High	1.38	0.86	2.22	0.176
	Unknown	0.50	0.29	0.86	0.013
Family structure	Intact				
	Single				
	Extended	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Blended				
	Institution Other				
Stressful life events	No				<0.001
	Yes	2.80	2.10	3.73	<0.001
<b>Constant</b>		<b>4.91</b>			<b>&lt;0.001</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

<sup>23</sup>*Gender* and *nationality* were not entered into the binary logistic regression model as the univariate analyses showed they were not significantly associated with lifetime drinking.



### *Current drinking among lifetime drinkers.*

The independent variables found to be significantly associated with current drinking among lifetime drinkers in univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. The results from the binary logistic regression model for current drinking have been split into two tables<sup>24</sup> (Table 29.1 and Table 29.2), the first presenting data on the proximal variables and the second on sociodemographic variables.

Table 29.1 presents data from the binary logistic regression analyses for the association between current drinking and proximal variables. After controlling for covariates, *expected problems from drinking* and *perceived accessibility to alcoholic drinks* were not significantly associated with current drinking.

As for *drinking risk perception*, the odds of continuing to drink among lifetime drinkers were significantly higher among adolescents perceiving drinking as having high ( $AOR = 1.77, p = 0.047$ ) or even medium risks to health ( $AOR = 2.24, p = 0.003$ ) than among those perceiving drinking as having low risks to health. Compared to adolescents holding negative *attitudes towards alcohol*, those holding positive ( $AOR = 3.80, p < 0.001$ ) or even neutral attitudes ( $AOR = 1.72, p = 0.001$ ) had significantly increased odds of continuing to drink. Whilst *expected benefits from drinking* was significantly associated with current drinking ( $p = 0.002$ ), the odds of continuing to drink were not significantly different between adolescents who did not expect positive outcomes from drinking and those either expecting benefits from drinking or not being sure.

With respect with *best friend's drinking behaviour*, there were significantly higher odds of continuing to drink among adolescents whose best friends were regular drinkers ( $AOR = 4.95, p < 0.001$ ) or even occasional drinkers ( $AOR = 2.79, p < 0.001$ ) than among adolescents whose best friends have never drank. The odds for adolescents whose best friends had quit drinking or who did not know whether their best friends were drinkers were not significantly different from those whose best friends have never drank.

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<sup>24</sup>No data is presented on *health-related quality-of-life* because after controlling for covariates it ceased to be significantly associated with current drinking.

Regarding *perceived parental drinking approval*, the odds of continuing to drink were significantly lower among adolescents expecting their parents to punish ( $AOR = 0.29$ ,  $p < 0.001$ ) or to prohibit ( $AOR = 0.26$ ,  $p < 0.001$ ) drinking when compared to those expecting their parents to be indifferent. The odds for adolescents expecting their parents to be disapproving were not significantly different from those expecting their parents to be indifferent.

Table 29.1  
Binary Logistic Regression for Current Drinking - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Drinking risk perception	Low				0.006
	Medium	2.24	1.322	3.790	0.003
	High	1.77	1.008	3.098	0.047
Attitudes towards alcoholic drinks	Negative				<0.001
	Neutral	1.72	1.233	2.401	0.001
	Positive	3.80	2.340	6.172	<0.001
Expected problems from drinking	No				
	Do not know	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Yes				
Expected benefits from drinking	No				0.002
	Do not know	1.47	0.963	2.231	0.075
	Yes	0.80	0.560	1.154	0.237
Perceived accessibility to alcoholic drinks	Easy				
	Fairly easy	n.s.	n.s.	n.s.	n.s.
	Difficult				
Best friend's drinking behaviour	Never user				<0.001
	Quitter	0.85	0.463	1.564	0.604
	Occasional user	2.79	1.833	4.258	<0.001
	Regular user	4.95	2.688	9.119	<0.001
	Unknown	0.67	0.385	1.166	0.157
Perceived parental drinking approval	Indifference				<0.001
	Disapproval	0.79	0.452	1.377	0.404
	Punishment	0.29	0.163	0.506	<0.001
	Prohibition	0.26	0.150	0.461	<0.001

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant

Table 29.2 presents data from the binary logistic regression analysis for the association between current drinking and sociodemographic variables<sup>25</sup>. For *age*, compared to adolescents aged 12, the odds of continuing to drink were higher among adolescents aged 14 ( $AOR = 2.04$ ,  $p = 0.010$ ), 15 ( $AOR = 2.19$ ,  $p = 0.004$ ), 16 ( $AOR = 2.02$ ,  $p = 0.010$ ), 17 ( $AOR = 2.83$ ,  $p < 0.001$ ), and 18 years ( $AOR = 2.88$ ,  $p = 0.001$ ). The odds for the 13 year old adolescents were not significantly different from those for 12 year old adolescents.

<sup>25</sup>*Gender, nationality, and SES* were not entered into the binary logistic regression model as univariate analyses showed they were not significantly associated with current drinking.

As for *family structure*, compared with those living within intact families, adolescents living within extended families ( $AOR = 0.26, p = 0.001$ ) or living in an institution ( $AOR = 0.19, p = 0.003$ ) had reduced odds of continuing to drink. The odds for adolescents living within single families, blended families, or within other family structures were not significantly different from those living within intact families. Compared to adolescents that have not experience a *stressful live event* within the previous six months, the odds of continuing to drink were significantly higher among adolescents that had experienced such life events ( $AOR = 2.20, p < 0.001$ ).

Table 29.2  
Binary Logistic Regression for Current Drinking - Sociodemographic Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years				0.006
	13 years	1.48	0.87	2.53	0.152
	14 years	2.04	1.19	3.49	0.010
	15 years	2.19	1.28	3.77	0.004
	16 years	2.02	1.18	3.44	0.010
	17 years	2.83	1.61	4.98	<0.001
Family structure	18 years	2.88	1.54	5.36	0.001
	Intact				0.001
	Single	0.91	0.63	1.30	0.587
	Extended	0.26	0.12	0.60	0.001
	Blended	0.92	0.53	1.57	0.749
	Institution	0.19	0.06	0.57	0.003
Stressful life events	Other	0.47	0.22	1.03	0.060
	No				
	Yes	2.20	1.50	3.21	<0.001
<b>Constant</b>		<b>0.59</b>			<b>0.009</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

#### *Regular drinking among current drinkers.*

The independent variables presented in the univariate analyses which were found to be significantly associated with regular drinking among current drinkers were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. The results from the binary logistic regression model for regular drinking have

beensplit into two tables<sup>26</sup> (Table 30.1 and Table 30.2), the first presenting data on the proximal variables and the second on sociodemographic variables.

Table 30.1 presents data from the binary logistic regression analysis for the association between regular drinking and proximal variables. After controlling for covariates, *drinking risk perception*, *expected problems from drinking*, and *expected benefits from drinking* were not significantly associated with regular drinking.

Compared to adolescents holding negative *attitudes towards alcohol*, the odds of drinking regularly were significantly higher for those holding positive attitudes ( $AOR = 3.20$ ,  $p < 0.001$ ) or even neutral attitudes ( $AOR = 1.92$ ,  $p = 0.019$ ). As for *perceived accessibility to alcoholic drinks*, compared with those considering accessing to alcoholic drinks to be easy, adolescents that considered accessing alcohol to be difficult ( $AOR = 0.36$ ,  $p = 0.014$ ) or even fairly easy ( $AOR = 0.58$ ,  $p = 0.010$ ) had significantly reduced odds of drink regularly.

Further, with respect to *best friends' drinking behaviour*, there were significantly higher odds of drinking regularly among adolescents whose best friends were regular drinkers ( $AOR = 6.08$ ,  $p < 0.001$ ) than among adolescents whose best friends had never drank. The odds among adolescents who did not know whether their best friends had drank alcohol, whose best friends had quit drinking, or were occasional drinkers, were not significantly different from those whose best friends had never drank.

As for *perceived parental drinking approval*, adolescents that expected their parents to prohibit their drinking ( $AOR = 0.43$ ,  $p = 0.004$ ) had significantly reduced odds of drinking regularly than adolescents expecting their parents to be indifferent. The odds for adolescents expecting their parents to be disapproving or to punish were not significantly different from those expecting their parents to be indifferent.

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<sup>26</sup>Health-related quality-of-life because was not entered into the binary logistic regression model as the univariate analyses showed that it was not significantly associated with regular drinking.

Table 30.1  
Binary Logistic Regression for Regular Drinking - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Drinking risk perception	Low				
	Medium	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	High				
Attitudes towards alcoholic drinks	Negative				< 0.001
	Neutral	1.92	1.113	3.304	0.019
	Positive	3.20	1.779	5.745	< 0.001
Expected problems from drinking	No				
	Do not know	n.s.	n.s.	n.s.	n.s.
	Yes				
Expected benefits from drinking	No				
	Do not know	n.s.	n.s.	n.s.	n.s.
	Yes				
Perceived accessibility to alcoholic drinks	Easy				0.003
	Fairly easy	.58	.387	.877	0.010
	Difficult	.36	.159	.814	0.014
Best friend's drinking behaviour	Never user				< 0.001
	Quitter	.37	.087	1.538	0.170
	Occasional user	1.18	.560	2.484	0.663
	Regular user	6.08	2.633	14.032	< 0.001
	Unknown	.36	.113	1.120	0.077
Perceived parental drinking approval	Indifference				0.002
	Disapproval	1.02	.639	1.625	0.936
	Punishment	.69	.396	1.188	0.179
	Prohibition	.43	.240	.761	0.004

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant

Table 30.2 presents data from the binary logistic regression analysis for the association between regular drinking in current drinkers and sociodemographic variables<sup>27</sup>. After controlling for covariates, age was not significantly associated with regular drinking.

Regarding *gender*, results show that when compared to males, the odds of drinking regularly were significantly lower among females ( $AOR = 0.57$ ,  $p = 0.001$ ). Further, compared to Portuguese adolescents, the odds of drinking regularly were significantly higher for those from other nationalities ( $AOR = 2.11$ ,  $p = 0.014$ ).

<sup>27</sup>SES, family structure, and stressful life events were not entered into the binary logistic regression model as univariate analyses showed they were not significantly associated with regular drinking.

Table 30.2  
Binary Logistic Regression for Regular Drinking - Sociodemographic Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	13 years				
	14 years				
	15 years				
	16 years				
	17 years				
Gender	Male	0.57	0.41	0.80	0.001
	Female				
Nationality	Portuguese	2.11	1.16	3.83	0.014
	Other				
<b>Constant</b>		<b>0.38</b>			<b>&lt; 0.001</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value.

<sup>f</sup>Non-significant.

### Smoking.

#### Univariate analyses.

##### Proximal variables<sup>28</sup>.

Table 31 presents data from univariate analyses between proximal variables and lifetime, current<sup>29</sup>, and regular smoking<sup>30</sup>. Data show that *smoking risk perception* is associated with lifetime ( $\chi^2 = 139.44$ ,  $p < 0.001$ ) and current smoking ( $\chi^2 = 53.89$ ,  $p < 0.001$ ), but not with regular smoking ( $\chi^2 = 4.26$ ,  $p = 0.119$ ). The lowest lifetime (32.98%) and current (36.85%) smoking prevalence was seen in adolescents who perceived smoking as having high risks to health, whereas adolescents perceiving smoking as having low risks showed higher lifetime (58.00%) and current (75.00%) smoking prevalence. Overall, the less tobacco was perceived as harmful to health, the higher the lifetime smoking and the current smoking among lifetime smokers.

*Attitudes towards tobacco* were associated with lifetime ( $\chi^2 = 336.03$ ,  $p < 0.001$ ), current ( $\chi^2 = 165.45$ ,  $p < 0.001$ ), and regular smoking ( $\chi^2 = 20.92$ ,  $p < 0.001$ ). The trend was similar for lifetime, current, and regular smoking: adolescents holding positive attitudes towards tobacco, showed the highest lifetime (88.73%), current (92.06%), and regular (91.38%) smoking prevalence, while those holding negative attitudes showed the lowest lifetime (25.25%), current (21.58%), and regular (61.84%) smoking prevalence. It is interesting to note that over

<sup>28</sup>See Table 31.

<sup>29</sup>Data on current smoking is limited to adolescents that had ever smoked.

<sup>30</sup>Data on regular smoking is limited to current smokers.

half (61.84%) of current smokers that expressed negative attitudes towards tobacco smoked on a regular basis. On the whole, the more favorable attitudes were, the greater the lifetime smoking, the current smoking among lifetime smokers, and the regular smoking among current smokers.

Regarding *expected problems from smoking*, results indicate that there was an association with lifetime ( $\chi^2 = 184.66$ ,  $p < 0.001$ ), current ( $\chi^2 = 79.39$ ,  $p < 0.001$ ), and regular smoking ( $\chi^2 = 28.31$ ,  $p < 0.001$ ). The highest lifetime (79.45%), current (76.33%), and regular (94.53%) smoking prevalence was seen in adolescents who did not expect negative outcomes as a consequence of smoking. Accordingly, the lowest lifetime (34.29%), current (38.36%), and regular (71.80%) smoking prevalence was seen among adolescents who expected such negative outcomes. It is interesting to highlight that, of current smokers expecting negative outcomes as a result of smoking, over two-thirds (71.80%) smoked regularly. Overall, the less tobacco was perceived as leading to negative consequences, the higher the lifetime smoking, the current smoking among lifetime smokers, and the regular smoking among current smokers.

For *expected benefits from smoking*, data showed an association with lifetime ( $\chi^2 = 197.23$ ,  $p < 0.001$ ) and current smoking ( $\chi^2 = 90.38$ ,  $p < 0.001$ ), but not with regular smoking ( $\chi^2 = 3.15$ ,  $p = 0.207$ ). The highest lifetime (58.98%) and current (61.37%) smoking prevalence was identified in adolescents who expected positive outcomes as a consequence of smoking while the lowest lifetime (27.64%) and current (28.05%) smoking prevalence was seen in adolescents who were not sure whether such positive consequences would happen to them. Overall, the more tobacco was perceived as leading to positive consequences, the greater the lifetime smoking and the current smoking among lifetime smokers.

*Perceived accessibility of tobacco* was associated with lifetime ( $\chi^2 = 132.42$ ,  $p < 0.001$ ) and current smoking ( $\chi^2 = 20.68$ ,  $p < 0.001$ ), but not with regular smoking ( $\chi^2 = 1.65$ ,  $p = 0.439$ ). Adolescents that perceived tobacco as easy to get had greater lifetime (50.23%) and current (50.24%) smoking prevalence. On the other hand, those who considered that accessing tobacco would be difficult showed lower lifetime (22.60%) and current (27.97%) smoking prevalence. On the whole, the more tobacco was perceived as accessible, the higher lifetime the lifetime smoking and the current smoking among lifetime smokers.

*Best friend's smoking behaviour* was associated with lifetime ( $\chi^2 = 882.73, p < 0.001$ ), current ( $\chi^2 = 240.67, p < 0.001$ ), and regular smoking ( $\chi^2 = 69.06, p < 0.001$ ). Despite the different percentages, the trend was similar for lifetime and current smoking: adolescents whose best friends had never smoked presented the lowest lifetime (15.61%) and current (18.63%) smoking prevalence, while those whose best friends were regular smokers showed the highest lifetime (89.11%) and current (77.53%) smoking prevalence. Conversely, for regular smoking, the lowest prevalence was seen among adolescents that did not know if their best friends had ever smoked (60.00%). However, among current smokers, adolescents whose best friends were regular smokers continued to present the highest regular smoking prevalence (94.24%). Overall, the higher the best friends' experience with smoking, the greater the lifetime smoking, the current smoking among lifetime smokers, and the regular smoking among current smokers.

*Perceived parental smoking approval* was also associated with lifetime ( $\chi^2 = 296.88, p < 0.001$ ), current ( $\chi^2 = 105.70, p < 0.001$ ), and regular smoking ( $\chi^2 = 47.16, p < 0.001$ ). Although differing in percentages, the pattern was again similar for lifetime, current, and regular smoking: adolescents that expected their parents to be indifferent to their smoking had the highest lifetime (84.85%), current (88.89%), and regular (100.00%) smoking prevalence. The lowest lifetime (29.76%) and current (32.72%) smoking prevalence was associated with expecting parents to prohibit smoking, whereas among current smokers, the lowest prevalence of regular smoking (67.80%) was associated with expecting parents to punish. It should be noted that, of current smokers that expected their parents to be disapproving almost all (94.61%) still smoked regularly and of current smokers expecting their parents to prohibit them from smoking, over two-thirds (70.71%) still smoked regularly. Overall, the less parents were perceived as being against smoking, the higher the lifetime, current, and regular smoking of their children.

In summary, lifetime smoking and current smoking among lifetime smokers were negatively associated with perceiving smoking as risky and expecting problems from smoking, but positively associated with holding positive attitudes towards tobacco, expecting benefits from smoking, perceiving tobacco as accessible, having best friends who smoke, expecting best friends to approve smoking, and expecting parents not to be disapproving of smoking.



Complementarily, regular smoking among current smokers was negatively associated with expecting problems from smoking, but positively associated with holding positive attitudes towards tobacco, having best friends who smoke, expecting best friends to approve smoking, and expecting parents not to be disapproving of smoking.

Table 31  
 Association Between Proximal Variables and Lifetime, Current, and Regular Smoking

Variables	Categories	Lifetime Smoking				Current Smoking <sup>a</sup>				Regular Smoking <sup>b</sup>			
		n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>
Smoking risk perception	Low	50	58.00	n = 2556				28	75.00	n = 1001			
	Medium	608	59.21	139.44	<0.001	357	58.82	53.89	<0.001	207	82.61	4.26	0.119
	High	1898	32.98					616	36.85				
Attitudes towards tobacco	Negative	1477	25.25	n = 2561				366	21.58	n = 1006			
	Neutral	1013	57.65	336.03	<0.001	577	56.33	166.45	<0.001	321	81.93	20.92	<0.001
	Positive	71	88.73					63	92.06				
Expected problems from smoking	No	219	79.45	n = 2561				169	76.33	n = 1006			
	Do not know	248	51.61	184.66	<0.001	128	47.66	79.39	<0.001	61	83.61	28.31	<0.001
	Yes	2094	34.29					709	38.36				
Expected benefits from smoking	No	565	38.41	n = 2561				212	39.62	n = 1006			
	Do not know	1194	27.64	197.23	<0.001	328	28.05	90.38	<0.001	89	73.03	3.15	0.207
	Yes	802	58.98					466	61.37				
Perceived accessibility to tobacco	Easy	1280	50.23	n = 2551				633	50.24	n = 1004			
	Fairly easy	740	34.46	132.42	<0.001	253	43.48	20.68	<0.001	108	77.78	1.65	0.439
	Difficult	531	22.60					118	27.97				
Best friend's smoking behaviour	Never user	1320	15.61	n = 2561				204	18.63	n = 1006			
	Quitter	306	61.76					186	24.73				
	Occasional user	306	71.57	882.73	<0.001	215	52.09	240.67	<0.001	109	62.39	69.06	<0.001
	Regular user	358	89.11					316	77.53				
	Unknown	271	32.10					85	24.71				
Perceived parental smoking approval	Indifference	33	84.85	n = 2523				27	88.89	n = 994			
	Disapproval	310	79.68					241	69.29				
	Punishment	698	41.83	296.88	<0.001	289	41.87	105.70	<0.001	118	67.80	47.16	<0.001
	Prohibition	1482	29.76					437	32.72				

<sup>a</sup>Data on current smoking is limited to adolescents that had ever smoked. <sup>b</sup>Data on regular smoking is limited to current smokers. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value

*Health-related quality-of-life items*<sup>31</sup>.

Table 32 presents data from the univariate analyses between health-related quality-of-life items and lifetime, current<sup>32</sup>, and regular smoking<sup>33</sup>. Results show that *fitness* was associated with lifetime ( $t = 8.42, p < 0.001$ ), current ( $t = 3.26, p = 0.001$ ), and regular smoking ( $t = 2.09, p = 0.037$ ). Data show that lifetime, current, and regular smokers reported a lower level of fitness when compared with non-smokers. *Energy* was associated with lifetime ( $t = 8.51, p < 0.001$ ) and current smoking ( $t = 3.16, p = 0.002$ ), but not with regular smoking ( $t = 1.85, p = 0.065$ ). Lifetime and current smokers reported a lower level of energy than non-smokers.

*Sadness* showed an association with lifetime smoking ( $t = 7.74, p < 0.001$ ), but not with current ( $t = 1.22, p = 0.222$ ) or regular smoking ( $t = -1.83, p = 0.068$ ). Lifetime smokers presented higher levels of sadness than non-smokers. Data indicated an association between *loneliness* and lifetime smoking ( $t = 6.25, p < 0.001$ ), but not with current ( $t = 0.73, p = 0.463$ ) or regular smoking ( $t = -1.37, p = 0.171$ ). When compared with non-smokers, lifetime smokers reported higher levels of loneliness.

Data indicated an association between *time for oneself* and lifetime smoking ( $t = 5.31, p < 0.001$ ), but not with current ( $t = -0.17, p = 0.867$ ) or regular smoking ( $t = -0.52, p = 0.603$ ). Results indicate that lifetime smokers reported less time for themselves when compared with non-smokers. *Enjoying leisure activities* was associated with lifetime smoking ( $t = 5.05, p < 0.001$ ), but not with current ( $t = 1.21, p = 0.226$ ) or regular smoking ( $t = -1.01, p = 0.311$ ). When compared with non-smokers, lifetime smokers reported fewer opportunities for doing enjoying leisure activities.

*Being treated fairly by parents* was associated with lifetime ( $t = 8.44, p < 0.001$ ) and current smoking ( $t = 2.24, p = 0.026$ ), but not with regular smoking ( $t = -1.09, p = 0.277$ ). Data indicated that lifetime and current smokers felt that their parents treated them fairly less often when compared with non-smokers. For *having fun with friends*, analysis showed an association with lifetime smoking ( $t = 2.26, p = 0.024$ ), but not with current ( $t = -1.66, p = 0.097$ ) or regular smoking ( $t = -1.11, p = 0.266$ ). Compared with non-smokers, lifetime smokers reported having fewer opportunities to have fun with friends.

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<sup>31</sup>See Table 32.

<sup>32</sup>Data on current smoking is limited to adolescents that had ever smoked.

<sup>33</sup>Data on regular smoking is limited to current smokers.

*Being a good student* was associated with lifetime ( $t = 11.26, p < 0.001$ ) and current smoking ( $t = 3.30, p = 0.001$ ), but not with regular smoking ( $t = 0.10, p = 0.918$ ). Lifetime and current smokers perceived themselves as worse students than non-smokers did. *Ability to pay attention at school* showed an association with lifetime ( $t = 14.18, p < 0.001$ ) and current smoking ( $t = 3.81, p < 0.001$ ), but not with regular smoking ( $t = -1.32, p = 0.189$ ). Results show that lifetime and current smokers considered themselves to be less able to pay attention than non-smokers did.

The overall variable combining items assessing *health-related quality-of-life* indicated an association with lifetime ( $t = 12.58, p < 0.001$ ) and current smoking ( $t = 2.77, p = 0.006$ ), but not with regular smoking ( $t = -0.78, p = 0.456$ ). Results indicate that lifetime and current smokers reported a lower level of health-related quality-of-life when compared with non-smokers.

In summary, lifetime smoking was negatively associated with higher levels of fitness and energy, increased time for oneself, plenty opportunities for enjoying leisure activities, being treated fairly by parents, having fun with friends, being a good student, being able to pay attention at school, and overall health-related quality-of-life, but positively associated with higher levels sadness and loneliness. Current smoking among lifetime smokers was negatively associated with higher levels of fitness and energy, being treated fairly by parents, being a good student, being able to pay attention, and overall health-related quality-of-life. Regular smoking among current smokers was negatively associated with higher fitness.

Table 32  
*Association Between Health-Related Quality of Life Items and Lifetime, Current, and Regular Smoking*

Items	Use	Lifetime Smoking				Current Smoking <sup>a</sup>				Regular Smoking <sup>b</sup>			
		n	M <sup>c</sup> (SD <sup>d</sup> )	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD <sup>d</sup> )	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD <sup>d</sup> )	t <sup>e</sup>	p <sup>f</sup>
Fitness	No	1533	80.56 (18.98)	8.42	<0.001	541	75.67 (19.47)	3.26	0.001	90	75.78 (17.35)	2.09	0.037
	Yes	1012	73.91 (20.25)			457	71.51 (20.81)			360	70.72 (21.2)		
Energy	No	1530	79.76 (19.54)	8.51	<0.001	540	74.63 (19.26)	3.16	0.002	90	74.22 (19.94)	1.85	0.065
	Yes	1010	73.03 (19.48)			456	70.75 (19.43)			359	70.03 (19.08)		
Sadness	No	1522	79.15 (19.49)	7.74	<0.001	540	73.56 (20.39)	1.22	0.222	90	68.44 (21.62)	-1.83	0.068
	Yes	1005	72.86 (20.75)			452	71.95 (20.99)			355	72.96 (20.75)		
Loneliness	No	1521	86.05 (20.02)	6.25	<0.001	539	81.19 (21.47)	0.73	0.463	90	77.33 (23.83)	-1.37	0.171
	Yes	1005	80.80 (21.61)			452	80.18 (21.72)			355	80.85 (21.11)		
Time for oneself	No	1520	79.24 (20.65)	5.31	<0.001	540	74.44 (22.47)	-	0.867	90	73.56 (21.16)	-0.52	0.603
	Yes	1009	74.63 (22.38)			455	74.68 (22.07)			358	74.92 (22.40)		
Enjoying leisure activities	No	1516	78.22 (22.70)	5.05	<0.001	538	74.13 (23.34)	1.21	0.226	90	70.22 (25.48)	-1.01	0.311
	Yes	1005	73.45 (23.93)			453	72.27 (24.66)			356	73.15 (24.16)		
Being treated fairly by parents	No	1513	82.02 (20.99)	8.44	<0.001	534	75.99 (21.56)	2.24	0.026	89	70.34 (20.47)	-1.09	0.277
	Yes	996	74.62 (22.25)			448	72.81 (22.92)			352	73.30 (23.50)		
Having fun with friends	No	1513	84.51 (19.37)	2.26	0.024	538	81.67 (20.74)	-	0.097	90	82.00 (20.12)	-1.11	0.266
	Yes	1002	82.69 (20.14)			451	83.81 (19.45)			354	84.52 (18.92)		
Being a good student	No	1520	70.30 (19.12)	11.26	<0.001	537	63.24 (18.26)	3.30	0.001	90	59.56 (16.42)	0.10	0.918
	Yes	1003	61.60 (18.87)			452	59.34 (18.89)			355	59.32 (19.59)		
Ability to pay attention at school	No	1517	77.01 (17.95)	14.19	<0.001	537	68.38 (17.72)	3.81	<0.001	88	61.36 (18.89)	-1.32	0.189
	Yes	1000	66.46 (18.71)			449	63.88 (19.37)			354	64.41 (19.54)		
<b>Health-related quality-of-life<sup>g</sup></b>	No	1537	79.68 (12.18)	12.58	<0.001	541	74.30 (12.10)	2.77	0.006	90	71.25 (12.38)	-0.78	0.456
	Yes	1014	73.39 (12.59)			459	72.10 (12.97)			362	72.39 (13.03)		

<sup>a</sup>Data on current smoking is limited to adolescents that had ever smoked. <sup>b</sup>Data on regular smoking is limited to current smokers. <sup>c</sup>Mean. <sup>d</sup>Standard Deviation. <sup>e</sup>Independent Sample T-Test. <sup>f</sup>p-value. <sup>g</sup>This variable combines the answers given to the ten items presented above.

### Sociodemographic variables<sup>34</sup>.

Table 33 presents data from the univariate analyses between sociodemographic variables and lifetime, current<sup>35</sup>, and regular smoking<sup>36</sup>. Age was associated with lifetime ( $\chi^2 = 654.71$ ,  $p < 0.001$ ), current ( $\chi^2 = 94.54$ ,  $p < 0.001$ ), and regular smoking ( $\chi^2 = 33.08$ ,  $p < 0.001$ ). Whereas 12 year old adolescents showed the lowest lifetime (9.81%), current (17.65%), and regular smoking prevalence (36.36%), 18 year olds showed the highest lifetime (76.27%), current (70.90%), and regular (90.53%) smoking prevalence. As age increased, so did lifetime smoking, current smoking among lifetime smokers, and regular smoking among current smokers.

For *gender*, there was an association with lifetime smoking ( $\chi^2 = 6.15$ ,  $p = 0.013$ ), but not with current ( $\chi^2 = 0.20$ ,  $p = 0.675$ ) or regular smoking ( $\chi^2 = 1.75$ ,  $p = 0.186$ ) with lifetime smoking prevalence being higher among males (42.03%) than females (37.21%). *Nationality* showed no association with lifetime ( $\chi^2 = 2.76$ ,  $p = 0.097$ ), current ( $\chi^2 = 0.52$ ,  $p = 0.469$ ), or regular smoking ( $\chi^2 = 0.32$ ,  $p = 0.574$ ).

SES show an association with lifetime ( $\chi^2 = 34.86$ ,  $p < 0.001$ ), current ( $\chi^2 = 13.49$ ,  $p = 0.004$ ), and regular smoking ( $\chi^2 = 10.12$ ,  $p = 0.018$ ). Adolescents from a low SES showed the highest lifetime (51.30%) and regular (91.36%) smoking prevalence, while those from a higher SES show the highest current smoking prevalence (59.18%).

Data indicate that *family structure* was associated with lifetime smoking ( $\chi^2 = 66.15$ ,  $p < 0.001$ ), but not with current ( $\chi^2 = 3.00$ ,  $p = 0.701$ ) or regular smoking ( $\chi^2 = 5.90$ ,  $p = 0.316$ ). Institutionalized adolescents showed the highest lifetime smoking prevalence (71.43%) and adolescents living within blended families the second highest (54.79%), while adolescents living within intact families show the lowest lifetime smoking prevalence (35.33%).

*Stressful life events* showed an association with lifetime smoking ( $\chi^2 = 56.23$ ,  $p < 0.001$ ), but not with current ( $\chi^2 = 3.06$ ,  $p = 0.080$ ) or regular smoking ( $\chi^2 = 0.19$ ,  $p = 0.665$ ). Adolescents who reported stressful life events within the previous six months had higher lifetime smoking prevalence (43.54%) than those who had not had such experience (25.52%).

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<sup>34</sup>See Table 33.

<sup>35</sup>Data on current smoking is limited to adolescents that had ever smoked.

<sup>36</sup>Data on regular smoking is limited to current smokers.

In summary, lifetime smoking was associated with older age, being male, lower SES, living within an institution, and having experienced stressful life events. Current smoking among lifetime smokers was associated with older age and higher SES, whereas regular smoking among current smokers was associated with older age and lower SES.

Table 33  
*Association Between Sociodemographic Variables and Lifetime, Current, and Regular Smoking*

Variables	Categories	Lifetime Smoking				Current Smoking <sup>a</sup>				Regular Smoking <sup>b</sup>			
		n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>
Age		n = 2561				n = 1006				n = 455			
	12 years	693	9.81			68	17.65			11	36.36		
	13 years	507	23.67			117	23.93			27	66.67		
	14 years	320	41.88			131	35.88			45	64.44		
	15 years	267	60.67	654.71	<0.001	160	50.00	94.54	<0.001	79	74.68	33.08	<0.001
	16 years	344	63.08			213	44.60			95	83.16		
	17 years	253	72.73			183	57.38			103	85.44		
	18 years	177	76.27			134	70.90			95	90.53		
Gender		n = 2561				n = 1006				n = 455			
	Male	1392	42.03	6.15	0.013	576	46.53	0.20	0.657	265	81.89	1.75	0.186
	Female	1169	37.21			430	45.12			190	76.84		
Nationality		n = 2524				n = 991				n = 445			
	Portuguese	2335	39.36	2.76	0.097	908	45.26	0.52	0.469	404	79.21	0.32	0.574
	Other	189	45.50			83	49.40			41	82.93		
SES		n = 2561				n = 1006				n = 455			
	Low	345	51.30			176	46.59			81	91.36		
	Medium	1698	40.11	34.86	<0.001	672	42.71	13.49	0.004	281	76.87	10.12	0.018
	High	323	31.58			98	59.18			58	74.14		
	Unknown	195	30.77			60	58.33			35	85.71		
Family structure		n = 2561				n = 1006				n = 455			
	Intact	1851	35.33			649	44.38			285	77.19		
	Single	373	48.79			179	49.72			87	82.76		
	Extended	55	54.55	66.15	<0.001	30	50.00	3.00	0.701	15	100.00	5.90	0.316
	Blended	146	54.79			74	43.24			31	80.65		
	Institution	42	71.43			30	50.00			14	85.71		
	Other	94	46.81			44	52.27			23	82.61		
Stressful life events		n = 2500				n = 981				n = 438			
	No	525	25.52	56.23	<0.001	133	38.35	3.06	0.080	50	82.00	0.19	0.665
	Yes	1975	43.54			848	46.46			388	79.38		

<sup>a</sup>Data on current smoking is limited to adolescents that had ever smoked. <sup>b</sup>Data on regular smoking is limited to current smokers. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.



### *Multivariate analyses.*

The multivariate analysis was performed for lifetime, current, and regular smoking using the variables that the univariate analyses have shown to be associated with lifetime, current<sup>37</sup>, and regular<sup>38</sup> smoking.

### *Lifetime smoking.*

The independent variables that the univariate analyses showed to be significantly associated with lifetime smoking were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. The results from the binary logistic regression model for lifetime smoking have been split into three tables (Table 34.1, Table 34.2, and Table 34.3), the first presenting data on proximal variables, the second on health-related quality-of-life, and the third on sociodemographic variables.

Table 34.1 presents data from the binary logistic regression analysis for the association between lifetime smoking and proximal variables. After controlling for covariates, *expected problems from smoking* and *perceived accessibility to tobacco* were not significantly associated with lifetime smoking.

Even though data show that *smoking risk perception* is significantly associated with lifetime smoking ( $p = 0.007$ ), the odds of smoking at some point in life were not significantly different between adolescents considering tobacco as having medium risks and high risks for their health and those considering tobacco as having low risk. Regarding *attitudes towards tobacco*, the odds of being a lifetime smoker were significantly higher for adolescents holding positive ( $AOR = 3.24, p = 0.014$ ) or even neutral attitudes ( $AOR = 1.77, p < 0.001$ ) than for adolescents holding negative attitudes.

As for *expected benefits from smoking*, compared with adolescents not expecting positive outcomes from smoking, adolescents not sure about the positive outcomes from smoking ( $AOR = 0.63, p = 0.002$ ) had significantly reduced odds of lifetime smoking whereas adolescents expecting benefits from smoking ( $AOR = 1.40, p = 0.038$ ) had significantly increased odds of smoking at some point during their lives.

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<sup>37</sup>Data on current smoking is limited to adolescents that had ever smoked.

<sup>38</sup>Data on regular smoking is limited to current smokers.

Results for *best friends' smoking behaviour* show there were significantly higher odds of smoking at some point in life among adolescents who did not know whether their best friends have ever smoked ( $AOR = 1.90, p < 0.001$ ), whose best friends had quit smoking ( $AOR = 6.47, p < 0.001$ ), who were occasional smokers ( $AOR = 5.24, p < 0.001$ ), or regular smokers ( $AOR = 11.19, p < 0.001$ ) than among adolescents whose best friends had never smoked. Further, *perceived parental smoking approval*, whilst significantly associated with lifetime smoking ( $p = 0.001$ ), the odds of being a lifetime smoker were not significantly different between adolescents expecting their parents to disapprove, to punish, or to prohibit and those expecting their parents to be indifferent.

Table 34.1  
Binary Logistic Regression for Lifetime Smoking - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Smoking risk perception	Low				0.007
	Medium	2.16	0.90	5.19	0.086
	High	1.45	0.60	3.47	0.406
Attitudes towards smoking	Negative				<0.001
	Neutral	1.77	1.39	2.26	<0.001
	Positive	3.24	1.27	8.28	0.014
Expected problems from smoking	No				
	Do not know Yes	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
Expected benefits from smoking	No				
	Do not know	0.63	0.47	0.84	<0.001
	Yes	1.40	1.02	1.92	
Perceived accessibility to tobacco	Easy				
	Fairly easy				
	Difficult	n.s.	n.s.	n.s.	n.s.
Best friend's smoking behaviour	Never user				<0.001
	Quitter	6.47	4.69	8.93	<0.001
	Occasional user	5.24	3.74	7.36	<0.001
	Regular user	11.19	7.37	16.98	<0.001
	Unknown	1.90	1.34	2.70	<0.001
Perceived parental smoking approval	Indifference				0.001
	Disapproval	1.59	0.49	5.19	0.440
	Punishment	0.81	0.26	2.55	0.717
	Prohibition	0.71	0.23	2.22	0.555

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant

Table 34.2 presents data from the binary logistic regression analyses for the association between lifetime smoking and health-related quality-of-life. Results show that the odds of smoking at some point in life were significantly reduced for adolescents who reported a higher *health-related quality-of-life* ( $AOR = 0.99, p = 0.008$ ).

Table 34.2

Binary Logistic Regression for Lifetime Smoking - Health-Related Quality-of-Life Variable

Variable	AOR	95% CI		p
		LL	UL	
Health-related quality-of-life <sup>a</sup>	0.99	0.98	1.00	0.008

<sup>a</sup>The health-related quality-of-life items were continuous so the adjusted odds ratio represents the common change for each one unit change in the independent variable

Table 34.3 presents data from the binary logistic regression analysis for the association between lifetime smoking and sociodemographic variables<sup>39</sup>. After controlling for covariates, *gender* and *SES* were not significantly associated with lifetime smoking.

For *age*, compared to adolescents aged 12, the odds of being a lifetime smoker were significantly higher among those aged 13 ( $AOR = 1.66, p = 0.010$ ), 14 ( $AOR = 3.73, p < 0.001$ ), 15 ( $AOR = 5.19, p < 0.001$ ), 16 ( $AOR = 6.07, p < 0.001$ ), 17 ( $AOR = 6.53, p < 0.001$ ), or 18 ( $AOR = 8.02, p < 0.001$ ). Regarding *family structure*, institutionalized adolescents ( $AOR = 2.658, p = 0.034$ ) and those living within blended families ( $AOR = 2.37, p < 0.001$ ) had significantly higher odds of smoking at some point in life than those living within intact families. The odds were not significantly different between adolescents living within single families, extended families, or other family structures and those living within intact families. Concerning *stressful life events*, compared to adolescents that had not experienced a stressful life event within the previous six months, those that had experienced such life events had increased odds of smoking at some point in live ( $AOR = 1.90, p < 0.001$ ).

<sup>39</sup>*Nationality* was not entered into the model because univariate analyses showed it was not significantly associated with lifetime smoking.

Table 34.3  
Binary Logistic Regression for Lifetime Smoking - Sociodemographic Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years				<0.001
	13 years	1.66	1.13	2.43	0.010
	14 years	3.73	2.50	5.55	<0.001
	15 years	5.19	3.41	7.90	<0.001
	16 years	6.07	4.06	9.07	<0.001
	17 years	6.53	4.14	10.30	<0.001
Gender	18 years	8.02	4.69	13.69	<0.001
	Male	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
SES	Female				
	Low				
	Medium	n.s.	n.s.	n.s.	n.s.
	High				
Family structure	Unknown				
	Intact				0.002
	Single	1.25	0.91	1.73	0.163
	Extended	1.61	0.80	3.21	0.182
	Blended	2.37	1.48	3.80	<0.001
	Institution	2.58	1.07	6.19	0.034
Stressful life events	Other	0.81	0.43	1.53	0.522
	No				
	Yes	1.90	1.41	2.55	<0.001
<b>Constant</b>		<b>5.46</b>			<b>&lt; 0.001</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

#### Current smoking among lifetime smokers.

The independent variables found to be significantly associated with current smoking among lifetime smokers in the univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. The results from the binary logistic regression model for current smoking have been split into two tables<sup>40</sup> (Table 35.1 and Table 35.2), the first presenting data on the proximal variables and the second on sociodemographic variables.

Table 35.1 presents data from the binary logistic regression analyses for the association between current smoking and proximal variables. After controlling for covariates, *smoking risk perception*, *expected problems from smoking*, *perceived accessibility to tobacco*, and *perceived parental smoking approval* were not significantly associated with current smoking.

For *attitudes towards tobacco*, there were significantly higher odds of continuing to smoke among adolescents holding positive ( $AOR = 14.16, p < 0.001$ ) or even neutral attitudes ( $AOR =$

<sup>40</sup>No data is presented on *health-related quality-of-life* because after controlling for covariates in the multivariate model, it ceased to be significantly associated with current smoking.

3.08,  $p < 0.001$ ) than among adolescents holding negative attitudes. For *expected benefits from smoking*, adolescents expecting positive outcomes from smoking ( $AOR = 2.36$ ,  $p < 0.001$ ) had significantly increased odds of continuing to smoke, compared with adolescents that did not expect positive consequences. The odds were not significantly different between adolescents that did not know whether to expect benefits from smoking and those who did not expect positive outcomes.

As for *best friends' smoking behaviour*, adolescents whose best friends were regular ( $AOR = 8.38$ ,  $p < 0.001$ ) or occasional smokers ( $AOR = 2.90$ ,  $p < 0.001$ ) had significantly increased odds of continuing to smoke compared with those adolescents whose best friends had never smoked. Compared to the latter, neither adolescents that did not know whether their best friends had smoked, nor those whose best friends had quit smoking, showed significantly different odds of becoming current smokers.

Table 35.1  
Binary Logistic Regression for Current Smoking - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Smoking risk perception	Low	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Medium				
	High				
Attitudes towards tobacco	Negative	3.08	2.099	4.519	< 0.001
	Neutral				< 0.001
	Positive				< 0.001
Expected problems from smoking	No	n.s.	n.s.	n.s.	n.s.
	Do not know				
	Yes				
Expected benefits from smoking	No	.70	.434	1.124	< 0.001
	Do not know				0.140
	Yes				< 0.001
Perceived accessibility to tobacco	Easy	n.s.	n.s.	n.s.	n.s.
	Fairly easy				
	Difficult				
Best friend's smoking behaviour	Never user	1.24	.697	2.196	< 0.001
	Quitter				0.467
	Occasional user				< 0.001
	Regular user				< 0.001
	Unknown				0.566
Perceived parental smoking approval	Indifference	n.s.	n.s.	n.s.	n.s.
	Disapproval				
	Punishment Prohibition				

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

Table 35.2 presents data from the binary logistic regression analysis for the association between current smoking and sociodemographic variables<sup>41</sup>. For age, compared to adolescents aged 12 years, the odds of continuing to smoke were significantly higher for adolescents aged 14 (AOR = 2.94,  $p = 0.022$ ), 15 (AOR = 3.65,  $p = 0.004$ ), 16 (AOR = 2.83,  $p = 0.019$ ), 17 (AOR = 4.75,  $p = 0.001$ ), or 18 years (AOR = 8.28,  $p < 0.001$ ). The odds for adolescents aged 13 were not significantly different from those for adolescents aged 12 years. Also, compared to adolescents from a low SES, the odds of continuing to smoke were significantly higher for adolescents from a high SES (AOR = 3.31,  $p = 0.001$ ). The odds among adolescents from a medium SES or that did not know their status were not significantly different from those from a low SES.

Table 35.2  
Binary Logistic Regression for Current Smoking - Sociodemographic Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years				< 0.001
	13 years	1.06	.402	2.778	0.910
	14 years	2.94	1.169	7.391	0.022
	15 years	3.65	1.500	8.870	0.004
	16 years	2.83	1.188	6.744	0.019
	17 years	4.75	1.955	11.558	0.001
	18 years	8.28	3.211	21.374	< 0.001
SES	Low				< 0.001
	Medium	.99	.632	1.555	0.969
	High	3.31	1.671	6.571	0.001
	Unknown	1.75	.762	3.994	0.188
<b>Constant</b>		<b>1.74</b>			<b>0.095</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value.

#### *Regular smoking among current smokers.*

The independent variables found to be significantly associated with regular smoking among current smokers in the univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. Results from the binary logistic regression model for regular smoking have been split into two tables<sup>42</sup> (Table 36.1 and Table 36.2), the first presenting data on the proximal variables and the second on sociodemographic variables.

<sup>41</sup>Gender, nationality, family structure, and stressful life events were not entered into the binary logistic regression model as univariate analyses showed they were not significantly associated with current smoking.

<sup>42</sup>No data is presented on health-related quality-of-life because it was not significantly associated with regular smoking in the univariate analyses.

Table 36.1 presents data from the binary logistic regression analyses for the association between regular smoking and proximal variables<sup>43</sup>. After controlling for covariates, *expected problems from smoking* was not significantly associated with regular smoking.

Concerning *attitudes towards tobacco*, adolescents holding neutral attitudes ( $AOR = 2.31, p = 0.018$ ) had significantly increased odds of smoke regularly compared with those holding negative attitudes. The odds for adolescents holding positive attitudes were not significantly different from those holding negative attitudes.

As for *best friend's smoking behaviour*, results show that the odds of smoking regularly among those whose best friends were regular smokers ( $AOR = 5.52, p = 0.001$ ) were significantly higher than among those whose best friends had never smoked. The odds for adolescents whose best friends had quit smoking, were occasional smokers, or that did not know if their best friends were smokers were not significantly different from those whose best friends have never smoked.

Regarding *parental smoking approval*, whilst significantly associated with regular smoking ( $p = 0.003$ ), the odds of being a regular smoking among adolescents expecting their parents to disapprove, to punish, or to prohibit them from smoking were not significantly different from the odds among adolescents who expected their parents to be indifferent to their smoking.

Table 36.1  
*Binary Logistic Regression for Regular Smoking - Proximal Variables*

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Attitudes towards tobacco	Negative				0.049
	Neutral	2.31	1.152	4.629	0.018
	Positive	2.73	.798	9.334	0.110
Expected problems from smoking	No				
	Do not know	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Yes				
Best friend's smoking behaviour	Never user				0.000
	Quitter	.82	.282	2.408	0.724
	Occasional user	.78	.307	1.966	0.594
	Regular user	5.52	2.049	14.886	0.001
	Unknown	.58	.153	2.209	0.425
Parental smoking approval	Indifference				0.003
	Disapproval	.00	0.000		0.998
	Punishment	.00	0.000		0.998
	Prohibition	.00	0.000		0.998

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>P-value. <sup>f</sup>Non-significant.

<sup>43</sup>*Smoking risk perception, expected benefits from smoking, and perceived accessibility to tobacco* were not entered into the binary logistic regression model as univariate analyses showed they were not significantly associated with regular smoking.

Table 36.2 presents data from the binary logistic regression analyses for the association between regular smoking among current smokers and sociodemographic variables<sup>44</sup>. After controlling for covariates, *SES* was not significantly associated with regular smoking.

For age, compared to adolescents aged 12 years, those aged 16 (*AOR* = 10.66, *p* = 0.005), 17 (*AOR* = 7.84, *p* = 0.016), and 18 years (*AOR* = 8.47, *p* = 0.015) had significantly increased odds of smoke regularly. The odds for 13, 14, and 15 year old adolescents were not significantly different from those aged 12.

Table 36.2  
*Binary Logistic Regression for Regular Smoking- Sociodemographic Variables*

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years				0.037
	13 years	4.88	0.80	29.68	0.086
	14 years	3.78	0.69	20.88	0.127
	15 years	3.74	0.71	19.78	0.120
	16 years	10.66	2.02	56.39	0.005
	17 years	7.84	1.48	41.60	0.016
	18 years	8.47	1.52	47.17	0.015
SES	Low				
	Medium	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	High				
	Unknown				
<b>Constant</b>		<b>376.5</b>			<b>0.998</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

### ***Cannabis Use.***

#### *Univariate analyses.*

##### *Proximal variables<sup>45</sup>.*

Table 37 presents data from univariate analyses between proximal variables and lifetime, current<sup>46</sup>, and regular smoking<sup>47</sup>. Results from the univariate analyses show that *cannabis use risk perception* was associated with lifetime ( $\chi^2 = 185.41$ , *p* < 0.001), current ( $\chi^2 = 32.57$ , *p* < 0.001), and regular cannabis use ( $\chi^2 = 13.17$ , *p* = 0.001). The highest lifetime (56.36%), current (80.65%), and regular (80.00%) cannabis use prevalence was seen in adolescents who considered cannabis use to have low risks to health. Accordingly, the lowest lifetime

<sup>44</sup>*Gender, nationality, family structure, and stressful life events* were not entered into the binary logistic regression model as univariate analyses showed they were not significantly associated with regular smoking.

<sup>45</sup>See Table 37.

<sup>46</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis.

<sup>47</sup>Data on regular cannabis use is limited to current cannabis users.



(8.14%), current (33.65%), and regular(34.29%) cannabis use prevalence was identified among adolescents who perceived using cannabis as having high risks to health. Overall, the less cannabis was perceived as dangerous to health, the higher the lifetime cannabis use, the current use among lifetime users, and the regular use among current users.

Regarding *attitudes towards cannabis*, data showed an association with lifetime ( $\chi^2= 385.90$ ,  $p < 0.001$ ), current ( $\chi^2= 30.41$ ,  $p < 0.001$ ), and regular cannabis use ( $\chi^2= 10.87$ ,  $p = 0.004$ ). Adolescents holding negative attitudes towards cannabis use showed the lowest lifetime (3.33%), current (20.83%), and regular (20.00%) cannabis use prevalence. In contrast, adolescents holding positive attitudes showed the highest lifetime (56.46%), current (70.34%), and regular (59.04%) cannabis use prevalence. On the whole, the more favorable attitudes towards cannabis were, the greater the lifetime cannabis use, the current use among lifetime users, and the regular use among current users.

*Expected problems from cannabis use* showed an association with lifetime ( $\chi^2= 58.63$ ,  $p < 0.001$ ) and current cannabis use ( $\chi^2= 12.22$ ,  $p = 0.002$ ), but not with regular use ( $\chi^2= 2.28$ ,  $p = 0.321$ ). The highest lifetime (58.62%) and current (88.24%) cannabis use prevalence was seen in those who did not expect negative outcomes as a consequence of using cannabis. Accordingly, adolescents expecting negative outcomes showed the lowest lifetime (12.51%) and current (48.70%) cannabis use prevalence. It is interesting to highlight that, of lifetime cannabis users expecting negative outcomes as a result of using cannabis, around half (48.70%) use it currently. Overall, the less cannabis was perceived as leading to negative consequences, the higher the lifetime cannabis use and the current use among lifetime users.

Concerning *expected benefits from cannabis use*, data showed an association with lifetime ( $\chi^2= 192.57$ ,  $p < 0.001$ ) and current cannabis use ( $\chi^2= 25.18$ ,  $p < 0.001$ ), but not with regular use ( $\chi^2= 1.92$ ,  $p = 0.384$ ). The highest lifetime (29.39%) and current (62.50%) cannabis use prevalence was seen in those who expected positive outcomes from using cannabis. Adolescents that did not expect positive outcomes from cannabis use reported the lowest lifetime (6.25%) and current (30.43%) cannabis use prevalence. Overall, the more cannabis was perceived as leading to positive consequences, the greater the lifetime use and current cannabis use among lifetime users.

*Perceived accessibility to cannabis* was associated with lifetime ( $\chi^2 = 217.84, p < 0.001$ ), current ( $\chi^2 = 7.71, p = 0.021$ ), and regular cannabis use ( $\chi^2 = 13.01, p = 0.001$ ). Adolescents that perceived cannabis as easy to get had greater lifetime (39.21%), current (56.88%), and regular (64.52%) cannabis use prevalence. Conversely, those who considered that accessing to cannabis would be difficult showed lower lifetime (4.54%), current (33.33%), and regular (23.08%) cannabis use prevalence. It is worth noting that, of lifetime cannabis users believing that accessing cannabis is difficult, one-third (33.33%) are current cannabis users. On the whole, the more cannabis was perceived as accessible, the higher the lifetime cannabis use, the current use among lifetime users, and the regular use among current users.

*Best friends' cannabis use behaviour* was also associated with lifetime ( $\chi^2 = 731.77, p < 0.001$ ), current ( $\chi^2 = 34.21, p < 0.001$ ), and regular cannabis use ( $\chi^2 = 42.87, p < 0.001$ ). Adolescents whose best friends' had never used cannabis had the lowest lifetime (3.02%), current (28.95%), and regular (0.00%) cannabis use prevalence. On the other hand, adolescents whose best friends' were regular cannabis users had the highest lifetime (83.33%), current (82.86%), and regular (96.55%) cannabis use prevalence. It should be highlighted that just over half (54.26%) of adolescents whose best friends had quit using cannabis had tried cannabis at some point of their lives. In summary, the more experienced the best friends were with cannabis, the greater the lifetime cannabis use, the current use among lifetime users, and the regular use among current users.

*Perceived parental cannabis use approval* was associated with lifetime ( $\chi^2 = 149.79, p < 0.001$ ), current ( $\chi^2 = 18.47, p < 0.001$ ), and regular cannabis use ( $\chi^2 = 11.16, p = 0.011$ ). Of lifetime cannabis users, those who expected their parents to be indifferent to their cannabis use showed the highest current (100.00%) and regular (83.33%) cannabis use prevalence. For lifetime use, across all adolescents, the highest prevalence (68.89%) was associated with disapproval. The lowest lifetime (9.72%), current (41.90%), and regular (45.45%) cannabis use prevalence was associated with having parents that were expected to prohibit cannabis use. Overall, the less parents were perceived as being against cannabis use, the higher the lifetime cannabis use, the current use among lifetime users, and the regular use among current users.

In summary, lifetime cannabis use and current cannabis use in lifetime users were negatively associated with perceiving cannabis use as risky and expecting problems from cannabis use,

but positively associated with holding positive attitudes towards cannabis, expecting benefits from cannabis use, perceiving cannabis as accessible, having best friends who use cannabis, and expecting parents not to be disapproving of cannabis use. Regular use among current cannabis users was associated with perceiving cannabis use as risky, holding attitudes towards cannabis, perceive cannabis as accessible, having best friends who use cannabis, and expecting parents not to be disapproving of cannabis use.

Table 37

Association Between Proximal Variables and Lifetime, Current, and Regular Cannabis Use

Variables	Categories	Lifetime Cannabis Use				Current Cannabis Use <sup>a</sup>				Regular Cannabis Use <sup>b</sup>			
		n	%	$\chi^{2c}$	p <sup>d</sup>	n	%	$\chi^{2c}$	p <sup>d</sup>	n	%	$\chi^{2c}$	p <sup>d</sup>
Cannabis use risk perception	Low	55	56.36	n = 1683				31	80.65	n = 229			
	Medium	326	29.45	185.41	<0.001	94	67.02	32.57	<0.001	63	44.44	13.17	0.001
	High	1302	8.14					104	33.65				
Attitudes towards cannabis	Negative	720	3.33	n = 1686				24	20.83	n = 230			
	Neutral	757	12.15	385.90	<0.001	88	39.77	30.41	<0.001	35	28.57	10.87	0.004
	Positive	209	56.46					118	70.34				
Expected problems from cannabis use	No	29	58.62	n = 1686				17	88.24	n = 230			
	Do not know	82	24.39	58.63	<0.001	20	70.00	12.22	0.002	14	50.00	2.28	0.321
	Yes	1575	12.51					193	48.70				
Expected benefits from cannabis use	No	368	6.25	n = 1686				23	30.43	n = 230			
	Do not know	709	4.51	192.57	<0.001	31	19.36	25.18	<0.001	6	33.33	1.92	0.384
	Yes	609	29.39					176	62.50				
Perceived accessibility to cannabis	Easy	278	39.21	n = 1672				109	56.88	n = 230			
	Fairly easy	491	17.11	217.84	<0.001	82	58.54	7.71	0.021	48	35.42	13.01	0.001
	Difficult	903	4.54					39	33.33				
Best friend's cannabis use behaviour	Never user	1260	3.02	n = 1686				38	28.95	n = 123			
	Quitter	94	54.26					50	32.00				
	Occasional user	129	67.44	731.77	<0.001	85	62.35	34.21	<0.001	53	35.85	42.87	<0.001
	Regular user	42	83.33					35	82.86				
	Unknown	161	14.29					22	63.64				
Perceived parental cannabis use approval	Indifference	11	54.55	n = 1651				6	100.00	n = 226			
	Disapproval	45	68.89	149.79	<0.001	31	77.42	18.47	<0.001	24	70.83	11.16	0.011
	Punishment	494	17.41					84	57.14				
	Prohibition	1101	9.72					105	41.90				

<sup>a</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis. <sup>b</sup>Data on regular cannabis use is limited to current cannabis users. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.

*Health-related quality-of-life*<sup>48</sup>.

Table 38 presents data from the univariate analyses between health-related quality-of-life items and lifetime, current<sup>49</sup>, and regular cannabis use<sup>50</sup>. Results from the univariate analyses show that *fitness* was negatively associated with lifetime cannabis use ( $t = 5.60, p < 0.001$ ), but not with current ( $t = 1.06, p = 0.291$ ) or regular cannabis use ( $t = 0.87, p = 0.386$ ). Results show that the level of *fitness* was lower among lifetime cannabis users than among non-cannabis users. The level of *energy* was negatively associated with lifetime ( $t = 3.60, p < 0.001$ ) and current cannabis use ( $t = 2.44, p = 0.016$ ), but not with regular cannabis use ( $t = 0.86, p = 0.392$ ). Hence, the level of *energy* was lower among lifetime and current cannabis users than among non-users.

*Sadness* was not associated with lifetime ( $t = 1.73, p = 0.084$ ), current ( $t = 0.32, p = 0.749$ ), or regular cannabis use ( $t = 1.52, p = 0.131$ ). Similarly, there were no associations between *loneliness* and lifetime ( $t = 0.69, p = 0.493$ ), current ( $t = -0.18, p = 0.859$ ), nor regular cannabis use ( $t = 0.42, p = 0.677$ ). *Having time for oneself* was also not associated with lifetime ( $t = 1.79, p = 0.073$ ), current ( $t = 0.66, p = 0.510$ ), or regular cannabis use ( $t = 1.52, p = 0.132$ ). However, *enjoying leisure activities* showed an association with lifetime cannabis use ( $t = 3.42, p = 0.001$ ), but not with current ( $t = 1.03, p = 0.302$ ) or regular cannabis use ( $t = 1.02, p = 0.308$ ). When compared with non-cannabis users, lifetime cannabis users reported fewer opportunities to do leisure activities of their liking.

*Being treated fairly by parents* was negatively associated with lifetime cannabis use ( $t = 4.67, p < 0.001$ ), but not with current ( $t = 0.07, p = 0.941$ ) or regular cannabis use ( $t = -0.69, p = 0.494$ ). Therefore, lifetime cannabis users were less likely to feel that their parents treated them fairly than non-users. *Having fun with friends* showed no association with lifetime ( $t = 0.13, p = 0.897$ ), current ( $t = -0.92, p = 0.357$ ), nor regular cannabis use ( $t = -0.59, p = 0.559$ ).

*Being a good student* was associated with lifetime ( $t = 7.22, p < 0.001$ ) and regular cannabis use ( $t = 2.06, p = 0.042$ ), but not with current cannabis use ( $t = 0.74, p = 0.461$ ). Hence, lifetime cannabis users perceived themselves as worse students than non-users did, and among current cannabis users those who used cannabis regularly considered themselves to

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<sup>48</sup>See Table 38.

<sup>49</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis.

<sup>50</sup>Data on regular cannabis use is limited to current cannabis users.

be worse students than those who were not regular users. Results on *ability to pay attention at school* showed that there was an association with lifetime cannabis use ( $t = 7.37, p < 0.001$ ), but not with current ( $t = 1.14, p = 0.255$ ) or regular cannabis use ( $t = 1.40, p = 0.163$ ). When compared with non-users, lifetime cannabis users felt less able to pay attention at school.

As for the overall variable combining items assessing *health-related quality-of-life*, data indicated an association with lifetime cannabis use ( $t = 5.73, p < 0.001$ ), but not with current use among lifetime cannabis users ( $t = 0.79, p = 0.430$ ) nor with regular use among current cannabis users ( $t = 1.44, p = 0.153$ ). Results indicate that lifetime cannabis users had a lower level of health-related quality-of-life when compared with non-users.

In summary, lifetime cannabis use was negatively associated with higher levels of fitness and energy, plenty opportunities for enjoying leisure activities, being treated fairly by parents, being a good student, being able to pay attention at school, and overall health-related quality-of-life. Current cannabis use among lifetime users was negatively associated with fitness, whereas regular cannabis use among current users was negatively associated with being a good student.

Table 38  
 Association Between Health-Related Quality-of-Life Items and Lifetime, Current, and Regular Cannabis Use

Items	Use	Lifetime Cannabis Use				Current Cannabis Use <sup>a</sup>				Regular Cannabis Use <sup>b</sup>			
		n	M <sup>c</sup> (SD) <sup>d</sup>	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD) <sup>d</sup>	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD) <sup>d</sup>	t <sup>e</sup>	p <sup>f</sup>
Fitness	No	2304	78.68 (19.43)	5.60	<0.001	108	72.59 (18.66)	1.06	0.291	63	71.43 (22.64)	0.87	0.386
	Yes	236	71.19 (20.96)			124	69.68 (22.74)			61	67.87 (22.88)		
Energy	No	2301	77.52 (19.78)	3.60	<0.001	107	75.70 (17.60)	2.44	0.016	63	71.11 (18.93)	0.86	0.392
	Yes	234	72.65 (19.18)			123	69.59 (20.06)			60	68.00 (21.22)		
Sadness	No	2288	76.82 (20.26)	1.73	0.084	107	74.95 (20.39)	0.32	0.749	62	76.77 (17.06)	1.52	0.131
	Yes	233	74.42 (19.95)			122	74.10 (19.87)			60	71.33 (22.21)		
Loneliness	No	2287	83.99 (20.86)	0.69	0.493	107	82.61 (21.99)	-0.18	0.859	62	83.87 (19.11)	0.42	0.677
	Yes	233	83.00 (20.92)			122	83.11 (20.25)			60	82.33 (21.50)		
Time for oneself	No	2290	77.59 (21.44)	1.79	0.073	107	75.89 (20.87)	0.66	0.510	62	77.10 (21.07)	1.52	0.132
	Yes	233	74.94 (22.29)			122	73.93 (23.55)			60	70.67 (25.64)		
Enjoying leisure activities	No	2283	76.78 (23.08)	3.42	0.001	107	72.90 (24.76)	1.03	0.302	61	71.80 (23.77)	1.02	0.308
	Yes	232	71.29 (25.28)			121	69.42 (25.83)			60	67.00 (27.76)		
Treated fairly by parents	No	2276	79.68 (21.63)	4.67	<0.001	103	72.62 (22.05)	0.07	0.941	62	70.97 (23.93)	-0.69	0.494
	Yes	228	72.63 (22.65)			121	72.40 (23.42)			59	73.90 (22.97)		
Having fun with friends	No	2281	83.73 (19.81)	0.13	0.897	106	82.26 (19.19)	-0.92	0.357	61	83.61 (19.15)	-0.59	0.559
	Yes	231	83.55 (19.19)			121	84.63 (19.28)			60	85.67 (19.52)		
Being a good student	No	2288	67.68 (19.08)	7.22	<0.001	106	59.25 (21.19)	0.74	0.461	61	60.98 (18.41)	2.06	0.042
	Yes	231	58.10 (20.76)			121	57.19 (20.71)			60	53.33 (22.30)		
Ability to pay attention	No	2284	73.67 (18.67)	7.37	<0.001	105	65.71 (19.56)	1.14	0.255	61	65.25 (18.94)	1.40	0.163
	Yes	230	64.09 (20.02)			121	62.64 (20.65)			60	60.00 (22.09)		
<b>Health-related quality-of-life<sup>g</sup></b>	No	2309	77.61 (12.58)	5.73	< 0.001	108	73.32 (12.85)	0.79	0.430	63	73.67 (13.47)	1.44	0.153
	Yes	236	72.66 (13.27)			124	71.93 (13.68)			61	70.15 (13.78)		

<sup>a</sup>Data on current drinking is limited to adolescents that had ever drank. <sup>b</sup>Data on regular drinking is limited to current drinkers. <sup>c</sup>Mean. <sup>d</sup>Standard Deviation. <sup>e</sup>Independent Sample T-Test. <sup>f</sup>p-value. <sup>g</sup>This variable combines the answers given to the ten items presented above.

### *Sociodemographic variables*<sup>51</sup>.

Table 39 presents data from the univariate analyses between sociodemographic variables and lifetime, current<sup>52</sup>, and regular cannabis use<sup>53</sup>. Results show that age was associated with lifetime cannabis use ( $\chi^2 = 235.38, p < 0.001$ ), but not with current ( $\chi^2 = 7.57, p = 0.271$ ) or regular cannabis use ( $\chi^2 = 4.63, p = 0.592$ ). Thus, 12 year old adolescents showed the lowest lifetime (0.58%) cannabis use prevalence whilst 18 year olds showed the highest (27.53%).

*Genders* showed an association with lifetime cannabis use ( $\chi^2 = 16.73, p < 0.001$ ), but not with current ( $\chi^2 = 0.10, p = 0.752$ ) or regular cannabis use ( $\chi^2 = 3.45, p = 0.063$ ). Males had a higher lifetime prevalence of cannabis use (11.48%) than females (6.76%).

*Nationality* showed an association with lifetime ( $\chi^2 = 6.44, p = 0.011$ ) and regular cannabis use ( $\chi^2 = 5.41, p = 0.020$ ), but not with current cannabis use ( $\chi^2 = 3.50, p = 0.061$ ). Adolescents from nationalities other than Portuguese reported a higher lifetime prevalence of cannabis use (14.36%) than Portuguese adolescents (8.80%), and among current cannabis users, non-Portuguese adolescents reported a higher prevalence of regular use (73.68% compared with 44.66% in Portuguese adolescents). For *SES*, there was no association with lifetime ( $\chi^2 = 0.49, p = 0.921$ ), current ( $\chi^2 = 4.26, p = 0.235$ ), or with regular cannabis use ( $\chi^2 = 1.90, p = 0.594$ ).

*Family structure* was associated with lifetime cannabis use ( $\chi^2 = 32.58, p < 0.001$ ), but not with current ( $\chi^2 = 0.29, p = 0.998$ ) or regular cannabis use ( $\chi^2 = 7.77, p = 0.169$ ). Hence, adolescents living within intact families reported the lowest lifetime cannabis use prevalence (7.52%), whereas institutionalized adolescents reported the highest (16.67%). *Stressful life events* showed an association with lifetime cannabis use ( $\chi^2 = 15.96, p < 0.001$ ), but not with current ( $\chi^2 = 2.02, p = 0.156$ ) or regular cannabis use ( $\chi^2 = 2.74, p = 0.098$ ). Adolescents who had experienced stressful life events within the previous six months reported a higher lifetime cannabis use prevalence (10.31%) when compared with those who had not experienced such events (4.63%).

In summary, lifetime cannabis use was associated with older age, being male, being of a nationality other than Portuguese, living within an institution, and having experienced a stressful life event. Current cannabis use among lifetime cannabis users was not associated

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<sup>51</sup>See Table 39.

<sup>52</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis.

<sup>53</sup>Data on regular cannabis use is limited to current cannabis users.



with any of the assessed sociodemographic variables. Regular cannabis use among current cannabis users was associated with being of a nationality other than Portuguese.

Table 39  
*Association Between Sociodemographic Variables and Lifetime, Current, and Regular Cannabis Use*

Variables	Categories	Lifetime Cannabis Use				Current Cannabis Use <sup>a</sup>				Regular Cannabis Use <sup>b</sup>			
		n	%	$\chi^{2c}$	p <sup>d</sup>	n	%	$\chi^{2c}$	p <sup>d</sup>	n	%	$\chi^{2c}$	p <sup>d</sup>
		n = 2554				n = 234				n = 125			
Age	12 years	690	0.58			4	50.00			2	0.00		
	13 years	507	2.17			11	27.27			3	33.33		
	14 years	317	7.89			23	52.17			12	50.00		
	15 years	266	15.41	235.38	<0.001	40	47.50	7.57	0.271	19	42.11	4.63	0.592
	16 years	343	15.74			54	53.70			29	44.83		
	17 years	253	21.34			53	50.94			27	51.85		
	18 years	178	27.53			49	67.35			33	60.61		
		n = 2554				n = 234				n = 125			
Gender	Male	1385	11.48	16.73	<0.001	157	54.14	0.10	0.752	85	55.29	3.45	0.063
	Female	1169	6.76			77	51.95			40	37.50		
		n = 2518				n = 228				n = 122			
Nationality	Portuguese	2330	8.80	6.44	0.011	201	51.24	3.50	0.061	103	44.66	5.41	0.020
	Other	188	14.36			27	70.37			19	73.68		
		n = 2554				n = 234				n = 125			
SES	Low	346	9.54			33	54.55			18	55.56		
	Medium	1691	9.28			155	49.68			77	45.45		
	High	321	9.97	0.49	0.921	30	70.00	4.26	0.235	21	52.38	1.90	0.594
	Unknown	196	8.16			16	56.25			9	66.67		
		n = 2554				n = 234				n = 125			
Family structure	Intact	1848	7.52			137	54.0			74	41.89		
	Single	368	16.30			58	51.7			30	66.67		
	Extended	55	10.91	32.58	<0.001	6	50.0	0.29	0.998	3	33.33	7.77	0.169
	Blended	148	9.46			14	57.1			8	37.50		
	Institution	42	16.67			7	57.1			4	75.00		
	Other	93	12.90			12	50.0			6	66.67		
		n = 2496				n = 224				n = 119			
Stressful life events	No	518	4.63	15.96	<0.001	23	39.13	2.02	0.156	9	22.22	2.74	0.098
	Yes	1978	10.31			201	54.73			110	50.91		

<sup>a</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis. <sup>b</sup>Data on regular cannabis use is limited to current cannabis users. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.

### *Multivariate analyses.*

The multivariate analysis was performed for lifetime, current, and regular cannabis use using the variables that the univariate analyses have shown to be associated with lifetime, current<sup>54</sup>, and regular<sup>55</sup> cannabis use.

### *Lifetime cannabis use.*

The independent variables found to be significantly associated with lifetime cannabis use in univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. Results from the binary logistic regression model for lifetime cannabis use have been split into two tables<sup>56</sup> (Table 40.1 and Table 40.2), the first presenting data on the proximal variables and the second on the sociodemographic variables.

Table 40.1 presents data from the binary logistic regression analyses for the association between lifetime cannabis use and proximal variables. After controlling for covariates, *cannabis use risk perception* and *expected problems from cannabis use* were not significantly associated with lifetime cannabis use.

Compared to adolescents holding negative *attitudestowards cannabis*, there were significantly higher odds of being a lifetime cannabis user among adolescents holding positive attitudes ( $AOR = 6.75, p < 0.001$ ) or even neutral attitudes ( $AOR = 1.89, p = 0.030$ ) than among those holding negative attitudes. Whilst *expecting benefits from cannabis use* was significantly associated with lifetime cannabis use ( $p < 0.001$ ), the odds of using cannabis at some point in live were not significantly different between adolescents who did not expect positive outcomes from cannabis use and those either expecting benefits from cannabis use or not being sure. Regarding *perceived accessibility to cannabis*, adolescents considering access to cannabis to be difficult ( $AOR = 0.43, p = 0.004$ ) or fairly easy ( $AOR = 0.49, p = 0.008$ ) had significantly decreased odds of being a lifetime cannabis user compared with adolescents considering access to be easy.

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<sup>54</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis.

<sup>55</sup>Data on regular cannabis use is limited to current cannabis users.

<sup>56</sup>No data is presented on *health-related quality-of-life* because after controlling for covariates it ceased to be significantly associated with lifetime cannabis use.

For *best friend's cannabis use behaviour*, the odds of using cannabis at some point in life were significantly higher for adolescents who did not know whether their best friends had used cannabis ( $AOR = 2.39, p = 0.009$ ), whose best friends had quit using cannabis ( $AOR = 15.31, p < 0.001$ ), were occasional cannabis users ( $AOR = 21.34, p < 0.001$ ), or were regular cannabis users ( $AOR = 22.32, p < 0.001$ ) than among adolescents whose best friends had never used cannabis. Whilst *perceived parental cannabis use approval* was significantly associated with lifetime cannabis use ( $p = 0.015$ ), the odds of being a lifetime cannabis user were not significantly different between adolescents expecting their parents to disapprove, to punish, or to prohibit them from using cannabis and those expecting their parents to be indifferent.

Table 40.1  
Binary Logistic Regression for Lifetime Cannabis Use - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Cannabis use risk perception	Low	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Medium				
	High				
Attitudes towards cannabis	Negative	1.89	1.06	3.38	<0.001
	Neutral				0.030
	Positive				<0.001
Expected problems from cannabis use	No	n.s.	n.s.	n.s.	n.s.
	Do not know				
	Yes				
Expected benefits from cannabis use	No	0.57	0.28	1.16	<0.001
	Do not know				0.121
	Yes				0.059
Perceived accessibility to cannabis	Easy	0.49	0.29	0.83	0.006
	Fairly easy				0.008
	Difficult				0.004
Best friend's cannabis usebehaviour	Never user	21.34	11.82	38.50	<0.001
	Quitter				<0.001
	Occasional user				<0.001
	Regular user				<0.001
	Unknown				0.009
Perceived parental cannabis use approval	Indifference	2.74	0.25	30.13	0.015
	Disapproval				0.410
	Punishment				0.563
	Prohibition				0.991

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

Table 40.2 presents data from the binary logistic regression analysis for the association between lifetime cannabis use and sociodemographic variables<sup>57</sup>. After controlling for covariates, *gender, nationality, family structure, and stressful life events* were not significantly associated with lifetime cannabis use.

<sup>57</sup>SES was not entered into the binary logistic regression model because univariate analyses showed it was not significantly associated with lifetime cannabis use.

As for *age*, compared to adolescents aged 12 years, those aged 14 ( $AOR = 3.55, p = 0.045$ ), 15 ( $AOR = 4.94, p = 0.008$ ), 16 ( $AOR = 5.93, p = 0.003$ ), 17 ( $AOR = 7.81, p = 0.001$ ), and 18 years ( $AOR = 11.01, p < 0.001$ ) had significantly increased odds of using cannabis at some point in live. The odds for 13 year old adolescents were not significantly different from those aged 12 years.

Table 40.2  
*Binary Logistic Regression for Lifetime Cannabis Use - Sociodemographic Variables*

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Age	12 years				< 0.001
	13 years	1.46	.386	5.509	0.578
	14 years	3.55	1.027	12.295	0.045
	15 years	4.94	1.508	16.186	0.008
	16 years	5.93	1.868	18.853	0.003
	17 years	7.81	2.406	25.336	0.001
Gender	18 years	11.09	3.309	37.128	< 0.001
	Male	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
Nationality	Female	n.s.	n.s.	n.s.	n.s.
	Portuguese	n.s.	n.s.	n.s.	n.s.
Family structure	Other	n.s.	n.s.	n.s.	n.s.
	Intact				
	Single				
	Extended	n.s.	n.s.	n.s.	n.s.
Stressful life events	Blended				
	Institution				
	Other				
Stressful life events	No	n.s.	n.s.	n.s.	n.s.
	Yes				
<b>Constant</b>		<b>0.36</b>			<b>0.002</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

#### *Current cannabis use among lifetime cannabis users.*

The independent variables found to be significantly associated with current cannabis use among lifetime cannabis users in the univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates.

Results from the binary logistic regression model for current cannabis use are presented into one table<sup>58</sup> (Table 41) which presents data on the proximal variables. After controlling for covariates, *cannabis use risk perception*, *attitudes towards cannabis*, *expected problems from cannabis use*, and *perceived accessibility of cannabis* were not significantly associated with current cannabis use.

<sup>58</sup>No data is presented on *health-related quality-of-life* neither or on *sociodemographic variables* because neither were significantly associated with current cannabis use in the univariate analyses.

Even though *expected benefits from cannabis use* had a significant association with current cannabis use overall ( $p = 0.013$ ), the odds of continuing to use cannabis use were not significantly different between adolescents who did not expect positive outcomes from cannabis use and those either expecting benefits from cannabis use or not being sure. The same for *perceived parental cannabis use approval*: Despite the significant association with current cannabis use overall ( $p = 0.038$ ), the odds of continuing to use cannabis were not significantly different between adolescents who expected their parents to disapprove, to punish, or to prohibit if knowing that their children were using cannabis and those expecting their parents to be indifferent.

As for *best friend's cannabis use*, results show that adolescents whose best friends were regular users ( $AOR= 4.79$ ,  $p = 0.023$ ) had significantly increased odds of continuing to use cannabis than those whose best friends had never used cannabis. The odds were not significantly different between adolescents whose best friends had quit cannabis use, were occasional users, or that did not know if their best friends were cannabis users or not and those whose best friends had never used cannabis.

Table 41  
Binary Logistic Regression for Current Cannabis Use - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Cannabis use risk perception	Low	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Medium				
	High				
Attitudes towards cannabis	Negative	n.s.	n.s.	n.s.	n.s.
	Neutral				
	Positive				
Expected problems from cannabis use	No	n.s.	n.s.	n.s.	n.s.
	Do not know				
	Yes				
Expected benefits from cannabis use	No	0.43	0.09	2.01	0.013
	Do not know	2.19	0.66	7.31	0.281
	Yes				0.203
Perceived accessibility to cannabis	Easy	n.s.	n.s.	n.s.	n.s.
	Fairly easy				
	Difficult				
Best friend's cannabis usebehaviour	Never user				0.037
	Quitter	0.88	0.29	2.62	0.815
	Occasional user	2.27	0.87	5.97	0.095
	Regular user	4.79	1.24	18.41	0.023
	Unknown	2.73	0.73	10.25	0.138
Perceived parental cannabis use approval	Indifference				0.038
	Disapproval	0.00	0.00		0.999
	Punishment	0.00	0.00		0.999
	Prohibition	0.00	0.00		0.999
<b>Constant</b>		<b>105.48</b>			<b>0.999</b>

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

### *Regular cannabis use in current cannabis users.*

The independent variables found to be significantly associated with regular cannabis use among current cannabis users in univariate analyses were entered into a binary logistic regression model. After controlling for covariates, *cannabis use risk perception, attitudes towards cannabis, perceived accessibility to cannabis, best friend's cannabis use behaviour, and perceived parental cannabis use approval* were not significantly associated with regular cannabis use. Only nationality was significant. Compared to Portuguese adolescents, adolescents from another nationality ( $AOR = 4.53, p = 0.028$ ) had significantly increased odds of continue to use cannabis.

### **Cocaine Use.**

#### *Univariate analyses.*

##### *Proximal variables<sup>59</sup>.*

Table 42 presents data from univariate analyses between proximal variables and lifetime, current<sup>60</sup>, and regular cocaine use<sup>61</sup>. Results from the univariate analyses show that *cocaine use risk perception* was associated with lifetime ( $\chi^2 = 103.80, p < 0.001$ ) and current cocaine use ( $\chi^2 = 10.62, p = 0.005$ ), but not with regular cocaine use ( $\chi^2 = 2.24, p = 0.327$ ). Adolescents who considered cocaine use to have low risks to health had the highest lifetime (25.81%) and current (87.50%) cocaine use prevalence. Adolescents who believed cocaine use had high risks showed the lowest lifetime (1.14%) and current (21.05%) cocaine use prevalence. Overall, the less cocaine was perceived as dangerous to health, the higher the lifetime use and current use among lifetime cocaine users.

*Attitudes towards cocaine* showed an association with lifetime ( $\chi^2 = 106.11, p < 0.001$ ) and current cocaine use ( $\chi^2 = 7.64, p = 0.022$ ), but not with regular cocaine use ( $\chi^2 = 0.49, p = 0.486$ ). Adolescents holding negative attitudes towards cocaine use showed the lowest lifetime (0.49%) and current (0.00%) cocaine use prevalence. On the other hand, adolescents holding positive attitudes showed the highest lifetime (15.74%) and current cocaine use prevalence

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<sup>59</sup>See Table 42.

<sup>60</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine.

<sup>61</sup>Data on regular cocaine use is limited to current cocaine users.

(62.50%). On the whole, the more favorable attitudes towards cocaine were, the greater the lifetime use and current use among lifetime cocaine users.

*Expected problems from cocaine use* were associated with lifetime ( $\chi^2 = 214.41, p < 0.001$ ) and current cocaine use ( $\chi^2 = 11.58, p = 0.003$ ), but not with regular cocaine use ( $\chi^2 = 0.59, p = 0.746$ ). The highest lifetime (50.00%) and current (80.00%) cocaine use prevalence, were seen in adolescents who did not expect negative outcomes from cocaine use, while adolescents who expected negative outcomes showed the lowest lifetime (1.66%) and current (22.58%) cocaine use prevalence. Overall, the less cocaine was perceived as leading to negative consequences, the higher the lifetime use and current use among lifetime cocaine users.

Concerning *expected benefits from cocaine use*, there was an association with lifetime cocaine use ( $\chi^2 = 42.73, p < 0.001$ ), but not with current ( $\chi^2 = 3.52, p = 0.172$ ) or regular cocaine use ( $\chi^2 = 0.94, p = 0.624$ ). The highest lifetime cocaine use prevalence (5.86%) was seen among adolescents who expected positive outcomes from using cocaine whereas the lowest (0.78%) was seen in adolescents that were not sure about these positive outcomes. Overall, the more cocaine was perceived as leading to positive consequences, the greater the lifetime use and current use among lifetime cocaine users.

*Perceived accessibility to cocaine* was associated with lifetime cocaine use ( $\chi^2 = 72.12, p < 0.001$ ), but not with current ( $\chi^2 = 3.73, p = 0.155$ ) or regular cocaine use ( $\chi^2 = 4.29, p = 0.117$ ). Adolescents that perceived cocaine as easy to obtain had greater lifetime cocaine use (9.96%), while those who considered that access to cocaine would be difficult showed the lowest prevalence (1.03%). On the whole, the more cocaine was perceived as accessible, the higher the lifetime use.

*Best friend's cocaine use behaviour* was also associated with lifetime ( $\chi^2 = 466.37, p < 0.001$ ), current ( $\chi^2 = 21.84, p < 0.001$ ), and regular cocaine use ( $\chi^2 = 10.22, p = 0.037$ ). Adolescents whose best friends had never taken cocaine had the lowest lifetime cocaine use prevalence (0.94%), while those whose best friends were regular users showed the highest (75.00%). For current cocaine use, the figures were rather different: The lowest prevalence (11.11%) was associated with best friends that had quit using cocaine, whereas the highest (100.00%) was still associated with best friends that were regular users. Overall, even though the more the



best friend was experienced with cocaine, the higher the cocaine lifetime and current cocaine use among lifetime users, the sample size means these results should be treated with caution.

*Perceived parental cocaine use approval* was also associated with lifetime ( $\chi^2 = 299.88$ ,  $p < 0.001$ ) and current cocaine use ( $\chi^2 = 12.75$ ,  $p = 0.005$ ) but not with regular cocaine use ( $\chi^2 = 0.62$ ,  $p = 0.892$ ). Adolescents whose parents' were expected to be indifferent to their cocaine use showed the highest lifetime (72.73%) and current (87.50%) cocaine use prevalence. For lifetime cocaine use, expecting parents to punish cocaine use was associated with the lowest prevalence (1.08%). For current cocaine use, the lowest prevalence was seen among those who expected their parents would prohibit cocaine use (20.00%). Overall, the less parents were perceived as being against cocaine use, the greater lifetime and current cocaine use among lifetime users.

In summary, lifetime cocaine use was negatively associated with perceiving cocaine use as risky and expecting problems from cocaine use, but positively associated with holding positive attitudes towards cocaine, expecting benefits from cocaine use, perceiving cocaine as accessible, having best friends who use cocaine, and expecting parents not to be disapproving of cocaine use. Current cocaine use among lifetime cocaine users, was associated with perceiving cocaine use as risky and expecting problems from cocaine use, but positively associated with holding attitudes towards cocaine, having best friends who use cocaine, and expecting parents not to be disapproving of cocaine use. Regular cocaine use among current cocaine users was associated with having best friends who use cocaine.

Table 42

Association Between Proximal Variables and Lifetime, Current, and Regular Cocaine Use

Variables	Categories	Lifetime Cocaine Use				Current Cocaine Use <sup>a</sup>				Regular Cocaine Use <sup>b</sup>			
		n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>
Cocaine use risk perception	Low	31	25.81	n = 2033				8	87.50	n = 44			
	Medium	337	5.34	103.80	<0.001	17	35.29	10.62	0.005	6	50.00	2.24	0.327
	High	1665	1.14					19	21.05	n = 17			
Attitudes towards cocaine	Negative	1028	0.49	n = 2036				5	0.00	n = 44			
	Neutral	900	2.56	106.11	<0.001	23	30.43	7.64	0.022	7	42.86	0.49	0.486
	Positive	108	15.74					16	62.50	n = 17			
Expected problems from cocaine use	No	20	50.00	n = 2036				10	80.00	n = 44			
	Do not know	94	3.19	214.41	<0.001	3	66.67	11.58	0.003	2	50.00	0.59	0.746
	Yes	1922	1.66					31	22.58	n = 17			
Expected benefits from cocaine use	No	501	1.40	n = 2036				7	14.29	n = 44			
	Do not know	1023	0.78	42.73	<0.001	8	25.00	3.52	0.172	2	50.00	0.94	0.624
	Yes	512	5.86					29	48.28	n = 17			
Perceived accessibility to cocaine	High	231	9.96	n = 2015				23	52.17	n = 44			
	Medium	519	1.73	72.12	<0.001	8	25.00	3.73	0.155	12	66.67	4.29	0.117
	Low	1265	1.03					13	23.08	n = 17			
Best friend's cocaine use behaviour	Never user	1805	0.94	n = 2036				17	11.76	n = 44			
	Quiter	34	29.41					9	11.11	n = 17			
	Occasionally user	29	34.48	466.37	<0.001	10	70.00	21.84	<0.001	7	14.29	10.22	0.037
	Regular user	8	75.00					6	100.00				
	Unknown	160	1.25					2	50.00				
Perceived parental cocaine use approval	Indifference	11	72.73	n = 1999				8	87.50	n = 44			
	Disapproval	20	25.00					5	60.00	n = 17			
	Punishment	556	1.08	299.88	<0.001	6	33.33	12.75	0.005	3	33.33	0.62	0.892
	Prohibition	1412	1.84					25	20.00				

<sup>a</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine. <sup>b</sup>Data on regular cocaine use is limited to current cocaine users. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.

*Health-related quality-of-life items*<sup>62</sup>.

Table 43 presents data from the univariate analyses between health-related quality-of-life items and lifetime, current<sup>63</sup>, and regular cocaine use<sup>64</sup>. Results from the univariate analyses show that *fitness* was negatively associated with lifetime cocaine use ( $t = 2.34, p = 0.019$ ), but not with current ( $t = 0.21, p = 0.831$ ) or regular cocaine use ( $t = 0.76, p = 0.462$ ). Level of fitness was lower among lifetime cocaine users than among non-cocaine users. Data show that level of *energy* was not associated with lifetime ( $t = 1.12, p = 0.262$ ), current ( $t = 0.41, p = 0.686$ ), or regular cocaine use ( $t = 0.10, p = 0.926$ ).

*Sadness* showed an association with lifetime cocaine use ( $t = 2.15, p = 0.032$ ), but not with current ( $t = 0.38, p = 0.706$ ) or regular cocaine use ( $t = 1.46, p = 0.165$ ). Thus, lifetime cocaine users expressed higher levels of sadness than non-cocaine users. Similarly, *loneliness* showed an association with lifetime cocaine use ( $t = 2.14, p = 0.033$ ), but not with current ( $t = 0.87, p = 0.389$ ), nor regular cocaine use ( $t = 0.25, p = 0.804$ ). When compared with non-cocaine users, lifetime users reported feeling lonelier.

*Time for oneself* had no association with lifetime ( $t = 0.99, p = 0.323$ ), current ( $t = 1.27, p = 0.212$ ), nor regular cocaine use ( $t = -0.08, p = 0.935$ ). Regarding having opportunities to engage in *enjoyable leisure activities*, data showed an association with lifetime cocaine use ( $t = 3.50, p < 0.001$ ), but not with current ( $t = 1.71, p = 0.094$ ) or regular cocaine use ( $t = 0.43, p = 0.673$ ). Hence, when compared with non-users, lifetime cocaine users reported having fewer opportunities for doing enjoying leisure activities.

There was an association between *being treated fairly by parents* and lifetime cocaine use ( $t = 2.78, p = 0.006$ ), but not with current ( $t = 2.00, p = 0.052$ ) or regular cocaine use ( $t = 0.56, p = 0.584$ ). Hence, cocaine users were less likely to feel that their parents have treated them fairly than non-users. *Having fun with friends* was not associated with lifetime ( $t = 1.29, p = 0.197$ ), current ( $t = 1.86, p = 0.071$ ), or regular cocaine use ( $t = -0.22, p = 0.832$ ).

*Being a good student*, was associated with lifetime cocaine use ( $t = 4.54, p < 0.001$ ), but not with current ( $t = -0.10, p = 0.918$ ) or regular cocaine use ( $t = -0.24, p = 0.812$ ). Therefore, lifetime cocaine users perceived themselves as worse students than non-users did. The *ability*

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<sup>62</sup>See Table 43.

<sup>63</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine.

<sup>64</sup>Data on regular cocaine use is limited to current cocaine users.

*to pay attention at school* was negatively associated with lifetime cocaine use ( $t = 3.63, p < 0.001$ ), but not with current ( $t = 1.11, p = 0.275$ ) or regular cocaine use ( $t = -0.34, p = 0.735$ ). Thus, current cocaine users felt less able to pay attention at school when compared with non-users.

As for the overall variable combining item assessing *health-related quality-of-life*, data indicated an association with lifetime use ( $t = 3.95, p < 0.001$ ), but not with current ( $t = 0.79, p = 0.430$ ) or regular cocaine use ( $t = 1.44, p = 0.153$ ). Results indicate that lifetime cocaine users reported a lower level of health-related quality-of-life when compared with non-users.

In summary, lifetime cocaine use was negatively associated with higher levels of fitness, enjoying leisure activities, plenty opportunities for enjoying leisure activities, being treated fairly by parents, being a good student, and being able to pay attention at school, but positively associated with higher levels of sadness and loneliness. Current cocaine use among lifetime cocaine users and regular cocaine use among current cocaine users were not associated with any of the health-related quality-of-life items assessed.

Table 43  
 Association Between Health-Related Quality-of-Life Items and Lifetime, Current, and Regular Cocaine Use

Items	Use	Lifetime Cocaine Use				Current Cocaine Use <sup>a</sup>				Regular Cocaine Use <sup>b</sup>			
		n	M <sup>c</sup> (SD) <sup>d</sup>	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD) <sup>d</sup>	t <sup>e</sup>	p <sup>f</sup>	n	M <sup>c</sup> (SD) <sup>d</sup>	t <sup>e</sup>	p <sup>f</sup>
Fitness	No	2505	78.06 (19.61)	2.34	0.019	27	71.11 (23.75)	0.21	0.831	8	75.00 (23.30)	0.76	0.462
	Yes	45	71.11 (25.43)										
Energy	No	2500	77.11 (19.70)	1.12	0.262	27	74.81 (20.45)	0.41	0.686	8	72.50 (28.16)	0.10	0.926
	Yes	45	73.78 (23.67)										
Sadness	No	2487	76.76 (20.14)	2.15	0.032	27	71.11 (23.75)	0.38	0.706	8	77.50 (19.82)	1.46	0.165
	Yes	45	70.22 (23.98)										
Loneliness	No	2486	84.04 (20.74)	2.14	0.033	27	80.00 (22.87)	0.87	0.389	8	75.00 (29.76)	-0.25	0.804
	Yes	45	77.33 (25.80)										
Time for oneself	No	2489	77.42 (21.43)	0.99	0.323	27	78.52 (20.70)	1.27	0.212	8	67.50 (35.36)	-0.08	0.935
	Yes	45	74.22 (26.15)										
Enjoying leisure activities	No	2482	76.48 (23.18)	3.50	<0.001	26	69.23 (27.27)	1.71	0.094	8	57.50 (32.84)	0.43	0.673
	Yes	44	64.09 (29.12)										
Being treated fairly by parents	No	2470	79.21 (21.75)	2.78	0.006	26	76.15 (22.64)	2.00	0.052	8	65.00 (25.63)	0.56	0.584
	Yes	44	70.00 (24.59)										
Having fun with friends	No	2477	83.82 (19.61)	1.29	0.197	27	85.19 (17.18)	1.86	0.071	8	70.00 (28.28)	-0.22	0.832
	Yes	45	80.00 (23.74)										
Being a good student	No	2483	67.01 (19.27)	4.54	<0.001	27	53.33 (24.18)	-0.10	0.918	8	52.50 (26.05)	-0.24	0.812
	Yes	45	53.78 (24.05)										
Ability to pay attention	No	2477	73.00 (18.81)	3.63	<0.001	27	65.93 (20.62)	1.11	0.275	8	55.00 (29.76)	-0.34	0.735
	Yes	45	62.67 (23.97)										
<b>Health-related quality-of-life<sup>g</sup></b>	No	2511	77.28 (12.59)	3.95	<0.001	27	72.55 (13.35)	1.42	0.164	8	66.75 (21.41)	0.31	0.765
	Yes	45	69.75 (17.39)										

<sup>a</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine. <sup>b</sup>Data on regular cocaine use is limited to current cocaine users. <sup>c</sup>Mean. <sup>d</sup>Standard Deviation. <sup>e</sup>Independent Sample T-Test. <sup>f</sup>p-value. <sup>g</sup>This variable combines the answers given to the ten items presented above.

### Sociodemographic variables<sup>65</sup>.

Table 44 presents data from the univariate analyses between sociodemographic variables and lifetime, current<sup>66</sup>, and regular cocaine use<sup>67</sup>. The univariate analyses showed that *age* was associated with lifetime cocaine use ( $\chi^2 = 106.78$ ,  $p < 0.001$ ), but not with current ( $\chi^2 = 6.77$ ,  $p = 0.239$ ) or regular cocaine use ( $\chi^2 = 7.67$ ,  $p = 0.104$ ). Prevalence for lifetime cocaine use was lower among 12 year olds (0.00%) and higher among 18 year olds (10.67%). Overall, as age increased, so did cocaine lifetime use. *Genders* showed no association with lifetime ( $\chi^2 = 1.89$ ,  $p = 0.169$ ), current ( $\chi^2 = 0.01$ ,  $p = 0.907$ ), or regular cocaine use ( $\chi^2 = 3.44$ ,  $p = 0.064$ ).

Regarding *nationality*, results indicated that there was an association with lifetime cocaine use ( $\chi^2 = 38.33$ ,  $p < 0.001$ ), but not with current ( $\chi^2 = 3.77$ ,  $p = 0.052$ ) or regular cocaine use ( $\chi^2 = 2.95$ ,  $p = 0.086$ ). Non-Portuguese adolescents showed higher lifetime prevalence (7.41%) than Portuguese adolescents (1.28%). There was an association between SES and current cocaine use ( $\chi^2 = 6.26$ ,  $p = 0.044$ ), but not lifetime ( $\chi^2 = 7.57$ ,  $p = 0.056$ ) or regular cocaine use ( $\chi^2 = 1.65$ ,  $p = 0.439$ ). Thus, among lifetime cocaine users, adolescents from the highest SES showed the highest current use prevalence (83.33%) whereas those from a medium status showed the lowest (28.57%). Data on *family structure* showed an association with lifetime cocaine use ( $\chi^2 = 32.30$ ,  $p < 0.001$ ), but not with current ( $\chi^2 = 7.14$ ,  $p = 0.211$ ) or regular cocaine use ( $\chi^2 = 7.25$ ,  $p = 0.123$ ). Institutionalized adolescents showed the highest lifetime prevalence of cocaine use (11.90%). *Stressful life events* showed an association with lifetime cocaine use ( $\chi^2 = 3.90$ ,  $p = 0.048$ ), but not with current ( $\chi^2 = 0.24$ ,  $p = 0.624$ ) or regular cocaine use ( $\chi^2 = 2.55$ ,  $p = 0.110$ ). Adolescents who reported stressful life events within the previous six months showed higher lifetime cocaine use prevalence (2.06%) when compared with those who had not experienced such events (0.77%).

In summary, lifetime cocaine use was associated with older age, being of a nationality other than Portuguese, living within an institution, and having experienced a stressful life event. Current cocaine use among lifetime cocaine users, was associated with higher SES, while regular cocaine use among current cocaine users was not associated with any of the assessed sociodemographic variables.

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<sup>65</sup>See Table 44.

<sup>66</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine.

<sup>67</sup>Data on regular cocaine use is limited to current cocaine users.

Table 44  
*Association Between Sociodemographic Variables and Lifetime, Current and Regular Cocaine Use*

Variables	Categories	Lifetime Cocaine Use				Current Cocaine Use <sup>a</sup>				Regular Cocaine Use <sup>b</sup>			
		n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>	n	%	$\chi^2$ <sup>c</sup>	p <sup>d</sup>
Age		n = 2561				n = 44				n = 17			
	12 years	697	0.00			0	0.00			0	0.00		
	13 years	505	0.79			4	75.00			3	33.33		
	14 years	318	0.63			2	50.00			1	100.00		
	15 years	268	1.87	106.78	<0.001	5	20.00	6.77	0.239	1	0.00	7.67	0.104
	16 years	342	1.46			5	0.00			0	0.00		
	17 years	253	3.95			10	50.00			5	20.00		
	18 years	178	10.67			18	38.89			7	85.71		
Gender		n = 2561				n = 44				n = 17			
	Male	1391	2.08	1.89	0.169	28	39.29	0.01	0.907	11	36.36	3.44	0.064
	Female	1170	1.37			16	37.50			6	83.33		
Nationality		n = 2527				n = 43				n = 17			
	Portuguese	2338	1.28	38.33	<0.001	30	30.00	3.77	0.052	9	33.33	2.95	0.086
	Other	189	7.41			13	61.54			8	75.00		
SES		n = 2561				n = 44				n = 17			
	Low	349	3.15			10	40.00			4	75.00		
	Medium	1695	1.65	7.57	0.056	28	28.57	6.26	0.044	8	37.50	1.65	0.439
	High	321	1.87			6	83.33			5	60.00		
	Unknown	196	0.00			0	0.00			0	0.00		
Family structure		n = 2561				n = 44				n = 17			
	Intact	1854	1.35			25	28.00			7	28.57		
	Single	372	2.96			10	40.00			4	50.00		
	Extended	55	3.64	32.30	<0.001	2	50.00	7.14	0.211	1	100.00	7.25	0.123
	Blended	148	0.68			1	100.00			1	0.00		
	Institutionalized	42	11.90			5	80.00			4	100.00		
	Other/Unknown	90	1.11			1	0.00			0	0.00		
Stressful life events		n = 2506				n = 44				n = 17			
	No	519	0.77	3.90	0.048	4	50.00	0.24	0.624	2	0.00	2.55	0.110
	Yes	1987	2.06			40	37.50			15	60.00		

<sup>a</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine. <sup>b</sup>Data on regular cocaine use is limited to current cocaine users. <sup>c</sup>Chi-Square Test for Independence. <sup>d</sup>p-value.

### *Multivariate analyses.*

The multivariate analysis was performed for lifetime and current cocaine use<sup>68</sup> using the variables that the univariate analyses have shown to be associated with lifetime and current cocaine use<sup>69</sup>.

### *Lifetime cocaine use.*

The independent variables found to be significantly associated with lifetime cocaine use in the univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. Results from the binary logistic regression model for lifetime cocaine use are presented into one table<sup>70</sup> (Table 45) which presents data on the proximal variables.

Compared to adolescents holding negative *attitudes towards cocaine*, there were significantly higher odds of being a lifetime cocaine user among adolescents holding positive ( $AOR = 7.71$ ,  $p = 0.003$ ) or even neutral attitudes ( $AOR = 4.18$ ,  $p = 0.010$ ) than among adolescents holding negative attitudes. Regarding *perceived accessibility of cocaine*, compared with adolescents considering that accessing to cocaine was easy, those considering that accessing cocaine was difficult ( $AOR = 0.29$ ,  $p = 0.011$ ) or even fairly easy ( $AOR = 0.35$ ,  $p = 0.043$ ) had significantly lower odds of using cocaine at some point in live.

For *best friend's cocaine use behaviour*, the odds of being a lifetime cocaine user were significantly higher among adolescents whose best friends had quit using cocaine ( $AOR = 16.62$ ,  $p < 0.001$ ) or were occasional users ( $AOR = 13.74$ ,  $p < 0.001$ ) than among adolescents whose best friends had never used cocaine. The odds for adolescents reporting that their best friends were regular cocaine users or even among adolescents who did not know whether their best friends had used cocaine were not significantly different from those whose best friends had never used cocaine. However the sample size means these results should be treated with caution.

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<sup>68</sup>The multivariate analysis was not performed for regular cocaine use given that only one variable was found to be significantly associated with regular cocaine use in univariate analyses.

<sup>69</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine.

<sup>70</sup>No data is presented on *health-related quality-of-life* nor on *sociodemographic variables* because after controlling for covariates neither were significantly associated with lifetime cocaine use.



Concerning *perceived parental cocaine use approval*, there were significantly lower odds of using cocaine at some point in live among adolescents expecting their parents would punish ( $AOR = 0.02$ ,  $p = 0.001$ ) or prohibit cocaine use ( $AOR = 0.03$ ,  $p = 0.002$ ) than among those expecting their parents to be indifferent towards cocaine use.

Table 45  
Binary Logistic Regression for Lifetime Cocaine Use - Proximal Variables

Variables	Categories	AOR <sup>b</sup>	95% CI <sup>a</sup>		p <sup>e</sup>
			LL <sup>c</sup>	UL <sup>d</sup>	
Cocaine use risk perception	Low	n.s. <sup>f</sup>	n.s.	n.s.	n.s.
	Medium				
	High				
Attitudes towards cocaine	Negative	4.18	1.41	12.40	0.008
	Neutral				0.010
	Positive				0.003
Expected problems from cocaine use	No	n.s.	n.s.	n.s.	n.s.
	Do not know				
Expected benefits from cocaine use	Yes	n.s.	n.s.	n.s.	n.s.
	No				
	Do not know				
Perceived accessibility to cocaine	Easy	0.35	0.13	0.97	0.027
	Fairly easy				0.043
	Difficult				0.011
Best friend's cocaine use behaviour	Never user	19.62	6.95	55.42	<0.001
	Quiter	13.74	4.14	45.55	<0.001
	Occasionally user	4.23	0.21	86.95	0.350
	Regular user	0.85	0.18	4.16	0.845
Perceived parental cocaine use approval	Unknown	0.14	0.01	2.21	0.003
	Indifference				0.161
	Disapproval				0.001
	Punishment				0.002
Perceived parental cocaine use approval	Prohibition	0.03	0.00	0.28	0.002
	Prohibition				

<sup>a</sup>Confidence Interval. <sup>b</sup>Adjusted Odds Ratio. <sup>c</sup>Lower-limit. <sup>d</sup>Upper-limit. <sup>e</sup>p-value. <sup>f</sup>Non-significant.

#### *Current cocaine use in lifetime users.*

The independent variables found to be significantly associated with current cocaine use among lifetime cocaine users in univariate analyses were entered into a binary logistic regression model to further assess significant associations after controlling for covariates. However, none of the variables entered into the model (i.e., *cocaine use risk perception*, *attitudes towards cocaine*, *expected problems from cocaine use*, *best friend's cocaine use behaviour*, *perceived parental cocaine use approval*, and *SES*) were significantly associated with current cocaine use.

#### *Regular cocaine use among current users.*

Considering that only one independent variable (i.e. *best friends' cocaine use behaviour*) was found to be significantly associated with regular cocaine use in the univariate analyses, the binary logistic regression model was not performed as there were no covariates to control for.

## Discussion

This section presents the discussion of the descriptive and the association analyses (univariate and multivariate analyses) performed for smoking, drinking, cannabis use, and cocaine use, each presented in a substance-specific sub-section.

### Drinking

Results in this study showed that over half of adolescents (56.84%) reported having drunk alcohol at some point in their lives (see Table 22). However, higher lifetime prevalence has been reported by major large-sample studies conducted with Portuguese adolescents, that show prevalence ranging from 71% (Feijão et al., 2011; Hibell et al., 2012) to 80% (Feijão, 2011). The higher prevalence of lifetime drinking found in these studies can probably be attributed to the higher mean age of their samples. In the current study, over half of adolescents (56.84%) had already drunk at some point in their lives. From these, over half (57.28%) continued to drink alcohol, and of these, over one-third (41.80%) drink on a regular basis (see Table 22). Moreover, alcohol was the substance for which more adolescents (drinkers and non-drinkers) expressed an intention to use (28.01%) or were not sure whether they would continue to drink (37.24%) (see Table 22).

Similar to the findings from other studies assessing Portuguese adolescents (Balsa et al., 2009; Feijão et al., 2011), this study revealed that lifetime and current drinking significantly and steadily increase with is age (see Table 27), even after controlling for covariates (see Table 28.2 and Table 29.2). For instance, when compared with adolescents aged 12, those aged 14 had three times greater odds of having tried alcohol and two times greater odds of being a current drinker. By the age of 18, the odds of having tried alcohol were six times greater and the odds of being a current drinker three times greater than for adolescents aged 12. Yet, after controlling for covariates, age ceased to be significantly associated with regular drinking. Overall, results indicated that increasing age was a significant risk factor for adolescents' decision to drink at some point of their lives and for lifetime drinkers to continue to drink, but not for current drinkers to drink regularly, indicating that once adolescents decide to start drinking, age was no longer relevant to how often they drink.

This steady increase in drinking behaviour can accrue from a more autonomous functioning that leads adolescents to spend more time with their friends away from parental supervision (Duarte et al., 2001), along with the increasing influence of peers on adolescents' behaviours and decisions that take place over adolescence (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011). Thus, with the increasing broadening of social contexts, it is reasonable to assume that adolescents have a growing exposure to people who use substances without manifesting evident adverse consequences (Clark et al., 2011). This, in turn, may lead adolescents to question the veracity of the so publicized harmful effects of drinking. Moreover, as adolescents start to be able to perform a more abstract reasoning, they are able to think about the positive effects of substance use alongside the negative ones (Cameron et al., 2003).

A question related to age is the age of onset. Among the sample of vulnerable adolescents assessed in this study, from those who have reported having tried alcohol, just less than one-quarter (20.74%) have had their first drink at 11 years old and, taken together, just over half (55.89%) at 13 years or younger (see Table 22). A similar percentage was reported by the 2011 ESPAD survey that found that half of Portuguese adolescents (51%) started drinking at 13 years or younger (Hibell et al., 2012). In fact, research has shown that the earlier the age of drinking onset, the greater the likelihood of stress-reactive drinking (Dawson et al., 2007), heavy drinking (Blomeyer et al., 2011), alcohol use disorders (DeWit et al., 2000), alcohol dependence (Hingson et al., 2006), the greater the difficulty in quitting (von Sydow et al., 2002) and the greater the risk of illicit substance use later in life (Ellickson et al., 2003). Besides, early users are also more likely to start using other substances at an early age (Ciairano et al, 2009).

Data from the present study on the perceived accessibility of alcoholic drinks has shown that even though the minimum legal age to purchase alcoholic drinks in Portugal is 16 years old, and 18 years old for purchasing spirits, over two-thirds of the adolescents participating in this study (82.10%), whose mean age is 13 years old, believed alcoholic drinks to be easy or fairly easy to obtain (see Table 20). A similar percentage (85%) was reported by the 2011 ESPAD survey (Hibell et al., 2012). It is interesting to note that, when compared with tobacco, cannabis, and cocaine, alcohol was the substance perceived as being most accessible. This higher perceived accessibility can be the result of alcohol being a legal substance and indeed, the similarity between the percentage of adolescents considering alcohol and tobacco (both

legal substances) as accessible (82.10% and 79.11% respectively) seems to corroborate this argument (see Table 20). However, the advertisement of alcoholic drinks, including through the sponsorship of large scale events by the alcohol industry, should also be taken into consideration as it may contribute to an overall perception of alcohol as a socially accepted and valued substance.

Consistent with studies associating alcohol consumption with ease of alcohol access (Durant et al., 2008; Komro et al., 2007), this study showed that adolescents who perceive alcohol to be difficult to access had lower lifetime, current, and regular drinking prevalence than those who believe it is easy to access (see Table 25). Indeed, the odds of trying alcoholic drinks were two times greater for adolescents perceiving alcohol as easy to obtain than for those perceiving alcohol as difficult to obtain (see Table 28.1). For adolescents perceiving alcohol as accessible, the odds of becoming a regular drinker among current were three times greater than for those perceiving alcohol as difficult to obtain (see Table 30.1).

As for current drinking amongst those who have tried alcohol, after controlling for covariates, perceived accessibility ceased to be significantly associated with current drinking (see table 29.1). One possible explanation for this loss of significance might be the overlap between perceived accessibility and best friends' drinking behaviour, a variable that remained significant for current drinking even after controlling for covariates in the multivariate model (see Table 29.1). Hence, it may be argued that having best friends that drink alcohol provide adolescents with opportunities for drinking and facilitate access to alcoholic drinks. This would make alcoholic beverages more accessible, particularly to adolescents under the legal age for purchasing alcoholic drinks, which is the case for vulnerable adolescents assessed within this study. This argument is in accordance with the studies showing that most adolescents seem to rely on older friends as their main access route to alcoholic drinks (Dent et al., 2005; Hughes et al., 2010; Storvoll et al., 2008; Williams & Mulhall, 2005). Taken together, these findings allege the role of higher perceived accessibility as a significant risk factor for adolescents' decision to drink at some point of their lives and for regular drinking among those who continued to drink, but not for lifetime drinkers' decision to continue to drink.

Additionally, within this study, half of adolescents (50.06%) reported that their best friends had drunk at some point in their lives, from which just less than half (43.66%) state that their best

friends drink occasionally or regularly (see Table 20). It is note-worthy that alcohol was the substance showing the lowest percentage best friends who have never used it (36.34%), which further indicates that alcohol is a substance whose consumption is widespread and socially accepted (see Table 20).

Consistent with evidence showing the influence of best friends' drinking behaviour on adolescents' drinking (Bahr et al., 2005), data from this study indicated that, when compared with adolescents whose best friends have never drunk, the odds of being a lifetime, a current, and a regular drinker were higher among adolescents whose best friends were regular drinkers (see Table 25), even after controlling for covariates (see Table 28.1, Table 29.1, and Table 30.1). When compared with adolescents whose best friends' have never drunk, the odds of having tried alcoholic beverages were ten times greater for adolescents whose best friends are occasional drinkers and seven times greater for those whose best friends are regular drinkers. The odds of lifetime drinkers becoming current drinkers were three times greater if the best friend is an occasional drinker, and five times greater if the best friend is a regular drinker. The odds of a current drinker becoming a regular drinker were six times higher if their best friend is a regular drinker. Taken together, these findings confirms best friends' drinking behaviour as a significant risk factor for adolescents' decision to drink at some point of their lives, for lifetime drinkers to continue to drink, and for current drinkers to drink regularly, particularly if the best friend is a regular drinker.

Within the sample of adolescents assessed in this study, no association was found between gender and lifetime or current drinking within the univariate analyses (see Table 27). These results are in line with those from the 2011 ESPAD survey that found no significant differences between boys and girls in drinking prevalence over the 12 past months (Hibell et al., 2012). Again in line with data reported by the 2011 ESPAD survey, boys were more likely to report regular drinking and the odds of progressing to regular drinking were higher for boys than girls (see Table 27), even after controlling for covariates (see Table 30.2) (Hibell et al., 2012). Overall, the results indicate that gender was not a risk factor for adolescents' decision to drink at some point of their lives or to continue to drink, but it is a significant risk factor for male current drinkers' decision to drink regularly.

The extent to which adolescents perceive their parents as being against or in favour of drinking also influences adolescents' decisions to drink. Among the sample assessed in this study, almost all adolescents (93.42%) expected their parents to be disapproving of their drinking, from which just less than three-quarters (74.71%) expected attitudes to be highly disapproving, with prohibition being the most anticipated reaction (see Table 20). However, it is still noteworthy that, when compared with tobacco, cannabis, and cocaine, alcohol was the substance for which the parents were least expected to prohibit (48.36%), thus revealing the social acceptance of drinking.

Similar to studies assessing the influence of parental disapproval of drinking on adolescents' drinking (Bahr et al., 2005; Nash et al., 2005), in this study, adolescents who reported expecting their parents to prohibit or to punish them if they knew that they drank were those also reporting the lowest lifetime, current, and regular drinking prevalence (see Table 25), even after controlling for covariates (see Table 28.1, Table 29.1, and Table 30.1). Indeed, the odds of having tried alcoholic beverages and, in lifetime drinkers, of being a current drinker were four times lower for adolescents that expected their parents to punish or prohibit their drinking, when compared with those expecting their parents to be indifferent. Moreover, the odds of a current user becoming a regular user, if parents were expected to prohibit their children from drinking, were two times lower than if they were expected to be indifferent.

An interesting finding, in line with what has been reported by the SAMHSA (2009), is that there was no significant difference in the odds of lifetime, current, or regular drinking among adolescents expecting their parents to be indifferent and those expecting their parents to be merely disapproving, highlighting the need for parents to clearly and strongly express their disapproval towards their children's drinking. On the whole, results within this study seem to indicate that parental drinking approval was a significant risk factor for adolescents' decision to drink at some point of their lives, for lifetime drinkers to continue to drink, and for current drinkers to drink regularly.

Family structure is another variable that has been associated with adolescent drinking. Research has shown that adolescents living within intact families report lower drinking prevalence than those living within single and blended families (Crawford & Novak, 2008; Gil-Lacruz & Gil-Lacruz, 2010). In this study, adolescents that lived within intact families reported

the lowest lifetime drinking prevalence and, comparatively, those living within extended families reported the highest lifetime drinking prevalence (see Table 27). However, after controlling for covariates, family structure ceased to be significantly associated with lifetime drinking (see Table 28.2). Yet, family structure remained significantly associated with current drinking in lifetime drinkers, with lower odds seen among students living within institutions than among adolescents living within intact families (see Table 29.2). One possible explanation for the lower odds of current drinking among adolescents living within institutions might be that living within an institution restrains their access to alcoholic drinks.

The present study has added to knowledge of family structure's impact on adolescent drinking by considering several types of non-intact family structures (i.e., single-families, extended families, blended families, institutions, and other family structures). For instance, in this sample, contrary to Crawford and Novak's findings (2008), adolescents living within single or blended families did not show significantly higher current drinking prevalence (see Table 29.2). One possible justification for the absence of a higher current drinking prevalence among adolescents living within single or blended families might be the central role of the family among Portuguese population (Morrison & James, 2009), namely the closeness and proximity that is characteristic of Portuguese family members even within non-intact families (Albert, Ferring, & Michels, 2013; Monteiro, Veríssimo, Vaughn, & Fernandes, 2010). Moreover, no association was found between family structure and regular drinking among current drinkers within the univariate analyses (see Table 27), which may indicate that, as a more stable drinking pattern is established, family structure is no longer relevant for adolescents' decision to progress to a regular drinking pattern. Taken together, findings indicate that family structure was not a significant risk factor for adolescents' decision to drink at some point of their lives, nor for current drinkers to drink regularly, but it is a significant risk factor for lifetime drinkers' decision to continue to drink.

Paxton et al. (2007) identified SES as a covariate that has not been accounted for in many studies assessing family structure. This study shows that even though SES remained significantly associated with lifetime drinking after controlling for, the odds of lifetime alcohol use did not differ significantly between adolescents from lower SES and those from medium or higher SES (see Table 28.2). Despite more research being needed to better understand the relationship between SES and lifetime drinking among vulnerable adolescents, it can be

presupposed that the loss of significance between SES and lifetime drinking, might be an overlap between SES and stressful life events, considering that studies reporting that adolescents from lower SES report a higher occurrence of stressful life events (Glasscock et al., 2013; Stronks et al., 1998). Additionally, among drinkers no association was found between SES and current or regular drinking (see Table 27), which may indicate that affordable alcohol prices make alcohol accessible to adolescents regardless of their SES.

In line with studies showing a positive relationship between stressful life events and drinking (Blomeyer et al., 2011; Dawson et al., 2005; Dawson et al., 2007; Windle, 2000), this study showed that the odds for lifetime drinking were higher for adolescents that have experienced a stressful life event and, amongst these, the odds of progressing to current drinking were also higher for those that have experienced such life events (see Table 27), even after controlling for covariates (see Table 28.2 and Table 29.2). Compared with adolescents that have not experienced a stressful life event, those who have had three times greater odds for being a lifetime drinker and, in lifetime drinkers, two times greater odds for being a current drinker. The higher odds of becoming a current drinker among lifetime drinkers that have experienced a stressful life event may point to drinking as a situational strategy to cope with stress and unpleasant emotions, as has been argued by Dawson et al. (2007). Furthermore, the fact that, among the sample of adolescents assessed in this study, one of the most expected benefits from drinking was feeling more relaxed (see Table 16), and that no association was found between life events and regular drinking (see Table 27), seems to support drinking as a situational coping strategy to deal with unpleasant situations. These findings therefore identify stressful life events as a significant risk factor for adolescents' decision to drink at some point of their lives and for lifetime drinkers to continue to drink, but not for current drinkers to drink regularly.

Like other studies, findings from this study showed that adolescents' level of health-related quality-of-life was negatively related with drinking (Kuntsche & Gmel, 2004; Phillips-Howard, et al., 2010). Within this study, the prevalence of lifetime and current drinking was lower among adolescents who reported higher levels of health-related quality-of-life (see Table 26). Nonetheless, after controlling for covariates, health-related quality-of-life ceased to be significantly associated with lifetime and current drinking. One possible justification for this loss of significance might be an overlap between health-related quality-of-life and life events,



variables that remained significant for lifetime and current drinking even after controlling for covariates (see Table 28.2 and Table 29.2). As defined by Becker et al. (2009), quality-of-life captures an individual's satisfaction with life in areas of personal importance. Considering that the question on stressful life events included events that are relevant for adolescents, there might have been an overlap between the domains addressed within this question and the ones addressed with the question assessing health-related quality-of-life, which would help to explain the loss of significance for health-related quality-of-life. Moreover, within the univariate analyses, no association was found between health-related quality-of-life and regular drinking (see Table 26), which may indicate that, as a more stable pattern of drinking is established, lower quality-of-life is not relevant for adolescents' decisions to drink regularly. Overall, results discard lower health-related quality-of-life as a significant risk factor for adolescents' alcohol use.

For nationality, unlike some studies which have found that adolescents from minority groups have lower levels of substance use (Guo et al 2002; Johnston et al., 2011; Nishimura et al., 2005; Watt, 2004), in this study, within current drinking, regular drinking was more common among adolescents from nationalities other than Portuguese (see Table 27), even after controlling for covariates (see Table 30.2). However, no association was found between nationality and lifetime drinking or current drinking (see Table 27). On the whole, these findings suggest that nationality was not a significant risk factor for adolescents' decision to drink at some point of their lives or for lifetime drinkers to continue to drink, but it is for current drinkers' decision to drink regularly.

Substance use among adolescents is also related to intrapersonal variables, such as attitudes towards substances. Indeed, attitudes have been largely associated with decision making processes and several authors mention attitudes as relevant factors for understanding of adolescent substance use (Hawkins et al., 1992; O'Connell, et al., 2009; Petraitis et al., 1995; Wright & Pemberton, 2004). Unlike Barkin et al. (2002) who found that only a small proportion of adolescents had positive attitudes towards substance use, over one-third (38.32%) of adolescents assessed in this study expressed negative attitudes towards drinking (see Table 20). Furthermore, findings from this study complement previous work by showing that, compared with tobacco, cannabis, and cocaine, alcohol was the substance towards which more adolescents expressed neutral or positive attitudes (see Table 20).

Consistent with other studies showing that adolescents holding positive attitudes towards alcohol are more likely to drink (Jiménez et al., 2009; Roek et al., 2010; Vaughan et al., 2011), this study shows that, compared with adolescents with negative attitudes, adolescents holding positive attitudes had increased odds of having drunk at some point of their lives, of becoming current drinkers, and of becoming regular drinkers, even after controlling for covariates (see Table 28.1, Table 29.1, and Table 30.1). Moreover, the findings from this study complement previous work by showing that, again compared with adolescents holding negative attitudes, those holding neutral attitudes also had higher odds of having drunk at some point in their lives and of progressing to current drinking (see Table 28.1, Table 29.1, and Table 30.1). Those holding positive attitudes had three times greater odds of drinking at some point of their lives and of becoming regular drinkers, and four times greater odds of becoming current drinkers than compared with adolescents holding negative attitudes. Adolescents holding neutral attitudes had two times greater odds of lifetime alcohol use and of becoming current drinkers. Taken together, these findings suggest that both positive and neutral attitudes towards alcohol were significant risk factors for adolescents' decision to drink at some point in their lives, for lifetime drinkers to continue to drink, and for current drinkers to drink regularly.

Another variable that has been identified as relevant for adolescents' decision to use substances is risk perception (Wright & Pemberton, 2004). In agreement with Lundborg and Lindgreen's (2002) finding that adolescents estimate great risks from drinking, within the sample assessed in this study, almost all adolescents (93.48%) perceived drinking as having medium or high risks to health (see Table 20). However, when compared with tobacco, cannabis, and cocaine, alcohol is the substance with the highest percentage of adolescents perceiving it as having low risk to health (6.52%), which supports adolescents' views of alcohol as the least harmful substance (see Table 20).

In line with other studies (Leeuw et al., 2008; Tomar & Hatsukami, 2007), findings from this work show that adolescents who perceived drinking as having high risks to health report the lowest lifetime, current, and regular drinking prevalence (see Table 25). After controlling for covariates, the overall variable assessing risk perception remained significantly associated with lifetime drinking, even though the odds of drinking did not differ significantly between adolescents considering drinking as having medium or high risks and those considering drinking as having low risks (see Table 28.1). Such an outcome may indicate that other risk

perception features besides those considered in this study need to be considered, and thus additional research is needed to better understand the relationship between drinking risk perception and drinking among vulnerable adolescents. It can be argued that this loss of significance around risk perception might be due to the overlap between drinking risk perception and attitudes towards drinking, which remained significant for lifetime drinking even after controlling for covariates (see Table 28.1). Indeed, risk perception has been used as an indicator for measuring attitudes (Järvinen&Østergaard, 2011), which seems to indicate that these two variables are, at least, partially associated. For current drinking among lifetime drinkers, the association with drinking risk perception remained significant even after controlling for covariates with results showing that, compared with adolescents perceiving alcohol as having low risks to health, the odds of becoming a current drinker were higher for those perceiving high risks (see Table 29.1). The odds of being a current drinker and perceiving high risks from drinking were two times greater when compared with adolescents perceiving low risks. One possible justification for this finding might be that adolescents who regard drinking as a thrill-seeking behaviour are more likely to continue to drink.

Regarding regular drinking among current drinkers, after controlling for covariates, drinking risk perception ceased to be significantly associated with regular drinking (see Table 30.1), which might be explained by an overlap between drinking risk perception and attitudes towards drinking, which remained significant for regular drinking after controlling for covariates in the multivariate model (see Table 30.1). Overall, results seem to indicate that drinking risk perception was a significant risk factor for adolescents' decision to drink at some point in their lives, but not for current drinkers' decision to drink regularly. Furthermore, there was evidence of a positive relationship between risk perception and lifetime drinkers' decision to continuing to drink. However, additional research is needed to better understand this association.

Besides being the substance evoking the lowest percentage of negative attitudes, alcohol is also the substance for which the least adolescents anticipated problems as a consequence of use, with just less than half of adolescents (48.43%) stating that they expect negative outcomes (see Table 20). Such an outcome indicates the extent to which alcohol is perceived as a non-harmful and socially accepted substance. Yet, the most anticipated negative consequence was having problems with peers (see Table 12).

Consistent with studies showing a negative association between negative expectancies and substance use (Jones et al., 2001; Kristjansson et al, 2012; Leigh & Stacy, 2004), in this study, adolescents expecting problems as a consequence of drinking were those showing the lowest lifetime, current, and regular drinking prevalence (see Table 25). Nevertheless, after controlling for covariates, expected problems ceased to be significantly associated with lifetime, current, and regular drinking (see Table 28.1, Table 29.1, and Table 30.1). One possible explanation for the loss of significance between expected problems and lifetime and current drinking might be the overlap with attitudes towards drinking, which remained significant even after controlling for covariates (see Table 28.1, Table 29.1, and Table 30.1). This argument is reinforced by the fact that expected problems have been used as an indicator for measuring attitudes (Lancaster & Hughes, 2013), which seems to suggest that these two variables are, at least, partially associated. Another possible justification for the loss of significance between expected problems and lifetime and current drinking might be that expected benefits from drinking, which also remain significant for lifetime and current drinking after controlling for covariates (see Table 28.1 and Table 29.1) are more readily taken into consideration in the decision to drink than expected problems are, especially for young people when problems are frequently in the future. Indeed, research has shown that adolescents from 12 years onwards, start to see expected problems associated with substance use as less likely and expected benefits as more likely to occur (Alfonso & Dunn, 2007; Chassin et al., 2001; O'Connor et al., 2007). These views on substance use might be a consequence of adolescents being increasingly exposed to people who use substances without manifesting adverse consequences (Clark et al., 2011), as adolescents with increasing age gain more autonomy and socialize within broader contexts (Duarte et al., 2011). Additionally, and considering that, with increasing age, adolescents report increasing experience with alcohol (Feijão et al., 2011; Hibell et al., 2012), expected problems may lose significance as adolescents have more positive experiences with alcohol (Goldberg, 2002). Moreover, with increasing abstract reasoning, adolescents are progressively more able to activate both positive and negative information on substance use (Cameron et al., 2003), and may even be willing to tolerate the unpleasant consequences of drinking as a by-product of experiencing the positive consequences (Lee et al., 2011).

As for the loss of significance between expected problems and regular drinking (see Table 30.1), it might be argued that the establishment of a more regular pattern of drinking may lead

to a progressive acceptance of drinking by parents, teachers, and peers, leading to a lower likelihood of experiencing problems with these individuals. On the whole, expected problems from drinking did not seem to be a significant risk factor for adolescents' alcohol use.

When compared with tobacco, cannabis, and cocaine, alcohol was the substance for which the greatest proportion of adolescents (59.82%) stated that they expected positive outcomes as a consequence of use (see Table 20). Again, this finding indicates the extent to which alcohol is perceived as a socially accepted substance with more benefits than problems associated with its use. Even though research has shown that positive expectancies are associated with higher substance use prevalence (Clark et al., 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001), among the sample of adolescents assessed in this study, the highest lifetime, current, and regular drinking prevalence was reported by adolescents that did not know whether or not they would experience positive consequences from drinking (see Table 25). After controlling for covariates, despite the overall variable assessing expected benefits remaining significantly associated with lifetime and current alcohol use, the odds of being a lifetime drinker or of lifetime drinkers becoming current drinkers did not differ between those expecting benefits, not being sure about the benefits, and those not expecting benefits from drinking (see Table 28.1 and Table 29.1). Furthermore, expected benefits ceased to be significantly associated with regular drinking in multivariate analysis (see Table 30.1). One possible explanation for the loss of significance between expected benefits and lifetime, current, and regular drinking might be the overlap between expected benefits and attitudes, a variable that remained significant for lifetime, current, and regular drinking even after controlling for covariates (see Table 28.1, Table 29.1, and Table 30.1). This argument is reinforced by the fact that expected benefits have been used as an indicator for measuring attitudes (Lancaster & Hughes, 2013). These results may indicate that other features of positive expectations besides those considered in this study need to be considered. Taken together, results indicate that expected benefits from drinking were, overall, a significant risk factor for adolescents' decision to drink at some point of their lives and to continue to drink, but not for drinking regularly. However, additional research is needed to better understand the relationship between expected benefits from drinking and drinking among vulnerable adolescents.

Table 46 presents a summary regarding the association between proximal, health-related quality-of-life, and sociodemographic variables and lifetime, current, and regular drinking.

Table 46

*Summary of the Association Between Proximal, Health-Related Quality-of-Life, and Sociodemographic Variables and Lifetime, Current, and Regular Drinking*

<b>Variables</b>	<b>Lifetime Drinking</b>	<b>Current Drinking<sup>a</sup></b>	<b>Regular Drinking<sup>b</sup></b>
<b>Drinking risk perception</b>	No significant differences between categories	The odds of continuing to drink were higher among adolescents considering drinking to be medium and high risk	Non-significant after controlling for covariates
<b>Attitudes towards alcoholic drinks</b>	The odds of lifetime drinking were higher among adolescents holding positive attitudes and even neutral attitudes towards drinking	The odds of continuing to drink were higher among adolescents holding positive attitudes and even neutral attitudes towards drinking	The odds of drinking regularly were higher among adolescents holding positive and neutral attitudes towards drinking
<b>Expected problems from drinking</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant after controlling for covariates
<b>Expected benefits from drinking</b>	No significant differences between categories	No significant differences between categories	Non-significant after controlling for covariates
<b>Perceived accessibility to alcoholic drinks</b>	The odds of lifetime drinking were lower among adolescents considering difficult to access to alcoholic drinks	Non-significant after controlling for covariates	The odds of drinking regularly were lower among adolescents considering difficult or even fairly easy to access alcoholic drinks
<b>Best friend's drinking behaviour</b>	The odds of lifetime drinking are higher among adolescents not knowing if best friends were drinkers, among those whose best friends drank occasionally or regularly and even among those who best friends have quitted drinking	The odds of continuing to drink were higher among adolescents whose best friends drink occasionally or regularly	The odds of drinking regularly were higher among adolescents whose best friends drink regularly
<b>Perceived parental drinking approval</b>	The odds of lifetime drinking were lower among adolescents expecting their parents to punish or to prohibit them from drinking	The odds of continuing to drink were lower among adolescents expecting their parents to punish or to prohibit them from drinking	The odds of drinking regularly were lower among adolescents expecting their parents to prohibit them from drinking
<b>Health-related quality-of-life</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Age</b>	The odds of lifetime drinking increases with increasing age	The odds of current drinking increases with increasing age	Non-significant after controlling for covariates
<b>Gender</b>	Non-significant within the univariate analyses	Non-significant within the univariate analyses	The odds of drinking regularly are higher among boys
<b>Nationality</b>	Non-significant within the univariate analyses	Non-significant within the univariate analyses	The odds of drinking regularly are higher among non-Portuguese
<b>SES</b>	The odds of lifetime drinking are lower among adolescents not knowing their SES	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Family structure</b>	Non-significant after controlling for covariates	The odds of continuing to drink were lower among adolescents living within extended families and within institutions	Non-significant within the univariate analyses
<b>Stressful life events</b>	The odds of lifetime drinking were higher among adolescents that have experienced a stressful life event	The odds of continuing to drink were higher among adolescents that have experienced a stressful life event	Non-significant within the univariate analyses

<sup>a</sup>Data on current drinking is limited to adolescents that had ever drank. <sup>b</sup>Data on regular drinking is limited to current drinkers.

## Smoking

Results from the sample used in this study concur with previous large sample studies with Portuguese adolescents (Feijão, 2011; Feijão et al., 2011; Hibell et al., 2012) by showing that over one-third of adolescents (39.83%) report having smoked at some point in their lives (see Table 22). Within the sample assessed in this study, over one-third of adolescents (39.83%) had smoked at some point in their lives. Of these, just less than half (45.92%) continue to smoke and, of these, over three-quarters (79.78%) smoke on a regular basis (see Table 22). It is interesting to note that, when compared with alcohol, cannabis, and cocaine, tobacco was the substance with the highest percentage of consumers becoming regular consumers (see Table 22). Further, tobacco was, after alcohol, the substance towards which more adolescents (smokers and non-smokers) expressed intention to use within the next year (9.39%) or not being sure about their future smoking habits (34.29%) (see Table 22). Both findings might be related not only to the fact that tobacco is a legal substance, but also its high addictiveness (NIDA, 2012b) as well as with the ease of tobacco addiction establishment among adolescents (Prokhorov et al., 2006).

Like large sample studies undertaken within Portuguese adolescents (Balsa et al., 2009; Feijão et al., 2011), this study shows that lifetime, current, and regular smoking significantly and steadily increased with increasing age (see Table 31), even after controlling for covariates (see Table 34.3, Table 35.2, and Table 36.2). For instance, when compared with adolescents aged 12, those aged 14 had four times greater odds of having tried tobacco and those who had ever smoked had three times greater odds of being a current smoker. By the age of 18, the odds of having tried tobacco, of being a current smoker, and of being a regular smoker were eight times greater than for adolescents aged 12. Overall, results indicated that increasing age was a significant risk factor for adolescents' decision to smoke at some point in their lives, for lifetime smokers to continue to smoke, and for current smokers to smoke regularly.

Similarly to what has been argued for drinking among adolescents, this steady increase in smoking behaviour can be the result of a more autonomous functioning that takes place during adolescence and leads adolescents to start to spend more time with their friends away from parental supervision (Duarte et al., 2011), accompanied by the increasing influence of peers

on adolescents' behaviours and decisions (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011). Additionally, as adolescents start to spend more time away from home, they also diversify their interactions and, therefore, might experience increasing exposure to people who use substances, most without manifesting evident adverse consequences (Clark et al., 2011). This may lead adolescents to question the veracity of the publicized negative effects of smoking. Furthermore, the emergence of a more abstract reasoning that takes place over adolescence enables adolescents to consider not only the negative effects of smoking but also the positive effects (Cameron et al., 2003).

When assessing adolescent substance use, of interest is the age at which adolescents first try substances. Among the sample assessed in this study, just less than one-quarter (23.20%) of adolescents who had smoked at some point in their lives had their first cigarette at 11 years old and, taken together, over half (60.91%) had their first cigarette at 13 years or younger (see Table 22). Indeed, researchers have shown that the earlier the age of onset for tobacco, the greater the escalation of tobacco consumption over time (Tucker et al., 2003), the greater the risk of becoming a heavy smoker (Hughes et al., 2010) and being addicted to tobacco (Breslau et al., 1993), the greater the difficulty in quitting (von Sydow et al., 2002), and the greater the risk of illicit substance use later in life (Ellickson et al., 2003). Additionally, early users are also more likely to start using other substances at an early age (Ciairano et al., 2009). Overall, the high percentage of early smokers found among the sample of adolescents assessed in this study suggests it is a group with more risk-taking than the 2011 ESPAD survey sample, which reported a much lower percentage (31%) of early smoking initiation (i.e., <13 years) in Portuguese adolescent smokers (Hibell et al., 2012). The difference might be explained by the fact that the sample used in this study has been identified, within the PORI diagnosis, as a priority group in need of substance use prevention interventions, making it reasonable to assume that adolescents within this sample live within risky environments for substance use.

Data from the present study on perceived accessibility to tobacco have shown that even though the minimum legal age to purchase tobacco in Portugal is 18 years old, over three-quarters of adolescents participating in this study (79.11%), whose mean age is 14 years old, perceived tobacco as easy or fairly easy to obtain (see Table 20). A slightly lower percentage (69%) was reported by the 2011 ESPAD survey (Hibell et al., 2012), which, again, might be



explained by the sample used in this study living within riskier environments for substance use, where smoking might be seen as, at least to some extent, a normative behaviour.

Several studies (Cummings et al., 2003; Hublet et al., 2009; Williams & Mulhall, 2005) have, in fact, shown that adolescents perceiving tobacco as easy to obtain report the highest smoking prevalence. Despite a similar result being found among the sample of Portuguese adolescents assessed in this research (see Table 31), after controlling for covariates, perceived accessibility ceased to be significantly associated with lifetime and current smoking (see Table 34.1 and Table 35.1). Further, no association was found between perceived accessibility and regular smoking among current smokers in the univariate analyses (see Table 31). Overall, these results seem to show that although perceived accessibility may be a risk factor for adolescent smoking, it is likely to be related through other intermediate factors. Thus, one possible justification for the loss of significance between perceived accessibility and lifetime and current smoking after controlling for covariates might be the overlap between perceived accessibility and best friends' smoking behaviour. Considering that best friends' smoking behaviour remained significant for lifetime and current smoking in multivariate analysis (see Table 31, Table 34.1, and Table 35.1) it may be argued that having best friends that smoke provides adolescents with opportunities for smoking and facilitates access to tobacco. Thus, the supply measure that determines 18 years as the legal age for tobacco purchase would be overcome, through best friends as a route for access to tobacco. This has been reported by several studies showing that most adolescents seem to rely on older friends as their main first access route to tobacco (Dent et al., 2005; Harrison et al., 2000; Hughes et al., 2010; Storvoll et al., 2008; Williams & Mulhall, 2005).

Within this study, over one-third of adolescents (37.85%) reported that their best friends have smoked at some point in their lives, of which one quarter (25.88%) state that their best friends smoke occasionally or regularly (see Table 20). Consistent with other studies showing the influence of best friends' smoking behaviour on adolescent smoking (Trucco et al., 2011; Rumpold et al., 2006), data from this study indicated that, when compared with adolescents whose best friends have never smoked, adolescents whose best friends were occasional smokers or regular smokers had increased odds of being lifetime, current, and regular smokers (see Table 31), even after controlling for covariates (see Table 34.1, Table 35.1, and

Table 36.1). As argued by Allen et al. (2003), tobacco seems to be the substance where the influence of peers is stronger. Actually, when compared with adolescents whose best friends' have never smoked, the odds of having used tobacco were five times greater for adolescents whose best friends were occasional smokers and 11 times greater for those whose best friends were regular smokers.

An interesting finding regards adolescents that smoke on a regular basis is that, although the overall variable measuring best friends' smoking behaviour was significantly associated with regular smoking amongst current smokers, the odds of a smoker being a regular smoker were only significantly higher (i.e., six times higher) for adolescents whose best friends were regular smokers as well. Taken together, these findings confirm best friends' experience with smoking as a significant risk factor for adolescents' decision to smoke at some point of their lives, for lifetime smokers to continue to smoke, and for current smokers to smoke regularly, particularly if the best friend was a regular smoker, which confirms the high modelling effect that best friends have on adolescents' substance use.

Recently, Mason et al. (2013) revealed that, when compared with boys, girls seem to be more susceptible to friends' influence on substance use. Additionally, as highlighted by Branstetter et al. (2012), girls seem to be surrounded by more smokers in their social environments. However, data from the the 2011 ESPAD survey regarding Portuguese adolescents have shown no significant differences in boys and girls' smoking prevalence (Hibell et al., 2012). In fact, despite boys reporting a higher lifetime smoking prevalence than girls (see Table 33), after controlling for covariates, gender ceased to be significantly associated with lifetime smoking (Table 34.3). Additionally, within the univariate analyses, no association was found between gender and current or regular smoking, suggesting that gender was not a significant risk factor for tobacco use in this sample (see Table 33).

Another variable influencing adolescents' decision to smoke is the extent they perceive their parents as being against smoking. Among the sample assessed in this study, almost all adolescents (98.62%) expected their parents to be disapproving of their smoking, of which over three-quarters (86.38%) expected their parents to be highly disapproving, with prohibition being the most anticipated reaction (see Table 20). In line with results reported previously within studies assessing the influence of parental smoking disapproval on adolescents'

smoking (Bahr et al., 2005; Berg et al., 2009; Ellickson et al., 2008; Sargent & Dalton, 2001), in this study adolescents expecting their parents to prohibit or to punish them for smoking reported the lowest lifetime, current, and regular smoking prevalence (see Table 31).

According to Bahr et al. (2005), parental attitudes towards smoking are among the most important family variables associated with adolescent smoking and, as noted by Allen et al. (2003), tobacco seems to be the substance towards which parental influence is stronger. Yet, it is interesting to note that, within the sample assessed in this study, almost all (94.61%) current users expecting their parents to be disapproving and over two-thirds (70.71%) expecting their parents to prohibit them from smoking, acknowledged smoking on a regular basis (see Table 20).

Although the overall variable measuring parental smoking approval remained significantly associated with lifetime and regular smoking in multivariate analysis, the odds of being a lifetime or a regular smoker did not differ significantly between those adolescents expecting their parents to be indifferent and those expecting their parents to hold disapproving reactions (i.e., disapprove, punish, or prohibit) (see Table 34.1). Such an outcome may indicate that other parental reactions besides those that have been included in this study need to be considered, and thus additional research is needed to better understand the relationship between parental smoking approval and smoking among vulnerable adolescents. Moreover, after controlling for covariates, parental smoking approval ceased to be significantly associated with current smoking (see Table 35.1). Taken together, these findings might be explained by an overlap between parental smoking approval and best friends' smoking behaviour, which remained significant for lifetime and current smoking after controlling for covariates (see Table 34.1 and table 35.1). The underlying assumption is that, compared with parents, peers have a higher influence on adolescents' decision to smoke, which has been reported by other studies (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011). Taken together, results indicate that overall, parental smoking approval was a significant risk factor for adolescents' decision to smoke at some point in their lives and for current smokers to smoke regularly, but not for lifetime smokers to continue to smoke. However, more research is needed to better understand the relationship between perceived parental smoking approval and smoking among vulnerable adolescents.

Family structure is another family variable that has been associated with adolescent smoking (Brown & Rinelli, 2010; Lundborg, 2007). Research has shown that adolescents living within intact families report lower smoking prevalence than those living within single and blended families (Brown & Rinelli, 2010; Lundborg, 2007). Findings from this study show that, in fact, adolescents living within intact families report the lowest lifetime smoking prevalence and, comparatively, those living within blended families report higher lifetime smoking prevalence (see Table 33), even after controlling for covariates (see Table 34.3). The odds of being a lifetime smoker were two times greater for adolescents living within blended families than for adolescents living within an intact family. These findings emphasize the protective role of living with both parents which, in turn, may be related with higher levels of parental monitoring (Hemovich et al., 2011), control and support (Brown & Rinelli, 2010), and maternal knowledge (Wang et al., 2009), which have been associated with intact families. Equally, the higher smoking prevalence among adolescents living within blended families emphasizes the risk that has been associated with this family structure that may be the result of lower parental attachment (Kierkus & Baer, 2002), lower maternal knowledge (Wang et al., 2009), and lower levels of monitoring (Demuth & Brown, 2004), features that have been associated with this type of family structure.

Additionally, the present study has added to the field of family structure's impact on adolescent smoking by considering several types of non-intact family structures (i.e., single-families, extended families, blended families, institutions, and other family structures). Contrary to Brown and Rinelli's findings (2010), in this study adolescents living within single families did not have a significantly higher lifetime smoking prevalence (see Table 34.3). One possible explanation for the absence of a higher lifetime smoking prevalence among adolescents living within single families might be the central role of the family among Portuguese population (Morrison & James, 2009), namely the closeness and proximity that is established between Portuguese parents and their children even if living within non-intact families (Albert et al., 2013; Monteiro et al., 2010).

Moreover, this study found that adolescents living in institutions were, from all the family structures considered, most likely to have smoked at some point in their lives (see Table 33 and Table 34.3). In fact, the odds of having tried tobacco were three times greater for

institutionalized adolescents than for adolescents living within intact families. As stated by Browne (2009), in Europe, institutionalization is regarded as the traditional response to protect children from harmful environments that include poor and inadequate parenting. For that reason, it can be argued that adolescents that are institutionalized had lived within families and environments that have placed them at greater risk for unhealthy outcomes, such as substance use, which could help explain the higher lifetime smoking prevalence among this subgroup of adolescents. Furthermore, no association was found between family structure and current or regular smoking among smokers (see Table 33). Overall, results regarding family structure point to this variable as a significant risk factor for adolescents' decision to smoke at some point in their lives, but not for their decision to continue to smoke nor to smoke regularly, which might indicate that, as a more stable pattern of smoking is established, family structure is no longer relevant for adolescents' decision to keep smoking.

Considering Paxton et al. (2007) finding that many studies assessing family structure have not accounted for covariates such as SES, a distinguishing feature of this research is that it controls for SES as a factor in multivariate analysis. Hence, in line with results reported by Hanson and Chen (2007), this study showed that adolescents from a lower SES report higher lifetime and regular smoking prevalence (see Table 33). Nonetheless, after controlling for covariates, SES ceased to be significantly associated with lifetime or regular smoking (see Table 34.3 and Table 36.2). However, SES remained significant for current use among those who had ever smoked, but results show that adolescents from higher SES reported significantly higher odds of current smoking (see Table 35.2). This agrees with the findings from Hughes et al. (2010) showing that a higher proportion of adolescents from a higher SES are current smokers. Indeed, in this study the odds of those who have ever smoked being a current smoker were three times greater for adolescents from a higher SES when compared with adolescents from a lower SES. One possible justification for the lower current smoking among adolescents from a lower SES might be a deterrence effect caused by the increase in tobacco selling prices that has been recently adopted in Portugal (Lei n.º 64-B/2011), that could make more difficult, at least for some adolescents from lower SES, to maintain smoking behaviour. This being the case, tobacco selling prices could be considered a factor restraining adolescents' regular purchase of tobacco. Taken together, in this sample SES was not a significant factor for adolescents' decision to smoke or for current smokers' decision to smoke

regularly, but was a significant factor in adolescents' who have used tobacco decision to continue smoking.

Taking into account the loss of significance between SES and lifetime use, one possible explanation might be an overlap between SES and stressful life events, which remained significantly associated with lifetime smoking (see Table 33), even after controlling for covariates (see Table 34.3). In fact, some studies have found evidence that adolescents from lower SES report a higher occurrence of stressful life events (Glasscock et al., 2013; Stronks et al., 1998). If this were the case among the sample of adolescents assessed within this study, it could be argued that, as pointed by Windle (2000), smoking might be a coping strategy to deal with the stress caused by life events.

In line with studies showing a positive relationship between stressful life events and smoking (Booker et al., 2004; Low et al., 2012; Weinstein & Mermelstein, 2013), this study showed that the odds of lifetime smoking were higher among adolescents that had experienced a stressful live (see Table 33), even after controlling for covariates (see Table 34.3). Indeed, the odds of lifetime tobacco use were two times greater for adolescents that had experienced a stressful live event than for adolescents that had not experienced such an event. However, no association was found between life events and current or regular smoking (see Table 33). On the whole, these results identify the role of stressful life events as a significant risk factor for adolescents' decision to smoke at some point in their lives, but not for lifetime smokers' decision to continue to smoke or for current smokers' decision to smoke regularly. Taken together, these findings may indicate that adolescents start to smoke as a coping strategy to deal with unpleasant emotions, possibly finding support from the fact that, among the sample of adolescents assessed in this study, the most expected benefit from smoking was feeling more relaxed (see Table 17). Nevertheless, as a more stable pattern of smoking is established, adolescents' decision to keep smoking is no longer based on the occurrence of stressful life events, but perhaps motivated by the high addictiveness of tobacco (NIDA, 2012b).

The relationship between stress and smoking as a coping strategy may also be related to perceived health-related quality-of-life considering that, as stated by Becker et al. (2009), quality-of-life captures an individual's satisfaction with life in areas of personal importance.

Therefore, it can be argued that adolescents reporting lower health-related quality-of-life may experience higher levels of stress and might smoke as a strategy to deal with stress, in part, based on their expectations of feeling more relaxed as a consequence of smoking.

Consistent with other studies showing that adolescents' level of health-related quality-of-life is negatively related with smoking (Dunn et al., 2011; Matos, 2008; Piko et al., 2005), the findings of this study show that adolescents who reported higher levels of health-related quality-of-life had decreased odds of smoking (see Table 32), even after controlling for covariates (see Table 34.2). Considering the results from the univariate analyses on the association between lifetime smoking and the ten items assessing health-related quality-of-life, it can be presupposed that (a) having high levels of fitness and energy, (b) feeling sad and lonely less often, (c) having time for oneself, (d) having opportunities to do enjoyable leisure activities and to have fun with friends, (e) feeling fairly treated by parents, and (f) feeling like a good student and able to pay attention at school, contribute to making adolescents less prone to experiment with tobacco. However, it should be noted that, after controlling for covariates, health-related quality-of-life ceased to be significantly associated with current smoking among lifetime smokers. Besides, as shown within the univariate analyses, health-related quality-of-life was not significantly associated with regular smoking among current smokers (see Table 32). Taken together, these results indicate that lower health-related quality-of-life was a significant risk factor for adolescents' decision to smoke at some point in their lives, but not for lifetime smokers' decision to continue to smoke nor for current smokers' decision to smoke regularly. Again, it may be argued that adolescents experiment with tobacco as a coping strategy for dealing with the distress associated with low perceived quality-of-life, but as a more stable pattern of smoking is established, the decision to keep smoking is no longer based on adolescents' perception on their quality-of-life, but perhaps motivated by the high addictiveness of tobacco (NIDA, 2012b).

Despite studies reporting that adolescents from minority groups have lower levels of substance use (Guo et al 2002; Johnston et al., 2011; Nishimura et al., 2005; Watt, 2004), within the sample of adolescents assessed in this study, no association was found between nationality and lifetime, current, or regular smoking among smokers (see Table 33). Thus, while nationality or ethnic group might be important in other samples or countries, these findings

discard nationality as a significant risk factor for smoking among the sample of vulnerable adolescents assessed within this research.

The decision to smoke is also based on intrapersonal variables. Attitudes are one of these variables and have been largely associated with substance use among adolescents (Hawkins et al., 1992; O'Connell, et al., 2009; Petraitis et al., 1995; Wright & Pemberton, 2004). In line with studies showing that most adolescents report negative attitudes towards smoking (Barkin et al. 2002; Freeman et al., 2005), among the sample assessed in this study, over half of adolescents (57.65%) expressed negative attitudes towards smoking (see Table 20). Furthermore, findings from this study complement previous work by showing that, of alcohol, tobacco, cannabis, and cocaine, tobacco was the substance evoking the highest percentage of negative attitudes.

Consistent with studies showing that adolescents holding positive attitudes towards tobacco are more likely to report smoking (Bosson et al., 2012; Epstein et al., 2003; Otten et al., 2007), this study shows that, compared with adolescents holding negative attitudes, those holding positive attitudes had decreased odds of being lifetime and current smokers (see Table 31), even after controlling for covariates (see Table 34.1 and Table 35.1). Moreover, this study complements previous work by showing that, again compared with adolescents holding negative attitudes, the odds of being a lifetime, a current, and a regular smoker were also higher among adolescents holding neutral attitudes (see Table 34.1 and Table 35.1). In fact, when compared with adolescents holding negative attitudes, those holding positive attitudes had three times greater odds of experimenting with tobacco and, in lifetime smokers, 14 times greater odds of becoming a current smoker, whereas adolescents holding neutral attitudes had two times greater odds of experimenting, three times greater odds of becoming current smokers, and two times greater odds of start to smoke on a regular basis.

The fact that adolescents holding neutral attitudes have increased odds of lifetime and current smoking is of particular concern, considering that over one-third of adolescents assessed within this study (39.52%) expressed neutral attitudes towards tobacco (see Table 20). This indicates that, similar to those reporting positive attitudes, they are also at risk for experimenting with tobacco and becoming current and regular smokers. Taken together, these



findings support the role of positive attitudes but also of neutral attitudes as a significant risk factor for adolescent smoking.

Another variable that has been identified as relevant for adolescents' decision to use substances is risk perception (Wright & Pemberton, 2004). In line with studies reporting that adolescents estimate great risks from smoking (Lundborg & Lindgreen, 2004; Tomar&Hatsukami, 2007), within the sample assessed in this study, almost all adolescents(98.06%) perceived smoking as having medium or high risks to health, which seems to indicate that adolescents were aware at least of some of the harmful effects associated with smoking (see Table 20). It is worth citing the low percentage of adolescents (1.94%) that perceived smoking as having a low risk to health (see Table 20), which can be seen as a positive indicator of the implementation of measures aimed at increasing awareness of the harmful effects of tobacco that have been put in place in Portugal (Lei 37/2007).

Results from this study show, in agreement with other studies (Leeuw et al., 2008; Tomar&Hatsukami, 2007), that adolescents who perceive smoking as having high risks to health report the lowest lifetime and, among lifetime smokers, current smoking (see Table 31). However, after controlling for covariates, smoking risk perception ceased to be significantly associated with current smoking (see Table 35.1). Moreover, although the overall variable assessing risk perception remained significantly associated with lifetime smoking, the odds of smoking did not differ significantly between adolescents considering smoking as having medium or high risk and those considering smoking as having low risk (see Table 34.1). Such an outcome may indicate that other risk perception features besides those considered in this study need to be considered, and that additional research is needed to better understand the relationship between smoking risk perception and smoking among vulnerable adolescents. Yet, it can be argued that one possible justification for this loss of significance between risk perception and current smoking might be the overlap between smoking risk perception and attitudes towards smoking, which remained significant for current smoking after controlling for covariates (see Table 35.1). This argument is reinforced by some studies (Järvinen&Østergaard, 2011)that have used risk perception as an indicator for measuring attitudes. Furthermore, for current smokers, no association was found between risk perception and regular smoking, which suggest that regular smokers, with continued smoking, are less

likely to perceive smoking as harmful to their health or see the benefits as outweighing the risks (Chassin et al., 2001; Leeuw et al., 2008). On the whole, results seem to indicate that overall, smoking risk perception was a significant risk factor for adolescents' decision to smoke at some point in their lives, but not for lifetime smokers' decision to continue to smoke or for current smokers' decision to smoke regularly.

Besides being the substance evoking the highest percentage of negative attitudes, tobacco was also the substance towards which more adolescents anticipated problems as a consequence of use, with over three-quarters of adolescents (81.75%) expecting negative outcomes (see Table 20), mainly problems with parents (see Table 13). Consistent with studies showing a negative association between negative expectancies and substance use (Jones et al., 2001; Kristjansson et al., 2012; Leigh & Stacy, 2004), in this study, adolescents expecting problems as a consequence of smoking showed the lowest lifetime, current, and regular smoking prevalence (see Table 31). Nevertheless, after controlling for covariates, expected problems ceased to be significantly associated with smoking behaviours (see Table 34.1, Table 35.1, and Table 36.1). One possible explanation for this loss of significance might be the overlap with attitudes towards smoking, which remained significant after controlling for covariates (see Table 34.1, Table 35.1, and Table 36.1). This argument is reinforced by the fact that expected problems have been used as an indicator for measuring attitudes (Lancaster & Hughes, 2013). Another possible justification for the loss of significance between expected problems and lifetime and current smoking might be that expected benefits from smoking (that remained significant for lifetime and current smoking in multivariate analysis) are more readily taken into consideration in adolescents' decisions to smoke than expected problems are, particularly given that problems are likely to occur a long time in the future.

Indeed, research has shown that from 12 years of age onwards, adolescents start to see the expected problems associated with substance use as less likely and expected benefits as more likely (Alfonso & Dunn, 2007; Chassin et al., 2001; O'Connor et al., 2007). This change in the way adolescents perceive the consequences from smoking might be related to an increasing exposure to people who smoke without manifesting evident adverse consequences (Clark et al., 2011), which happens as adolescents gain more autonomy and socialize within broader contexts (Duarte et al., 2011). Additionally, and considering that adolescents report

increasing experience with tobacco with increasing age (Feijão et al., 2011; Hibell et al., 2012), expected problems may lose significance as adolescents have more positive experiences with smoking (Goldberg et al., 2002). Moreover, with increasing abstract reasoning, adolescents are able to consider not only the negative effects of smoking, but also the positive ones. Besides, as noted by Lee et al. (2011), adolescents may value positive consequences so highly that they are willing to endure the negative consequences to be able to experience the positive ones. As for the loss of significance between expected problems and regular smoking, it might be argued that the establishment of a more regular pattern of smoking may lead to a progressive acceptance of smoking by parents, teachers, and peers, leading to a lower likelihood of experiencing problems with these entities. On the whole, expected problems from smoking does not seem to be a significant risk factor for adolescents' smoking.

When compared with alcohol and cannabis, more adolescents (22.12%) stated that they did not expect positive outcomes from using tobacco (see Table 20). As with other research describing the role of positive expectations on substance use (Clark et al., 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001), this study showed that the odds of becoming a lifetime and a current smoker are higher among adolescents expecting positive outcomes from smoking (see Table 31), even after controlling for covariates (see Table 34.1 and Table 35.1). Indeed, amongst lifetime smokers, the odds of being a current smoker for adolescents expecting positive outcomes were two times greater when compared with adolescents not expecting such outcomes. However, no association was found between expected benefits and regular smoking (see Table 31). This may indicate that, with increasing use, the positive outcomes that may arise as a consequence from smoking were no longer relevant for the decision to smoke on a regular basis, perhaps due to the establishment of an addictive pattern. Taken together, results indicate that expected benefits from smoking are a significant risk factor for adolescents' decision to smoke at some point in their lives and to continue smoking, but not for smoking regularly.

Table 47 presents a summary regarding the association between proximal, health-related quality-of-life, and sociodemographic variables and lifetime, current, and regular smoking.

Table 47  
*Association Between Proximal, Health-Related Quality-of-Life, and Sociodemographic Variables and Lifetime, Current, and Regular Smoking*

<b>Variables</b>	<b>Lifetime smoking</b>	<b>Current Smoking<sup>a</sup></b>	<b>Regular Smoking<sup>b</sup></b>
<b>Smoking risk perception</b>	No significant differences between categories	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Attitudes towards tobacco</b>	The odds of lifetime smoking were higher among adolescents holding positive attitudes and even neutral attitudes towards smoking	The odds of continuing to smoke were higher among adolescents holding positive attitudes and even neutral attitudes towards smoking	The odds of smoke regularly were higher among adolescents holding neutral attitudes towards smoking
<b>Expected problems from smoking</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant after controlling for covariates
<b>Expected benefits from smoking</b>	The odds of lifetime smoking were higher among adolescents expecting benefits from smoking	The odds of continuing to smoke were higher among adolescents expecting benefits from smoking	Non-significant within the univariate analyses
<b>Perceived accessibility to tobacco</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Best friend's smoking behaviour</b>	The odds of lifetime smoking were higher among adolescents not knowing if best friends are smokers, among those whose best friends smoke occasionally or regularly and even among those who best friends have quit smoking	The odds of continuing to smoke were higher among adolescents whose best friends smoke occasionally or regularly	The odds of smoke regularly were higher among adolescents whose best friends smoke regularly
<b>Perceived parental smoking approval</b>	No significant differences between categories	Non-significant after controlling for covariates	No significant differences between categories
<b>Health-related quality-of-life</b>	The odds of lifetime smoking were lower among adolescents reporting higher health-related quality-of-life	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Age</b>	The odds of lifetime smoking increases with increasing age	The odds of continue to smoke increases with increasing age	The odds of smoke regularly increases with increasing age
<b>Gender</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Nationality</b>	Non-significant within the univariate analyses	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>SES</b>	Non-significant after controlling for covariates	The odds of continuing to smoke are higher among adolescents from higher SES	Non-significant after controlling for covariates
<b>Family structure</b>	The odds of lifetime smoking were higher among adolescents living in blended families or within institutions	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Stressful life events</b>	The odds of lifetime smoking were higher among adolescents that have experienced a stressful live event	Non-significant within the univariate analyses	Non-significant within the univariate analyses

<sup>a</sup>Data on current smoking is limited to adolescents that had ever smoked. <sup>b</sup>Data on regular smoking is limited to current smokers.

## Cannabis Use

Results from the sample assessed in this study show that less than one-tenth of adolescents (9.32%) report having used cannabis at some point in their lives (see Table 22). Higher prevalence has been reported by studies conducted with Portuguese adolescents (Feijão, 2011; Feijão et al., 2011; Hibell et al., 2012) that show prevalence ranging from 15% (Feijão et al., 2011) to 18.5% (Feijão, 2011). This higher prevalence is likely attributable to the higher mean age of the samples used within these studies. Findings reported by the EMCDDA (2012b) show that nearly half of adolescents that have used cannabis in the last year have done so in the last month, possibly indicating more regular use. Similarly, in this study, just over half (53.42%) of adolescents that have ever used cannabis continue to use and, of these current users, half (49.60%) use on a regular basis (see Table 22). However, despite the high percentage of current and regular cannabis use among lifetime users, just less than three-quarters of adolescents (cannabis users and non-users) expressed no intention to use cannabis within the next year (73.15%) (see Table 22).

Like other studies with Portuguese adolescents (Balsa et al., 2009; Feijão et al., 2011), this study shows that lifetime cannabis use significantly and steadily increases with increasing age (see Table 39), even after controlling for covariates (see Table 40.2). For instance, when compared with adolescents aged 12 years, the odds of having tried cannabis by the age of 15 were five times greater and 11 times greater by the age of 18. Among lifetime cannabis users, no association was found between age and current or regular cannabis use (see Table 39). Thus, these results indicate that increasing age was a significant risk factor for the decision to use cannabis at some point of life, but that once adolescents have used cannabis age does not affect their risk of continuing to use it nor of becoming a regular user.

This steady increase in lifetime cannabis use can be explained by an increasing influence from peers on adolescents' behaviours and decisions (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011) and a more autonomous functioning that takes place over adolescence and leads adolescents to spend more time with their friends away from parental supervision (Duarte et al., 2001). Therefore, with the broadening of social contexts, it can be presupposed that adolescents are increasingly exposed to people who use substances without manifesting evident adverse consequences (Clark et al., 2011), which may lead adolescents to question

the veracity of the publicized negative effects of cannabis use. Moreover, the emergence of a more abstract reasoning enables adolescents to consider not only the negative effects but also the positive effects of cannabis use (Cameron et al., 2003).

Of those adolescents that had used cannabis at some point in their lives, just a few (4.26%) had used cannabis for the first time by 11 years old, but over one-quarter (26.39%) had used by the age of 13 (see Table 22). Research has shown that the earlier the age of cannabis use onset, the greater the escalation of cannabis consumption over time (Siqueira et al., 2001), the greater the risk of abuse and dependence (Chen et al., 2009), the greater the likelihood of psychosocial impairment (Hicks et al., 2010), academic problems (Ellickson et al., 2003), and the greater the difficulty in quitting (von Sydow et al., 2002). Further, early users are more likely to use other substances later in life (von Sydow et al., 2002) and to start using them at an early age (Ciairano et al., 2009). A much lower percentage of early cannabis users was found by the 2011 ESPAD survey, which found that, of lifetime Portuguese cannabis users, only a few (4%) started using cannabis at 13 years or younger (Hibell et al., 2012). This difference might be explained by the fact that the sample used in this study had been identified as a priority group in need of substance use prevention interventions, and it can therefore be presupposed that adolescents within this sample are at increased risk of substance use.

Age of onset is somewhat related to perceived accessibility and, despite cannabis being an illegal substance in Portugal, just less than half of adolescents in this study (46.02%) perceived it as being easy or fairly easy to obtain (see Table 20). This proportion is much higher than that reported by the 2011 ESPAD survey (30%) (Hibell et al., 2012), which might again be explained by the assumption that the sample used in this study live within riskier environments for substance use, where substances are more accessible. In agreement with evidence demonstrating that adolescents who perceive cannabis as easy to obtain report the highest cannabis use prevalence (Coffey et al., 2000), this study shows that, when compared with adolescents perceiving cannabis as difficult to obtain, those perceiving it as easy to obtain report the highest lifetime, current, and regular use (see Table 37). After controlling for covariates, perceived accessibility remained significantly associated with lifetime cannabis use (see Table 40.1), with the odds of experimenting with cannabis being two times lower for adolescents perceiving cannabis as difficult or even fairly easy to obtain, when compared with adolescents perceiving cannabis as easy to obtain. However, among cannabis users, after

controlling for covariates, perceived accessibility ceased to be significantly associated with current and regular cannabis use (see Table 41). Overall, these results seem to show that perceived accessibility was a significant risk factor for adolescents' decision to use cannabis at some point of their lives, but that once adolescents have used cannabis perceived accessibility does not affect their risk of continuing to use it nor of becoming a regular user.

One possible justification for the loss of significance between perceived accessibility and current and regular cannabis use might be the overlap between perceived accessibility and best friends' cannabis use behaviour, a variable significant for current and regular cannabis use (see Table 37), even after controlling for covariates (see Table 40.1 and Table 41). Hence, it may be argued that having best friends that use cannabis not only provides adolescents with opportunities for using cannabis, but also opportunities to access it, which is in line with the fact that adolescents, particularly younger ones, have access to illegal substances through social sources (Harrison et al., 2000).

Allen et al. (2003) argue that cannabis seems to be one of the substances for which the influence of peers is stronger. For the sample assessed within this study, just over three-quarter of adolescents (74.14%) reported that their best friends had never used cannabis (see Table 20). Consistent with other studies showing the influence of best friends' cannabis use behaviour on adolescents' cannabis use (Ali et al., 2011; Mayet et al., 2010), data from this study shows that, when compared with adolescents whose best friends have never used cannabis, the odds of being a lifetime cannabis user and to continuing to use cannabis were higher among adolescents whose best friends are occasional users or regular cannabis users (see Table 40.1 and Table 41). Indeed, when compared with adolescents whose best friends' have never used cannabis, the odds of lifetime cannabis use were 21 times greater if the best friend was an occasional cannabis user and 22 times greater if a regular user (see Table 40.1). Moreover, the findings from this study complement previous work by showing that the odds of using cannabis at some point in life are increased even among adolescents whose best friends are former cannabis users (i.e., 16 times greater) and those adolescents who do not know whether their best friends are cannabis users or not (i.e., two times greater) (see Table 40.1). It was not possible to determine whether best friends were the same when adolescents tried cannabis for the first time and by the time they participated in this study. However, data on best friends' experience with cannabis seem to indicate that other factors,

besides direct modelling, may mediate the relationship between best friends' cannabis use and adolescents' cannabis use. Thus, it seems that adolescents may take the decision to use cannabis even if their best friends have stopped using it. As for current use among lifetime users (see Table 41), it is interesting to note that the odds of being a current cannabis user are only significantly higher (i.e., five times higher) for adolescents whose best friends are regular cannabis users, which indicates the high modeling effect that best friends' substance use has on adolescents' substance use. Additional research is needed to better understand the relationship between best friends' cannabis use and cannabis use among vulnerable adolescents. Overall, findings confirm best friends' experience with cannabis as a significant risk factor for adolescents' decision to use cannabis at some point in their lives, and to continue using it, particularly if the best friend is a regular cannabis user.

Despite Mason et al. (2013) identifying that girls seem to be more susceptible to friends' influence on substance use than boys, within both the sample assessed in this study and in the 2011 ESPAD survey (Hibell et al., 2012), boys report a higher lifetime cannabis use prevalence than girls (see Table 39). Nevertheless, after controlling for covariates, gender ceased to be significantly associated with lifetime cannabis use (see Table 40.2). Moreover, within the univariate analyses (see Table 39) no association was found between gender and current or regular cannabis use, suggesting that gender was not a significant risk factor for adolescents' cannabis use.

Perceived parental approval of substance use is another variable influencing adolescents' decision to use substances, including illicit substances. Among the sample assessed in this study, almost all adolescents (99.34%) expected their parents to be disapproving of their cannabis use, of which almost all (96.63%) expected them to be highly disapproving, with prohibition being the most anticipated reaction towards cannabis use (see Table 20). In line with results from previous studies (Olsson et al., 2003; Wright & Pemberton, 2004), data from this study show that adolescents expecting stronger parental disapproval towards cannabis use show the lowest lifetime, current, and regular prevalence of cannabis use (see Table 37). Nevertheless, it is noteworthy that over three-quarters of adolescents (77.42%) that have tried cannabis at some point in their lives, despite expecting their parents to be disapproving of cannabis use, continue to use cannabis and a similar proportion of current users (70.83%) still



use it on a regular basis (see Table 37). According to what has been reported by other studies (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011), this may be the result of the increasing influence of peers over parents on adolescents' decisions and behaviours. In fact, after controlling for covariates, whilst parental cannabis use approval continued to be significantly associated with lifetime and current cannabis use, the odds of experimenting with cannabis and becoming a current cannabis user did not differ significantly between adolescents expecting their parents to be indifferent, to disapprove, to punish, or to prohibit (see Table 40.1 and Table 41). Such an outcome may indicate that other types of parental reactions besides those assessed in this study need to be considered, and that additional research is needed to better understand the relationship between parental cannabis use approval and cannabis use among vulnerable adolescents. Moreover, after controlling for covariates, parental cannabis use approval ceased to be significantly associated with regular cannabis use. One possible explanation for the loss of significance between parental cannabis use approval and adolescents' cannabis use might be an overlap with best friends' cannabis use behaviour, which remained significant for cannabis use (see Table 37) after controlling for covariates (see Table 40.1 and Table 41). This justification finds ground in several studies (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011) showing a higher influence from peers than from parents on adolescents' decisions to use substances. On the whole, results seem to indicate that, parental cannabis use approval is a significant risk factor for adolescents' decision to experiment with cannabis.

Another family variable that has been associated with adolescent substance use, including with cannabis use, is family structure. Research has shown a relationship between living within a non-intact family and an increased use of cannabis (Georgiades & Boyle, 2007; Rumpold et al., 2006). In fact, results from this study show that, when compared with adolescents living within an intact family, those living within institutions or within single families report higher lifetime cannabis use prevalence (see Table 39). However, after controlling for covariates, family structure ceased to be significantly associated with lifetime cannabis use (see Table 40.2). Moreover, amongst cannabis users, no association was found between family structure and current or regular cannabis use (see Table 39). Overall, results seem to indicate that family structure is not a significant independent risk factor for adolescents' decision to use cannabis at some point in life, to continue to use, or to use regularly.

A similar process occurs for life events: in line with studies showing a positive relationship between stressful life events and cannabis use (Butters, 2002; Low et al., 2012), this study shows that adolescents that have experienced a stressful live event have increased odds of use cannabis at some point of their lives (see Table 39). However, after controlling for covariates, life events ceased to be significantly associated with lifetime cannabis use (see Table 40.2). Furthermore, among cannabis users, no association was found between life events and either current or regular cannabis use (see Table 39). On the whole, these findings do not identify stressful life events as a significant risk factor for cannabis use in this sample. The absence of a significant association between life events and cannabis use might be due to the fact, reported by Siqueira et al. (2001), that cannabis users are less likely to report greater perceived stress due to the physiological effects of cannabis that contribute to a gradual distancing and alienation from daily events. Moreover, consistent with studies showing a negative relationship between health-related quality-of-life and cannabis use (Dunn et al., 2011; Fergusson & Boden, 2008; Matos, 2008), this study showed that adolescents that had tried cannabis at some point of their lives reported lower levels of health-related quality-of-life (see Table 38). However, after controlling for covariates, health-related quality-of-life ceased to be significantly associated with lifetime cannabis use. Moreover, among cannabis users, no association was found between health-related quality-of-life and current or regular cannabis use (see Table 38). Taken together, these results seem to suggest that lower health-related quality-of-life was not a significant risk factor for adolescents' cannabis use in this sample. Again, distancing and alienation from daily reality elapsing from cannabis use may help to interpret the absence of significance between health-related quality-of-life and cannabis use.

Regarding SES, even though some studies report that adolescents from lower SES are more likely to use substances (Georgiades & Boyle, 2007; Gil-Lacruz & Gil-Lacruz, 2010; Humensky, 2010), within the sample of adolescents assessed in this study there was no association between SES and cannabis use (see Table 39). Likewise, despite studies showing that adolescents from minority groups have lower levels of substance use (Guo et al 2002; Johnston et al., 2011; Nishimura et al., 2005; Watt, 2004), within the sample of adolescents assessed in this study, those from minority groups reported higher lifetime and regular cannabis use (see Table 39). However, after controlling for covariates, nationality ceased to be

significantly associated with lifetime and regular cannabis use (see Table 40.2). Further, among lifetime users, no association was found between nationality and current cannabis use(see Table 39). On the whole, this finding suggests that nationality is not a significant risk factor for adolescents' cannabis use in this sample.

As for intrapersonal variables, attitudes have been associated with decision making processes and several authors consider attitudes as a relevant factor for the understanding of adolescent substance use (Hawkins et al., 1992; O'Connell, et al., 2009; Petraitis et al., 1995; Wright & Pemberton, 2004). In line with studies demonstrating that attitudes towards cannabis have been changing and becoming more positive (Roy et al., 2005), even than those towards tobacco (Akre et al., 2009) and alcohol (Willner, 2001), this study found that the percentage of adolescents holding positive attitudes towards cannabis (12.32%) was higher than the percentage holding positive attitudes towards tobacco (2.83%) and very similar to the percentage holding positive attitudes towards alcohol (13.25%)(see Table 20).

Consistent with studies showing that adolescents holding positive attitudes towards cannabis are more likely to report using it (Alvaro et al., 2013; Malmberg et al., 2012; O'Callaghan & Joyce, 2006), this study found that, compared with adolescents holding negative attitudes, those holding positive attitudes towards cannabis had increased odds of cannabis use at some point in their lives (see Table 37), even after controlling for covariates (see Table 40.1). In fact, when compared with adolescents holding negative attitudes, those holding positive attitudes had seven times greater odds of experimenting with cannabis, whereas adolescents holding neutral attitudes had two times greater odds of experimenting with it (see Table 40.1). The increased likelihood of using cannabis among adolescents holding neutral attitudes is a matter of concern as almost half of adolescents in this study (45.30%) held neutral attitudes towards cannabis (see Table 20). Despite the influence on lifetime cannabis use, among cannabis users attitudes ceased to be significantly associated with current and regular cannabis use in multivariate analysis (see Table 41). Even though not statistically significant, it is interesting to note that one-fifth of adolescents (20.83%) that had tried cannabis at some point in their lives, continued to use cannabis and a similar proportion of current cannabis users (20.00%) still used it on a regular basis, despite holding negative attitudes towards cannabis(see Table 37). One possible explanation for the loss of significance between attitudes towards cannabis and current and regular cannabis use may be that, after starting to use cannabis, adolescents may

need to adjust their opinions to their overt behaviour in order to feel that they are acting according to their beliefs, attitudes, and values, as claimed by the cognitive dissonance theory (Festinger & Carlsmith, 1959). Another possibility is the influence of other variables on the decision to use cannabis, namely best friends' cannabis use, which remained significantly associated with adolescents' cannabis use (see Table 37) even after controlling for covariates (see Table 40.1 and Table 41). On the whole, these findings support the role of positive attitudes (and also of neutral attitudes) as a significant risk factor for adolescents' decision to use cannabis at some point in their lives, but not for continuing to use cannabis or using it regularly.

Another variable that has been mentioned as being relevant for adolescents' decision to use substances is perceived risk (Wright & Pemberton, 2004). In line with studies reporting that adolescents estimate great risks from cannabis use (EMCDDA, 2012; Kilmer et al., 2007; Miller et al., 2009), this study shows that almost all adolescents (96.65%) perceive cannabis as having medium or high risks to health (see Table 20), which indicates that adolescents were aware at least of some of the harm associated with cannabis use. It is interesting to note that a higher percentage of adolescents (3.35%) stated that cannabis use has low risk to health than smoking tobacco (1.94%) (see Table 20), which suggests that at least some adolescents seem to believe the myth that it is less damaging to smoke a joint than to smoke a cigarette. Results from this study show, as reported by other studies (Kilmer et al., 2007; Miller et al., 2009), that adolescents who perceive cannabis use as having high risks to health reported the lowest lifetime, current, and regular cannabis use (see Table 37). Nevertheless, after controlling for covariates, cannabis risk perception ceased to be significantly associated with cannabis lifetime and current use (see Table 40.1 and Table 41). One possible justification for the loss of significance between cannabis risk perception and lifetime use might be the overlap between cannabis risk perception and attitudes towards cannabis, which remained significant for lifetime use even after controlling for covariates (see Table 40.1). This argument is reinforced by the fact that risk perception has been used as an indicator for measuring attitudes (Järvinen & Østergaard, 2011). As for the loss of significance between risk perception and current and regular use among cannabis users, this may, in turn, be explained by the fact that regular cannabis users, with continued use, are less likely to perceive cannabis as being harmful to their health, as seen in other studies (Apostolidis et al., 2006; Chomynova et

al., 2009; Swaim, 2003). Taken together, data suggest that cannabis use risk perception is not a significant risk factor for adolescents' cannabis use in this sample.

Despite the percentage of adolescents holding positive attitudes towards cannabis (12.32%) being higher than the percentage holding positive towards tobacco (2.83%), the percentage of adolescents expecting problems from cannabis use (92.76%) is higher than the percentage expecting problems from smoking (81.75%) and very similar to the percentage expecting problems from cocaine use (93.82%)(see Table 20). Similar to tobacco, the most anticipated negative consequence from cannabis use was problems with parents (see Table 14). These findings indicate that, despite adolescents being aware of the fact that cannabis use is not socially accepted and, above all, not accepted by their parents, they still consider cannabis as a beneficial substance. Other studies show a negative association between negative expectancies and substance use (Jones et al., 2001; Kristjansson et al, 2012; Leigh & Stacy, 2004). Here, adolescents expecting problems as a consequence of cannabis use showed the lowest lifetime and current use (see Table 37). Nevertheless, after controlling for covariates, expected problems ceased to be significantly associated with lifetime and current cannabis use(see Table 40.1 and Table 41). One possible explanation for this loss of significance might be that expected benefits from cannabis use, which remain significant for lifetime and current use in multivariate analyses (see Table 40.1 and Table 41), are more readily taken into consideration in the decision to use cannabis than expected problems are. In fact, as with alcohol and tobacco (see "Drinking" and "Smoking" discussion sections) this might be due to the expected costs associated with substance use starting to be seen as less likely (Alfonso & Dunn, 2007; Chassin et al., 2001; O' Connor et al., 2007) and less important (Goldberg et al., 2002; Lee et al., 2011) than the expected benefits, along with increasing exposure to substance users that do not manifest evident adverse consequences (Clark et al., 2011). Additionally, no association was found between expected problems and regular cannabis use (see Table 37), which may be related to frequent cannabis users, as pointed out by Siqueira et al. (2001), experiencing a gradual distancing and alienation from daily life, leading to a lower perception of the problems that come from cannabis use. On the whole, expected problems from cannabis use do not seem to be a significant risk factor for adolescents' cannabis use.

Regarding expected benefits from using cannabis, within the sample assessed in this study, just over one-third of adolescents (35.79%) expected positive consequences from using

cannabis (see Table 20), which confirms adolescents' views on cannabis as a beneficial substance. It is interesting to note that of adolescents that have tried cannabis at some point in their lives, just less than one-third (30.43%) were current cannabis users despite not expecting benefits from using cannabis (see Table 20). This may indicate the influence of other factors in the maintenance of cannabis use, such as best friends' cannabis use behaviour.

As with other studies assessing the positive expectancies of cannabis (Aarons et al., 2001; Buckner & Schmidt, 2008; Kristjansson et al., 2012), here the most expected positive outcome from cannabis use was feeling more relaxed (see Table 18). In line with other research describing the role of positive expectations on substance use (Clark et al., 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001), this study found that adolescents expecting positive consequences from cannabis use showed the highest lifetime, current, and regular cannabis use prevalence (see Table 37). However, after controlling for covariates, whilst expected benefits from cannabis use continued to be significantly associated with lifetime and current cannabis use, the odds of using cannabis at some point in life were not significantly different between the categories assessed (see Table 40.1 and Table 41). Such an outcome may indicate that other features of positive expectations besides those considered in this study need to be considered, and that additional research is needed to better understand the relationship between expected benefits from using cannabis and cannabis use among vulnerable adolescents. Furthermore, no association was found between expected benefits and regular cannabis use (see Table 37), which may indicate that, with increasing use, the positive outcomes that may arise as a consequence from cannabis use are no longer relevant for the decision to use it on a regular basis, perhaps due to the establishment of an addictive or social pattern. Taken together, results seem to indicate that expected benefits are a significant risk factor for adolescents' decision to use cannabis at some point in their lives and to continue to use cannabis, but not for using it regularly.

Table 48 presents a summary regarding the association between proximal, health-related quality-of-life, and sociodemographic variables and lifetime, current, and regular cannabis use.

Table 48  
Variables Related with Cannabis Use

Variables	Lifetime Cannabis Use	Current Cannabis Use <sup>a</sup>	Regular Cannabis Use <sup>b</sup>
<b>Cannabis risk perception</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant after controlling for covariates
<b>Attitudes towards cannabis</b>	The odds of lifetime cannabis user were higher among adolescents holding positive attitudes and even neutral attitudes towards cannabis	Non-significant after controlling for covariates	Non-significant after controlling for covariates
<b>Expected problems from cannabis use</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Expected benefits from cannabis use</b>	No significant differences between categories	No significant differences between categories	Non-significant within the univariate analyses
<b>Perceived accessibility to cannabis</b>	The odds of lifetime cannabis use were lower among adolescents considering difficult or even fairly easy to access to cannabis	Non-significant after controlling for covariates	Non-significant after controlling for covariates
<b>Best friend's cannabis use behaviour</b>	The odds of lifetime cannabis user were higher among adolescents who do not know if their best friends use cannabis, have quitted using cannabis, or use cannabis occasionally or regularly	The odds of continue to use cannabis are higher among adolescents whose best friends use cannabis regularly	Categories non-significantly different
<b>Perceived parental cannabis use approval</b>	No significant differences between categories	No significant differences between categories	Non-significant after controlling for covariates
<b>Health-related quality-of-life</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Age</b>	The odds of lifetime cannabis use increases with increasing age	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Gender</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Nationality</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	The odds of using cannabis regularly were higher among non-Portuguese adolescents
<b>SES</b>	Non-significant within the univariate analyses	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Family structure</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Stressful life events</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses

<sup>a</sup>Data on current cannabis use is limited to adolescents that had ever used cannabis. <sup>b</sup>Data on regular cannabis use is limited to current cannabis users.

## Cocaine Use

Few adolescents in this study reported having used cocaine at some point in their lives (1.76%) (see Table 22). This prevalence is in line with two main large sample studies conducted with Portuguese adolescents that report prevalence ranging from 2% (Feijão, 2011) to 2.5% (Feijão et al., 2011). A slightly higher prevalence (3%) was reported by the 2011 ESPAD survey (Hibell et al., 2012), which may be attributable to the higher mean age of the sample used within this study. Of those adolescents that have tried cocaine at some point in their lives, just over one-third (38.64%) continue to use cocaine and, of these, just over half (52.94%) use it on a regular basis (see Table 22). Furthermore, over three-quarters of adolescents expressed no intention to use cocaine within the next year (82.33%) (see Table 22). It is interesting to note that, in line with previous studies (Bridges et al., 2003; Sigelman et al., 2002) cocaine was the substance towards which most adolescents expressed no intention to use (see Table 22). Yet, it was also the substance for which the percentage of lifetime users (1.76%) was most similar to the percentage of those willing to use it in the future (1.25%) (see Table 22).

In line with large sample studies undertaken within Portuguese adolescents (Balsa et al., 2009; Feijão et al., 2011), this study shows that lifetime cocaine use increases with increasing age (see Table 44). However, no association was found between age and current cocaine use or was age related to regular cocaine use (see Table 44). Another relevant question related with age is the age of onset. Among adolescents that had used cocaine in this study, just over one-tenth (13.33%) had used for the first time at 11 years of age and, taken together, one-third (31.31%) had used cocaine by the age of 13 (see Table 22). In fact, research has shown that early users have greater escalation on consumption over time (Tucker et al., 2003; Siqueira et al., 2001), greater risk of abuse (Blomeyer et al., 2011; Chen et al., 2009; Hughes et al., 2010), dependence (Breslau et al., 1993; Chen et al., 2009; Hingson et al., 2006), greater likelihood of psychosocial impairment (Hicks et al., 2010), academic problems (Ellickson et al., 2003), and greater difficulty in quitting (von Sydow et al., 2002). Moreover, early users are more likely to use other substances later in life (Ellickson et al., 2003), to start using them at an early age (Ciairano et al, 2009), and to report poor outcomes at age 23 even if they reduced their substance use during adolescence (Tucker et al., 2005).



Perceived accessibility is an important variable for the understanding of substance use onset. Despite cocaine being an illegal substance in Portugal, over one-third of adolescents (37.26%) perceived it as easy or fairly easy to obtain (see Table 20). As with other studies showing that adolescents who perceive substances as easy to obtain report higher prevalence of use (Coffey et al., 2000; Cummings et al., 2003; Durant et al., 2008; Hublet et al., 2009; Komro et al., 2007; Williams & Mulhall, 2005), this study shows that, when compared with adolescents perceiving cocaine as difficult to obtain, those who perceive it as easy to obtain report the highest lifetime cocaine use (see Table 42). Indeed, the odds of becoming a lifetime cocaine user were four times lower for adolescents perceiving it as difficult to obtain and even three times lower for adolescents perceiving it as fairly easy, when compared with those perceiving it as easy to obtain (see Table 45). Among adolescents that had used cocaine, no association was found between perceived accessibility and current cocaine use, and among current users no association was found between perceived accessibility and regular use. This may indicate that, from the moment adolescents have a direct contact with cocaine, they become knowledgeable about strategies and networks for obtaining it that are not subjected to restraining measures such as those implemented for legal substances. Overall, these results seem to show that perceived accessibility is a significant risk factor for adolescents' decision to use cocaine at some point in their lives, but not for the decision to continue to use or to use cocaine regularly.

As stated by Harrison et al. (2000), adolescents access illicit substances through a combination of social sources and purchasing them from people who they know. Therefore, best friends' substance use behaviour is an important variable for understanding adolescents' perceived accessibility to substances. Yet, within the sample assessed within this study, the majority of adolescents (87.99%) reported that their best friends had never used cocaine (see Table 20). In line with studies showing the influence of best friends' illicit substance use behaviour on adolescents' illicit substance use (Eitle, 2005; Fujimoto & Valente, 2012), this study shows that, when compared with adolescents whose best friends have never used cocaine, adolescents whose best friends have used cocaine reported higher lifetime, current, and regular cocaine use (see Table 42). Indeed, when compared with adolescents whose best friends have never used cocaine, the odds of using cocaine at some point in life were 14 times greater if the best friend was an occasional cocaine user (see Table 45). Moreover, the

findings from this study complement previous work by showing that the odds of experimenting with cocaine are greater (i.e., 20 times greater) even among adolescents whose best friends were former cocaine users, which seems to indicate that other factors besides direct modelling may mediate the relationship between best friends' cocaine use and adolescents lifetime use, as adolescents may take the decision to use cocaine even if their best friends stopped using it (see Table 45). The odds associated with having best friends that were regular cocaine users were also higher, but this did not achieve significance, likely due to small sample size. However, according to Allen et al. (2003), the influence of peers on cocaine use is weaker. Other issues regarding best friends' experience with cocaine could be considered besides those that have been included in this study. Among cocaine users, best friends' cocaine use ceased to be significantly associated with current cocaine use after controlling for covariates, again likely due to small sample size. Taken together, these findings confirm best friends' experience with cocaine as a significant risk factor for adolescents' decision to use cocaine at some point in their lives, but not for continuing to use it, which may indicate that other factors, namely the high addictiveness of cocaine, may explain better adolescents' progression to current cocaine use.

Regarding perceived parental approval, among the sample assessed in this study, virtually all adolescents (99.45%) expected their parents to be disapproving of their cocaine use, of which virtually all (98.45%) expected them to be highly disapproving, with prohibition being the most anticipated reaction (see Table 20). In fact, problems with parents were the most anticipated negative consequence from using cocaine (see Table 15). In agreement with studies assessing the influence of parental disapproval on adolescents' use of illicit substances (Bahr et al., 2005; Olsson et al., 2003; Wright & Pemberton, 2004), in this study, adolescents that expected their parents to prohibit or to punish them if knowing that they had used cocaine reported the lowest lifetime and current cocaine use prevalence (see Table 42). Indeed, the odds of having tried cocaine were 33 times lower for adolescents expecting their parents to prohibit them from using cocaine and 50 times lower for those expecting their parents to punish them if knowing that they were using cocaine, when compared with those expecting indifference from parents (see Table 45). An interesting finding, in line to what has been reported by the SAMHSA (2009), is that there was no significant difference in the odds of being a lifetime cocaine user among adolescents expecting their parents to be indifferent and

those expecting their parents to be merely disapproving, which emphasizes the need for parents to be clear and firm in expressing their disapproval towards cocaine use by their children's (see Table 45). No association was found within the univariate analyses between parental cocaine use approval and regular use (see Table 42). On the whole, results seem to indicate that parental cocaine use approval is a significant risk factor for adolescents' decision to use cocaine at some point in their lives but not to continue to use cocaine or use it regularly. Again, the absence of a significant association between perceived parental approval and current and regular cocaine use might indicate that other factors, namely the high addictiveness of cocaine, are more relevant for explaining adolescents' decision to keep using cocaine.

Family structure is another family variable that has been associated with adolescent substance use. Research has shown a relationship between living within a non-intact family and increased use of substances (Brown & Rinelli, 2010; Crawford & Novak, 2008; Georgiades & Boyle, 2007; Gil-Lacruz & Gil-Lacruz, 2010; Lundborg, 2007; Rumpold et al., 2006) and, indeed, results from this study showed that, when compared with adolescents living within an intact family, those living within institutions reported a higher lifetime cocaine use prevalence (see Table 44). However, after controlling for covariates, family structure ceased to be significantly associated with lifetime cocaine use. Moreover, no association was found between family structure and current or regular cocaine use (see Table 44). Overall, results seem to indicate that, in this sample, family structure is not a significant risk factor for adolescent cocaine use.

The same was seen for stressful life events: in line with data from studies reporting a relationship between stressful life events and substance use (Butters, 2002; Dawson et al., 2007; Low et al., 2012), adolescents in this study that had experienced stressful life events reported a higher prevalence of lifetime cocaine use (see Table 44). After controlling for covariates, stressful life events ceased to be significantly associated with lifetime cocaine use. Further, no association was found between stressful life events and current and regular cocaine use (see Table 44). These results suggest that stressful life events are not a significant independent risk factor for adolescents' cocaine use in this sample. This absence of association between stressful life events and cocaine use may be related with the fact that cocaine, being a psychoestimulant substance, is mostly used within recreational settings with

the role of enhancing fun and pleasure and not so much to cope with unpleasant feelings arising from stressful events.

Unlike studies reporting that adolescents from minority groups have lower levels of substance use (Guo et al 2002; Johnston et al., 2011; Nishimura et al., 2005; Watt, 2004), within the sample of adolescents examined in this study, adolescents from minority groups reported higher lifetime cocaine use (see Table 44). However, after controlling for covariates, nationality ceased to be significantly associated with lifetime cocaine use. Furthermore, among cocaine users, no association was found between nationality and current and regular cocaine use (see Table 44). On the whole, in this sample, nationality does not seem to be a significant risk factor for adolescents' cocaine user.

Regarding SES, and in line with studies reporting a higher prevalence of illicit substance use among adolescents from higher SES (Humensky, 2010; Legleye et al., 2012), this study shows that adolescents from a higher SES that have used cocaine are more likely to continue to use it (see Table 44). However, after controlling for covariates, SES ceased to be significantly associated with current cocaine use. In addition, no association was found between SES and lifetime cocaine use, or regular cocaine use (see Table 44). Taken together, results seem to indicate that SES is not a significant independent risk factor for adolescents' cocaine use.

Regarding health-related quality-of-life, although significantly associated with lifetime cocaine use in univariate analysis(see Table 43), in line with studies showing a negative relationship between health-related quality-of-life and cocaine use (Thatcher et al., 2002; Zullig et al., 2001), health-related quality-of-life ceased to be significantly associated with lifetime cocaine use after controlling for civariates. Moreover, amongst cocaine users, no association was found between health-related quality-of-life and current or regular cocaine use (see Table 43). Overall, these results suggest that lower health-related quality-of-life is not a significant risk factor for adolescent cocaine use.

For intrapersonal variables, attitudes have been identified as a relevant factor for the understanding of adolescent substance use by several researchers (Hawkins et al., 1992; O'Connell, et al., 2009; Petraitis et al., 1995; Wright & Pemberton, 2004). Although, as stated by Bridges et al. (2003), little is known about changes in attitudes towards cocaine, this study shows that cocaine was the substance for which the second highest percentage of

adolescents (50.10%) hold negative attitudes, only exceeded by tobacco (see Table 20). Consistent with other studies (Alvaro et al., 2013; Bosson et al., 2012; Epstein et al., 2003; Jiménez et al., 2009; Malmberg et al., 2012; O'Callaghan & Joyce, 2006; Otten et al., 2007; Roek et al., 2010; Vaughan et al., 2011), this study reveals that, compared with adolescents holding negative attitudes towards cocaine, the odds of using cocaine at some point in life were higher among adolescents holding positive attitudes (see Table 42), even after controlling for covariates (see Table 45).

Moreover, the findings from this study complement previous work by showing that, compared with adolescents holding negative attitudes, those holding neutral attitudes had increased odds of using cocaine at some point in their lives (see Table 45). In fact, when compared with students holding negative attitudes towards cocaine, the odds of experimenting with cocaine were eight times greater for students holding positive attitudes, but also four times greater for those holding neutral attitudes (see Table 45). This is a concerning finding considering that nearly half of adolescents within the sample assessed in this study (44.60%) held neutral attitudes towards cocaine (see Table 20), meaning that they are at increased risk of experimenting with it. However, after controlling for covariates, attitudes ceased to be significantly associated with current cocaine use.

Additionally, among current cocaine users, no association was found between attitudes towards cocaine and regular use (see Table 42). Yet, it is noteworthy that none of the adolescents holding negative attitudes towards cocaine reported being either current or regular users. One possible explanation for the loss of significance between attitudes towards cocaine and current use as well as for the absence of association between attitudes towards cocaine and regular use may be that, with continued use, adolescents may need, as claimed by the cognitive dissonance theory (Festinger & Carlsmith, 1959), to adjust their opinions to their overt behaviour so that they act according to their beliefs, attitudes, and values. Overall, these findings support the role of positive attitudes but also of neutral attitudes as a significant risk factor for adolescents' decision to use cocaine at some point in their lives, but not for continuing to use cocaine or using it regularly.

Perceived risk is another intrapersonal variable that has been associated with adolescents' decision to use substances (Wright & Pemberton, 2004). Consistent with studies reporting that

adolescents estimate great risks from substance use (Lundborg&Lindgreen, 2002; Lundborg&Lindgreen, 2004), this study showed that almost all adolescents (98.48%) considered cocaine to have high or medium risks to health (see Table 20), which indicates that adolescents were aware at least of some risks associated with cocaine use.

Further, the findings from this study complement previous work by showing that, compared with tobacco, alcohol, and cannabis, cocaine was considered to be the most harmful substance (see Table 20). However, and even though adolescents considering cocaine to have high risks to health reported lower and current use (see Table 42), after controlling for covariates, cocaine risk perception ceased to be significantly associated with lifetime and current use (see Table 45). One possible justification for the loss of significance between cocaine risk perception and lifetime use might be the overlap between cocaine risk perception and attitudes towards cocaine, which remained significantly associated with lifetime use after controlling for covariates (see Table 45). This argument is reinforced by the fact that some studies (Järvinen&Østergaard, 2011) have used risk perception as an indicator for measuring attitudes. The loss of significance between risk perception and current use might, in turn, be explained by the fact, described by other studies (Kilmer et al., 2007; Leeuw et al., 2008; Miller et al., 2009; Tomar & Hatsukami, 2007) that with continued use, adolescents are less likely to perceive substances as being harmful to their health. Furthermore, no association was found between cocaine risk perception and regular cocaine use (see Table 42), which may be related with the fact that regular substance users are less likely to perceive substances as being harmful to their health (Apostolidis et al., 2006; Chomynova et al., 2009; Swaim, 2003). Taken together, data suggest that cocaine use risk perception was not a significant risk factor for adolescents' cocaine use in the sample assessed within this study.

Besides being the substance most perceived as having risks to health, cocaine was also the substance towards which most adolescents (93.82%) expect problems as a consequence from its use (see Table 20), principally problems with parents (see Table 15). In line with studies showing that adolescents expecting negative outcomes as a result of using substances are less likely to use them (Jones et al., 2001; Kristjansson et al., 2012; Leigh & Stacy, 2004), this study found that adolescents expecting problems from cocaine use reported lower lifetime and current cocaine use prevalence (see Table 42). Nevertheless, after controlling for covariates, expecting problems from cocaine use ceased to be significantly associated with lifetime and

current cocaine use(see Table 45). Furthermore, among current cocaine users no association was shown between expected problems from cocaine use and its regular use (see Table 42). Taken together, these results seem to suggest that expected problems are not a significant risk factor for adolescent cocaine use.

As well as being the substance for which most adolescents expect problems as a consequence of its use, cocaine was also the substance towards which the least adolescents expected benefits (25.05%) (see Table 20). In line with other research describing the role of positive expectations on substance use (Clark et al. 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001), here adolescents expecting positive consequences from cocaine use had the highest lifetimeprevalence (see Table 42). However, after controlling for covariates, expected benefits ceased to be significantly associated with lifetime cocaine use (see Table 45). Moreover, expected benefits were not significantly associated with regular use (see Table 42) which may indicate that, with increasing use, the positive outcomes that may arise as a consequence from cocaine use are no longer relevant for the decision to use it on a regular basis, perhaps due to the establishment of an addictive pattern. Taken together, results seem to indicate that expected benefits are not a consistent risk factor for adolescents' cocaine use.

Table 49 presents a summary of the data regarding the association between proximal variables, health-related quality-of-life, and sociodemographic variables and lifetime, current, and regular cocaine use.

Table 49

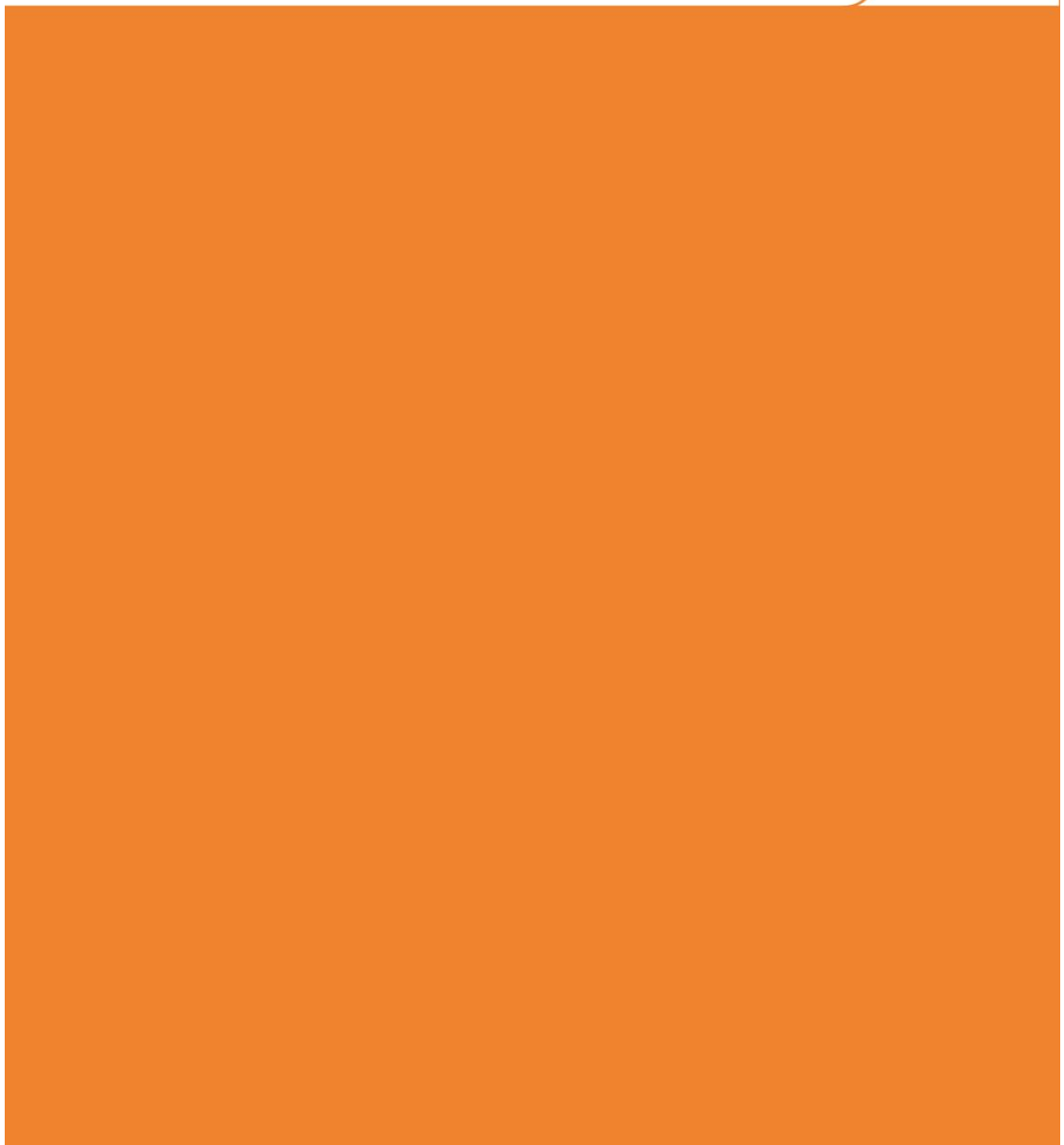
Association Between Proximal, Health-Related Quality-of-Life, and Sociodemographic Variables and Lifetime, Current, and Regular Cocaine Use

Variables	Lifetime Cocaine Use	Current CocaineUse <sup>a</sup>	Regular CocaineUse <sup>b</sup>
<b>Cocaine risk perception</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Attitudes towards cocaine</b>	The odds of lifetime cocaine user were is higher among adolescents holding positive attitudes and even neutral attitudes towards cocaine	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Expected problems from cocaine use</b>	Non-significant after controlling for covariates	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Expected benefits from cocaine use</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Perceived accessibility to cocaine</b>	The odds of lifetime cannabis use were lower among adolescents considering difficult or even fairly easy to access to cocaine	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Best friend's cocaine use behaviour</b>	The odds of lifetime cocaine user were higher among adolescents whose best friends has quitted using cocaine and use cocaine occasionally	Non-significant after controlling for covariates	Significant within the univariate analyses <sup>c</sup>
<b>Parental cocaine use approval</b>	The odds of lifetime cocaine user were lower among adolescents expecting their parents to punish or to prohibit them from using cocaine	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Health-related quality-of-life</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Age</b>	No significant differences between categories	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Gender</b>	Non-significant within the univariate analyses	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Nationality</b>	Non-significant after controlling for covariates	Non-significant within the multivariate analyses	Non-significant within the multivariate analyses
<b>SES</b>	Non-significant within the univariate analyses	Non-significant after controlling for covariates	Non-significant within the univariate analyses
<b>Family structure</b>	Non-significant within the multivariate analyses	Non-significant within the univariate analyses	Non-significant within the univariate analyses
<b>Stressful life events</b>	Non-significant after controlling for covariates	Non-significant within the univariate analyses	Non-significant within the univariate analyses

<sup>a</sup>Data on current cocaine use is limited to adolescents that had ever used cocaine. <sup>b</sup>Data on regular cocaine use is limited to current cocaine users. <sup>c</sup>Considering that *best friends' cocaine use behaviour* was the only variable found to be significantly associated with regular cocaine use in the univariate analyses, the binary logistic regression model was not performed as there were no covariates to control for.



**STUDY 2**



This chapter presents the results and the discussion for study 2 which is aimed to (a) assess prevention interventions' effects on proximal and distal variables; (b) evaluate prevention interventions' effects on substance use; (c) determine which prevention intervention approaches are effective in changing risk factors for substance use; and (d) examine any iatrogenic effects from interventions. Data were collected among a sample of 1,381 adolescents identified as in need of and participating in substance use prevention interventions (i.e., cases) and a sample of 375 adolescents not participating in such interventions (i.e., controls). For a better reading, this chapter is divided into two sections: a first section presenting the results; and a second section presenting the discussion of the main findings.

## **Results**

This section presents the comparative analyses between the pre-test and the post-test measurement points<sup>71</sup> for three sets of variables (i.e. proximal variables, health-related quality-of-life items, and substance use behaviour variables), for the four substances being assessed in this study (i.e. tobacco, alcohol, cannabis, and cocaine) for the case and the control groups. Individuals within the case and the control groups were paired and compared with themselves in two measurement points in time (i.e. pre and post-test) using the Wilcoxon Signed Rank Test. A Chi Square Test was then used to examine if the case and the control groups differed in ratios of individuals changing or retaining reported views or behaviours between these two time periods, which is necessary especially as cases are ageing during the study and changes could be due to changes in age rather than the prevention interventions.

The variables included in this comparative analysis were those that the study 1 multivariate analysis performed within study 1 showed to be significantly associated with at least one of the three types of use (i.e., lifetime, current, and regular use). Two additional variables measuring substance use (i.e., level of substance use and intention to use substances) were also included within the comparative analyses. For a better reading, this section is divided into five sub-sections: a first section presenting the comparative analyses for drinking; a second for smoking; a third for cannabis use; a fourth for cocaine use; and a fifth and last sub-section presenting the comparative analyses for the health-related quality-of-life variable.

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<sup>71</sup>A comparative analyses between the post-test and the follow-up measurement points was not performed considering that agencies did not collect enough follow-up data among controls, thereby invalidating the evaluation of interventions' effects on cases.

## Drinking

Table 50 presents data on the comparison between pre-test and post-test data for drinking and variables that remained significantly associated with at least one type of drinking behaviour (i.e., lifetime, current, and regular use) after controlling for covariates in the multivariate model performed within study 1 (see chapter "Study 1"). Thus, *drinking risk perception, attitudes towards drinking, expected benefits from drinking, perceived accessibility to alcoholic drinks, best friends' drinking behaviour, and parental drinking approval*, were compared between pre-test and post-test measurement points, as well as the level of drinking behaviour and intention to drink.

*Drinking risk perception* showed, among cases, a statistically significant change after intervention ( $Z = -3.38, p = 0.001$ ), whereas among controls the change at the post-test was not statistically significant ( $Z = -17.30, p = 0.084$ ). Hence, for cases, despite over half of adolescents (59.11%) reporting no change on their risk perception about drinking (i.e., pre = post), just less than one-quarter (23.48%) perceived drinking as less risky after intervention than before it (i.e., pre > post), and just over one-sixth (17.41%) perceived drinking as more risky after intervention than before it (i.e., pre < post). The difference between the case and controls was statistically significant ( $\chi^2 = 8.39, p = 0.015$ ), indicating that interventions may have caused a decrease in drinking risk perception among cases.

Regarding *attitudes towards drinking*, results show a statistically significant change among cases after intervention ( $Z = -2.65, p = 0.008$ ), whereas among controls the change at the post-test measurement point was not statistically significant ( $Z = -1.49, p = 0.136$ ). Hence, for cases, even though over half of adolescents (58.24%) have not changed their attitudes (i.e., pre=post), just less than one-quarter (22.95%) reported less positive attitudes towards the use of alcohol after intervention than they did before it (i.e., pre>post), and just over one-sixth (18.81%) reported more positive attitudes towards alcohol use after intervention than before it (i.e., pre>post). However, when comparing the case with the control group, results indicate that the difference between these two groups was not statistically significant ( $\chi^2 = 1.50, p = 0.472$ ). These results indicate that interventions were not effective in contributing to a significant change in positive attitudes towards drinking among cases.

As for *expected benefits from drinking*, data showed a significant change among cases ( $Z = -10.07, p < 0.001$ ) as well as among controls ( $Z = -6.61, p < 0.001$ ). Among cases, just less than half of adolescents (49.04%) began to expect fewer benefits from drinking after intervention than they did before intervention (i.e., pre > post), just over one-quarter (26.14%) began to expect more benefits after intervention than they did before it (i.e., pre < post), and one-quarter (24.82%) did not change their views on the benefits they expected to have as a consequence of drinking (i.e., pre = post). Among controls, just over half of adolescents (54.00%) began to expect fewer benefits from drinking at the post-test than they did at the pre-test (i.e., pre > post), just less than one-quarter (23.14%) reported more expect benefits at the post-test than they did at the pre-test (i.e., pre < post), and just less than one-quarter (22.87%) did not change their views on the expected benefits from drinking (i.e., pre = post). However, these differences between the case and the control groups were not statistically significant ( $\chi^2 = 2.86, p = 0.239$ ), suggesting that interventions did not significantly change positive expectations from drinking among cases.

*Perceived accessibility to alcoholic drinks* showed a statistically significant change among case ( $Z = -10.51, p < 0.001$ ) as well as among controls ( $Z = -3.24, p = 0.001$ ). Hence, for cases, despite over half of adolescents (55.54%) reporting no change on their perceived accessibility to alcoholic drinks (i.e., pre = post), just less than one-third (31.85%) considered that accessing alcoholic drinks was easier after intervention than before it (i.e., pre < post), and just less than one-sixth (12.61%) perceived alcoholic drinks as less accessible after intervention than before it (i.e., pre > post). As for controls, even though just over half of adolescents (52.56%) reported no change in their perceived accessibility of alcoholic drinks (i.e., pre = post), just less than one-third (29.65%) considered that accessing alcoholic drinks was easier at the post-test than at the pre-test (i.e., pre < post), and just over one-sixth (17.79%) perceived alcoholic drinks as less accessible at the post-test than at the pre-test (i.e., pre > post). Still, the difference between the case and controls was not statistically significant ( $\chi^2 = 0.51, p = 0.775$ ), which seems to point to interventions' lack of effectiveness in changing the perception of ease of access to alcoholic drinks among cases.

*Best friend's drinking behaviour* showed, among cases, a significant change ( $Z = -5.49, p < 0.001$ ) as well as among controls ( $Z = -4.16, p < 0.001$ ). Among cases, despite over half of adolescents (60.34%) not reporting any change on their best friends' drinking behaviour (i.e.,

pre = post), one-quarter (24.95%) reported that their best friends drank more after intervention than before it (i.e., pre < post), and just less than one-sixth (14.71%) that their best friends drank less after intervention than before it (i.e., pre > post). As for controls, over half of adolescents (60.31%) did not reported any change on their best friends' drinking behaviour (i.e., pre = post), one-quarter (27.01%) reported that their best friends drank more at the post-test than at the pre-test measurement points (i.e., pre < post), and just less than one-sixth (12.60%) that their best friends drank less at the post-test than at the pre-test measurement points (i.e., pre > post). When comparing these results between the case and controls, data indicated that the difference was not statistically significant ( $\chi^2 = 1.04$ ,  $p = 0.596$ ), suggesting that interventions were not effective in influencing drinking behaviour among best friends nor the selection of best friends among cases.

As for *parental drinking approval*, data showed a statistically significant change among cases ( $Z = -4.78$ ,  $p < 0.001$ ) as well as among controls ( $Z = -3.44$ ,  $p = 0.001$ ). Regarding cases, even though just over half of adolescents (51.83%) reported no change on their views about their parents approval towards drinking (i.e., pre = post), just over one-quarter (28.41%) reported that their parents were less favorable to drinking after intervention than before it (i.e., pre > post), and less than one-quarter (19.76%) that their parents were more favorable after intervention than before it (i.e., pre < post). As for controls, despite just over half of adolescents (53.89%) reported no change on their views about their parents approval towards drinking (i.e., pre = post), just over one-quarter (27.50%) reported that their parents were less favorable to drinking at the post-test than they did at the pre-test (i.e., pre > post), and just over one-sixth (18.61%) that their parents were more favorable at the post-test than at the pre-test (i.e., pre < post). The difference between the case and controls was not statistically significant ( $\chi^2 = 0.51$ ,  $p = 0.776$ ), indicating the lack of interventions' effectiveness in significant change cases' the perception of parental approval of drinking.

The *level of drinking behaviour* showed a significant change among controls at the post-test measurement point ( $Z = -3.45$ ,  $p = 0.001$ ), whereas among cases the change after intervention was not statistically significant ( $Z = -0.43$ ,  $p = 0.668$ ). With respect to controls, over half (57.88%) of adolescents did not changed their drinking behaviour (i.e., pre = post), just over one-quarter (26.63%) reported drinking less at the post-test than at the pre-test (i.e., pre > post), whilst less than one-sixth (15.49%) reported drinking more at the post-test than at the

pre-test (i.e., pre < post). As for cases, even though just over half of adolescents (56.68%) reported no change on their drinking behaviour (i.e., pre = post), just less than one-quarter (22.21%) reported drinking less at the post-test than at the pre-test (i.e., pre > post), whilst less than one-quarter (21.11%) reported drinking more at the post-test than at the pre-test (i.e., pre < post). The difference between the case and controls was statistically significant ( $\chi^2 = 7.10$ ,  $p = 0.029$ ), suggesting that interventions may have had an iatrogenic effect on cases by contributing to a higher increase in their drinking behaviour than the one reported by controls.

With regards to *intention to drink*, data show that there were no statistically significant differences neither among cases ( $Z = -1.75$ ,  $p = 0.080$ ), nor among controls ( $Z = -1.67$ ,  $p = 0.095$ ) between the two measurement points. Likewise, the case and controls did not differ significantly either on their intention to drink ( $Z = 0.29$ ,  $p = 0.865$ ) showing that interventions were not effective in significant change cases' intention to drink.

Table 50

Pre and Post Comparison for Proximal Variables Associated with Drinking and for Drinking Behaviour Variables

Variables	Condition	N	Categories of Change						Z <sup>i</sup>	p <sup>j</sup>	$\chi^2$ <sup>k</sup>	p <sup>l</sup>
			Pre>Post		Pre=Post		Pre<Post					
			n	%	n	%	n	%				
Drinking risk perception <sup>a</sup>	Case	1367	321	23.48	808	59.11	238	17.41	-3.38	0.001	8.39	0.015
	Control	366	63	17.21	223	60.93	80	21.86	-17.30	0.084		
Attitudes towards alcoholic drinks <sup>b</sup>	Case	1377	316	22.95	802	58.24	259	18.81	-2.65	0.008	1.50	0.472
	Control	372	78	20.97	232	62.37	62	16.67	-1.49	0.136		
Expected benefits from drinking <sup>c</sup>	Case	1358	666	49.04	337	24.82	355	26.14	-10.07	< 0.001	2.86	0.239
	Control	363	196	54.00	83	22.87	84	23.14	-6.61	< 0.001		
Perceived accessibility to alcoholic drinks <sup>d</sup>	Case	1372	173	12.61	762	55.54	437	31.85	-10.51	< 0.001	0.51	0.775
	Control	371	66	17.79	195	52.56	110	29.65	-3.24	0.001		
Best friend's drinking behaviour <sup>e</sup>	Case	1054	155	14.71	636	60.34	263	24.95	-5.49	< 0.001	1.04	0.596
	Control	262	33	12.60	158	60.31	71	27.01	-4.16	< 0.001		
Perceived parental drinking approval <sup>f</sup>	Case	1341	265	19.76	695	51.83	381	28.41	-4.78	< 0.001	0.51	0.776
	Control	360	67	18.61	194	53.89	99	27.50	-3.44	0.001		
Level of drinking behaviour <sup>g</sup>	Case	1355	301	22.21	768	56.68	286	21.11	-0.43	0.668	7.10	0.029
	Control	368	98	26.63	213	57.88	57	15.49	-3.45	0.001		
Intention to drink <sup>h</sup>	Case	1036	221	21.33	557	53.77	258	24.90	-1.75	0.080	0.29	0.865
	Control	282	57	20.21	151	53.55	74	26.24	-1.67	0.095		

<sup>a</sup>(1=low; 2=medium; 3=high). <sup>b</sup>(1=negative; 2=neutral; 3=positive). <sup>c</sup>(1=no; 2=yes; 3=do not know). <sup>d</sup>(1=easy; 2=fairly easy; 3=difficult). <sup>e</sup>(1=non-user; 2=quitter; 3=occasional user; 4=regular user). <sup>f</sup>(1=indifference; 2=disapproval; 3=punishment; 4=prohibition). <sup>g</sup>(0=non-drinkers; 1=lifetime drinkers; 3=current drinkers; 4=regular drinkers). <sup>h</sup>(0=no; 1=do not know; 2=yes). <sup>i</sup>Wilcoxon Signed Rank Test. <sup>j</sup>p-value. <sup>k</sup>Chi Square Test. <sup>l</sup>p-value.

## Smoking

Table 51 presents data on the comparison between pre-test and post-test data for smoking and variables that remained significantly associated with at least one type of smoking behaviour (i.e., lifetime, current, and regular use) after controlling for covariates in the multivariate model performed within study 1 (see chapter "Study 1"). Thus, *smoking risk perception*, *attitudes towards tobacco*, *expected benefits from smoking*, *best friends' smoking behaviour*, and *parental smoking approval* were compared between pre-test and post-test measurement points, as well as the level of smoking behaviour and intention to smoke.

*Smoking risk perception* showed a significant change among cases ( $Z = -2.25$ ,  $p = 0.024$ ), but not among controls ( $Z = -1.65$ ,  $p = 0.099$ ). Among cases, even though just less than three-quarters of adolescents (70.84%) did not report any change on their smoking risk perception (i.e., pre = post), just over one-sixth (16.31%) considered smoking as having less risks to health after intervention than before it (i.e., pre > post), and just less than one-sixth (13.21%) considered smoking as more risks to health after intervention than before it (i.e., pre < post). The difference between the case and controls was not statistically significant ( $\chi^2 = 1.90$ ,  $p = 0.388$ ), pointing to the lack of interventions' effectiveness in significantly changing smoking risk perception among cases.

Concerning *attitudes towards tobacco*, results show that among cases the change in attitudes towards tobacco after intervention was not statistically significant ( $Z = -0.92$ ,  $p = 0.360$ ), whereas among controls the change at the post-test measurement point was statistically significant ( $Z = -2.31$ ,  $p = 0.021$ ). Hence, for controls, even though around three-quarters of adolescents (74.19%) had not changed their attitudes (i.e., pre=post), one-sixth (15.86%) reported more positive attitudes towards the use of tobacco at the post-test than they did at the pre-test (i.e., pre<post), and one-tenth (9.95%) reported less positive attitudes towards tobacco use at the post-test than they did at the pre-test (i.e., pre>post). When comparing cases and controls, results indicate that the difference between these two groups was statistically significant ( $\chi^2 = 14.10$ ,  $p < 0.001$ ). These results indicate that interventions may have been effective in contributing to a significant decrease in positive attitudes towards smoking among cases.



*Expected benefits from smoking* showed a significant change among cases ( $Z = -18.77, p < 0.001$ ) as well as among controls ( $Z = -11.59, p < 0.001$ ). Among cases, just over half of adolescents (53.50%) began to expect fewer benefits from smoking after intervention than they did before the intervention (i.e., pre > post), just over one-third (33.53%) did not change their views on the benefits they expected to have as a consequence of smoking (i.e., pre = post), and more than one-tenth (12.97%) began to expect more benefits after intervention than they did before it (i.e., pre < post). Among controls, more than half of adolescents (61.02%) began to expect fewer benefits from smoking at the post-test than they did at the pre-test (i.e., pre > post), just less than one-third (30.14%) did not change their views on the expected benefits from smoking (i.e., pre = post), and less than one-tenth (8.77%) reported more expected benefits at the post-test than they did at the pre-test (i.e., pre < post). The difference between the case and control group was statistically significant ( $\chi^2 = 8.23, p = 0.016$ ), suggesting that interventions may have had a negative effect on cases by contributing to a higher increase in positive expectations than the one reported by controls.

Concerning *best friend's smoking behaviour* there was a significant change among cases ( $Z = -5.99, p < 0.001$ ) as well as among controls ( $Z = -6.05, p < 0.001$ ). Among cases, even though over half of adolescents (61.33%) did not report any change in their best friends' smoking behaviour (i.e., pre = post), one-quarter (25.16%) reported that their best friends smoke more after intervention than before it (i.e., pre < post), and just less than one-sixth (13.51%) that their best friends smoke less after intervention than before it (i.e., pre > post). As for controls, despite over half of adolescents (65.05%) not reporting any change in their best friends' smoking behaviour (i.e., pre = post), one-quarter (27.83%) reported at the post-test that their best friends smoke more than at the pre-test measurement points (i.e., pre < post), and just less than one-tenth (7.12%) that their best friends smoke less at the post-test than at the pre-test measurement points (i.e., pre > post). When comparing these results between controls and cases, data indicated that there was a statistically significant difference ( $\chi^2 = 9.37, p = 0.009$ ), suggesting that interventions may have contributed to a decrease in smoking behaviour among adolescents' best friends or that adolescents select other peers, who are less experienced with tobacco, as their best friends.

Regarding *perceived parental smoking approval*, data showed that there was a statistically significant change among cases after intervention ( $Z = -4.80, p < 0.001$ ), whereas among

controls the change at the post-test was not statistically significant ( $Z = -1.66, p = 0.097$ ). Regarding cases, even though over half of adolescents (59.64%) reported no change on their views about their parents approval towards smoking (i.e., pre = post), just less than one-quarter (23.99%) reported that their parents were more favorable to smoking after intervention than before it (i.e., pre > post), and one-sixth (16.37%) that their parents were less favorable after intervention than before it (i.e., pre < post). Despite these changes among cases, the difference between the case and controls was not statistically significant ( $\chi^2 = 0.94, p = 0.625$ ), which seems to point to interventions' lack of effectiveness in significantly changing cases' perception of parental smoking approval.

The *level of smoking behaviour* showed a significant change among controls at the post-test measurement point ( $Z = -2.78, p = 0.005$ ), whereas among cases the change after intervention was not statistically significant ( $Z = -1.14, p = 0.255$ ). Among cases, despite just over three-quarters (78.53%) of adolescents not changing their smoking behaviour (i.e., pre = post), just less than one-sixth (14.40%) reported smoking more at the post-test than they did at the pre-test (i.e., pre < post), whilst just less than one-sixth (13.15%) reported smoking less at the post-test than at the pre-test (i.e., pre > post). As for controls, despite just over three-quarters (78.53%) of adolescents not changing their smoking behaviour (i.e., pre = post), just less than one-sixth (15.58%) reported smoking more at the post-test than they did at the pre-test (i.e., pre < post), whereas less than one-tenth (7.70%) reported smoking less at the post-test than at the pre-test (i.e., pre > post). The difference between the case and controls was statistically significant ( $\chi^2 = 11.41, p = 0.003$ ), showing that interventions may have contributed to a significant decrease in smoking behaviour among cases.

As for *intention to smoke*, data showed that there were no statistically significant changes among either the case ( $Z = -1.05, p = 0.295$ ), or controls ( $Z = -0.86, p = 0.390$ ) between the two measurement points. Likewise, the case and controls did not differ significantly either on their intention to smoke ( $\chi^2 = 5.21, p = 0.074$ ), suggesting a lack of effectiveness of interventions in significantly changing cases' intention to smoke.

Table 51

Pre and Post Comparison for Proximal Variables Associated with Smoking and for Smoking Behaviour Variables

Variables	Condition	N	Categories of Change						Z <sup>h</sup>	p <sup>i</sup>	$\chi^2$ <sup>k</sup>	p <sup>l</sup>
			Pre>Post		Pre=Post		Pre<Post					
			n	%	n	%	n	%				
Smoking risk perception <sup>a</sup>	Case	1355	221	16.31	955	70.84	179	13.21	-2.25	0.024	1.90	0.388
	Control	367	50	13.62	282	76.84	35	9.54	-1.65	0.099		
Attitudes towards tobacco <sup>b</sup>	Case	1377	233	16.92	892	64.78	252	18.30	-0.92	0.360	14.10	< 0.001
	Control	372	37	9.95	276	74.19	59	15.86	-2.31	0.021		
Expected benefits from smoking <sup>c</sup>	Case	1357	726	53.50	455	33.53	176	12.97	-18.77	< 0.001	8.23	0.016
	Control	365	223	61.02	110	30.14	32	8.77	-11.59	< 0.001		
Best friends' smoking behaviour <sup>d</sup>	Case	1125	152	13.51	690	61.33	283	25.16	-5.99	< 0.001	9.37	0.009
	Control	309	22	7.12	201	65.05	86	27.83	-6.05	< 0.001		
Parental smoking approval <sup>e</sup>	Case	1338	321	23.99	798	59.64	219	16.37	-4.80	< 0.001	0.94	0.625
	Control	368	82	22.28	219	59.51	67	18.21	-1.66	0.097		
Level of smoking behaviour <sup>f</sup>	Case	1361	179	13.15	970	71.27	212	15.58	-1.14	0.255	11.41	0.003
	Control	368	26	7.07	289	78.53	53	14.40	-2.78	0.005		
Intention to smoke <sup>g</sup>	Case	1060	197	18.59	649	61.22	214	20.19	-1.05	0.295	5.21	0.074
	Control	292	43	14.73	200	68.49	49	16.78	-0.86	0.390		

<sup>a</sup>(1=low; 2=medium; 3=high). <sup>b</sup>(1=negative; 2=neutral; 3=positive). <sup>c</sup>(1=no; 2=yes; 3=do not know). <sup>d</sup>(1=non-user; 2=quitter; 3=occasional user; 4=regular user). <sup>e</sup>(1=indifference; 2=disapproval; 3=punishment; 4=prohibition). <sup>f</sup>(0=non-smokers; 1=lifetime smokers; 3=current smokers; 4=regular smokers). <sup>g</sup>(0=no; 1=do not know; 2=yes). <sup>h</sup>Wilcoxon Signed Rank Test. <sup>i</sup>p-value. <sup>k</sup>Chi Square Test. <sup>l</sup>p-value.

## Cannabis Use

Table 52 presents data on the comparison between pre-test and post-test data for cannabis use and variables that remained significantly associated with at least one type of cannabis use behaviour (i.e., lifetime, current, and regular use) after controlling for covariates in the multivariate model performed within study 1 (see chapter "Study 1"). Thus, *attitudes towards cannabis*, *expected benefits from cannabis use*, *perceived accessibility to cannabis*, *best friends' cannabis use behaviour*, and *parental cannabis use approval* were compared between pre-test and post-test measurement points, as well as the level of cannabis use behaviour and intention to use cannabis.

Regarding *attitudes towards cannabis*, results show no statistically significant change among either the cases ( $Z = -0.11$ ,  $p = 0.909$ ) or controls ( $Z = -1.29$ ,  $p = 0.196$ ). Likewise, the difference between these two groups was not statistically significant ( $\chi^2 = 2.63$ ,  $p = 0.269$ ), which suggests that interventions were not effective in significantly changing positive attitudes towards cannabis among cases.

Concerning *expected benefits from cannabis use*, data showed a significant change among cases ( $Z = -5.82$ ,  $p < 0.001$ ) and controls ( $Z = -3.37$ ,  $p = 0.001$ ). Among cases, over one-third (39.41%) began to expect fewer benefits from cannabis use after intervention than they did before intervention (i.e., pre > post), over one-third (37.88%) did not change their views on the expected benefits as a consequence of cannabis use (i.e., pre = post), and just less than one-quarter (22.61%) began to expect more benefits after intervention than they did before it (i.e., pre < post). Among controls, just less than half of adolescents (45.83%) began to expect fewer benefits from cannabis use at the post-test than they did at the pre-test (i.e., pre > post), just over one-quarter of adolescents (28.33%) did not change their views on the benefits they expected from cannabis use (i.e., pre = post), and just over one-quarter (25.83%) reported more expected benefits at the post-test than they did at the pre-test (i.e., pre < post). These differences between controls and cases were statistically significant ( $\chi^2 = 7.44$ ,  $p = 0.024$ ), indicating that interventions may have had a negative effect on cases by contributing to a significant increase in the expected benefits from using cannabis.

*Perceived accessibility to cannabis* showed a statistically significant change among cases ( $Z = -8.77$ ,  $p = 0.000$ ) as well as among controls ( $Z = -3.36$ ,  $p = 0.001$ ). Hence, for cases, despite

over half of adolescents (54.88%) reporting no change in their perceived accessibility to cannabis (i.e., pre = post), one-third (32.98%) considered that access to cannabis was easier after intervention than before it (i.e., pre < post), and just less than one-sixth (12.14%) perceived cannabis as less accessible after intervention than before it (i.e., pre > post). As for controls, even though over half of adolescents (57.14%) reported no change on their perceived accessibility to cannabis (i.e., pre = post), just less than one-third (28.57%) considered that accessing to cannabis was easier at the post-test than at the pre-test (i.e., pre < post), and just over one-sixth (14.29%) perceived cannabis as less accessible at the post-test than at the pre-test (i.e., pre > post). Still, the difference between cases and controls was not statistically significant ( $\chi^2 = 1.97$ ,  $p = 0.373$ ), pointing to interventions' lack of effectiveness in significantly changing cases' perception of ease of access to cannabis.

*Best friend's cannabis use behaviour* showed no statistically significant change, neither among cases ( $Z = -1.56$ ,  $p = 0.120$ ), nor among controls ( $Z = -1.51$ ,  $p = 0.132$ ). Similarly, the difference between these two groups was not statistically significant ( $\chi^2 = 2.57$ ,  $p = 0.277$ ), showing that interventions were not effective in significantly influencing the cannabis use behaviour among cases' best friends nor the selection of best friends among cases.

Likewise, *perceived parental cannabis use approval* showed no statistically significant change, neither among cases ( $Z = -0.46$ ,  $p = 0.644$ ), nor among controls ( $Z = -1.63$ ,  $p = 0.103$ ). Likewise, the difference between these two groups was not statistically significant ( $\chi^2 = 3.68$ ,  $p = 0.159$ ), suggesting that interventions were not effective in significantly changing adolescents' perception of parental cannabis use approval.

The *level of cannabis use* showed no statistically significant change, neither among cases ( $Z = -0.25$ ,  $p = 0.806$ ), nor among controls ( $Z = -1.50$ ,  $p = 0.133$ ). Similarly, the difference between cases and controls was not statistically significant ( $\chi^2 = 4.47$ ,  $p = 0.107$ ), indicating that interventions were not effective in significantly changing cannabis use among cases.

With regards to *intention to use cannabis*, data show that there were no statistically significant changes among either cases ( $Z = -0.65$ ,  $p = 0.518$ ) or controls ( $Z = -1.19$ ,  $p = 0.233$ ) between the two measurement points. Likewise, cases and controls did not differ significantly either on their intention to use cannabis ( $Z = 2.49$ ,  $p = 0.289$ ), pointing to interventions' lack of effectiveness in significantly changing cases' intention to use cannabis.

Table 52

*Pre and Post Comparison for Proximal Variables Associated with Cannabis Use and for Cannabis Use Behaviour Variables*

Variables	Condition	N	Categories of Change						Z <sup>h</sup>	p <sup>i</sup>	$\chi^2_j$	P <sup>k</sup>
			Pre>Post		Pre=Post		Pre<Post					
			n	%	n	%	n	%				
Attitudes towards cannabis <sup>a</sup>	Case	861	179	20.79	500	58.07	182	21.14	-0.11	0.909	2.63	0.269
	Control	243	52	21.40	151	62.14	40	16.46	-1.29	0.196		
Expected benefits from cannabis use <sup>b</sup>	Case	858	339	39.51	325	37.88	194	22.61	-5.82	< 0.001	7.44	0.024
	Control	240	110	45.83	68	28.33	62	25.83	-3.37	0.001		
Perceived accessibility to cannabis <sup>c</sup>	Case	840	102	12.14	461	54.88	277	32.98	-8.77	< 0.001	1.97	0.373
	Control	238	34	14.29	136	57.14	68	28.57	-3.36	0.001		
Best friend's cannabis use behaviour <sup>d</sup>	Case	697	50	7.17	580	83.21	67	9.61	-1.56	0.120	2.57	0.277
	Control	205	10	4.88	180	87.81	15	7.32	-1.51	0.132		
Perceived parental cannabis use approval <sup>e</sup>	Case	827	137	16.57	525	63.48	165	19.95	-1.63	0.103	3.68	0.159
	Control	241	41	17.01	165	68.46	35	14.52	-0.46	0.644		
Level of cannabis use <sup>f</sup>	Case	1344	66	4.91	1222	90.92	56	4.17	-0.25	0.806	4.47	0.107
	Control	368	16	4.35	345	93.75	7	1.90	-1.50	0.133		
Intention to use cannabis <sup>g</sup>	Case	537	75	13.97	377	70.21	85	15.83	-0.65	0.518	2.49	0.289
	Control	147	28	19.05	99	67.35	20	13.61	-1.19	0.233		

<sup>a</sup>(1=negative; 2=neutral; 3=positive). <sup>b</sup>(1=no; 2=yes; 3=do not know). <sup>c</sup>(1=easy; 2=fairly easy; 3=difficult). <sup>d</sup>(1=non-user; 2=quitter; 3=occasional user; 4=regular user). <sup>e</sup>(1=indifference; 2=disapproval; 3=punishment; 4=prohibition). <sup>f</sup>(0=non-cannabis user; 1=lifetime cannabis user; 3=current cannabis user; 4=regular cannabis user). <sup>g</sup>(0=no; 1=do not know; 2=yes). <sup>h</sup>Wilcoxon Signed Rank Test. <sup>i</sup>p-value. <sup>j</sup>Chi Square Test. <sup>k</sup>p-value.

## Cocaine Use.

Table 53 presents data on the comparison between pre-test and post-test data for cocaine use and variables that remained significantly associated with at least one type of cocaine use behaviour (i.e., lifetime, current, and regular use) after controlling for covariates in the multivariate model performed within study 1 (see chapter "Study 1"). Thus, attitudes towards cocaine, perceived accessibility to cocaine, best friends' cocaine use behaviour, and perceived parental cocaine use approval were compared between pre-test and post-test measurement points, as well as the level of cocaine use behaviour and intention to use cocaine.

*Attitudes towards cocaine* showed no statistically significant change, neither among cases ( $Z = -0.63$ ,  $p = 0.529$ ) nor among controls ( $Z = -0.29$ ,  $p = 0.770$ ). Likewise, the difference between these two groups was not statistically significant ( $\chi^2 = 4.73$ ,  $p = 0.094$ ), suggesting that interventions were not effective in significantly changing positive attitudes towards cocaine among cases.

*Perceived accessibility to cocaine* showed a statistically significant change among cases ( $Z = -3.99$ ,  $p = 0.000$ ), whereas among controls the change was not significantly different ( $Z = -0.80$ ,  $p = 0.424$ ). Hence, for cases, despite over half of adolescents (60.32%) reporting no change on their perceived accessibility to cocaine (i.e., pre = post), one-quarter (24.75%) considered that accessing to cocaine was easier after intervention than before it (i.e., pre < post), and just less than one-sixth (14.93%) perceived cocaine as less accessible after intervention than before it (i.e., pre > post). Still, the difference between the case and controls was not statistically significant ( $\chi^2 = 1.58$ ,  $p = 0.455$ ), indicating that interventions were not effective in significantly changing cases' perception of ease of access to cocaine.

*Best friend's cocaine use behaviour* showed no statistically significant change among either cases ( $Z = -1.39$ ,  $p = 0.165$ ) or controls ( $Z = -1.71$ ,  $p = 0.087$ ). Likewise, the difference between these two groups was not statistically significant ( $\chi^2 = 3.54$ ,  $p = 0.171$ ), which points to the lack of interventions' effectiveness in significantly changing best friends cocaine use behaviour nor the selection process of best friends among cases.

As for *perceived parental cocaine use approval*, results showed that there was no statistically significant change among either cases ( $Z = -0.62$ ,  $p = 0.533$ ) or controls ( $Z = -0.58$ ,  $p = 0.560$ ). Similarly, the difference between these two groups was not statistically significant ( $\chi^2 = 0.83$ ,  $p =$

0.659), indicating that interventions were not effective in significantly changing cases' perception of parental approval of cocaine use.

The *level of cocaine* use showed no statistically significant change among either cases ( $Z = -0.37$ ,  $p = 0.715$ ) or controls ( $Z = -1.67$ ,  $p = 0.096$ ). Likewise, the difference between these two groups was not statistically significant ( $\chi^2 = 2.43$ ,  $p = 0.297$ ), showing that interventions were not effective in significantly changing cocaine use among cases.

With regards to *intention to use cocaine*, data show a statistically significant change among controls ( $Z = -2.11$ ,  $p = 0.035$ ), whereas among cases the change was not statistically significant ( $Z = -1.68$ ,  $p = 0.094$ ). Hence, for controls, despite over three-quarters of adolescents (79.02%) reporting no change on their intention to use cocaine (i.e., pre = post), just less than one-tenth (8.19%) became more willing to use cocaine at the post-test than they were at the pre-test, and just over than one-sixth (15.79%) became less willing to use cocaine than they were at the pre-test (i.e., pre > post). The difference between cases and controls was statistically significant ( $\chi^2 = 8.53$ ,  $p = 0.014$ ) suggesting that interventions may have caused an iatrogenic effect on cases by contributing to a higher intention to use cocaine than the one reported by controls.



Table 53

*Pre and Post Comparison for Proximal Variables Associated with Cocaine Use and for Cocaine Use Variables*

Variables	Condition	N	Categories of Change						Z <sup>g</sup>	p <sup>h</sup>	$\chi^2$ <sup>i</sup>	p <sup>j</sup>
			Pre>Post		Pre=Post		Pre<Post					
			n	%	n	%	n	%				
Attitudes towards cocaine <sup>a</sup>	Case	1024	195	19.04	615	60.06	214	20.90	-0.63	0.529	4.73	0.094
	Control	293	49	16.72	196	66.89	48	16.38	-0.29	0.770		
Perceived accessibility to cocaine <sup>b</sup>	Case	998	149	14.93	602	60.32	247	24.75	-3.99	< 0.001	1.58	0.455
	Control	283	48	16.96	174	61.48	61	21.55	-0.80	0.424		
Best friend's cocaine use behaviour <sup>c</sup>	Case	861	19	2.21	818	95.01	24	2.79	-1.39	0.165	3.54	0.171
	Control	248	1	0.40	240	96.77	7	2.82	-1.71	0.087		
Perceived parental approval <sup>d</sup>	Case	985	155	15.74	669	67.92	161	16.35	-0.62	0.533	0.83	0.659
	Control	285	49	17.19	195	68.42	41	14.39	-0.58	0.560		
Level of cocaine use <sup>e</sup>	Case	1348	15	1.11	1319	97.85	14	1.04	-0.37	0.715	2.43	0.297
	Controls	359	1	0.28	353	98.33	5	1.39	-1.67	0.096		
Intention to use cocaine <sup>f</sup>	Case	586	50	8.53	468	79.86	68	11.60	-1.68	0.094	8.53	0.014
	Controls	171	27	15.79	130	76.02	14	8.19	-2.11	0.035		

<sup>a</sup>(1=negative; 2=neutral; 3=positive). <sup>b</sup>(1=easy; 2=fairly easy; 3=difficult). <sup>c</sup>(1=non-user; 2=quitter; 3=occasional user; 4=regular user). <sup>d</sup>(1=indifference; 2=disapproval; 3=punishment; 4=prohibition). <sup>e</sup>(0=non-cocaine users; 1=lifetime cocaine users; 3=current cocaine users; 4=regular cocaine users). <sup>f</sup>(0=no; 1=do not know; 2=yes). <sup>g</sup>Wilcoxon Signed Rank Test. <sup>h</sup>p-value. <sup>i</sup>Chi Square Test. <sup>j</sup>p-value.

### **Health-Related Quality-of-Life.**

*Health-related quality-of-life variable* did not show a statistically significant change among either cases ( $Z = -1.82, p = 0.069$ ) or controls ( $Z = -1.80, p = 0.072$ ). Likewise, the difference between these two groups was not statistically significant ( $\chi^2 = 4.29, p = 0.117$ ), suggesting that interventions were not effective in significantly changing health-related quality-of-life among cases.

### **Discussion**

This section presents the discussion of the comparative analyses for pre and post-test analyses of the variables that the multivariate analyses performed within study 1 have shown to be associated with drinking<sup>72</sup>, smoking<sup>73</sup>, cannabis use<sup>74</sup>, and cocaine use<sup>75</sup>. Given that there are similar findings across the four substances assessed within the research, the results are going to be presented for each variable included within study 2. This chapter is then divided into nine sub-sections, each presenting data on the following variables<sup>76</sup>: risk perception, attitudes, expected benefits, perceived accessibility, best friends' substance use behaviour, parental substance use approval, level of use, intention to use, and health-related quality-of-life.

Considering the impact that substance use may have on adolescents' physical, mental, and social well-being that may hinder them from achieving the developmental transitions they are supposed to, decreasing substance use prevalence among adolescents has been a purpose of strategies implemented in most European countries. In Portugal, along with environmental strategies aimed at controlling supply reduction (Lei 30/2000; Lei 37/2007), most implemented strategies aimed at preventing substance use among adolescents are universal prevention interventions, mainly delivered within schools (EMCDDA, 2011a; IDT, IP National Report, 2011).

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<sup>72</sup>See Table 50

<sup>73</sup>See Table 51

<sup>74</sup>See Table 52

<sup>75</sup>See Table 53

<sup>76</sup> Expected problems were not included within study 2 as study 1 has shown that it was not significantly associated with any of the substances assessed within this research.

Based on monitoring information on substance use prevention interventions implemented in EU Member States, the EMCDDA (2011a) concluded that information provision seems to be the most employed approach, including in Portugal. In line with this finding, within the sample of 15 Portuguese agencies delivering prevention interventions assessed in this study, informative sessions on substances were delivered by two-thirds of agencies (66.67%).

### **Risk Perception**

Despite research showing that adolescents are aware, and sometimes even overestimate the risks associated with substance use (Lundborg & Lindgreen, 2002; Lundborg & Lindgreen, 2004; Reyna & Fairley, 2006), the most common approach to prevention is to provide information about the risks associated with substance use (EMCDDA, 2009a), with the underlying assumption that, if adolescents are informed, they will decide rationally not to use substances (Karlsson, 2008). However, even if information influences knowledge and attitudes (Booth et al., 1999; White & Pitts, 1998), there is no evidence showing that information alone has an impact on substance use behaviour (EMCDDA, 2008c). Rather, it may increase substance use by boosting curiosity and enhancing knowledge about how to identify, obtain, and use substances (Flay, 2000).

From the comparison of pre and post-test data on drinking risk perception, this research has found evidence that over half of both cases (59.11%) and controls (60.93%) had not changed their risk perception about drinking. From those adolescents that have changed their perception on the risks associated with drinking, a higher proportion of controls (21.86%) than cases (17.41%) reported an increase in their drinking risk perception and, conversely, a higher proportion of cases (23.48%) than controls (17.21%) reported an decrease in drinking risk perception. The change among cases ( $Z = -3.38, p = 0.001$ ) and the difference between cases and controls ( $\chi^2 = 8.39, p = 0.015$ ) were statistical significant. Considering research showing that, with increasing age, adolescents perceive substance use as less risky (Lundborg, 2007; Lundborg & Lindgreen, 2002; NSDUH, 2009), one possible explanation for the fact that, at the post-test, both cases and controls reported a decrease in risk perception can, indeed, be age. Given that controls are, on average, a year older than cases, the fact that a higher proportion of cases reported to perceive reduced risks from drinking (23.48%) than controls (17.21%),

suggests that prevention interventions may have caused a negative effect by leading a higher proportion of cases than controls to perceive less risks from drinking. Taking into consideration Lundborg and Lindgreen's finding (2002) that adolescents overestimate some risks associated with drinking, one possible explanation for the higher proportion of cases reporting to perceive less risks from drinking might be that interventions, by providing adolescents with accurate information on alcohol effects, might have contributed to them perceiving drinking as having less risks to health at the post-test than they did before. Krank et al. (2010) have even found that information deliberately and explicitly presented as a myth (a strategy that is sometimes used within informative sessions) increases the likelihood that the content was perceived as a fact.

Regarding smoking risk perception, the comparison of pre and post-test, showed that at the post-test, around three-quarters of adolescents did not change their risk perception about smoking, with the proportion of those who have not change their risk perception being higher among controls (76.84%) than cases (70.84%). From those that have changed their risk perception on smoking, a marginally higher proportion of cases (16.31%) than controls (13.62%) reported a decrease in smoking risk perception, which could be considered a negative effect from interventions, particularly considering that cases were, on average, a year younger than controls. However, the proportion of those who reported an increase in their smoking risk perception was also higher among cases (13.21%) than controls (9.54%). Yet, even though the change among cases was statistically significant ( $Z = -2.25$ ,  $p = 0.024$ ), the difference between cases and controls did not reach statistical significance ( $\chi^2 = 1.90$ ,  $p = 0.388$ ). Overall, these results indicate that prevention interventions were not effective in contributing to a significant change in smoking risk perception among cases.

### **Attitudes**

Research has consistently shown that adolescents who hold more positive attitudes towards substance use are more likely to report substance use (Alvaro et al., 2013; Bosson et al., 2012; Epstein et al., 2003; Jiménez et al., 2009; Malmberg et al., 2012; O'Callaghan & Joyce, 2006; Otten et al., 2007; Roek et al., 2010; Vaughan et al., 2011). Further, some studies have shown that giving information on substances can increment knowledge which, in turn, may

increase negative attitudes towards substance use (Botvin, 2000; Michaelidou, Dibb, & Ali, 2010; Tobler et al., 2000).

From the comparison of pre and post-test data on attitudes towards drinking, this research found evidence that, at the post-test, over half of adolescents had not changed their attitudes towards drinking with a higher proportion seen among controls (62.37%) than cases (58.24%). From those adolescents that have changed their attitudes towards drinking, for both cases and controls, a greater proportion (cases 22.95%; controls 20.97%) reported a decrease in positive attitudes towards drinking than an increase (cases 18.81%; controls 16.67%). The similar proportion of cases and controls reporting a decrease in positive attitudes towards drinking indicate that factors external to the intervention had an influence on this outcome. However, even though the change among cases was statistically significant ( $Z = -2.65$ ,  $p = 0.008$ ), the difference between cases and controls was not ( $\chi^2 = 1.50$ ,  $p = 0.472$ ). On the whole, these findings indicate that prevention interventions were not effective in contributing to a significant change in cases' positive attitudes towards drinking.

With respect to attitudes towards smoking, the comparison of pre and post-test data reveals that, at the post-test, over two-thirds of adolescents did not change their attitudes towards smoking, with the proportion being higher among controls (74.19%) than cases (64.78%). From those adolescents that have changed their attitudes towards smoking, the highest proportion of cases (18.30%) and controls (15.86%) reported an increase in positive attitudes towards smoking. This increase can be attributable to age as evidence shows that attitudes towards tobacco become more positive with increasing age (Freeman et al., 2005; Piko, 2001). Complementarily, more cases (16.92%) than controls (9.95%) reported a decrease in positive attitudes towards smoking. Even though the change among cases did not reach statistical significance ( $Z = -0.92$ ,  $p = 0.360$ ), the statistically significant difference between cases and controls ( $\chi^2 = 14.10$ ,  $p < 0.001$ ) suggest that prevention interventions may have been effective in contributing to a significant decrease in positive attitudes towards smoking among cases.

As for the comparison of pre and post-test data on attitudes towards cannabis, results indicate that, at the post-test, over half of adolescents did not change their attitudes towards cannabis use, with a higher proportion among controls (62.14%) than cases (58.07%). From those adolescents that have changed their attitudes towards cannabis use, a marginally higher

proportion of controls (21.40%) than cases (20.79%) reported an decrease in positive attitudes towards cannabis use. Complementarily, a higher proportion of cases (21.14%) than controls (16.46%) reported an increase in positive attitudes towards cannabis use. However, neither the change among cases ( $Z = -0.11$ ,  $p = 0.909$ ) nor among controls ( $Z = -1.29$ ,  $p = 0.196$ ) was statistically significant, as neither the difference between cases and controls ( $\chi^2 = 2.63$ ,  $p = 0.296$ ), suggesting that prevention interventions were not effective in contributing for a significant change in positive attitudes towards cannabis use among cases.

By comparing pre and post-test data on attitudes towards cocaine, over half of adolescents did not change their attitudes towards cocaine use, the proportion being higher among controls (66.89%) than cases (60.06%). From those adolescents that have changed their attitudes towards cocaine use, a marginally higher proportion of cases (19.04%) than controls (16.72%) reported a decrease in positive attitudes towards cocaine use. Yet, a higher proportion of cases (20.90%) than controls (16.38%) also reported an increase in positive attitudes towards cocaine use. Considering that neither the change among cases ( $Z = -0.63$ ,  $p = 0.529$ ) nor among controls ( $Z = -0.29$ ,  $p = 0.770$ ) was statistically significant, as neither the difference among cases and controls ( $\chi^2 = 4.73$ ,  $p = 0.094$ ), there is evidence that prevention interventions were not effective in contributing to a significant change in cases' positive attitudes towards cocaine use.

### **Expected Benefits**

Positive expectancies are thought to be associated with increased substance use (Aarons et al., 2001; Buckner & Schmidt, 2008; Clark et al., 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001; Kristjansson et al., 2012). Hence, interventions aimed at preventing substance use often highlight the negative consequences of using substances by providing information on the short term social and behavioural effects of substance use as well as on the long term physiological effects (Pruitt, 1993; Tobler et al., 2000). Hence, it seems reasonable to presuppose that providing adolescents with information about the negative consequences of substance use may contribute to deconstruct some of the benefits that they associate with substances and, therefore, decrease the risk for their substance use.

The comparison of pre and post-test data on expected benefits from drinking indicates that, at the post-test, around one-fourth of adolescents did not change their perception on expected benefits from drinking, with the proportion similar among cases (24.82%) and controls (22.87%). From those that have changed their expectations on benefits from drinking, the highest proportion of cases (49.04%) and controls (54.00%) reported a decrease in the expected benefits from drinking. This decrease reported by cases and controls may indicate that factors external to interventions had an impact on both groups leading them to perceive less benefits from drinking. A greater proportion of cases (26.14%) than controls (23.14%) reported to expect more benefits from drinking. These findings could have been interpreted as a negative effect from interventions considering that the change on expected benefits from drinking has reached statistical significance among cases ( $Z = -10.07, p < 0.001$ ) as well as among controls ( $Z = -6.61, p < 0.001$ ). However, given that the difference between cases and controls was not statistically significant ( $\chi^2 = 2.86, p = 0.239$ ), it can be assumed that prevention interventions were not effective in significantly changing the positive expectations from drinking among cases.

Regarding expected benefits from smoking, the comparison of pre and post-test indicates that, at the post-test, around one-third of both cases (33.53%) and controls (30.14%) had not changed their perception on the expected benefits from smoking. From those that have changed their expectations, the highest proportion of cases (53.50%) and controls (61.02%) reported a decrease in the expected benefits from smoking. Both the change among cases ( $Z = -18.77, p < 0.001$ ) and controls ( $Z = -11.59, p < 0.001$ ) reached statistical significance. Considering research showing that, from 12 years of age onwards, adolescents start to perceive the benefits from using substances as more probable than problems (O'Connor et al., 2007; Alfonso & Dunn, 2007), including for smoking (Chassin et al., 2001), the unexpected decrease in positive expectations from smoking seems to indicate that factors external to the intervention had an impact on cases and controls by leading them to perceive less benefits from smoking. One possible external factor might have been the entry into force of the a new law addressing smoking (Lei 37/2007) that has established demand reduction measures such as the inclusion of messages on tobacco packages about the negative effects of smoking on health. In effect, large sample studies assessing Portuguese adolescents (Feijão et al., 2007; Feijão et al., 2011; Hibell et al., 2009; Hibell et al., 2012) report a decrease in lifetime smoking

since 2007, which eventually may corroborate the argument of an environmental strategy impacting smoking. Assuming that the decrease in expected benefits from smoking was an effect from an environmental strategy, the lower proportion of cases (53.50%) than controls (61.02%) reporting, at the post-test, to expect less benefits from smoking, aside with the statistically significant difference between cases and controls ( $\chi^2 = 8.23, p = 0.016$ ), suggest that prevention interventions may have had a negative effect on expected benefits from smoking among vulnerable adolescents by lessening the impact of an eventual environmental strategy put in place in the period of time relevant for this research.

The comparison of pre and post-test data on expected benefits from cannabis indicates that, at the post-test, around one-third of adolescents did not change their perception on expected benefits from cannabis use, with the proportion being higher among cases (37.38%) than controls (28.33%). From those that have changed their expectations on benefits from cannabis, the highest proportion of cases (39.51%) and controls (45.83%) reported a decrease in the expected benefits from using cannabis. The change was statistically significant for cases ( $Z = -5.82, p < 0.001$ ) and controls ( $Z = -3.37, p = 0.001$ ). Again, considering research showing that, from 12 years of age onwards, adolescents start to perceive the benefits from using substances as more probable than the expected problems (Chassin et al., 2001; O'Connor et al., 2007), including for cannabis use (Alfonso & Dunn, 2007), it can be argued that this unexpected decrease in expected benefits from cannabis use displayed by cases and controls might be the due to factors external to the intervention. At post-test, a lower proportion of cases (39.51%) than controls (45.83%) reported expecting less benefits from using cannabis. This suggests that prevention interventions may have had contributed to an increase in the positive expectations associated with using cannabis, even more taking into considering that the difference between cases and controls at the post-test is statistically significant ( $\chi^2 = 7.44, p = 0.024$ ).

### **Best Friends' Substance Use Behaviour**

Best friends' substance use has been shown to be a significant risk factor for adolescents' decision to use substances (Ali et al., 2011; Bahr et al., 2005; Eitle, 2005; Fujimoto & Valente, 2012; Mayet et al., 2010; Rumpold et al., 2006; Trucco et al., 2011). The comparison of pre and



the post-test found that, at the post-test, over half of adolescents did not report change in their best friends' drinking behaviour, with a similar proportion among cases (60.34%) and controls (60.31%). From those that have reported a change in their best friends' drinking behaviour, the highest proportion of controls (27.01%) and cases (24.95%) reported that their best friends had increased their drinking. This increase in drinking behaviour among cases and controls' best friends may be explained by age, as there is evidence from large sample studies (Feijão, 2011; Feijão et al., 2011) that, with increasing age, Portuguese adolescents report a higher drinking prevalence. Conversely, a marginally higher proportion of cases (14.71%) than controls (12.60%) reported that their best friends have decreased their drinking. Even though the change on best friends' drinking behaviour has reached statistical significance among cases ( $Z = -5.49, p < 0.001$ ) the fact that the difference between cases and controls was not statistically significant ( $\chi^2 = 1.04, p = 0.596$ ) suggest that prevention interventions were not effective in significantly changing drinking behaviour among best friends nor the selection of best friends among cases.

Regarding best friends' smoking behaviour, the comparison of pre and the post-test presents evidence that, at the post-test, around two-thirds of adolescents did not report change on their best friends' smoking behaviour, with a lower proportion among cases (61.33%) than controls (65.05%). From those adolescents that have reported a change in their best friends' smoking behaviour, the highest proportion of controls (27.83%) and cases (25.16%) reported that their best friends had increased their tobacco consumption. This increase in smoking prevalence among cases and controls' best friends is in agreement with data from large sample studies (Feijão, 2011; Feijão et al., 2011) showing that, with increasing age, Portuguese adolescents report increasing smoking prevalence. However, a higher proportion of cases (13.51%) than controls (7.12%) reported that their best friends have decreased their smoking behaviour. This decrease in smoking behaviour among cases' best friends can be considered a positive effect from interventions considering that it has reached statistical significance ( $Z = -5.99, p < 0.001$ ) and that the difference between cases and controls reached statistical significance as well ( $\chi^2 = 9.37, p = 0.009$ ). Considering that most prevention interventions taking part in this study were delivered within school setting and that, as shown by Goodwin, Mrug, Borch, and Cillessen (2012), adolescents tend to choose for best friends their schoolmates, it could be possible that cases' best friends may themselves have been targeted with a preventive intervention and,

therefore, that interventions had been effective in reducing their smoking behaviour. Another possibility is that interventions have contributed to a change in adolescents' peers network by changing the peers selection process meaning that, between pre and post-test, cases had selected other peers, less experienced with tobacco, as their best friends.

As for cannabis use among best friends, the comparison of pre and post-test data indicates that, at the post-test, over three-quarters of adolescents did not report change in their best friends' cannabis use behaviour, the proportion being lower among cases (83.21%) than controls (87.81%). From those that have reported a changed on their best friends' cannabis use behaviour, fewer controls (7.32%) than cases (9.61%) reported that their best friends had increased their cannabis use. This increase in cannabis use prevalence among cases and controls' best friends can be attributable to age given that, as it has been shown by large sample studies (Feijão, 2011; Feijão et al., 2011), Portuguese adolescents report increasing cannabis use prevalence with increasing age. Conversely, fewer controls (4.88%) than cases (7.17%) reported that their best friends had decreased their cannabis use. However, the change in best friends' cannabis use behaviour was not statistically significant among cases ( $Z = -1.56, p = 0.120$ ) as neither was the difference between cases and controls ( $\chi^2 = 2.57, p = 0.277$ ). Therefore, results indicate that prevention interventions were not effective in influencing the cannabis use behaviour among best friends nor the selection of best friends among cases.

Regarding the comparison of pre and post-test data on best friend's cocaine use behaviour, there is evidence that, at the post-test, the vast majority of adolescents did not report change on their best friends' cocaine use behaviour, the proportion being similar among cases (95.01%) and controls (96.77%). From those that have reported a changed on their best friends' cocaine use behaviour, similar levels of cases (2.79%) and controls (2.82%) reported that their best friends had increased their cocaine use. Again, this increase can be explained through increasing prevalence as adolescents get older, as reported by large sample studies assessing Portuguese adolescents (Feijão, 2011; Feijão et al., 2011). Comparatively, marginally more cases (2.21%) than controls (0.40%) reported that their best friends have decreased their cocaine use. However, the change on best friends' cocaine use experience did not reach statistical significance among cases ( $Z = -1.39, p = 0.165$ ), as neither the difference between cases and controls ( $\chi^2 = 3.54, p = 0.171$ ). Therefore, results suggest that prevention

interventions were not effective in influencing the cocaine use behaviour among best friends nor the selection of best friends among cases.

### **Perceived Accessibility**

Peers seem to have an influence on adolescents' decisions regarding using substances also by acting as a route for access to substances (Dent et al., 2005; Harrison et al., 2000; Hughes et al., 2010; Storvoll et al., 2008; Williams & Mulhall, 2005). This is particularly relevant to adolescents under the legal age for purchase legal substances such as alcoholic drinks and tobacco, like the ones assessed within this study.

The comparison of pre and post-test data on perceived accessibility to alcoholic drinks shows that, at the post-test, around half of adolescents reported no change in perceived accessibility to alcoholic drinks, with a similar proportion among cases (55.54%) and controls (52.56%). From those that have reported a changed in perceived accessibility to alcoholic drinks, the highest proportion of cases (31.85%) and controls (29.65%) considered it more difficult to access alcoholic drinks, which may indicate that factors external to the intervention, such the implementation of an environmental strategy, had an influence on this outcome. Comparatively, a lower proportion of cases (12.61%) and controls (17.79%) reported an increase in perceived accessibility to alcoholic drinks, which may be due to age, considering evidence showing that, as adolescents get older, substances are perceived as easier to obtain (Johnston et al., 2010). Even though change has reached statistical significance among cases ( $Z = -10.51$ ,  $p < 0.001$ ) the fact that the difference between cases and controls did not ( $\chi^2 = 0.51$ ,  $p = 0.775$ ) indicates that prevention interventions were not effective in significantly changing the perception of ease of access to alcoholic beverages among cases.

As for cannabis, the comparison of pre and post-test data shows that, at the post-test, around half of adolescents did not report change on perceived accessibility to cannabis, the proportion being similar among cases (54.88%) and controls (57.14%). From those that have reported a changed on perceived accessibility to cannabis, more cases (32.98%) than controls (28.57%) reported a decrease in their perceived accessibility to cannabis and marginally fewer cases (12.14%) than controls (14.29%) reported to perceived cannabis as more accessible. Even though change reached statistical significance among cases ( $Z = -8.77$ ,  $p = 0.000$ ), the

difference between cases and controls did not ( $\chi^2 = 1.97, p = 0.373$ ), indicating that prevention interventions were not effective in significantly changing cases' perception of ease of access to cannabis.

Regarding perceived accessibility to cocaine, the comparison of pre and post-test data reveals that, at the post-test, over half of adolescents did not report change on perceived accessibility to cocaine, the proportion being similar among cases (60.32%) and controls (61.48%). From those that have reported a change on perceived accessibility to cocaine, more cases (24.75%) than controls (21.55%) considered cocaine to be less accessible. Comparatively, a marginally lower proportion of cases (14.93%) than controls (16.96%) reported to perceive cocaine as more accessible. However, even though the change among cases was statistically significant ( $Z = -3.99, p = 0.000$ ), the difference between cases and controls did not ( $\chi^2 = 1.58, p = 0.455$ ), indicating that interventions were not effective in significantly changing cases' perception of ease of access to cocaine.

### **Perceived Parental Approval**

Despite peers seeming to be the strongest predictor of adolescent substance use (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011) and parents appearing to lose influence on their children's decision to use substances, perceived parental approval towards substance use still remains a significant factor for substance use (Sawyer & Stevenson, 2008). Indeed, as reported by Allen et al. (2003), alcohol is one of the substances towards which the influence of parents is stronger. The comparison of pre and post-test data on parental drinking approval indicates that, at the post-test, just over half of adolescents did not change their perceptions on parental drinking approval, with similar proportions among cases (51.83%) and controls (53.89%). From those adolescents that have changed their perceptions on parental drinking approval, the highest proportion of cases (28.41%) and controls (27.50%) perceived their parents as more disapproving of drinking. Comparatively, the lowest proportion of cases (19.76%) and controls (18.61%) perceived their parents as more approving of drinking. However, even though change has reached statistical significance among cases ( $Z = -4.78, p < 0.001$ ), the difference between cases and controls did not reach not statistical significance ( $\chi^2 =$

0.51,  $p = 0.776$ ). Therefore, results indicate that prevention interventions were not effective in significantly change cases' perception of parental approval of drinking.

Concerning parental smoking approval, the comparison of pre and post-test data reveals that, at the post-test, over half of both cases (59.64%) and controls (59.51%) had not changed their perceptions of parental smoking approval. For both cases and controls, proportions perceiving their parents as being less disapproving of smoking were higher (cases 23.99%; controls 22.28%) than those perceiving their parents to be more disapproving of smoking (cases 16.37%; controls 18.21%). This increase in perceived parental approval among cases and controls might be related with the fact, reported by Wang, Fitzhugh, Westerfield, and Eddy (1995) that, with increasing age, adolescents tend to perceive their parents as less disapproving of smoking. Yet, even though the change among cases has reached statistical significance ( $Z = -4.80$ ,  $p < 0.001$ ), the difference between cases and controls did not ( $\chi^2 = 0.94$ ,  $p = 0.625$ ), suggesting that prevention interventions were not effective in significantly changing cases' perception of parental smoking approval.

As reported by Allen et al. (2003), cannabis seems to be the substance towards which parental influence is weaker. The comparison of pre and post-test data reveals that, at the post-test, just over half of adolescents did not change their perceptions on parental cannabis use approval, the proportion being somewhat lower among cases (63.48%) than controls (68.46%). From those that have changed their perception on parental cannabis use approval, a higher proportion of cases (19.95%) than controls (14.52%) reported to perceive their parents as more disapproving of cannabis use. Given that neither the change among cases ( $Z = -1.63$ ,  $p = 0.103$ ) nor the difference between cases and controls ( $\chi^2 = 3.68$ ,  $p = 0.159$ ) reached statistical significance, it seems that prevention interventions were not effective in significantly changing cases' perception of parental approval of cannabis use among vulnerable adolescents.

The comparison of pre and post-test data on parental cocaine use approval reveals that, at the post-test, just over two-thirds of adolescents did not change their perceptions on parental cocaine use approval, with a similar proportion among cases (67.92%) and controls (68.42%). From those that have changed their perception on parental cocaine use approval, a marginally higher proportion of cases (16.35%) than controls (14.39%) reported to perceived their parents

as more approving of cocaine use. Marginally more controls (17.19%) than cases (15.74%) reported perceiving their parents as more approving of cocaine use. However, neither the change among cases ( $Z = -0.62, p = 0.533$ ) nor the difference among cases and controls ( $\chi^2 = 0.83, p = 0.659$ ) was statistically significant, suggesting that prevention interventions were not effective in significantly changing cases' perception of parental approval of cocaine use. The fact that only one out of 15 agencies collaborating in this research has implemented parental training sessions may help to explain the lack of effectiveness of prevention interventions in significantly change cases perception of parental substance use approval.

### **Substance Use Behaviour**

Regarding drinking behaviour, data from the comparison of pre and post-test show that, at the post-test, over half of adolescents did not change their drinking behaviour, with a similar proportion among controls (57.88%) and cases (56.68%). From those that have changed their drinking behaviour, a lower proportion of cases (22.21%) than controls (26.63%) reported a decrease in drinking behaviour. Comparatively, a higher proportion of cases (21.11%) than controls (15.49%) reported an increase in their drinking behaviour. Even though the change among cases did not reach statistical significance ( $Z = -0.43, p = 0.668$ ), among controls it did ( $Z = -3.45, p = 0.001$ ). The fact that, at the post-test, there was a similar proportion of cases (22.21%) and controls (26.63%) reporting a decrease in their drinking behaviour seems to indicate that factors external to the intervention had an impact on cases and controls by leading them to drink less. Indeed, large sample studies assessing Portuguese adolescents (Feijão et al., 2007; Feijão et al., 2011; Hibell et al., 2009; Hibell et al., 2012) also report a decrease in lifetime, past 12 months, and past 30 days drinking over the last years, thus indicating that an environmental strategy impacting drinking among adolescents has been put in place over the timeframe relevant for this research. However, the fact that a higher proportion of cases (21.11%) than controls (15.49%) reported an increase in their drinking behaviour along with the statistically significant difference between cases and controls ( $\chi^2 = 7.10, p = 0.029$ ), seems to indicate that prevention interventions may have had an iatrogenic effect on cases by contributing to a higher increase in their drinking behaviour than the one reported by controls.

For smoking behaviour, data from the comparison of pre and post-test show that, at the post-test, around three-quarters of adolescents had not changed their smoking behaviour, the proportion being higher among controls (78.53%) than among cases (71.27%). From those that have changed their smoking behaviour, marginally more cases (15.58%) than controls (14.40%) reported an increase in smoking behaviour while more cases (13.15%) than controls (7.07%) reported a decrease in their smoking. The change among cases did not reach statistical significance ( $Z = -1.14$ ,  $p = 0.255$ ) whereas the change among controls did ( $Z = -2.78$ ,  $p = 0.005$ ). The fact that, at the post-test, a greater proportion of cases than controls reported a decrease in smoking aside with the fact that the difference between cases and controls on smoking behaviour was statistically significant ( $\chi^2 = 11.41$ ,  $p = 0.003$ ) suggests that the prevention intervention may have been contributed to a decrease in smoking prevalence among cases.

Regarding cannabis use behaviour, data from the comparison of pre and post-test show that, at the post-test, the vast majority of adolescents did not change their cannabis use behaviour, the proportion being lower among cases (90.92%) than among controls (93.75%). From those that have changed their cannabis use behaviour, a similar proportion of cases (4.91%) and controls (4.35%) reported a decrease in their cannabis use behaviour while more cases (4.17%) than controls (1.90%) reported an increase in their cannabis use behaviour. Neither the change among cases ( $Z = -0.25$ ,  $p = 0.806$ ) nor controls ( $Z = -1.50$ ,  $p = 0.133$ ) reached statistical significance, as neither did the difference among cases and controls ( $\chi^2 = 4.47$ ,  $p = 0.107$ ), which seems to indicate that prevention interventions were not effective in significantly changing cannabis use behaviour among cases.

For cocaine use, data from the comparison of pre and post-test show that, at the post-test, the vast majority of adolescents did not change their cocaine use behaviour, the proportion being similar among cases (97.85%) and controls (98.33%). From those that have changed their cocaine use behaviour, a marginally higher proportion of cases (1.11%) than controls (0.28%) reported a decrease in cocaine use behaviour. Complementarily, a similar proportion of controls (1.39%) and cases (1.04%) reported an increase in cocaine use behaviour. However, neither the change among cases ( $Z = -0.37$ ,  $p = 0.715$ ), controls ( $Z = -1.67$ ,  $p = 0.096$ ) or the difference between cases and controls ( $\chi^2 = 2.43$ ,  $p = 0.297$ ) were significant, indicating that

prevention interventions were not effective in significantly change cocaine use behaviour among vulnerable adolescents.

### **Intention to Use**

Intention to use substances is one of the strongest predictors for later substance use (Alvaro et al., 2013; Andrews et al., 2003; Andrews et al., 2008; Barkin et al., 2002; Booker et al., 2004; Hohman et al., 2013; Vitória et al., 2011). The comparison of pre and post-test data indicates that, at the post-test, over half of adolescents did not change their drinking intention, with a similar proportion among cases (53.77%) and controls (53.55%). From those that have changed their intention to drink, the greatest proportion of cases (24.90%) and controls (26.24%) reported a higher intention to drink. Comparatively, a lower proportion of cases (21.33%) and controls (20.21%) reported a decrease in their intention to drink. Overall, as neither the change among cases ( $Z = -1.75, p = 0.080$ ) nor the difference between cases and controls ( $\chi^2 = 0.29, p = 0.865$ ) was statistically significant, it seems that prevention interventions were not effective in significantly changing intention to drink among cases.

Regarding intention to smoke, the comparison of pre and post-test data indicates that, at the post-test, around two-thirds of adolescents did not change their smoking intention, the proportion being higher among controls (68.49%) than cases (61.22%). From those that have changed their intentions, more cases (20.19%) than controls (16.78%) reported an increase in their intention to smoke. However, the proportion of those reporting a decrease in their intention to smoke was also higher among cases (18.59%) than controls (14.73%) reported. Yet, neither the change among cases ( $Z = -1.05, p = 0.295$ ) nor among controls ( $Z = -0.86, p = 0.390$ ) reached statistical significance, as neither the difference between cases and controls ( $\chi^2 = 5.21, p = 0.074$ ), indicating that prevention interventions were not effective in significantly changing intention to smoke among cases.

As for intention to use cannabis, the comparison of pre and post-test data indicates that, at the post-test, around two-thirds of adolescents did not change their intention to use cannabis, the proportion being higher among cases (70.21%) than controls (67.35%). From those that have changed their intention to use cannabis, a higher proportion of controls (19.05%) than cases (13.97%) reported a decrease in intention to use cannabis. Equally, a higher proportion of



cases (15.83%) than controls (13.61%) reported an increase in intention to use cannabis. However, neither the change among cases ( $Z = -0.65$ ,  $p = 0.518$ ) nor among controls ( $Z = -1.19$ ,  $p = 0.233$ ) was statistically significant, as neither the difference between cases and controls ( $\chi^2 = 2.49$ ,  $p = 0.289$ ). Therefore, it seems that prevention interventions were not effective in significantly changing intention to use cannabis among cases.

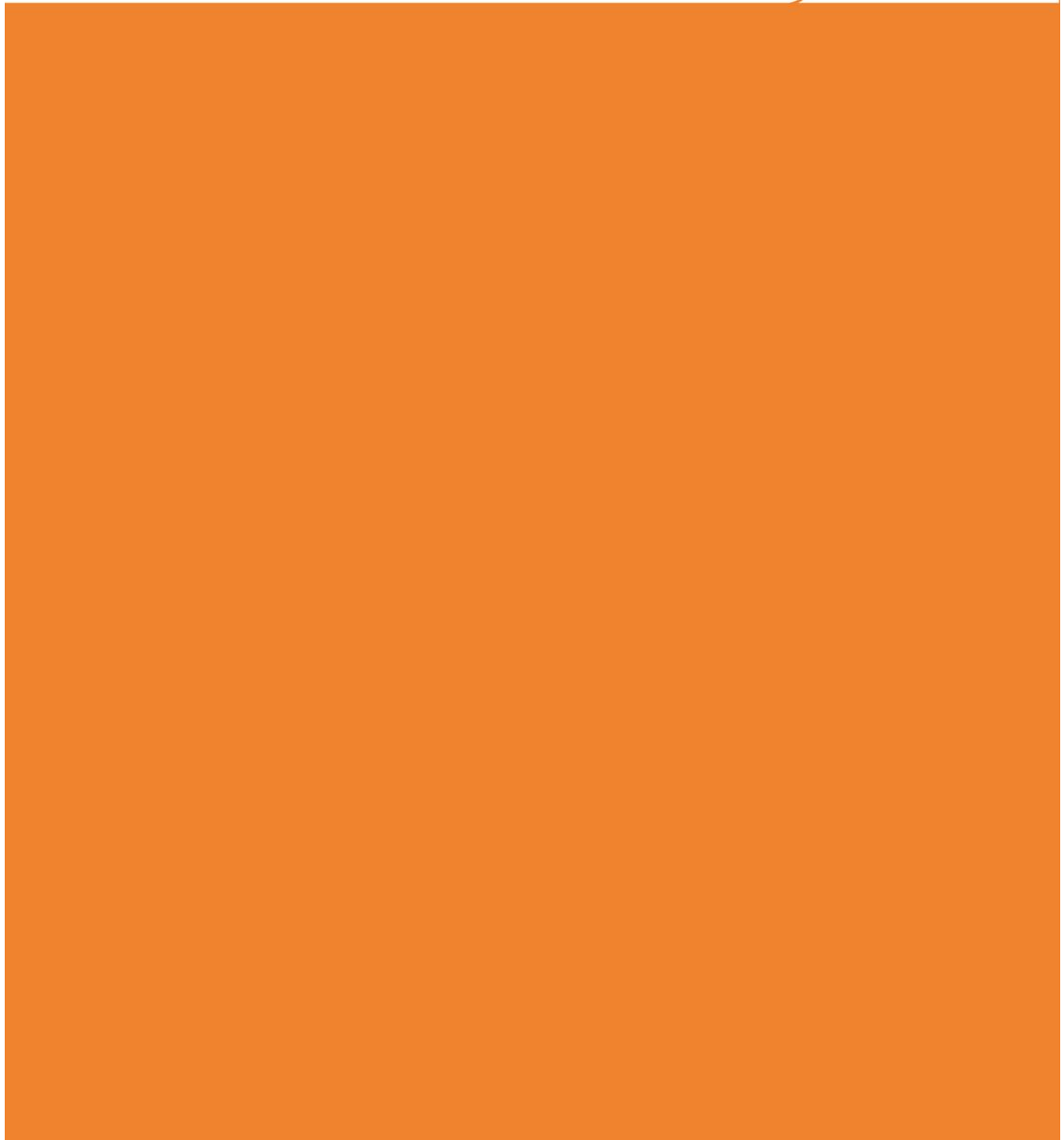
The comparison of pre and post-test data on intention to use cocaine reveals that, at the post-test, around three-quarters of adolescents did not change their intention to use cocaine, the proportion being higher among cases (79.86%) than controls (76.02%). From those that have changed their intention to use cocaine, a higher proportion of controls (15.79%) than cases (8.53%) reported an decrease in their intention to use cocaine while a higher proportion of cases (11.60%) than controls (8.19%) reported an increase in their intention to use cocaine. Whereas the change among cases did not reach statistical significance ( $Z = -1.68$ ,  $p = 0.094$ ), the change among controls did ( $Z = -2.11$ ,  $p = 0.035$ ). Considering that the difference between cases and controls was statistically significant ( $\chi^2 = 8.53$ ,  $p = 0.014$ ), the higher proportion of controls than cases reporting a decrease in their intention to use cocaine, together with the higher proportion of cases (11.60%) than controls (8.19%) reporting an increase in their intention to use cocaine, seems to indicate that prevention interventions had produced an iatrogenic effect on cases by leading cases to hold a higher intention to use cocaine.

### **Health-Related Quality-of-Life.**

Health-related quality-of-life has been associated with numerous unhealthy outcomes, namely with smoking (Dunn et al., 2011; Matos, 2008; Piko et al. 2005), drinking (Matos, 2008; Kuntsche & Gmel, 2004; Phillips-Howard, et al., 2010), cannabis use (Dunn et al., 2011; Fergusson & Boden, 2008; Matos, 2008), and cocaine use (Thatcher et al., 2002; Zullig et al., 2001). The comparison of pre and post-test data indicates that, at post-test, only a few adolescents did not report any change on their health-related quality-of-life (cases 6.45%; controls 6.50%). From those that have reported a change in their health-related quality-of-life, fewer cases (47.55%) than controls (53.39%) reported a decrease in health-related quality-of-life, while more cases (46.01%) than controls (40.11%) reported an increase. However, neither the change among cases ( $Z = -1.82$ ,  $p = 0.069$ ) nor the difference between cases and controls

( $Z = 4.73$ ,  $p = 0.094$ ) has reached statistical significance, suggesting that prevention interventions were not effective in contributing for a significantly higher health-related quality-of-life among adolescents.

## DISCUSSION



This chapter presents the main findings from this research, integrating data from the descriptive analyses and the association analyses performed within study 1 with data from the comparative analyses for pre and post-test performed within study 2. Data are presented for smoking, drinking, cannabis use, and cocaine use, each presented in a substance-specific section.

## **Drinking**

Drinking is considered by the WHO (2011) to be one of the main health issues affecting young people. Among adolescents, drinking is of particular cause of concern not only because alcohol affects every organ in the drinker's body, but also because, in cases of harmful drinking, it can impair brain function and motor skills and, in the long run, increase the risk of certain cancers, stroke, and liver disease (NIDA, 2012a). Alcohol use among adolescents, can also serve as a gateway to tobacco, cannabis, and other illicit substances (Kirby & Barry, 2012) and its heavy use during adolescence interferes with higher executive functions, eventually leading to problems with academic achievement (Jeynes, 2002), impulsive behavior, and alcohol abuse and dependence (Crews et al., 2007). Moreover, a significant share of the disease burden attributable to harmful drinking arises from unintentional and intentional injuries, including those due to road traffic accidents, violence, and suicides, which tend to occur in relatively younger age groups (WHO, 2011).

Results from study 1 showed that over half of adolescents (56.84%) had already drunk at some point in their lives. From these, over half (57.28%) continued to drink and, of these, over one-third (41.80%) drink on a regular basis (see Table 22). Higher lifetime drinking prevalence were reported by other studies assessing Portuguese adolescents, ranging from 71% (Feijão et al., 2011; Hibell et al., 2012) to 80% (Feijão, 2011) which can probably be attributable to the higher mean age of their samples. Moreover, study 1 has also shown that alcohol was the substance towards which more adolescents (drinkers and non-drinkers) expressed intention to use within the next year (28.01%) or not being sure about whether they will continue to use (37.24%) (see Table 22), suggesting a high spread of drinking among adolescents.

Even though there is no evidence that providing information alone on substances effects impacts substance use behaviour (EMCDDA, 2008c), informative sessions seems to be the

main approach to substance use prevention (EMCDDA, 2009a). Under the assumption that, if adolescents are well informed about the risks of using substances, they will decide rationally not to use them (Karlsson, 2008), providing information on the short term social and behavioural effects of substances, as well as on the long term physiological effects is a common approach in substance use prevention interventions (Pruitt, 1993; Tobler et al., 2000).

It seems that the sampled adolescents within this research were aware at least of some of the risks associated with drinking; study 1 has shown that almost all adolescents (93.48%) perceived drinking as having medium or high risks to health (see Table 20). According to Lundborg and Lindgreen (2002), adolescents seem to overestimate some risks associated with drinking, thus these authors consider that informing young people about substances may not be the optimal educational policy as it may decrease the perceived risk from using substances and, consequently, increase the risk for substance use.

It should, however, be noted that alcohol was the substance towards which there was a higher percentage of adolescents perceiving it as having low risk to health (6.52%), which seems to confirm adolescents' views of alcohol as a less harmful substance. Nevertheless, and despite data from study 1 demonstrating that adolescents who perceived drinking as having high risks to health were the ones reporting the lowest lifetime and regular drinking (see Table 25), after controlling for covariates in the multivariate model, drinking risk perception ceased to be a significant risk factor for regular drinking (see Table 30.1). Further, even though drinking risk perception remained a significant risk factor for lifetime drinking, the proportion of lifetime drinkers was not significantly different among adolescents perceiving drinking as having medium or high risks and those perceiving drinking as having low risks (see Table 28.1). For that reason, additional research is needed to better understand the relationship between drinking risk perception and drinking among vulnerable adolescents. Particularly noteworthy was evidence from study 1 that the greater the risk perception associated with drinking, the greater the likelihood of vulnerable adolescents who had drunk at some point in life to become current drinkers (see Table 29.1). This finding may suggest that adolescents who regard drinking as a thrill-seeking behaviour are more likely to continue to drink. Taking these findings into consideration and considering that more research is needed to better understand the relationship between risk perception and drinking among vulnerable adolescents, prevention interventions should abstain from delivering standalone informative sessions on the risks

associated with drinking until effective ways to communicate this information to vulnerable adolescents are found.

Data from study 2 (see Table 50) showed that, at the post-test, over half of cases (59.11%) did not change their perception on the risks associated with drinking. Still, both cases and controls reported a decrease in their drinking risk perception (cases 23.48%; controls 17.21%), being statistically significant the change among cases ( $Z = -3.38$ ,  $p = 0.001$ ) and the difference between cases and controls ( $\chi^2 = 8.39$ ,  $p = 0.015$ ). Considering research showing that, with increasing age, adolescents perceive substance use as less risky (Lundborg, 2007; Lundborg & Lindgreen, 2002; SAMHSA, 2009), one possible explanation for the decrease in risk perception among cases and controls can, indeed, be age. However, given that the proportion of those reporting a decrease in risk perception was higher among cases (23.48%) than controls (17.21%) and that controls are, on average, a year older than cases, evidence suggests that prevention interventions may have contributed to a decrease on cases' drinking risk perception higher than the one registered for controls. The impact of this decrease in the perceived risks associated with drinking is not clear. Study 1 has shown that, even though drinking risk perception remained a significant risk factor for drinking, the odds of being a lifetime drinker or of becoming a current drinker were not significantly different between adolescents considering drinking as having medium risk to health and those considering drinking as having low risk. Conversely, study 1 also presented evidence that the higher the perceived risk from drinking, the higher the current use among vulnerable adolescents. This later finding suggests that, by decreasing the perceived risk associated with drinking, prevention interventions may have weakened adolescents' current drinking. However, more research is needed before more firm conclusions can be drawn from these results.

By providing information on the short term social and behavioural effects of substances, as well as on the long term physiological effects of substances, prevention interventions aimed at preventing harmful drinking often emphasize the negative consequences of drinking. It is interesting to highlight that, as reported within study 1, alcohol was the substance towards which less adolescents anticipated problems as a consequence of use, with just less than half of them (48.43%) stating that they expected negative outcomes (see Table 20), revealing the extent to which drinking is perceived as normative and alcohol a socially accepted substance. Even though, in line with studies showing a negative association between negative

expectancies and substance use (Jones et al., 2001; Kristjansson et al, 2012; Leigh & Stacy, 2004), study 1 has shown that adolescents expecting problems as a consequence of drinking were the ones showing the lowest lifetime, current, and regular drinking prevalence (see Table 25), after controlling for covariates in the multivariate model, expected problems ceased to be a significant risk factor for drinking (see Table 28.1, Table 29.1, and Table 30.1). The practical implication of this finding is that there seems to be no particular benefit in prevention interventions providing information on the negative consequences from drinking as this variable was not a consistent risk factor for drinking among vulnerable adolescents.

From 12 years onwards, adolescents start to perceive the expected costs associated with substance use as less likely than the expected benefits (Alfonso & Dunn, 2007; Chassin et al., 2001; O'Connor et al., 2007). Combined with evidence showing that expected problems may lose significance as adolescents have more positive experiences from drinking (Goldberg et al., 2002), it is therefore possible to argue that adolescents take expected benefits from drinking more readily into consideration in their decision to drink than expected problems. As Lee et al. (2011) have noted, adolescents may value positive consequences so highly that they are willing to take the negative consequences just to be able to experience the positive ones. However, despite data from study 1 demonstrating that alcohol was the substance towards which more adolescents (59.82%) expected positive outcomes as a consequence of using it (see Table 20), after controlling for covariates in the multivariate model, the odds of drinking were not significantly different between adolescents who did not expect positive outcomes from drinking and those either expecting benefits from drinking or not being sure (see Table 28.1 and Table 29.1). Yet, and even though more research is needed to better understand the association between expected benefits and drinking among vulnerable adolescents, the fact that the overall variable assessing expected benefits from drinking remained significantly associated with lifetime and current drinking justifies that prevention interventions should try to deconstruct adolescents' positive expectations towards drinking.

Study 2 (see Table 50) revealed that, at the post-test, one-quarter of cases (24.82%) did not change their positive expectancies regarding drinking. From those adolescents that have changed their positive expectations, the highest proportion of cases (49.04%) and controls (54.00%) reported to expect less benefits from drinking, suggesting that factors external to interventions had an impact on cases and controls by leading them to decrease their positive

expectations towards drinking. However, the fact that the difference between cases and controls did not reach statistical significance ( $\chi^2 = 2.86$ ,  $p = 0.239$ ), indicate that prevention interventions were not effective in significantly changing the positive expectations from drinking among cases, a factor that seems to be associated with drinking among vulnerable adolescents.

As for attitudes towards drinking, study 1 revealed that among the sample assessed in this research, over one-third of adolescents (38.32%) expressed negative attitudes towards drinking (see Table 20). In fact, this research has added to the field by demonstrating that like positive attitudes, neutral attitudes also increase the risk of vulnerable adolescents to drink at some point in their lives, to continue to drink, and to become regular drinkers (see Table 25, Table 28.1, Table 29.1, and Table 30.1), with alcohol being the substance towards which more adolescents expressed neutral or positive attitudes (see Table 20).

Data from study 2 (see Table 50) indicated that over half of cases (58.24%) had not changed their attitudes towards drinking. Furthermore, a similar proportion of cases (22.95%) and controls (20.97%) reported a decrease in positive attitudes towards drinking, suggesting that factors external to the intervention had an influence cases and controls' attitudes towards drinking as well. Even though the change among cases reached statistical significance ( $Z = -2.65$ ,  $p = 0.008$ ), the difference between cases and controls did not ( $\chi^2 = 1.50$ ,  $p = 0.472$ ), suggesting that prevention interventions were not effective in contributing to a significant change in positive attitudes towards drinking among cases, a significant risk factor for vulnerable adolescents' drinking.

Regarding perceived accessibility, despite the minimum legal age to purchase alcoholic drinks in Portugal being 16 years old, and 18 years old for purchasing spirits, data from study 1 showed that over three-quarters of the adolescents (82.10%), whose mean age is 13 years old, perceived alcoholic drinks as easy or fairly easy to obtain (see Table 20). This is a cause of concern considering that a similar percentage (85%) was reported by the 2011 ESPAD survey using a sample of 16 years old adolescents (Hibell et al., 2012). The high perceived accessibility to alcoholic drinks can be the result of the legal status of alcohol, but it can also be presumed that the advertisements on alcoholic drinks may contribute for an overall perception of alcohol as a substance whose consumption is socially accepted and valued. The



higher perception of perceived accessibility reported by the sample of vulnerable adolescents assessed within this research may be assumed to be a consequence of these adolescents living within risky environments where access to alcoholic drinks is easier. Alcohol was the substance perceived as being most accessible, which is particularly concerning given that study 1 has demonstrated that perceived accessibility was a significant risk factor for lifetime and regular drinking among vulnerable adolescents.

Data from study 2 (see Table 50) revealed that over half of cases (55.54%) did not report any change in perceived accessibility to alcoholic drinks. From those that have reported change on perceived access to alcoholic drinks, a similar proportion of cases (31.85%) and controls (29.65%) perceived them as less accessible at the post-test, suggesting that factors external to the intervention had an impact on cases and controls and lead them to perceive alcoholic drinks as less easy to obtain. However, considering that the difference between cases and controls was not statistically significant ( $\chi^2 = 0.51$ ,  $p = 0.775$ ), it seems that prevention interventions were not effective in significantly change the perception of ease of access to alcoholic beverages among cases.

Moreover, data from study 1 showed that over half (55.89%) of the adolescents assessed in this research had their first drink at 13 years older or younger (see Table 22). So, considering that the legal age to purchase alcoholic beverages in Portugal is 16 years old and 18 years old for spirits, it is apparent that, as reported by other studies (Dent et al., 2005; Storvoll et al., 2008; Williams & Mulhall, 2005), social sources, such as peers, provide adolescents with opportunities for drinking and facilitate the access to alcoholic drinks, which is particularly relevant to adolescents under legal age to purchase alcoholic drinks, like the ones assessed within this research. Verily, half of adolescents (50.06%) reported that their best friends have drunk at some point of their lives, from which just less than half (43.66%) stated that their best friends drink occasionally or regularly (see Table 20). It is also interesting to note that alcohol was the substance showing the lowest percentage of never users among best friends (36.34%), suggesting that alcohol is a substance whose consumption is widespread and socially accepted. In line with evidence showing the role of peers' influence on drinking among adolescents (Bahr et al., 2005), data from study 1 indicated that a higher proportion of adolescents whose best friends were regular drinkers were themselves lifetime, current, and regular drinkers, indicating that best friends' drinking, particularly regular drinking, was a

significant risk factor for drinking among vulnerable adolescents (see Table 25, Table 28.1, Table 29.1, and Table 30.1). The practical implication is that prevention interventions should target adolescents' best friends and enhance strategies to deal with peer pressure.

Results from study 2 (see Table 50) have shown that over half of cases (60.34%) did not report change in their best friends' drinking behaviour. Moreover, besides showing a similar proportion of cases (14.71%) and controls (12.60%) reporting that their best friends have decreased their drinking, study 2 also showed that the difference between cases and controls did not reach statistical significance ( $\chi^2 = 1.04$ ,  $p = 0.596$ ). Taken together, these results suggest that prevention interventions were not effective in significantly change drinking behaviour among best friends nor the selection of best friends among cases, a significant risk factor for vulnerable adolescents' decision to drink.

Regarding parental drinking approval, data from study 1 showed that almost all adolescents (93.42%) expected their parents to be disapproving of their drinking, from which just less than three-quarters (74.71%) were expected to be highly disapproving, with prohibition being the most anticipated reaction towards their children's drinking (see Table 20). In congruence with studies assessing the influence of parental drinking disapproval on adolescents' drinking behaviour (Bahr et al., 2005; Nash et al., 2005), adolescents expecting their parents to prohibit or to punish them if knowing that they drank were the ones reporting the lowest lifetime, current, and regular drinking prevalence (see Table 25). An interesting finding from study 1, in line to what has been reported by the SAMHSA (2009), was that there was no significant difference in the proportion of lifetime, current, or regular drinkers among adolescents expecting their parents to be indifferent and those expecting their parents to be merely disapproving. High parental disapproval was the only reaction associated with a significantly lower proportion of drinking among adolescents (see Table 25). While study 1 has shown that problems with parents were the most anticipated negative consequence from drinking (see Table 12), it has also shown that alcohol was the substance towards which fewest parents are expected to prohibit (48.36%). This is a particularly worrying finding given that parental drinking approval was a consistent risk factor for adolescents' lifetime, current, and regular drinking. The practical implication of this finding regarding parental drinking approval is that prevention interventions should promote parental training sessions to explain to parents the need to

clearly and strongly express their disapproval towards their children's' drinking, as well as teaching them strategies to express this disapproval and establish boundaries accordingly.

Data from study 2 (see Table 50) showed that, at the post-test, just over half of cases (51.83%) had not changed their perceptions on parental drinking approval. From those adolescents who have changed their perceptions on parental drinking approval, a similar proportion of cases (28.41%) and controls (27.50%) reported to perceive their parents as more disapproving of their drinking. Considering that the difference between cases and controls was not statistically significant ( $\chi^2 = 0.51$ ,  $p = 0.776$ ), results indicate that prevention interventions were not effective in significantly change cases' perception of parental approval of drinking. Data from study 1 has demonstrated that only one out of the 15 agencies collaborating in this research has implemented parental training, which may help to understand the fact that interventions were not effective in significantly changing cases' perception of parental approval of drinking, a significant risk factor for vulnerable adolescents' decision to drink.

Concerning sociodemographic variables, study 1 has demonstrated that age was a significant risk factor for lifetime and current drinking (see Table 27, Table 28.2, and Table 29.2). Taking into account research showing that the earlier the age of drinking onset, the greater the likelihood of stress-reactive drinking (Dawson et al., 2007), heavy drinking (Blomeyer et al., 2011), abuse and dependence (DeWit et al., 2000; Hingson et al., 2006; von Sydow et al., 2002), and the risk of using other substances (Cairano et al, 2009; Ellickson et al., 2003), the fact that over half (55.89%) of the adolescents assessed in this research had their first drink at 13 years older or younger (see Table 22) is a particular cause of concern. The practical implication of the percentage of early drinkers is that it makes sense to provide prevention interventions addressing drinking before the age of 13, particularly to vulnerable adolescents such as those assessed in this research.

Nationality, as demonstrated by study 1, was a significant risk factor for regular drinking, with adolescents from nationalities other than Portuguese having higher risk for becoming regular drinkers (see Table 27 and Table 30.2). Hence, the practical implication of this finding is that substance use prevention interventions should monitor more closely drinking patterns among adolescents from nationalities other than Portuguese and to conceive specific activities to reduce harmful drinking patterns among this specific group.

Study 1 also revealed that stressful life events were a significant risk for lifetime and current drinking (see Table 27, Table 28.2, and Table 29.2), which seem to point to drinking as a situational strategy to cope with stress and unpleasant emotions, as had been argued by Dawson et al. (2007). Therefore, the practical implication is that prevention interventions should be designed to enhance stress management techniques among adolescents that had experienced stressful life events.

As for SES and family structure, study 1 has shown that neither of these variables represented a significant risk factor for drinking among vulnerable adolescents (see Table 27, Table 28.2, and Table 29.2). The practical implication of this absence of significant increased risk from family structure is that there seems to be no particular need to design specific prevention interventions to prevent drinking among adolescents living within non-intact families. Moreover, one practical implication deriving from the fact that SES was not a significant risk factor for drinking, is that alcohol selling prices should be increased as it seems reasonable to presuppose that alcohol affordable selling prices contributes to make alcohol accessible to adolescents regardless of their SES.

Regarding drinking behaviour (see Table 50), data from study 2 shows that, at the post-test, over half of cases (56.68%) did not report any change on their drinking behaviour. Moreover, there was a proportion of cases (22.21%) and controls (26.63%) reporting a decrease in their drinking behaviour, which suggests that factors external to interventions had an impact on cases and controls by leading them to decrease their drinking behaviour. Even though it is expected an increase in drinking prevalence as adolescents get older (Feijão et al., 2011; Feijão, 2011), the fact that a higher proportion of cases (21.11%) than controls (15.49%) have reported an increase in drinking behaviour, aside with the statistically significant difference between cases and controls ( $\chi^2 = 7.10$ ,  $p = 0.029$ ), suggest that prevention interventions may have had an iatrogenic effect on cases by contributing to a higher increase in drinking behaviour among cases than the one reported by controls. This result is in line with other studies reporting iatrogenic effects on drinking behaviour associated to substance use prevention interventions (Moos, 2005; Werch and Owen, 2002).

Additionally, study 2 revealed that just over half of cases (53.77%) did not change their intention to drink. Furthermore, a similar proportion of cases (21.33%) and controls (20.21%)

reported a decrease in their intention to drink, with no significant difference between cases and controls ( $\chi^2 = 0.29$ ,  $p = 0.865$ ). Overall, these findings indicate that prevention interventions were not effective in significantly change intention to drink, which has been shown to be one of the strongest predictors for drinking among adolescents (Andrews et al., 2003; Andrews et al., 2008; Barkin et al., 2002).

## **Smoking**

Smoking is considered by the WHO (2011) to be one of the main health issues affecting young people. Smoking among adolescents, besides serving as a possible gateway to alcohol and cannabis use (Graves et al., 2005), is a particular cause of concern as individuals who start smoking as adolescents continue to be at elevated risk for poorer physical health even if they successfully stop smoking (Georgiades & Boyle, 2007) and addiction seems to be established more easily in adolescents (Prokhorov et al., 2006).

Results from study 1 showed that over one-third of adolescents (39.83%) reported having smoked at some point in their lives and over three-quarters (79.78%) of these smoked on a regular basis (see Table 22). After alcohol, tobacco was the substance towards which most adolescents expressed an intention to use within the next year (9.39%) or not being sure about their use in the future (34.29%). It was also the substance with the highest percentage of consumers becoming regular consumers, confirming the high addictiveness of tobacco (see Table 22).

Similarly to what has been reported for alcohol, it seems that adolescents were aware at least of some of the risks associated with smoking, as data from study 1 showed that almost all adolescents (98.06%) perceived smoking as having medium or high risks to health (see Table 20). It is worth mentioning the low percentage of adolescents (1.94%) that perceived smoking as having a low risk to health, which can be seen as a positive indicator of the implementation of measures aimed at increasing awareness of the harmful effects of tobacco that have been put in place in Portugal (Lei 37/2007). Lundborg and Lindgreen (2004) have even found that adolescents seem to overestimate some risks associated with smoking. As such, providing accurate information about substances may not be the optimal educational policy as it may decrease the perceived risk from using substances and, as a consequence, increase the risk

for substance use. Still, informative sessions seems to be the main approach to substance use prevention (EMCDDA, 2009a).

Data from study 1 demonstrated that, despite adolescents who perceived smoking as having high risks to health being the ones reporting the lowest lifetime and current smoking (see Table 31), after controlling for covariates in the multivariate model, smoking risk perception ceased to be a significant risk factor for lifetime smokers' to continue to smoke (see Table 35.1). Yet, the overall variable assessing smoking risk perception remained significantly associated with lifetime smoking, even though the odds of smoking at some point in life were not significantly different between adolescents considering smoking as having medium or high risks and those considering smoking as having low risks. Taking these findings into consideration and given that more research is needed to better understand the relationship between smoking risk perception and smoking among vulnerable adolescents, prevention interventions should abstain from delivering standalone informative sessions on the risks associated with smoking until effective ways to communicate this contents to vulnerable adolescents are found.

Results from study 2 (see Table 51) revealed that just less than three-quarters of cases (70.84%) did not change their risk perception about smoking. From those adolescents that reported a change on their risk perception on smoking, a marginally higher proportion of cases (16.31%) than controls (13.62%) reported a decrease in their smoking risk perception, which could be considered a negative effect from prevention interventions, even more considering that cases were, on average, a year younger than controls. Yet, the fact that the difference between cases and controls did not reach statistical significance ( $\chi^2 = 1.90, p = 0.388$ ) indicate that interventions were not effective in contributing for a significant change in smoking risk perception among cases, a factor that seems to be associated with smoking among vulnerable adolescents.

When delivering informative sessions, prevention interventions often highlight the negative consequences of smoking. It is interesting to highlight that, as reported within study 1, tobacco was the substance towards which more adolescents anticipated problems as a consequence of use, with over three-quarters of adolescents (81.75%) expecting to have problems (see Table 20), mainly problems with parents (see Table 13). Even though adolescents expecting

problems as a consequence of smoking were the ones showing the lowest smoking prevalence (see Table 31), after controlling for covariates in the multivariate model, expected problems ceased to be a significant risk factor for smoking among vulnerable adolescents (see Table 34.1, Table 35.1, and Table 36.1). This finding can be explained with research presenting evidence that, from 12 years onwards, adolescents start to perceive the expected problems associated with substance use as less likely than the expected benefits (Alfonso & Dunn, 2007; Chassin et al., 2001; O' Connor et al., 2007). Additionally, adolescents may value positive consequences so highly that they are willing to tolerate the negative consequences to be able to experience the positive ones (Lee et al., 2011). The practical implication of this finding is that there seems to be no benefit from prevention interventions to provide information on the problems associated with smoking as expected problems were not a risk factor for smoking among vulnerable adolescents.

Conversely, expected benefits from smoking may be more readily taken into consideration in the decision to smoke than expected problems are, as for adolescents these problems are perceived as appearing in a distant future. In fact, study 1 showed that lifetime and current smoking prevalence was higher among adolescents expecting positive outcomes from smoking (see Table 31) even after controlling for covariates (see Table 34.1 and Table 35.1). The practical implication of this finding is that prevention interventions should address adolescents' positive expectations regarding tobacco and try to question these expectations. The fact, also reported in study 1, that tobacco was the substance towards which more adolescents expected no positive outcomes from use seems, to some extent, to be a protective factor for smoking among vulnerable adolescents.

Data from study 2 (see Table 51) showed that, at the post-test, just over one-third of cases (33.53%) did not report any change on the expected benefits from smoking. Yet, from those adolescents that have changed their positive expectations, the highest proportion of cases (53.50%) and controls (61.02%) reported to expect less benefits from smoking. Considering that, with increasing age, adolescents start to perceive the expected benefits from using substances as more likely (Alfonso & Dunn, 2007; Chassin et al., 2001; O' Connor et al., 2007), this unexpected decrease in positive expectations among cases and controls indicate that factors external to interventions had an impact on adolescents from both groups leading them to perceive less benefits from smoking. One possible external factor might have been the

entry into force of a new law addressing smoking (i.e., Lei 37/2007) that has established demand reduction measures. In effect, large sample studies assessing Portuguese adolescents (Feijão et al., 2007; Feijão et al., 2011; Hibell et al., 2009; Hibell et al., 2012) report a decrease in lifetime smoking since 2007, which eventually may corroborate the argument of an environmental strategy impacting smoking among adolescents. However, the fact that the proportion of those reporting a decrease in expected benefits was higher among controls (61.02%) than cases (53.50%) aside with the fact that the difference between cases and controls was not statistically significant ( $\chi^2 = 8.23$ ,  $p = 0.016$ ) seems to suggest that prevention interventions may have had a negative effect by contributing to cases reporting a lower decrease in positive expectations than the one reported by controls. If this were the case, it is a cause of concern given that expected benefits from smoking were shown to be a significant risk factor for lifetime and current smoking among the sample of vulnerable adolescents assessed within this research. The practical implication of this finding is that prevention interventions should not provide information on the risks associated with smoking as it may decrease the perception of the problems associated with smoking and, eventually, increase the perception about the benefits, leading to an increase in smoking prevalence among vulnerable adolescents.

Besides being the substance towards which less adolescents expected less benefits from, tobacco was also the substance evoking the highest percentage of negative attitudes, with over half of adolescents (57.65%) reporting negative attitudes towards smoking (see Table 20). Indeed, study 1 revealed that a higher proportion of adolescents holding positive or even neutral attitudes towards smoking have smoked at some point of their lives and were current and regular smokers (see Table 31). This research has added to the field by demonstrating that both positive and neutral attitudes towards smoking are risk factors for lifetime, current, and regular smoking. Hence, the proportion of adolescents holding negative attitudes towards smoking among the sample of vulnerable adolescents assessed within (57.65%) this research seems to be somewhat a protective factor against smoking. The practical implication of neutral attitudes being, like positive attitudes, a risk factor for smoking among vulnerable adolescents is that prevention interventions besides focusing on adolescents holding positive attitudes towards smoking, should also focus on adolescents who do not seem to have a consistent opinion on smoking as they are, as well, at increased risk for smoking.



Study 2 (see Table 51) revealed that over half of cases (64.78%) did not change their attitudes towards smoking. From those that have changed, a higher proportion of cases (16.92%) than controls (9.95%) reported a decrease in positive attitudes towards smoking at the post-test. The difference between cases and controls was statistically significant ( $\chi^2 = 14.10$ ,  $p < 0.001$ ) which seems to indicate that prevention interventions were effective in contributing for a decrease in positive attitudes towards smoking among cases. This is a positive finding considering that attitudes towards smoking were a significant risk factor for lifetime, current, and regular smoking among vulnerable adolescents (see Table 31), even after controlling for covariates (see Table 34.1, Table 35.1, and Table 36.1).

As for perceived accessibility, even though data from study 1 showing that just over three-quarters of adolescents (79.11%), whose mean age is 13 years old, perceived tobacco as easy or fairly easy to obtain (see Table 20), after controlling for covariates, perceived accessibility ceased to be a significant risk factor for smoking among vulnerable adolescents (see Table 34.1, Table 35.1, and Table 36.1). Given that over half of the lifetime smokers (60.91%) assessed within this study have had their first cigarette at 13 years or younger, and considering that the legal age to purchase tobacco in Portugal is 18 years old, it is evident that, as reported by other studies (Dent et al., 2005; Storvoll et al., 2008; Williams & Mulhall, 2005), social sources, such as peers, are likely the main route of access to tobacco.

Data from study 1 showed that over one-third of adolescents (37.85%) reported that their best friends have smoked (see Table 20). In agreement with studies showing the role of peers' influence on smoking among adolescents (Rumpold et al., 2006; Trucco et al., 2011), study 1 also demonstrated that lifetime, current, and regular smoking was higher among adolescents whose best friends were regular smokers (see Table 31), even after controlling for covariates (see Table 34.1, Table 35.1, and Table 36.1). Hence, study 1 has confirmed that best friends' smoking behaviour, particularly regular smoking, was a significant risk factor for lifetime, current, and regular smoking among vulnerable adolescents. The practical implication of this finding is that prevention interventions should address best friends' influence on adolescents' decision to smoke by delivering sessions on peer pressure.

Data from study 2 (see Table 51) showed that over half of cases (61.33%) did not report change in their best friends' smoking behaviour. Further, a greater proportion of controls

(27.83%) than cases (25.16%) reported that their best friends have increased their smoking behaviour and a greater proportion of cases (13.51%) than controls (7.12%) reported that their best friends have decreased their smoking. This may be considered a positive effect from interventions, even more considering that the difference between cases and controls has reached statistical significance ( $\chi^2 = 9.37, p = 0.009$ ). Therefore, it can be presupposed that prevention interventions had a positive effect either by effectively reducing smoking behaviour among cases' best friends or, eventually, by changing peers selection process among cases leading them to selected other peers less experienced with tobacco as their best friends. This is a positive finding suggesting that interventions have been effective in reducing a significant risk factor for lifetime, current, and regular smoking among vulnerable adolescents.

Regarding parental smoking approval, data from study 1 showed that almost all adolescents (98.62%) expected their parents to be disapproving of their smoking, with those expecting their parents to prohibit or to punish them if knowing that they smoked reporting the lowest lifetime, current, and regular smoking prevalence (see Table 31). However, study 1 also showed that, almost all (94.61%) current users expecting their parents to be disapproving and just less than three-quarters (70.71%) of current users expecting their parents to prohibit them from smoking, acknowledge to smoke on a regular basis (see Table 20). Furthermore, and even though Allen et al. (2003) have considered that tobacco was the substance towards which parental influence was stronger, data from study 1 indicated that parental smoking approval was not a consistent risk factor for smoking among vulnerable adolescents (see Table 31, Table 34.1, and Table 35.1). However, more research is needed to better understand the association between parental smoking approval and smoking prevalence among vulnerable adolescents as, even though the odds of smoking were not significantly different between adolescents expecting their parents to disapprove, to punish, or to prohibit and those expecting their parents to be indifferent, the overall variable remained significantly associated with lifetime and regular smoking. The fact that the overall variable is still significantly associated with lifetime and regular smoking justifies that prevention interventions should provide parental training sessions to explain to parents the need to clearly and strongly express their disapproval towards their children's smoking, as well as teaching them to express this disapproval and establish boundaries in accordance.

Data from study 2 (see Table 51) indicated that over half of cases (59.64%) did not report change on their perceptions of parental smoking approval. From those adolescents that have changed their perceptions on parental approval, the highest proportion of cases (23.99%) and controls (22.28%) perceived their parents as less disapproving of smoking. This increase in perceived parental approval among cases and controls can be attributable to age as there is evidence that, with increasing age, adolescents tend to perceive their parents as less disapproving of smoking (Wang et al., 1995). Yet, considering that the difference between cases and controls was not statistically significant ( $\chi^2 = 0.94$ ,  $p = 0.625$ ), it seems that interventions were not effective in significantly changing cases' perception of parental smoking approval. Data from study 1 has demonstrated that only one out of the 15 agencies collaborating in this research has implemented parental training, which may explain the fact that interventions were not effective in significantly changing cases' perception of parental smoking approval.

Regarding sociodemographic variables, study 1 has demonstrated that age was a significant risk factor for lifetime, current, and regular smoking (see Table 33) even after controlling for covariates (see Table 34.3, Table 35.2, and Table 36.2). Considering evidence showing that the earlier the age of onset for tobacco, the heavier the consumption over time (Hughes et al., 2010; Tucker et al., 2003), the greater the addiction (Breslau et al., 1993; von Sydow et al., 2002), and the risk of using other substances (Ciairano et al., 2009; Ellickson et al., 2003), the fact that over half (60.91%) of the adolescents assessed in this research had had their first cigarette by the age of 13 years is a particular cause of concern. Even more concerning is that the percentage of early smokers found among the sample of adolescents assessed within this research was almost the double the percentage found by the 2011 ESPAD survey (31%) (Hibell et al., 2012). The practical implication of the percentage of early smokers is that it makes sense to provide prevention interventions addressing smoking before the age of 13, particularly to vulnerable adolescents such as those assessed in this research.

Living within an institution or within a blended family and having experienced stressful life events represented a risk for vulnerable adolescents' decision to smoke at some point in their lives (see Table 33 and table 34.3) which seems to indicate that adolescents start to smoke as a coping strategy to deal with unpleasant emotions. The fact that, among the sample of adolescents assessed in this study, the most expected benefit from smoking was feeling more

relaxed (see Table 17) seems to corroborate this argument. Therefore, prevention interventions should enhance stress management techniques among adolescents that had experienced stressful life events and should take into consideration the specific need of institutionalized adolescents, as well as those living with blended families, when addressing substance use.

Study 1 has also demonstrated that a higher SES represented a risk factor for adolescents that have tried tobacco to continue to smoke (see Table 33 and Table 35.2). This finding seems to indicate that increase in tobacco selling prices may restrain low SES adolescents' decision to make a habit from smoking, thus such supply measures should be promoted. As for gender and nationality, study 1 has shown that neither of these variables represented a significant risk factor for smoking among vulnerable adolescents (see Table 33 and Table 34.3), meaning that there seems to be no need to design specific prevention interventions to prevent smoking among boys and girls nor among adolescents from other nationalities.

Regarding smoking behaviour, data from study 2 (see Table 51) showed that just less than three-quarters of cases (71.27%) did not change their smoking behaviour. Yet, a higher proportion of cases (13.15%) than controls (7.07%) reported a decrease in their smoking behaviour. Considering that the difference between cases and controls reached statistical significance ( $\chi^2 = 11.41$ ,  $p = 0.003$ ), study 2 suggested that prevention interventions were effective in reducing smoking prevalence among cases.

However, study 2 also showed that over half of cases (61.22%) did not change their smoking intention. From those who have changed their intention to smoke, the proportion of cases reporting an increase (20.19%) and a decrease (18.59%) in their intention to smoke was similar and the difference between cases and controls was not statistically significant ( $\chi^2 = 5.21$ ,  $p = 0.074$ ). Taken together, these findings indicate that interventions were not effective in significantly changing cases' intention to smoke, which research has shown to be one of the strongest predictors for smoking among adolescents (Andrews et al., 2003; Andrews et al., 2008; Barkin et al., 2002; Booker et al., 2004; Vitória et al., 2011).

## **Cannabis Use**

Despite studies showing that adolescents who use cannabis occasionally and in modest doses do not seem to show specific health or social problems (Engels & Bogt, 2001), cannabis use among adolescents is cause of concern because it may cause impairment on neurocognitive functions such as attention, working memory, verbal memory and comprehension, perceptual reasoning, processing speed, or learning (Bava et al., 2010; Meier et al., 2012; Schweinsburg et al., 2008) that may last even after cannabis use cessation (Bolla et al., 2002; Meier et al., 2012). Furthermore, cannabis use may increase the risk for later use of other illicit substances (Cox et al., 2007), as well as increase the risk for mental disorders (Degenhardt & Hall, 2006; Moore et al., 2007).

Data from study 1 has shown that less than one-tenth of adolescents (9.32%) reported having used cannabis at some point in their lives, from which just over half (53.42%) continued to use. From those who continued to use, half (49.60%) use cannabis on a regular basis (see Table 22).

In line with studies reporting that adolescents estimate great risks from cannabis use (Kilmer et al., 2007; Miller et al., 2009), study 1 has shown that almost all adolescents (96.65%) perceived high or medium risks to health from using cannabis (see Table 20). This finding seems to indicate that adolescents were aware at least of some of the harmful effects associated with cannabis use. It is, however, interesting to note that a higher percentage of adolescents (3.35%) stated that cannabis has lower risk to health than tobacco (1.94%), which suggests that adolescents seem to hold the myth that is less damaging to smoke a joint than to smoke a cigarette.

Nevertheless, and even though data from study 1 has shown, in agreement with other studies (Kilmer et al., 2007; Miller et al., 2009), that adolescents who perceived cannabis use as having high risks to health were the ones reporting the lowest lifetime, current, and regular cannabis use prevalence (see Table 37), after controlling for covariates, cannabis use risk perception ceased to be a consistent risk factor for cannabis use prevalence among vulnerable adolescents (see Table 40.1 and Table 41). The practical implication of this finding is that there seems to be no benefit in prevention interventions providing information on the risks associated with cannabis.

Regarding expected problems from cannabis, data from study 1 has shown that almost all adolescents (92.76%) expected negative consequences from using cannabis. Similarly to drinking and smoking, having problems with parents was the most anticipated negative consequence from cannabis use (see Table 14), which seems to indicate that adolescents were aware of the fact that cannabis use is not socially accepted and, above all, not accepted by their parents. Accordingly with studies showing a negative association between negative expectancies and substance use (Jones et al., 2001; Kristjansson et al, 2012; Leigh & Stacy, 2004), study 1 revealed that adolescents expecting problems as a consequence of cannabis use were the ones showing the lowest lifetime and current cannabis use prevalence (see Table 37). Nevertheless, after controlling for covariates, expected problems ceased to be a significant risk factor for cannabis use (see Table 40.1 and Table 41). The practical implication of this finding is that there seems to be no benefit in prevention interventions providing information on the problems arising from cannabis use.

Conversely, expected benefits from substance use has been consistently associated with adolescents' decision to use substances (Clark et al., 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001). Data from study 1 has revealed that over one-third of adolescents (35.79%) expected positive consequences from using cannabis (see Table 20), which suggest that, at least some adolescents, consider cannabis as a beneficial substance, with feeling more relaxed being the most expected positive outcome (see Table 18). Even though study 1 also demonstrated that adolescents expecting positive consequences from cannabis use were the ones showing the highest lifetime, current, and regular cannabis use prevalence (see Table 37), after controlling for covariates, expected benefits ceased to be a consistent risk factor for cannabis use among vulnerable adolescents (see Table 40.1 and Table 41). However, more research is needed to understand the association between expected benefits and cannabis use prevalence among vulnerable adolescents as, even though the overall variable remained significantly associated with lifetime and current cannabis use, the odds of lifetime and current smoking were not significantly different between adolescents who did not expect positive outcomes from smoking and those either expecting benefits from smoking or not being sure. Hence, the fact that the overall variable was still significantly associated with lifetime and current cannabis use justifies that prevention interventions should try to deconstruct adolescents' positive expectations towards the use of this substance. It is interesting to note

that from adolescents that have tried cannabis at some point of their lives, just less than one-third (30.43%) were current cannabis users, despite not expecting benefits from using cannabis, which, in turn, may indicate the influence of other factors in the maintenance of cannabis use, such as the best friends' cannabis use behaviour.

Study 2 (see Table 52), revealed that, at the post-test, over one third of cases (37.88%) did not change their perception on expected benefits from using cannabis. From those who have changed their perceptions, the highest proportion of cases (39.51%) and controls (45.83%) reported to expect less benefits from using cannabis. Given that, as adolescents get older, they start to perceive the expected benefits from using substances as more likely to occur (Alfonso & Dunn, 2007; Chassin et al., 2001; O' Connor et al., 2007), this unexpected decrease in positive expectations shown by cases and controls indicate that factors external to interventions had an impact on adolescents from both groups leading them to perceive less benefits from using cannabis. The fact that the proportion of adolescents reporting a decrease in expected benefits at the post-test was higher among controls (45.83%) than cases (39.51%) suggest that interventions may have had a negative effect by contributing to cases reporting a lower decrease in positive expectations than the one reported by controls. If this were the case, it is a cause of concern given that the overall variable assessing expected benefits from using cannabis was significantly associated with lifetime and current cannabis use.

Evidence demonstrates that attitudes towards cannabis have become more positive (Roy et al., 2005), even compared with tobacco (Akre et al., 2010) and alcohol (Willner, 2001). In this study, the percentage of adolescents holding positive attitudes towards cannabis (12.32%) was higher than the percentage holding positive attitudes towards tobacco (2.83%) and very similar to the percentage holding positive attitudes towards alcohol (13.25%) (see Table 20). In line with previous studies (Alvaro et al., 2013; Malmberg et al., 2012; O'Callaghan & Joyce, 2006), study 1 also showed that a higher proportion of adolescents holding positive attitudes towards cannabis use have used cannabis at some point of their lives (see Table 37), even after controlling for covariates (see Table 40.1), demonstrating that positive attitudes were a significant risk factor for adolescent's decision to use cannabis at some point in their lives. This research has added to the field by demonstrating that neutral attitudes increase, as well, the risk of vulnerable adolescents to use cannabis at some point in their lives (see Table 37 and Table 40.1). It is interesting to note that one-fifth of adolescents (20.83%) that have tried

cannabis at some point of their lives, were still current cannabis users and a similar proportion (20.00%) still used it on a regular basis, despite holding negative attitudes towards cannabis (see Table 20). This finding seems to point, either to the influence of other variables such as best friends' cannabis use on adolescents' decision to use cannabis, or to adolescents' adjustment of their opinions to their overt behaviour, as claimed by the cognitive dissonance theory (Festinger & Carlsmith, 1959).

Evidence from study 2 (see Table 52) showed that over half of cases (58.07%) did not change their attitudes towards cannabis, and that a similar proportion of cases reported a decrease (20.79%) and an increase (21.14%) in their positive attitudes towards cannabis use. Considering that the difference between cases and controls did not reach statistical significance ( $\chi^2 = 2.63$ ,  $p = 0.296$ ), it seems that prevention interventions were not effective in contributing for a significant change in positive attitudes towards cannabis use among cases, a significant risk factor for vulnerable adolescents' cannabis use.

As argued by Allen et al. (2003), cannabis seems to be one of the substances where the influence of peers is stronger. Consistently with other studies showing the influence of best friends' cannabis use behaviour on adolescents' cannabis use (Ali et al., 2011; Mayet et al., 2010), study 1 has shown that a higher proportion of adolescents whose best friends were occasional users or regular cannabis users were themselves lifetime, current, and regular cannabis users (see Table 37), even after controlling for covariates (see Table 40.1 and Table 41). These results indicate that best friends' cannabis use was a significant risk factor for cannabis use among vulnerable adolescents. Moreover, the findings from study 1 complement previous work by showing that the odds of experimenting with cannabis were greater even among adolescents whose best friends were former cannabis users and even among adolescents who did not know whether their best friends are cannabis users or not. The practical implication of these findings is that prevention interventions should take into account that best friends may influence adolescents' behaviour through mechanisms other than simple modeling.

Data from study 2 (see Table 52), besides revealing that over three-quarters of cases (83.21%) did not report change on their best friends' cannabis use, also revealed that the proportion of cases reporting an increase (9.61%) and a decrease (7.17%) in their best friends'



cannabis use behaviour was similar. Further, considering that the difference between cases and controls was not statistically significant ( $\chi^2 = 2.57$ ,  $p = 0.277$ ) results indicate that interventions were not effective in influencing the cannabis use behaviour among best friends nor the selection of best friends among cases, one of the most significant risk factors for the decision to use cannabis among vulnerable adolescents.

Furthermore, peers seem to have an influence on adolescents' decision to use cannabis also by acting as a route for access to cannabis (Dent et al., 2005; Harrison et al., 2000; Hughes et al., 2010; Storvoll et al., 2008; Williams & Mulhall, 2005). Indeed, data from study 1 showed that, despite cannabis being an illegal substance, just less than half of adolescents (46.02%) in this study, whose mean age is 13 years old, perceived it as easy or fairly easy to obtain (see Table 20). A lower proportion of adolescents perceiving cannabis as being easy or fairly easy to obtain (30%) was reported by the 2011 ESPAD survey when assessing a sample of adolescents with a mean age of 16 years old (Hibell et al., 2012). This higher perceived accessibility among the sample assessed in this research may be a result of these adolescents living within riskier environments where substances are perceived as being more accessible, thus contributing for an overall perception of cannabis as a substance whose consumption is socially accepted. Taken together, these are particularly worrying findings considering that, as demonstrated by study 1, perceived access to cannabis was a significant risk factor for vulnerable adolescents' decision to use cannabis at some point in their lives (see Table 37 and Table 40.1).

Data from study 2 (see Table 52) revealed that just over half of cases (54.88%) did not report change on perceived accessibility to cannabis, being higher the proportion of cases (32.98%) than controls (28.57%) reporting to perceive cannabis as less accessible. However, given that the difference between cases and controls was not statistically significant ( $\chi^2 = 1.97$ ,  $p = 0.373$ ), results indicate that prevention interventions were not effective in significantly change cases' perception of ease of access to cannabis, which is a significant risk factor for lifetime cannabis use among the sample of vulnerable adolescents assessed within this research.

Regarding parental cannabis use approval, data from study 1 showed that problems with parents were the most anticipated negative consequence from using cannabis (see Table 14). Furthermore, study 1 revealed that almost all adolescents (99.34%) expected their parents to

be disapproving of their cannabis use, from which almost all (96.63%) were expected to be highly disapproving, with prohibition being the most anticipated reaction towards their cannabis use (see Table 20). In congruence with results reported previously by studies assessing the influence of parental disapproval on adolescents' illicit substance use (Bahr et al., 2005; Olsson et al., 2003; Wright & Pemberton, 2004), data from study 1 showed that adolescents expecting stronger parental disapproval towards cannabis use showed the lowest lifetime, current, and regular prevalence of cannabis use (see Table 37). Nevertheless, it is noteworthy that just over three-quarters of adolescents (77.42%) that have tried cannabis at some point of their lives, despite expecting their parents to be disapproving of cannabis use, were still current cannabis users and a similar proportion (70.83%) still used it on a regular basis (see Table 20). This finding seems to be the result of the increasing influence of peers over parents on adolescents' decisions and behaviours, according to what have been reported by other studies (Kelly et al., 2011; Lundborg 2006; Vitória et al., 2011). In fact, after controlling for covariates, parental cannabis use approval ceased to be a consistent risk factor for adolescents' decision to use cannabis (see Table 40.1 and Table 41). However, more research is needed to understand the association between parental cannabis use approval and cannabis use prevalence among vulnerable adolescents as the overall variable remained significantly associated with lifetime and current cannabis use, even though the odds of being a lifetime cannabis user were not significantly different between adolescents expecting their parents to disapprove, to punish, or to prohibit them from using cannabis and those expecting their parents to be indifferent. The fact that the overall variable was still significantly associated with lifetime and current cannabis use justifies that prevention interventions should provide parental training sessions to explain to parents the need to clearly and strongly express their disapproving towards their children's cannabis use, as well as teaching them to express this disapproval and establish boundaries accordingly.

Moreover, data from study 2 (see Table 52) demonstrated that over half of cases (63.48%) did not change their perceptions on parental approval of cannabis use. The proportion of cases that reported a decrease (19.95%) and an increase (16.57%) in their perception on parental cannabis use approval was similar. As the difference between cases and controls did not reach statistical significance ( $\chi^2 = 3.68$ ,  $p = 0.159$ ), it seems that interventions were not effective in significantly change cases' perception of parental approval of cannabis use. Data

from study 1 has demonstrated that only one out of the 15 agencies collaborating in this research has implemented parental training, which may help to understand the fact that interventions were not effective in significantly change cases' perception of parental approval of using cannabis.

As for sociodemographic variables, study 1 has demonstrated that age was a significant risk factor for lifetime cannabis use (see Table 39) even after controlling for covariates (see Table 40.2). Considering that research has shown that the earlier the onset of cannabis use, the heavier the consumption over time (Siqueira et al., 2001), abuse and dependence (Chen et al., 2009), the greater the likelihood of psychosocial impairment (Hicks et al., 2010) and academic problems (Ellickson et al., 2003), the greater the difficulty in quitting (von Sydow et al., 2002), and the greater the risk of using other substances (Ciairano et al, 2009; Ellickson et al., 2003), the fact that just over one-quarter (26.39%) of adolescents that have used cannabis at some point in life have used it for the first time at 13 years older or younger, is worrying. A much lower percentage of early cannabis users (4%) was found by the 2011 ESPAD survey (Hibell et al., 2012). This difference might be explained by the fact that the sample of adolescents used within this research has been identified as being at increased risk for substance use. The practical implication of the percentage of early cannabis users is that it makes sense to provide prevention interventions addressing cannabis use before the age of 13, particularly to vulnerable adolescents as those assessed in this research.

As for gender, nationality, SES, family structure, and stressful life events, study 1 has shown that neither of these variables represented a significant risk factor for cannabis use among the vulnerable adolescents sampled. The practical implication is that there is no particular need of prevention interventions to design specific interventions to prevent cannabis use among boys and girls, among adolescents with nationalities other than Portuguese, from a particular SES, living within non-intact families, or that have experienced stressful life events.

Regarding cannabis use behaviour, data from study 2 (see Table 52) showed that the vast majority of cases (90.92%) did not change their cannabis use behaviour. Furthermore, considering the similarity between the proportion of cases that reported a decrease (4.91%) and an increase (4.17%) in their cannabis use behaviour, it seems that prevention

interventions were not effective in significantly change cannabis use among vulnerable adolescents.

Additionally, study 2 (see Table 52) also revealed that over two-thirds of cases (70.21%) did not change their intention to use cannabis. From those that have changed their intention to use cannabis, the proportion of cases reporting an increase (15.83%) and a decrease (13.97%) in their intention to use cannabis was similar. Taking into consideration that the difference between cases and controls was not statistically significant ( $\chi^2 = 2.49, p = 0.289$ ), it seems that interventions were not effective in significantly change intention to use cannabis among cases, which has been considered one of the strongest predictors for cannabis use among adolescents (Alvaro et al., 2013; Barkin et al., 2002; Hohman et al., 2013).

### **Cocaine Use**

Cocaine is a powerfully addictive substance that, with repeated use, negatively affects the brain's reward pathway by making the circuitry less sensitive, not only to natural reinforcers in the environment, but also to the substance itself (NIDA, 2010). This increases the need for it to be used in higher quantities, contributing to the quick establishment of addiction (NIDA, 2010). Moreover, according to the EMCDDA (2009c), the use of any psychoactive substance, particularly among adolescents, is a matter of concern considering that the brain as well as other organs, is still under development and exposure to toxic substances may cause damage, even though it might only appear later in life (EMCDDA, 2009c).

Even though data from study 1 has shown that few adolescents (1.76%) report having used cocaine at some point in their lives, there is evidence that cocaine lifetime prevalence might be increasing among adolescents (Hibell et al., 2009; Hibell et al., 2012). From those adolescents that have tried cocaine at some point of their lives, over one-third (38.64%) continued to use cocaine and, from these, just over half (52.94%) use it on a regular basis (see Table 22). In line with studies reporting adolescents' negative intention to use cocaine (Bridges et al., 2003; Sigelman et al., 2002), study 1 showed that cocaine was the substance towards which more adolescents expressed intention not to use in the future (82.33%) (see Table 22). Yet, it is also worth mentioning that cocaine was also the substance towards which the percentage of lifetime users (1.76%) was more similar to the percentage of those willing to use it in the future

(1.25%), which is in line with data from the 2012 INCSPPP survey showing that cocaine is one of the substances towards which users express a higher intention to use (Balsa et al., 2013).

Consistent with studies reporting that adolescents estimate great risks from substance use (Lundborg & Lindgreen, 2002; Lundborg & Lindgreen, 2004), study 1 showed that almost all adolescents (98.48%) considered cocaine to have high or medium risks to health, which seems to indicate that adolescents were aware at least of some risks associated with cocaine use (see Table 20). Further, the findings from study 1 complemented previous work by showing that cocaine was considered to be the most harmful substance from all the substances assessed in this research (see Table 20). According to Lundborg and Lindgreen (2002), informing young people about substances may not be the optimal educational policy as it may decrease risk perception associated with substances and, as a consequence, may increase the risk for substance use. Even though adolescents considering cocaine as having high risks to health were the ones reporting the lower lifetime and current cocaine use (see Table 42), after controlling for covariates, cocaine risk perception ceased to be a significant risk factor for cocaine use among vulnerable adolescents (see Table 45). The practical implication of this finding is that there seems to be no benefit in prevention interventions providing information on the risks associated with cocaine use as risk perception was not a significant risk factor for cocaine use among the sample of vulnerable adolescents assessed within this research.

Regarding expected problems from cocaine use, data from study 1 showed that cocaine, besides being the substance most perceived as having risks to health, was also the substance towards which more adolescents (93.82%) expected problems as a consequence from its use (see Table 20). Similarly to drinking, smoking, and using cannabis, having problems with parents was the most anticipated negative consequence from cocaine use (see Table 15), which seems to indicate that adolescents were aware that cocaine use is not socially accepted and, above all, not accepted by their parents. In agreement with studies showing a negative association between negative expectancies and substance use (Jones et al., 2001; Kristjansson et al, 2012; Leigh & Stacy, 2004), study 1 revealed that adolescents expecting problems as a consequence of cocaine use were the ones showing the lowest lifetime and current cocaine use prevalence (see Table 42). However, after controlling for covariates expected problems ceased to be a significant risk factor for cocaine use among vulnerable

adolescents (see Table 45). The practical implication of this finding is that there seems to be no benefit in prevention interventions providing information on the problems arising from cocaine use as negative expectations did not seem to be a significant protective factor for cocaine use among vulnerable adolescents.

As for expected benefits, research has shown an association with adolescents' decision to use substances (Aarons et al., 2001; Buckner & Schmidt, 2008; Clark et al., 2011; Leigh & Stacy, 2004; Linkovich-Kyle & Dunn, 2001; Kristjansson et al., 2012). Data from study 1 has revealed that, in addition of being the substance towards which more adolescents expected problems as a consequence of its use, cocaine was also the substance towards which less adolescents expected benefits (25.05%). In line with studies showing that, with increasing age, adolescents start to perceive the expected benefits from using substances as more likely (Alfonso & Dunn, 2007; Chassin et al., 2001; O' Connor et al., 2007), study 1 also revealed that adolescents expecting positive consequences from cocaine use reported higher cocaine lifetime use (see Table 42). However, after controlling for covariates, expected benefits ceased as well to be a significant risk factor for cocaine use among vulnerable adolescents (see Table 45). The practical implication of this finding is that there seems to be no benefit in prevention interventions providing information to deconstruct benefits from cocaine as this was not a significant risk factor for adolescents' decision to use cocaine.

In line with studies showing the influence of best friends' substance use behaviour on adolescents' illegal substance use (Eitle, 2005; Fujimoto & Valente, 2012), study 1 showed that a higher proportion of adolescents whose best friends have used cocaine had themselves tried cocaine at some point of their lives, indicating that best friends' cocaine use was a significant risk factor for adolescents' decision to experiment with cocaine (see Table 42), even after controlling for covariates (see Table 45). As argued by Allen et al. (2003), the influence of peers on cocaine use is weaker and, indeed, data from study 1 showed that cocaine was the only substance where best friends' substance use did not significantly influence current and regular use among vulnerable adolescents. However, it is also worth-considering that best friends' cocaine use was the only variable that was associated with adolescents' regular cocaine use in the univariate analyses, which confirms the strong influence of best friends' substance use among vulnerable adolescents.

Moreover, the findings from study 1 complemented previous work by showing that the odds of using cocaine at some point in life were greater even among adolescents whose best friends were former cocaine users, which seems to indicate that other factors besides direct modeling may mediate the relationship between best friends' cocaine use and adolescents lifetime use, as it seems that adolescents may take the decision to use cocaine even if their best friends have stopped using it. The practical implication of these findings is that prevention interventions should take into account that best friends may influence adolescents behaviour through mechanisms other than simple modeling.

Data from study 2 (see Table 53) revealed that the vast majority of cases (95.01%) did not report changes in their best friends' cocaine use behaviour, and that the proportion of cases reporting an increase (2.79%) and a decrease (2.21%) in their best friends' cocaine use behaviour was similar. As the difference between cases and controls was not statistically significant ( $\chi^2 = 3.54$ ,  $p = 0.171$ ), results indicate that interventions were not effective in influencing the cocaine use behaviour among best friends nor the selection of best friends among cases, one of the most significant risk factors for the decision to use cocaine among vulnerable adolescents.

Furthermore, peers seem to have an influence on adolescents' decision to use cocaine also by acting as a route for access to cocaine (Dent et al., 2005; Harrison et al., 2000; Hughes et al., 2010; Storvoll et al., 2008; Williams & Mulhall, 2005). Indeed, data from study 1 showed that, despite cocaine being an illegal substance, over one-third of adolescents (37.26%) perceived it as easy or fairly easy to obtain (see Table 20), which is a worrying finding considering that study 1 also revealed that perceived accessibility was a significant risk factor for adolescents' decision to use cocaine at some point in life. Therefore, congruently with studies showing that ease of access is associated with substance use (Coffey et al., 2000; Cummings et al., 2003; Durant et al., 2008; Hublet et al., 2009; Komro et al., 2007; Williams & Mulhall, 2005), study 1 showed that adolescents who perceived cocaine as easy to obtain were the ones reporting the highest lifetime cocaine use (see Table 42), even after controlling for covariates (see Table 45).

Additionally, study 2 (see Table 53) revealed that over half of cases (60.32%) did not report change on perceived accessibility to cocaine, being similar the proportion of cases (24.75%)

and controls (21.55%) that have reported to perceive cocaine as less accessible. However, the fact that the difference between cases and controls was not statistically significant ( $\chi^2 = 1.58, p = 0.455$ ), indicates that interventions were not effective in significantly change cases' perception of ease of access to cocaine, which was a significant risk factor for lifetime cocaine use among the vulnerable adolescents sampled.

Regarding parental cocaine use approval, data from study 1 showed that virtually all adolescents (99.45%) expected their parents to be disapproving of their cocaine use, from which virtually all (98.45%) were expected to be highly disapproving, with prohibition being the most anticipated reaction towards their cocaine use (see Table 20). In fact, study 1 revealed that problems with parents were the most anticipated negative consequence from using cocaine (see Table 15). In congruence with results reported previously by studies assessing the influence of parental disapproval on adolescents' use of illicit substances (Bahr et al., 2005; Olsson et al., 2003; Wright & Pemberton, 2004), data from study 1 showed that adolescents expecting stronger parental disapproval towards cocaine use were the ones showing the lowest lifetime of cocaine use (see Table 42), even after controlling for covariates (see Table 45). An interesting finding from study 1, in line with what has been reported by the SAMHSA (2009), was that there was no significant difference in the proportion of adolescents reporting lifetime cocaine use among adolescents expecting their parents to be indifferent and those expecting their parents to be merely disapproving, with high parental disapproval being the only reaction associated with a significantly lower proportion of cocaine use among adolescents (see Table 42 and Table 45). The practical implication of these findings is that prevention interventions should promote parental training sessions to explain to parents the need to clearly and strongly express their disapproval towards their children's' cocaine use, as well as teaching them strategies to express this disapproving and establish boundaries in accordance.

Study 2 (see Table 53) revealed that just over two-thirds of cases (67.92%) did not change their perceptions on parental cocaine use approval, and that the proportions of cases reporting a decrease (16.35%) and an increase (15.74%) in their perception on parental cocaine use approval were similar. Yet, given that the difference between cases and controls did not reach statistical significance ( $\chi^2 = 0.83, p = 0.659$ ), it seems that prevention interventions were not effective in significantly change cases' perception of parental approval of cocaine use. To



understand this lack of effectiveness, it is important to consider that, as shown within study 1, only one out of the 15 agencies collaborating in this research has implemented parental training. This may explain the fact that interventions were not effective in significantly change cases' perception of parental approval of using cocaine, a significant risk factor for vulnerable adolescents' decision to use cocaine at some point in life.

Although attitudes have been considered a relevant factor for the understanding of adolescent substance use (Hawkins et al., 1992; O'Connell, et al., 2009; Petraitis et al., 1995; Wright & Pemberton, 2004), according to Bridges et al. (2003), little is known about changes in attitudes towards cocaine. Data from study 1 added to the field by showing that cocaine was the substance presenting the second highest percentage of adolescents (50.10%) holding negative attitudes, only supplanted by tobacco (see Table 20). Consistent with previous studies showing that adolescents holding positive attitudes towards substances are more likely to report using them (Alvaro et al., 2013; Bosson et al., 2012; Epstein et al., 2003; Jiménez et al., 2009; Malmberg et al., 2012; O'Callaghan & Joyce, 2006; Otten et al., 2007; Roek et al., 2010; Vaughan et al., 2011), study 1 also showed that a higher proportion of adolescents holding positive, an even neutral attitudes towards cocaine have used it at some point of their lives (see Table 42), even after controlling for covariates (see Table 45). This is a cause of concern considering that study 1 revealed that just less than half of adolescents (44.60%) reported holding neutral attitudes towards cocaine (see Table 20), meaning that, like adolescents holding positive attitudes towards cocaine, those holding neutral attitudes are at increased risk of experimenting with cocaine.

Study 2 has shown that over half of cases (60.06%) did not report changes on their attitudes towards cocaine use aside with a similarity between the proportion of cases that reported a decrease (19.04%) and an increase (20.90%) in their positive attitudes towards cocaine use. Given that the difference between cases and controls did not reach statistical significance, there is evidence that interventions were not effective in contributing to significantly changes in positive attitudes towards cocaine use, a significant risk factor for vulnerable adolescents' decision to use cocaine at some point in their lives.

As for sociodemographic variables, study 1 presented evidence that age was not a consistent risk factor for cocaine use. However, this result can be attributable to the low number of

adolescents (i.e., 45) that reported having used cocaine at some point of their lives, which may lower the possibility of detecting a significant difference where one exists. Considering that research has shown that early users have greater escalation on consumption over time (Tucker et al., 2003; Siqueira et al., 2001), greater the risk of abuse (Blomeyer et al., 2011; Chen et al., 2009; Hughes et al., 2010) and dependence (Breslau et al., 1993; Chen et al., 2009; Hingson et al., 2006), greater likelihood of psychosocial impairment (Hicks et al., 2010) and academic problems (Ellickson et al., 2003), greater difficulty in quitting (von Sydow et al., 2002), greater risk of using other substances later in life (Ellickson et al., 2003), and greater risk to report poor outcomes even if they reduced their substance use during adolescence (Tucker et al., 2005), the fact that just less than one-third of adolescents (31.31%) have used cocaine at 13 years old or younger is worrying. The practical implication of the percentage of early cocaine users is that it makes sense to provide prevention interventions addressing cocaine use before the age of 13, particularly to vulnerable adolescents as those assessed in this research.

As for gender, nationality, SES, family structure, and stressful life events, study 1 has shown that none of these variables represented a significant risk factor for cocaine use among vulnerable adolescents. The practical implication is that there is no particular need for prevention interventions to design specific interventions to prevent cocaine use among boys and girls, among adolescents with nationalities other than Portuguese, from a particular SES, living within non-intact families, or that have experienced stressful life events. One practical implication from the absence of association between cocaine use and stressful life events is that cocaine, being a psychoestimulant substance, seems to be mostly used in recreational settings with the role of enhancing fun and pleasure and not so much to cope with unpleasant feelings arising from stressful events, which highlights the need of prevention interventions to address the recreational setting and associated expectations.

Regarding cocaine use behaviour, data from study 2 (see Table 53), besides showing that the vast majority of cases (97.85%) did not change their cocaine use, also revealed a similarity between the proportion of cases that reported a decrease (1.11%) and an increase (1.04%) in their cocaine use behaviour. Given that the difference between cases and controls did not reach statistical significance ( $\chi^2 = 2.43$ ,  $p = 0.297$ ), results indicate that interventions were not effective in significantly changing cocaine use behaviour among vulnerable adolescents.

Additionally, study 2 (see Table 53) also revealed that over three-quarters of cases (79.86%) did not change their intention to use cocaine. From those that have changed their intention to use cocaine, a higher proportion of cases (11.60%) than controls (8.19%) reported an increase in their intention to use cocaine, suggesting that prevention interventions may have caused an iatrogenic effect on cases by leading them to hold a higher intention to use cocaine, even more considering that the difference between cases and controls reached statistical significance ( $\chi^2 = 8.53, p = 0.014$ ). This is a cause of concern as research has shown that intention to use cocaine is one of the strongest predictors for cocaine use (Alvaro et al., 2013; Barkin et al., 2002; Hohman et al., 2013).

### **Health-Related Quality-of-Life**

Study 1 has demonstrated that just over two-thirds (68.68%) of the sample of adolescents assessed within this research reported a high level of health-related quality-of-life (see Table 21). Around three-quarters of adolescents considered themselves to have had fun with their friends (77.83%) and reported low levels of loneliness (76.24%) whereas around two-thirds considered that their parents have treated them highly fairly (69.12%), and felt highly fit and good shape (66.35%). Over half considered to have had plenty time for themselves (64.14%), reported low levels of sadness (64.04%) and high levels of energy (63.98%), had plenty opportunities to do enjoyable activities in their leisure times (62.97%), and felt highly able to pay attention at school (57.90%). However, only around one-third (39.24%) considered themselves to be very good students, which is a cause of concern considering that academic achievement seems to account for the greatest proportion in variance in alcohol, cannabis, and cocaine use and as the second highest proportion for smoking (Diego et al., 2003). One practical implication of this finding is that prevention interventions should include activities aimed at promoting academic achievement and, therefore, enhance academic self-concept among vulnerable adolescents.

Low health-related quality-of-life has been associated with drinking (Kuntsche & Gmel, 2004; Phillips-Howard, et al., 2010), smoking (Dunn et al., 2011; Matos, 2008; Piko et al. 2005), cannabis use (Dunn et al., 2011; Fergusson & Boden, 2008; Matos, 2008), and cocaine use (Thatcher et al., 2002; Zullig et al., 2001) among adolescents. However, despite data from

study 1 showing that the proportion of lifetime and current drinkers was lower among adolescents who report higher levels of health-related quality-of-life (see Table 26), after controlling for covariates, health-related quality-of-life ceased to be a significant risk factor for lifetime and current drinking among vulnerable adolescents. One possible explanation for the loss of significance between health-related quality-of-life and lifetime and current drinking might be an overlap between health-related quality-of-life and stressful life events, a variable that remained significant for lifetime and current drinking (see Table 26) even after controlling for covariates (see Table 28.2 and Table 29.2). As considered by Becker et al. (2009), quality-of-life captures an individual's satisfaction with life in areas of personal importance, the fact that the question assessing stressful life events integrated items related with domains relevant for adolescents might help to explain the loss of significance for health-related quality-of-life.

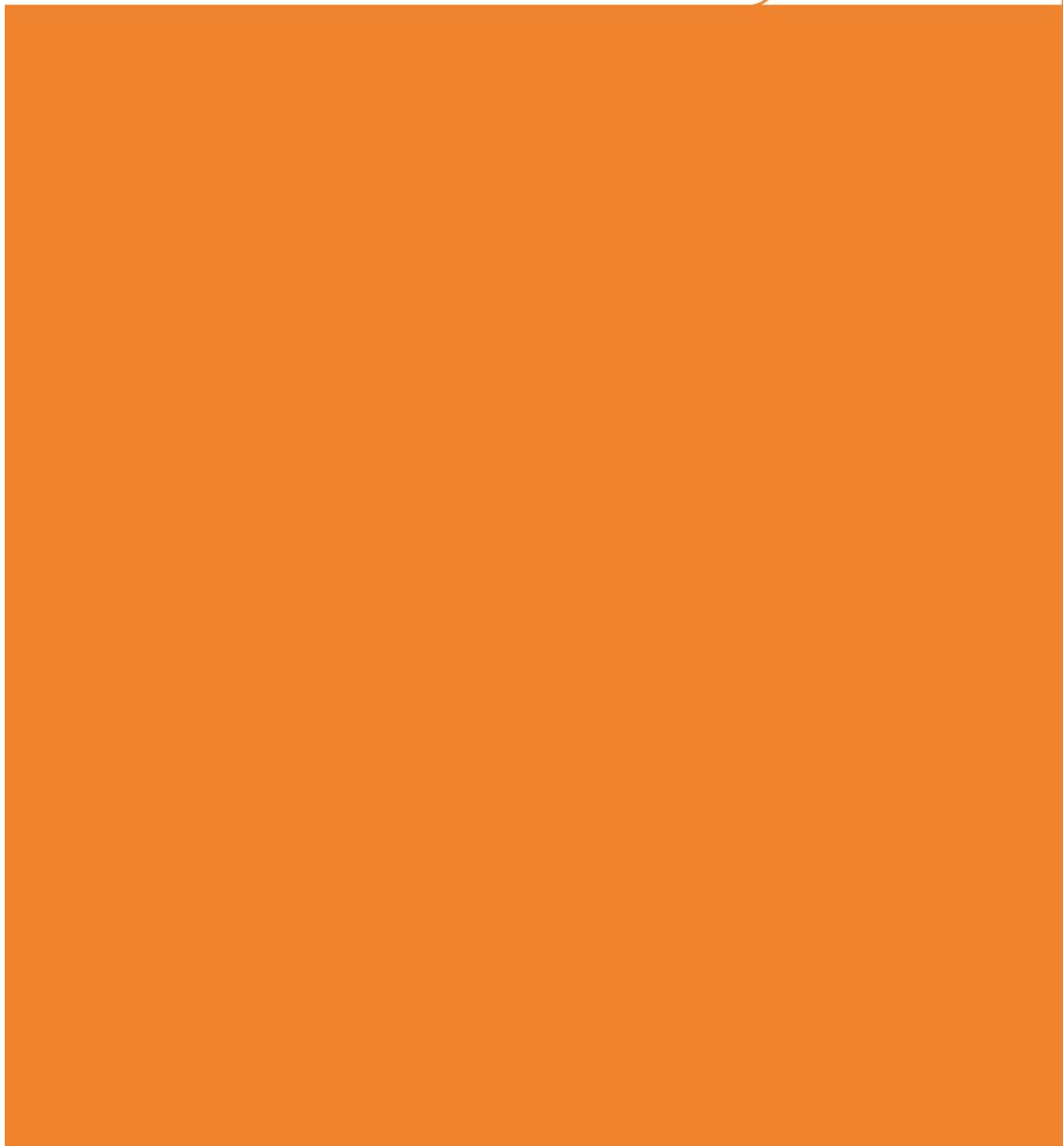
As for smoking, study 1 also showed that the proportion of lifetime smokers was higher among adolescents reporting lower levels of health-related quality-of-life (see Table 32), even after controlling for covariates (see Table 34.2), revealing that low health-related quality-of-life was a significant risk factor for lifetime smoking among vulnerable adolescents. Based on Windle's opinion (2000), this outcome suggests that smoking may be a coping strategy used by adolescents to deal with stress. The fact that one of the most expected benefits from smoking among adolescents assessed in this research is feeling more relaxed (see Table 17) seems to corroborate this argument. Therefore, based on data from the 10 items composing the scale to assess health-related quality-of-life, the practical implication of the findings regarding smoking and health-related quality-of-life was that prevention interventions may decrease the risk of lifetime smoking by (a) delivering activities that promote high levels of fitness and energy; (b) providing opportunities for enjoying leisure activities that allow adolescents to have fun with their friends, as well as to have time for themselves; (c) enhancing coping strategies to deal with stress and unpleasant emotions such as sadness and loneliness; (d) creating opportunities for the enhancement of academic self-concept and for stimulating ability to pay attention at school; and (e) promoting parent-child interactions to foster a warm and supportive relationship that allow adolescents to feel fairly treated by their parents.

Evidence from study 2 demonstrates that a similar proportion of cases (46.01%) and controls (40.11%) reported an increase in their health-related quality-of-life, with no significant difference between cases and controls ( $\chi^2 = 4.29, p = 0.117$ ). Hence, these results seem to indicate that

prevention interventions were not effective in contributing to a significantly higher health-related quality-of-life among vulnerable adolescents, a significant risk factor for their decision to smoke at some point in life.

Regarding cannabis and cocaine use, similar findings were shown within study 1: even though adolescents that have tried cannabis and cocaine at some point of their lives report lower levels of health-related quality-of-life (see Table 38 and Table 43), after controlling for covariates, health-related quality-of-life ceased to be a significant risk factor for cannabis use as well as for cocaine use among vulnerable adolescents. Therefore, study 2 demonstrating that prevention interventions were not effective in significantly improving adolescents quality-of-life does not seem to be a particularly worrying outcome, considering that lower health-related quality-of-life was not a significant risk factor for cannabis use neither to cocaine use among vulnerable adolescents.

## CONCLUSIONS



Of the four substances assessed within this research (i.e., alcohol, tobacco, cannabis, and cocaine), alcohol was the substance perceived as having least risks to health whereas cocaine was the substance perceived as having more risks to health. After controlling for covariates, drinking risk perception remained a significant risk factor for lifetime drinking (see Table 28.1), although more research is needed to better understand relationships between drinking risk perception and alcohol consumption. Regarding current drinking among lifetime drinkers, there was evidence that the greater the perceived risk associated with drinking (see Table 29.1), the greater the likelihood of vulnerable adolescents being current drinkers, which may indicate that thrill-seeking adolescents are more likely to continue to drink. Considering that this research has found evidence that prevention interventions seem to have had led vulnerable adolescents to perceive drinking as less risky for their health (see Table 50), together with the positive association between drinking risk perception and current drinking, it seems reasonable to suppose that prevention interventions may have decreased the odds of vulnerable adolescents continuing to drink. However, more research is needed before firm conclusions can be drawn on the impact of addressing drinking risk perception among vulnerable adolescents.

Regarding tobacco, this research has shown that almost all vulnerable adolescents perceived smoking as having medium or high risks to health (see Table 20). Even though smoking risk perception remained a significant risk factor for adolescents' decision to smoke after controlling for covariates (see Table 34.1), more research is needed to better understand this association as the proportion of smokers among adolescents perceiving smoking as having medium or high risk to health was not significantly different from the proportion among those perceiving low risk. Moreover, among current and regular smokers, smoking risk perception was not a significant risk factor. Results regarding prevention interventions' impact on smoking risk perception indicated that interventions were not effective in contributing to a significant change in this risk factor.

Similar to tobacco, almost all adolescents perceived high or medium risks to health from using cannabis and cocaine (see Table 20). However, after controlling for covariates, risk perception ceased to be a consistent risk factor for cannabis use (see Table 40.1) and cocaine use (see Table 45), thus the interventions' impact on this variable was not measured.

In line with the findings regarding risk perception, alcohol was the substance towards which least vulnerable adolescents anticipated problems as a consequence of use and cocaine the substance for which adolescents most expected problems (see Table 20). However, and given that expected problems were not a significant risk factor for drinking (see Table 28.1, Table 29.1, and Table 30.1) nor for cocaine use (see Table 45), interventions' impact on this variable was not measured. The same was found for smoking and cannabis use: after controlling for covariates, expected problems ceased to be a significant risk factor for smoking (see Table 31) and cannabis use (see Table 40.1 and Table 41), and interventions' impact on these variables was not measured either.

Alcohol was the substance that most vulnerable adolescents expected positive outcomes as a consequence of using and cocaine the substance for which least adolescents expected such outcomes (see Table 20). However, while expected benefits from drinking remained a significant risk factor for adolescents' decision to drinking at some point of their lives and to continue to drink (see Table 31) after controlling for covariates (see Table 28.1 and Table 29.1), more research is needed to better understand associations between expected benefits and alcohol consumption patterns. Further, more research is also needed to better understand why prevention interventions were not effective in significantly decreasing positive expectations from drinking among vulnerable adolescents.

As for expected benefits from smoking, this research revealed that this variable was a significant risk factor for adolescents' decision to smoke at some point in their lives and to continue to smoke (see Table 31), even after controlling for covariates (see Table 34.1 and Table 35.1). Therefore, evidence from this research showing that prevention interventions may have had a negative effect on cases by contributing to cases' higher positive expectations from smoking is a cause of concern. More research would be required to better understand the impact of this increase among vulnerable adolescents.

Regarding expected benefits from using cannabis, data indicated that at least some adolescents consider cannabis as a beneficial substance (see Table 20), with feeling more relaxed being the most expected positive outcome (see Table 18). Moreover, it is interesting to note that cannabis users may continue to use cannabis, despite not expecting benefits from using cannabis (see Table 22), which may indicate the influence of other factors in the



maintenance of cannabis use, such as best friends' cannabis use behaviour. After controlling for covariates, expected benefits from cannabis use remained a significant risk factor for lifetime use (see Table 40.1). However more research is needed to better understand the relationship between expected benefits and cannabis use among vulnerable adolescents. Thus, the fact that prevention interventions may have led to higher positive expectations from using cannabis among cases after intervention than before (see Table 52) can be considered a negative effect from interventions. Further research would be needed to better understand the impact of this increase among vulnerable adolescents.

Considering expected benefits from cocaine use, after controlling for covariates, expected benefits ceased to be a significant risk factor for cocaine use among vulnerable adolescents (see Table 45). For that reason prevention interventions' impact on this variable was not measured.

This research has also presented evidence that attitudes towards drinking were a significant risk factor for vulnerable adolescents' decision to drink at some point in their lives, to continue to drink, and to drink regularly (see Table 25, Table 28.1, Table 29.1, and Table 30.1). Alcohol was the substance towards which more vulnerable adolescents expressed neutral or positive attitudes (see Table 20), and findings suggested that prevention interventions were not effective in contributing to a decrease in positive attitudes towards drinking (see Table 50). These findings raise questions on prevention interventions' effectiveness in reducing an important risk factor for lifetime and continued drinking among vulnerable adolescents.

Attitudes towards smoking, either positive or neutral, also seemed to be a significant risk factor for lifetime, current, and regular smoking among vulnerable adolescents (see Table 31). Therefore, tobacco being the substance evoking the highest percentage of negative attitudes towards use (see Table 20) seemed to be somewhat a protective factor against smoking. Moreover, there was evidence that prevention interventions were effective in contributing to a decrease in positive attitudes towards smoking (see Table 51), which is a positive finding pointing to prevention interventions' effectiveness.

Similar to alcohol and tobacco, both positive and neutral attitudes towards cannabis (see Table 37, Table 40.1, and Table 41) and towards cocaine (see Table 37, Table 42 and Table 45) seemed to be a significant risk factor for lifetime cannabis and cocaine use among vulnerable

adolescents. Consequently, the fact that the percentage of adolescents holding positive attitudes towards cannabis was higher than the percentage holding positive attitudes towards tobacco and similar to the percentage holding positive attitudes towards alcohol was a cause of concern (see Table 20). This was particularly worrying given that lifetime cannabis users may continue to use cannabis and use it regularly despite holding negative attitudes towards cannabis (see Table 22). Consequently, the fact that cocaine was the substance with the second highest percentage of adolescents holding negative attitudes, only supplanted by tobacco (see Table 20), seemed to be a protective factor among the sample assessed within this research. Therefore, the finding showing that prevention interventions were not effective in contributing to a decrease in positive attitudes towards cannabis (see Table 52) or cocaine use (see Table 53) questions interventions' effectiveness in reducing this risk factor for vulnerable adolescents' decision to use cannabis and cocaine.

Another particularly significant risk factor for vulnerable adolescents' decision to use substances is substance use behaviour among their best friends. In fact this research has shown that best friends' use of alcohol (see Table 25, Table 28.1, Table 29.1, and Table 30.1), tobacco (see Table 31, Table 34.1, Table 35.1, and Table 36.1), cannabis (see Table 37, Table 40.1, and Table 41), and cocaine (see Table 42 and Table 45) was the most consistent risk factor for substance use among vulnerable adolescents, particularly if the best friends were regular substance users. Complementarily, this research has also demonstrated that alcohol was the substance showing the lowest percentage of never users among best friends (see Table 20), which indicates that alcohol is a substance whose consumption is widespread and socially accepted. Another interesting finding from this research was that the odds of using cannabis at some point in live were greater even among adolescents whose best friends were former cannabis users and those who did not know whether their best friends were cannabis users or not (see Table 40.1). This points to the need to consider other mechanisms, besides social peer pressure, to explain best friends' influence on cannabis use behaviour among vulnerable adolescents. As for cocaine, a finding worth mentioning that corroborates the influence of best friends' substance use behaviour on substance use behaviour was that best friends' cocaine use was the only variable associated with regular cocaine among current users (see Table 42). Hence, the lack of effectiveness of prevention interventions in influencing the substance use behaviour among best friends, either for alcohol (see Table 50),

cannabis (see Table 52), or cocaine (see Table 53) is a cause of concern given the strong influence that best friends have on vulnerable adolescents' substance use. The exception to this lack of effectiveness on impacting best friend's substance use was for tobacco, given that prevention interventions may have contributed to a decrease in smoking behaviour among adolescents' best friends or to adolescents selecting other peers, less experienced with tobacco, as their best friends(see Table 51). This is a particularly relevant finding suggesting that prevention interventions have been effective in reducing a risk factor for smoking among adolescents.

Best friends can also influence adolescents' substance use by providing them with opportunities and facilitating access to substances. This is particularly relevant to adolescents under the legal age for purchasing legal substances, such as those assessed within this research. Despite the minimum legal age to purchase alcoholic drinks in Portugal being 16 years old, and 18 years old for purchasing spirits and tobacco, most vulnerable adolescents assessed in this research (whose mean age is 13) perceived alcoholic drinks and tobacco as easy or fairly easy to obtain (see Table 20). This is a cause of concern considering that accessibility was a significant risk factor for lifetime and regular drinking (see Table 25, Table 28.1, Table 29.1, and Table 30.1). Moreover, this research presented evidence that prevention interventions were not effective in significantly changing perceptions of ease of access to alcohol (see Table 50), the substance perceived as being most accessible among the sample (see Table 20). As for tobacco, considering that, after controlling for covariates, accessibility ceased to be a significant risk factor for lifetime and current smoking among vulnerable adolescents (see Table 34.1 and Table 35.1), the high perceived accessibility to tobacco does not seem to be a very relevant issue. Regarding cannabis and cocaine, despite being illegal substances, almost half of vulnerable adolescents in this sample perceived cannabis as easy or fairly easy to obtain and over one-third perceived cocaine as easy or fairly easy to obtain(see Table 20). This is a cause of concern considering that perceived accessibility was a significant risk factor for adolescents' decision to use cannabis (see Table 37 and Table 40.2) and cocaine (see Table 42 and Table 45) at some point in their lives. Additionally, this research presented evidence that prevention interventions were not effective in significantly changing perceptions of ease of access to cannabis (see Table 52) or cocaine (see Table 53).

The extent to which adolescents perceive their parents as being against or in favour of substance use also influences adolescents' decisions to use substances. Among the sample of vulnerable adolescents assessed within this research, almost all adolescents expected their parents to be highly disapproving of their smoking and cannabis use and virtually all adolescents expected their parents to be highly disapproving of their cocaine use (see Table 20). Prohibition was, for these three substances, the most anticipated reaction (see Table 20). Complementary to this finding on perceived parental approval, results on expected problems from using substances indicate that having problems with parents were the most expected negative consequence from smoking (see Table 13), using cannabis (see Table 14), and using cocaine (see Table 15). However, despite the significant associations between perceived parental approval of smoking (see Table 31 and Table 34.1) and cannabis use (see Table 37, Table 40.1, and Table 41) and the lifetime use of these two substances, even after controlling for covariates, further research is needed to better understand this relationship. Regarding cocaine, perceived parental approval remained a significant risk factor for vulnerable adolescents' decision to use cocaine at some point in their lives, even after controlling for covariates (see Table 42 and Table 45).

The figure was rather different for alcohol as, despite problems with parents being the most anticipated negative consequence among vulnerable adolescents (see Table 12), from the four substances assessed within this research, alcohol was the substance that vulnerable adolescents expected their parents to prohibit the least (see Table 20). This is a worrying finding considering that, as this research has shown, parental drinking approval was a significant risk factor for vulnerable adolescents' decision to drink at some point in their lives, to continue to drink, and to drink regularly (see Table 25, Table 28.1, Table 29.1, and Table 30.1). An interesting finding from this research was that there was no significant difference in the proportion of lifetime, current, or regular drinkers among adolescents expecting their parents to be indifferent and those expecting their parents to be merely disapproving, with only high parental disapproval being independently associated with reduced odds for drinking among adolescents (see Table 28.1, Table 29.1, and Table 30.1).

As for prevention interventions' effect on perceived parental approval of substance use among their children, those assessed here were not effective in decreasing adolescents' perceptions of parental approval of drinking (see Table 50), smoking (see Table 51), cannabis use (see

Table 52), and cocaine use (see Table 53). The fact that only one out of the 15 agencies collaborating in this research implemented parental training, may explain this lack of effectiveness.

Regarding sociodemographic variables, age was a particularly relevant factor that significantly affects the risk for lifetime and continued drinking among adolescents (see Table 27, Table 28.2, Table 29.2, and Table 30.2). It also constituted a risk factor for lifetime, current, and regular smoking as well as for the lifetime use of cannabis (see Table 39 and Table 40.2) and cocaine (see Table 44). Taking into account the risks associated with early substance use, the fact that at the age of 13 or even younger, just over half of lifetime drinkers had their first drink, over half of lifetime smokers had smoked their first cigarette, just over one-quarter of lifetime cannabis users had used cannabis for the first time, and one-third of lifetime cocaine users had used cocaine for the first time (see Table 22) are particularly worrying findings. These results highlight the need to target vulnerable adolescents before 13 years old in order to delay the onset of substance use.

Concerning gender, there was evidence that, of current drinkers, boys were more likely to become regular drinkers than girls (see Table 27 and Table 30.2). However, gender did not represent a significant independent risk factors for smoking (see Table 33, Table 34.3, Table 35.2, and Table 36.2), using cannabis (see Table 39 and Table 40.2), nor using cocaine among the sample of vulnerable adolescents assessed within this research.

For nationality, there was evidence from this research demonstrating that adolescents from nationalities other than Portuguese who had drunk at some point in life were at higher risk for becoming regular drinkers (see Table 27 and Table 30.2). No significant association were found between nationality and smoking (see Table 33, Table 34.3, Table 35.2, and Table 36.2), cannabis use (see Table 39 and Table 40.2), nor cocaine use among this sample.

As for SES, there was evidence that higher SES represented a risk factor for current smoking among adolescents that smoked at some point in their lives (see Table 33 and Table 35.2), and this may suggest that supply measures addressing tobacco prices would be an effective strategy. Regarding alcohol, more research is needed to better understand the relationship between SES and lifetime drinking among vulnerable adolescents. This research found that

SES was not an independent risk factor for cannabis use (see Table 39 and Table 40.2) or cocaine use among vulnerable adolescents in this sample.

Family structure was shown to be a significant risk factor for current drinking among those that have drunk at some point in their lives, with institutionalized adolescents showing lower odds of being current drinkers (see Table 27 and Table 29.2), perhaps due to a lower accessibility to alcoholic drinks. Regarding smoking, results indicated that vulnerable adolescents living within an institution showed higher odds of smoking at some point in their lives (see Table 33 and Table 34.3), which may be explained by the assumption that these adolescents, before being institutionalized, had lived within families and environments that have placed them at greater risk for unhealthy outcomes, such as substance use. This research found that family structure was not an independent risk factor for cannabis use (see Table 39 and Table 40.2) or cocaine use among vulnerable adolescents in this sample.

The experience of stressful life events has been associated with substance use. Accordingly, this research found evidence that vulnerable adolescents that had experienced a stressful life event were at increased odds for drinking at some point in their lives and for continuing to drink (see Table 27, Table 28.2 and Table 29.2), as well as increased odds for smoking at some point in their lives (see Table 33 and Table 34.3). These results seem to point to drinking and smoking as a situational coping strategy to deal with stress and unpleasant emotions. The fact that the most expected benefit from smoking among vulnerable adolescents was feeling more relaxed (see Table 17) seems to corroborate this argument. This research found that stressful life events were not an independent risk factor for cannabis use (see Table 39 and Table 40.2) or cocaine use among vulnerable adolescents in this sample.

Lastly, results regarding substance use among this sample of vulnerable adolescents provide evidence that prevention interventions may have had an iatrogenic effect on vulnerable adolescents by leading them to drink more than they did before the intervention (see Table 50). Moreover, considering that alcohol was the substance that most vulnerable adolescents (drinkers and non-drinkers) expressed intention to use within the next year (see Table 22), the fact that prevention interventions were not effective in changing intentions to drink seems to indicate a lack of effectiveness in reducing future drinking among vulnerable adolescents. As regards smoking prevalence, there is evidence that prevention interventions were effective in

stopping or reducing levels of smoking in smokers (see Table 51). This is particularly important considering that tobacco was the substance with the highest percentage of consumers becoming regular consumers (see Table 22). However, no effects from prevention interventions were found for intention to smoke which seems to be a cause of concern given that tobacco was, after alcohol, the substance towards which more adolescents expressed intention to use within the next year (see Table 22). With respect to cannabis use, results seem to indicate that prevention interventions were not effective in changing cannabis use among vulnerable adolescents or adolescents' intention to use cannabis in the future (see Table 52). As regards cocaine, this research presented evidence that prevention interventions were not effective in changing cocaine use prevalence among vulnerable adolescents (see Table 53) and that these interventions may have led vulnerable adolescents to hold a higher intention to use cocaine (see Table 53). This is a cause of concern given that intention successfully predicts future cocaine use, and thus this could be considered an iatrogenic effect from interventions.

Overall, this research has shown that prevention interventions have not produced statistically significant changes in most of the variables associated with vulnerable adolescents' substance use. Although some positive effects were found prevention interventions led to more negative and even iatrogenic outcomes than positive and effective outcomes. One possible explanation for these results might be the lack of a strong evidence base and the inclusion of activities that may be counterproductive, such as drugs information days or external lecturers or stand alone informative sessions about substances, which according to the EMCDDA (2008c) is very common within prevention interventions. Additionally, the overall lack of effectiveness from prevention interventions assessed within this research may be partially explained by the fact that just over one-third of agencies (40.00%) implemented standardised social skills programmes (see Appendix L).

## RECOMMENDATIONS





This chapter presents the main recommendations arising from this research. Given that the recommendations are common to the four substances assessed within the study, they are presented together. This chapter is divided into two sections: the first presents recommendations for practice and the second presents recommendations for further research.

## **Practice**

This research has shown that among the sample of vulnerable adolescents participating in this study, of those that have drunk or smoked at some point of their lives, around half had their first drink or their first cigarette at 13 years or younger. Of those that have used cannabis at some point in their lives, just over one-quarter used it for the first time at 13 years or younger and one-third of those that have used cocaine used it at 13 years or younger. Thus, prevention interventions should target vulnerable adolescents before they reach 13 years old so that it is possible to delay the onset of substance use and, therefore, decrease the risks associated with early substance use.

Regarding risk perception, even though there was no statistically significant difference in the proportion of lifetime drinkers among adolescents perceiving medium or high risks from drinking and those perceiving low risks, there is evidence of a significant association between the overall variable and lifetime drinking and lifetime smoking. Further, there is evidence of a positive relationship between drinking risk perception and lifetime drinkers' decision to continue to drink. Therefore, it is recommended that prevention interventions abstain from delivering standalone informative sessions on the risks associated with drinking and smoking until a better understanding of the relationship between risk perception and substance use is achieved, along with a better understanding of how information on the risks associated with substance use can be effectively communicated to vulnerable adolescents.

Further, there seems to be no benefit in interventions focusing exclusively on providing information on the negative consequences of using substances as this was not a significant risk factor for substance use among vulnerable adolescents. Instead, it appears to be more beneficial that prevention interventions design strategies that focus on adolescents' expected benefits from substance use and try to question and deconstruct these positive expectations, as the overall variable assessing expected benefits was significantly associated with

substance use among this sample. The expectation of feeling more relaxed deserves particular attention as it was the most expected positive outcome from substance use among vulnerable adolescents. Hence, activities aiming to increase adolescents' repertoire of stress managing techniques are particularly worth considering.

As this research found that positive and even neutral attitudes towards substances were a significant risk factor for substance use among the sample assessed within this research, adolescents' positive and neutral attitudes towards substances should be addressed within prevention interventions as they influence vulnerable adolescents' decisions to use substances at some point in their lives, to continue to use substances, and to use them regularly.

In view of evidence showing that adolescents may decide to drink and to smoke as a strategy to deal with stress and unpleasant emotions, prevention interventions should include content on stress management techniques, particularly for adolescents that have experienced stressful life events, institutionalized adolescents, and those living with blended families. Additionally, taking into account that health-related quality-of-life represented a significant risk factor for vulnerable adolescents' experimentation with smoking, prevention interventions may decrease the risk of lifetime smoking by (a) delivering activities that promote high levels of fitness and energy; (b) providing opportunities for enjoyable leisure activities that allow adolescents to have fun with their friends, as well as to have time for themselves; (c) enhancing coping strategies to deal with stress and unpleasant emotions such as sadness and loneliness; (d) creating opportunities for the enhancement of academic self-concept and for stimulating ability to pay attention at school; and (e) promoting parent-child interactions to foster warm and supportive relationships that allow adolescents to feel fairly treated by their parents. Further, considering that academic self-concept was the item towards which vulnerable adolescents reported the lowest score on the health-related quality-of-life assessment, prevention interventions should include activities aimed at promoting academic achievement and, therefore, enhance academic self-concept among vulnerable adolescents.

In addition, with parental indifference towards their children's substance use being a significant risk factor for substance use among vulnerable adolescents, prevention interventions should promote parental training sessions to explain to parents the need to clearly express their strong disapproval towards their children's substance use, as well as teaching them strategies to

express this disapproval and establish boundaries accordingly. As for peers, given the influence of best friends on substance use among adolescents, prevention interventions should enhance strategies to deal with peer pressure particularly among adolescents whose best friends are regular substance users.

As for sociodemographic variables, particular attention should be paid to drinking patterns among adolescents from nationalities other than Portuguese and specific activities to reduce harmful drinking patterns among this specific group, which is at increased risk for regular drinking, should be delivered. As boys who drink were more likely to become regular drinkers than girls, prevention interventions should pay particular attention to drinking patterns among boys and design specific activities to reduce harmful drinking patterns among this subgroup.

Lastly but no less importantly, based on evidence from this research showing that perceived accessibility to alcoholic beverages was a significant risk factor for lifetime and regular drinking, supply reduction measures should be reinforced. Furthermore, evidence from this research suggesting that affordable alcohol selling prices may contribute to making alcohol accessible to adolescents regardless of their SES, provides a basis to recommend an increase in alcohol prices. Equally, considering that adolescents from higher SES reported the highest current smoking prevalence, there seems to be evidence that an increase in tobacco prices may restrain low SES adolescents' decisions to make a habit from smoking, and thus such supply measure should be promoted.

Considering the overall lack of effectiveness from prevention interventions assessed within this research, an effort should be made to adopt manualised prevention interventions as these are more likely to have been pre-tested and evaluated to avoid iatrogenic effects and to prove efficacy (EMCDDA, 2013). Moreover, recent evidence from the EMCDDA (2013) has demonstrated that evidence-based programmes can be adapted to different cultures and contexts and achieve similar levels of effectiveness (EMCDDA, 2013) which seems to be an effective way of increasing prevention interventions' quality and enhancing their success in preventing substance use among young people.

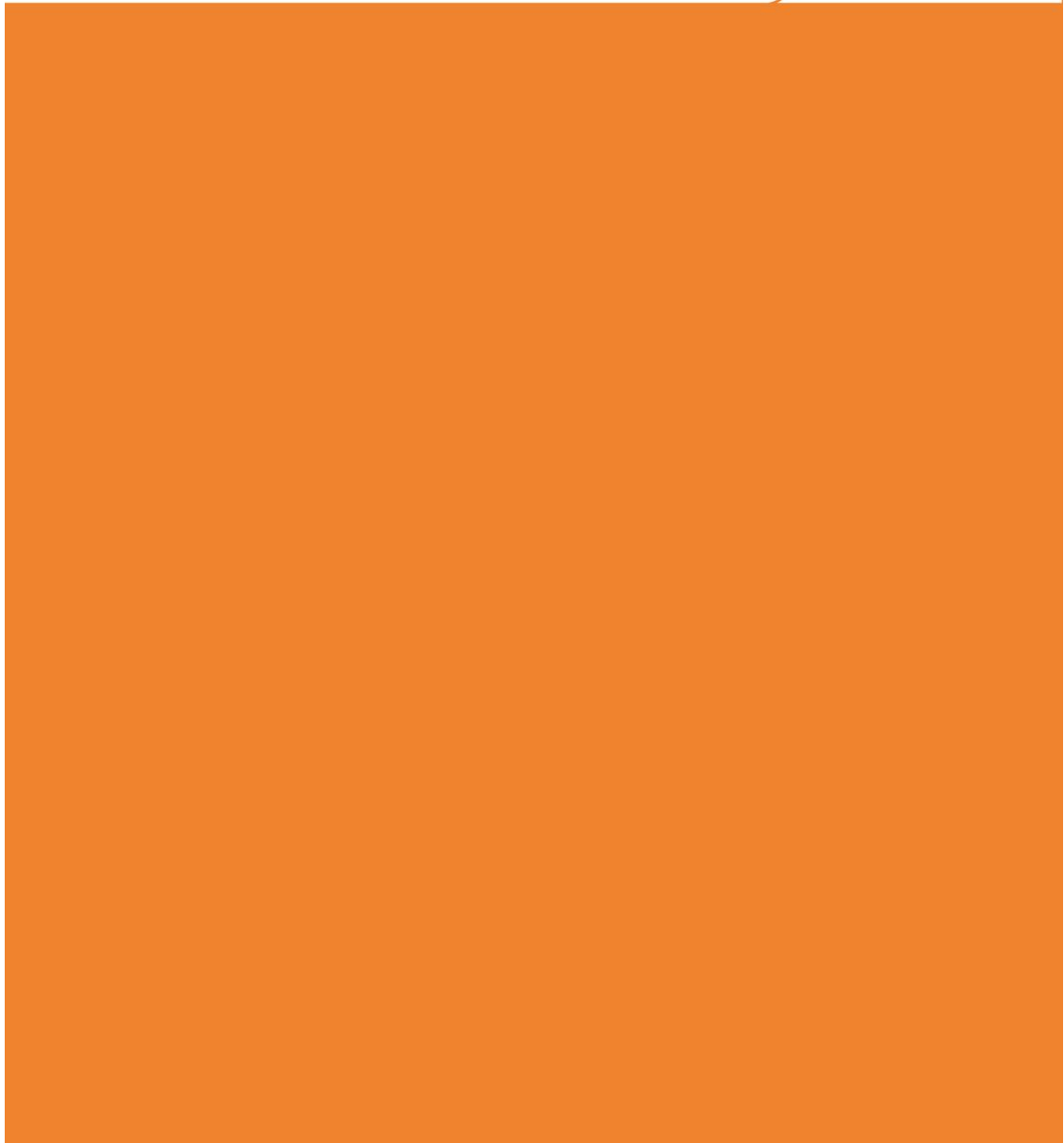
## Research

Developing better understanding on the role of risk perceptions in substance use is particularly important given that providing information on the risks of using substances is, according to the EMCDDA (2009a), the most common approach to prevention. Based on the results arising from this study, further research is needed to investigate the relationship between risk perception and drinking and smoking among vulnerable adolescents. Additionally, it would be beneficial to comprehend further the positive relationship between drinking risk perception and current drinking among lifetime drinkers, considering evidence showing that the higher the perceived risk associated with drinking, the higher the current drinking prevalence. Complementarily, the fact that prevention interventions seem to have had no effect on risk perception among vulnerable adolescents emphasizes the need for further research to identify how information on the risks associated with substance use can be delivered to vulnerable adolescents most effectively.

Considering evidence showing that perceived parental approval can influence adolescents' decision to smoke (Bahr et al., 2005; Berg et al., 2009; Ellickson et al. 2008; Sargent & Dalton, 2001) and to use illicit substances (Bahr et al., 2005; Olsson et al., 2003; Wright & Pemberton, 2004), another topic that deserves further research is the association between perceived parental substance use approval and vulnerable adolescents' substance use. Based on the results arising from this study, further research is needed to better understand the relationship between perceived parental approval and vulnerable adolescents' smoking and cannabis use, given that perceived parental reaction does not seem to consistently influence adolescents' decision to smoke or to use cannabis.

Positive expectations have also been associated with adolescents' decision to use cannabis (Aarons et al., 2001; Buckner & Schmidt, 2008; Kristjansson et al., 2012). However, in this study there were no significant differences in lifetime cannabis use or continued cannabis use between those expecting positive outcomes from cannabis and those not expecting such outcomes. Therefore, additional research to examine the association between expected benefits and cannabis use prevalence among vulnerable adolescents would be beneficial.

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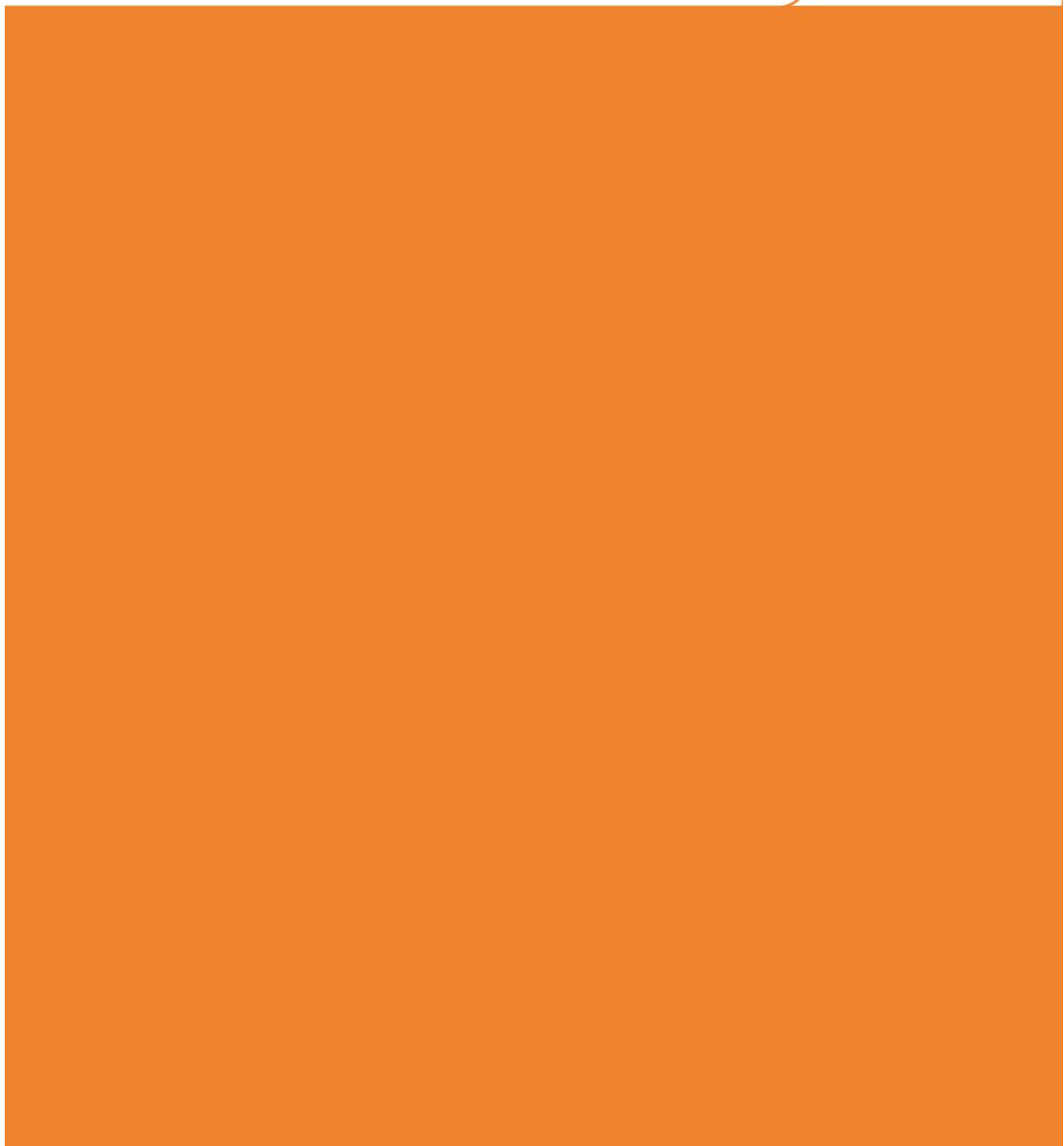
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## APPENDICES



## Appendix A – Presentation of the Research Project

Boa tarde Dr.<sup>a</sup> R. F.

Conforme combinado, venho por este meio apresentar uma proposta de avaliação do projecto "MVP" da responsabilidade da Associação ADPLC, financiado no âmbito do Programa Operacional de Respostas Integradas da Delegação Regional do Centro do Instituto da Droga e da Toxicodependência, IP.

Esta avaliação enquadra-se na investigação de Doutoramento que estou a realizar intitulada "Avaliação dos resultados e do impacto de projectos de prevenção das toxicodependências" e que está a ser orientada pelo Professor Telmo Mourinho Baptista (da Faculdade de Psicologia e de Ciências da Educação da Universidade de Lisboa) e pelo Professor Mark Bellis (da *Faculty of Health and Applied Social Sciences da Liverpool John Moores University*).

Tendo tido conhecimento do vosso projecto, pude avaliar o mérito teórico e prático que o justificam como um excelente candidato a objecto de estudo desta investigação, pelo que gostaria de saber da vossa disponibilidade e interesse em colaborar.

Junto envio um resumo da investigação para apreciação.

Sem outro assunto de momento e estando disponível para prestar os esclarecimentos que considere necessários, sou com os meus melhores cumprimentos

Elisabete Santos

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## Appendix B–Invitation to Attend a General Meeting

Boa tarde Dr.ª R. F.

Antes de mais, gostaria de agradecer a disponibilidade por vós demonstrada para integrar o projecto de investigação sobre "Avaliação dos Resultados e do Impacto de Projectos de Prevenção das Toxicodependências".

Venho, então, por este meio convidá-la a si e a um técnico do Projecto "MVP" a participarem na primeira reunião de operacionalização da investigação, a realizar no próximo dia 9 de Março (2ª feira). Esta reunião terá lugar nas instalações da Delegação Regional do Centro do IDT ((Rua Bernardo Albuquerque, 86) às 10:30.

A ordem de trabalhos será a seguinte:

- 1) apresentação da metodologia de investigação;
- 2) apresentação do instrumento de recolha de dados;
- 3) apresentação do protocolo de aplicação do instrumento de recolha de dados;
- 4) operacionalização da recolha de dados; e
- 5) discussão de questões relevantes para as equipas técnicas dos projectos.

Agradeço, desde já, a disponibilidade que demonstraram para estar presentes nesta reunião. Peço o favor de me enviar um e-mail a confirmar a vossa presença, indicando os nomes das pessoas que estarão presentes.

Sem outro assunto de momento e estando disponível para prestar os esclarecimentos que considere necessários, sou com os meus melhores cumprimentos,

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**Evaluating the outcomes and the impact of drug prevention interventions  
(Ref. 11/HEA/037)**

Liverpool John Moores University Research Ethics Committee (REC) reviewed the above application by chairs action and I am happy to inform you the Committee are content to give a favourable ethical opinion and recruitment to the study can now commence.

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project will be reported to the Committee immediately;
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately;
- any substantive amendments to the protocol will be reported to the Committee immediately.

the LJMU logo is used for all documentation relating to participant recruitment and participation eg poster, information sheets, consent forms, questionnaires.

The JMU logo can be accessed at [www.ljmu.ac.uk/images/jmulogo](http://www.ljmu.ac.uk/images/jmulogo)

For details on how to report adverse events or amendments please refer to the information provided at [http://www.ljmu.ac.uk/RGSO/RGSO\\_Docs/EC8Adverse.pdf](http://www.ljmu.ac.uk/RGSO/RGSO_Docs/EC8Adverse.pdf).

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be June 2016. An application for extension of approval must be submitted if the project continues after this date.

Yours sincerely,



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Processo n° 9405/08

AUTORIZAÇÃO N° 1852 /09

Elizabete Rute dos Santos, no âmbito da elaboração da sua tese de doutoramento, notificou à Comissão Nacional de Protecção de Dados (CNPD) um tratamento de dados pessoais, de jovens de idade compreendidas entre os 12 e os 18 anos, relativo à “*Avaliação dos resultados e do impacto de projectos de prevenção das toxicodependências*”

Aos alunos de escolas seleccionadas dos 2º e 3º ciclos do ensino básico e do ensino secundário serão aplicados inquéritos de auto-avaliação.

Os inquéritos são aplicados em cinco momentos, ao longo de 36 meses.

Nos questionários não há identificação nominal do titular, sendo aposto um código alfanumérico do aluno. A chave desta codificação é apenas do conhecimento da investigadora.

### 3.1. Dados referentes ao aluno

Os dados pessoais objecto de recolha são os seguintes:

São recolhidos os seguintes dados:

- Código alfanumérico;
- dados demográficos (género, idade, ano de frequência escolar, nacionalidade, nacionalidade dos pais, escolaridade dos pais, e coabitação);
- respostas ao questionário relativo a consumo de substâncias psicoactivas (tabaco, álcool, haxixe, ecstasy, cocaína e outras drogas);
- respostas ao inquérito de qualidade de vida (saúde e actividade física, sentimentos, humor, auto-conceito, tempos livres, ambiente familiar, nível económico, relação com pares, ambiente escolar e *bullying*).

O tratamento de dados pessoais está na disponibilidade dos seus titulares, apenas a estes cabendo decidir se pretendem prestar as informações em causa e autorizar a recolha de informação para a finalidade pretendida.

Porque referentes à vida privada, os dados abrangidos pelo estudo em causa têm a natureza de sensíveis, razão pela qual o respectivo tratamento só pode basear-se no consentimento expresso, esclarecido e livre dos titulares dos dados, nos termos do disposto no n° 2 do artigo 7º da Lei n° 67/98, de 26.10, ou, no caso de serem menores, dos seus legais representantes. Contudo, face à natureza pessoalíssima das respostas,

Rua de São Bento, 148-3º • 1200-821 LISBOA  
Tel: 213 928 400 Fax: 213 976 832  
geral@cnpd.pt www.cnpd.pt

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duvidas@cnpd.pt ]

entende a CNPD que, atendendo ao direito das crianças ao seu desenvolvimento e autonomia progressiva, apesar de menores, deverão também elas consentir a partir dos 16 anos. O estudo deverá ter em conta o superior interesse da criança e o direito à sua privacidade, que também releva face aos pais, ambos reconhecidos pela Convenção da ONU sobre os direitos da criança, de 1989.

Os destinatários deverão ser ainda informados sobre a natureza facultativa da sua participação e garantida confidencialidade no tratamento.

A(s) declaração(ões) de consentimento deverá ser entregue à directora de turma e arquivada junto do processo individual do aluno.

Tendo em atenção as exigências reforçadas para a obtenção do consentimento, o exercício dos direitos de acesso e rectificação deve corresponder ao sistema estabelecido para o consentimento.

Tendo em vista a finalidade do tratamento, os dados recolhidos afiguram-se pertinentes, adequados e necessários para a prossecução da finalidade visada.

A Comissão Nacional de Protecção de Dados considera existir legitimidade para o tratamento dos dados desde que pelos titulares, ou seus representantes, seja dado consentimento livre, específico e informado (artigos 3º alínea h) e 7º nº2 da Lei 67/98, de 26.10).

#### IV. Conclusão

Em face do exposto, a Comissão Nacional de Protecção de Dados autoriza o tratamento de dados pessoais *supra* apreciado, nos termos dos artigos 27.º nº1, 28 nº1 alínea a) e 30.º nº1 da Lei n.º 67/98, de 26 de Outubro, consignando-se o seguinte:

**1 - Responsável do tratamento:** Elizabete Rute dos Santos

**2 - Categorias de dados pessoais tratados:**

Código alfanumérico, dados demográficos (género, idade, ano de frequência escolar, nacionalidade, nacionalidade dos pais, escolaridade dos pais, e coabitação), respostas aos questionários relativas a consumo de substâncias psicoactivas (tabaco, álcool, haxixe, ecstasy, cocaína e outras drogas) e à qualidade de vida (saúde e actividade física, sentimentos, humor, auto-conceito, tempos livres, ambiente familiar, nível económico, relação com pares, ambiente escolar e *bullying*).

**3 - Finalidade:** "Avaliação dos resultados e do impacto de projectos de prevenção das *toxicodependências*".

**4 - Forma de exercício do direito de acesso e rectificação:** a solicitação dos titulares, ou dos encarregados de educação nos termos *supra* estabelecidos, junto da investigadora.




**6 – Comunicação de dados:** Não há.

**7 - Interconexão e fluxos transfronteiriço de dados:** Não há.

**8 - Tempo de conservação dos dados:** Um mês após a apresentação do trabalho académico os códigos de identificação dos alunos devem ser destruídos.

Lisboa, 4 de Maio de 2009

Luís Barroso; Luís Paiva de Andrade; Ana Roque; Carlos Campos Lobo; Helena Delgado António; Vasco Almeida

  
Luis Lingnau da Silveira (Presidente, que relatou)

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## Appendix E– DGIDC Consent to Collect Data



### Identificação da Entidade / Interlocutor

Nome da entidade:

Elisabete Rute Santos

Nome do Interlocutor:

Elisabete Rute Santos

E-mail do interlocutor:

elrute@sapo.pt

### Dados do Inquérito

**Número de registo:**

**001970001**

Designação:

Questionário de Avaliação dos Resultados e do Impacto de Projectos de Prevenção das Toxicodependências

Descrição:

O Questionário de Avaliação dos Resultados e do Impacto de Projectos de Prevenção das Toxicodependências (Q.A.R.I.P.P.T.) é um instrumento dirigido a jovens entre os 12 e os 18 anos, constituído por 110 questões e com um tempo de preenchimento estimado em 50 minutos.

Os documentos de suporte utilizados para a construção deste questionário foram os seguintes:

- Questionário desenvolvido pelo European School Survey Project on Alcohol and Other Drugs
- Questionário desenvolvido pelo European Drug Addiction Prevention Trial
- Instrumentos de avaliação que constam do Evaluation Instrument Bank do European Monitoring Centre for Drugs and Drug Addiction.
- National Youth Survey (12 to 18 version) do Institute of Behavioral Science, University of Colorado, U.S.A.

Este questionário integra ainda um instrumento, intitulado "Kidscreen", desenvolvido pelo Kidscreen European Group e traduzido e validado para a população Portuguesa pela Equipa da Professora Doutora Margarida Gaspar de Matos da Faculdade de Motricidade Humana. Esta utilização foi devidamente autorizada pela equipa de investigação Portuguesa que, não obstante ter autorizado a integração no questionário que desenvolvi, advertiu para a impossibilidade de efectuar quaisquer alterações aos conteúdos, estrutura interna ou formatação deste instrumento. Sendo este instrumento de aplicação trans-cultural com vista à possibilidade de comparação dos dados recolhidos nos diversos países Europeus, a alteração das questões que o compõem poderia comprometer esta comparabilidade. As questões que reproduzem o "Kidscreen" vão da 91 à 100.

A sua estrutura interna é a seguinte:

1. Secção sobre substâncias: esta secção tem como objectivo avaliar variáveis proximais relativamente ao consumo de substâncias psicoactivas e divide-se em seis sub-secções:

- a. tabaco
- b. álcool
- c. haxixe
- d. ecstasy
- e. cocaína
- f. outras drogas

Nota: para as primeiras cinco substâncias, as questões são sempre as mesmas.

2. Secção sobre qualidade de vida: esta secção tem como objectivo avaliar variáveis distais relativamente ao consumo de substâncias psicoactivas e corresponde à reprodução autorizada do instrumento "Kidscreen", que se divide em 10 sub-secções:

- a. saúde e actividade física
- b. sentimentos
- c. humor
- d. auto-conceito
- e. tempos livres
- f. ambiente familiar
- g. nível económico
- h. relação com pares
- i. ambiente escolar
- j. bullying

Nota: a esta secção foi acrescentada a questão 101 destinada a avaliar a variável "acontecimentos de vida", questão esta que não faz parte do instrumento "Kidscreen".

3. Secção sobre dados demográficos

(Para uma análise das variáveis avaliadas em cada uma das secções deste questionário, ver, por favor, documento "Matriz do Questionário" inserido no campo "Outros documentos").

A estrutura interna deste questionário foi concebida de forma a simplificar ao máximo o processo de resposta, razão pela qual:

- se evitou a utilização de tabelas e quadros de dupla e tripla entrada
- as questões na secção sobre substâncias são iguais para todas as substâncias no que respeita ao conteúdo, formulação e ordem de entrada
- as opções de resposta, embora tenham algumas variações conforme a substância em avaliação, são genericamente iguais para todas as substâncias no que respeita ao conteúdo, formulação e ordem de entrada
- existem filtros para que os respondentes sem experiência de consumo não tenham que ler e responder a questões sobre comportamentos de consumo

De referir que este questionário foi já submetido à Comissão Nacional de Protecção de Dados que irá emitir parecer comprovativo da conformidade com a Lei de Protecção de Dados.

Objectivos:

A aplicação deste questionário a jovens entre os 12 e os 18 anos que estejam a ser alvo de projectos de prevenção das toxicodependências em meio escolar visa a recolha de dados que nos permitam atingir o objectivo principal desta investigação que é o de avaliar os resultados e o impacto de projectos de prevenção.

Mais especificamente, este projecto pretende:

1. Avaliar a eficácia diferencial de alguns dos principais paradigmas, modelos e metodologias de intervenção, de modo a identificar alguns componentes interventivos com maior potencial de eficácia;
2. Identificar variáveis contextuais (associadas aos indivíduos, aos grupos, ao meio familiar e comunitário) que contribuam para potenciar a eficácia das intervenções;
3. Identificar sinais precoces que permitam monitorizar a implementação dos projectos e proceder às reformulações que se entendam ser necessárias com vista a aumentar a sua eficácia;
4. Identificar grupos-alvo específicos (quanto ao género, idade, escolaridade, etnia e nível sócio-económico) que se constituam mais permeáveis à eficácia dos projectos.

Periodicidade:

Outra: primeiras três recolhas anuais e restantes duas semestrais (ver esquema em "Nota metodológica")

Data do início do período de recolha de dados:

17-11-2008

Data do fim do período de recolha de dados:

31-12-2011

Universo:

Escolas de 2º e 3º ciclo do Ensino Básico e Escolas Secundárias da Rede Pública

Unidade de observação:

Indivíduo

Método de recolha de dados:

Aplicação de questionários

Inquérito registado no Sistema Estatístico Nacional:

Não

Inquérito aplicado pela entidade:

Sim

Instrumento de notação:

[00197\\_200811121535\\_Documento1.pdf](#) (PDF - 297,58 KB)

Nota metodológica:

[00197\\_200811121535\\_Documento2.pdf](#) (PDF - 197,93 KB)

Outros documentos:

[00197\\_200811121535\\_Documento3.pdf](#) (PDF - 152,00 KB)

Data de registo:

12-11-2008

Versão:

1 (1)

Dados adicionais

Estado:

Aprovado

Avaliação:

Exma. Senhora Dra. Elisabete Rute dos Santos,  
Informo por este meio que o pedido de aplicação de inquéritos em meio escolar é autorizado apenas se solicitar autorização aos pais/encarregados de educação dos alunos para que os mesmos possam responder ao questionário dado o conteúdo das questões da secção sobre o consumo de substâncias psicoactivas.

Com os melhores cumprimentos  
Joana Brocardo  
Directora-Geral  
DGIDC

Observações:

O pedido de aplicação de inquéritos em meio escolar é autorizado apenas se solicitar autorização aos pais/encarregados de educação dos alunos para que os mesmos possam responder ao questionário dado o conteúdo das questões da secção sobre o consumo de substâncias psicoactivas.

Outras observações:

Exma. Senhora Dra. Elisabete Rute dos Santos,  
Informamos por este meio que o pedido de aplicação de inquéritos por questionário em meio escolar foi aprovado.

Com os melhores cumprimentos,  
Tiago Pereira  
GEPE-DSE.

## Appendix F—Standardised Informed Consent for Legal Tutors

Caros Encarregados de Educação,

A [inserir nome da Entidade dinamizadora do Projecto], no âmbito do PRI (Programa de Respostas Integradas) e com o apoio do Instituto da Droga e da Toxicodependência,IP, está a desenvolver o projecto "[inserir nome do Projecto]", que teve início em [inserir data de início] e terminará em [inserir data de início].

Este projecto [inserir uma breve descrição do projecto].

Para que a nossa intervenção seja eficaz e adequada, será fundamental que se avaliem os resultados, pelo que iremos aplicar o "Questionário de Avaliação dos Resultados e do Impacto de Projectos de Prevenção das Toxicodependências". Este questionário inclui perguntas de conhecimento sobre álcool, tabaco, drogas e qualidade de vida dos alunos. O seu preenchimento é totalmente confidencial e, de forma a assegurar a total confidencialidade dos questionários, os resultados serão tratados no âmbito de um projeto entre a Faculdade de Psicologia e de Ciências da Educação da Universidade de Lisboa e o Centre for Public Health da Liverpool John Moores University em Inglaterra, por uma equipa de avaliação externa ao nosso projeto.

Caso tenha alguma dúvida objecção à participação do seu educando no projecto "[inserir nome do Projecto]" ou ao preenchimento do "Questionário de Avaliação dos Resultados e do Impacto de Projectos de Prevenção das Toxicodependências", por favor, entre em contacto com a Directora de Turma do seu educando, num prazo de oito dias.

A Equipa do Projeto



# OLÁ como estás?

Queremos pedir a tua colaboração num estudo sobre alguns aspectos importantes para jovens da tua idade, tais como: amigos, escola, família, tempos livres, saúde, consumo de tabaco, álcool e outras drogas.

Para isso **CONVIDAMOS–TE** a preencher este questionário.

As tuas respostas são totalmente **confidenciais** (ou seja, ninguém que tu conheças vai saber o que respondeste). Não escrevas nada que possa servir para te identificar.

A tua participação neste estudo é completamente voluntária, por isso, **SE NÃO QUIZERES PREENCHER** este questionário, devolve-o em branco a quem to entregou.

## Se decidires colaborar

demora o tempo que precisares para responder.

Pedimos-te que respondas a todas as perguntas. Este questionário não é um teste, por isso não há respostas certas nem erradas. Se nenhuma das opções de resposta corresponder ao que queres, escolhe a opção que se aproximar mais da tua resposta.

Para que este estudo possa ser útil, é importante que respondas o mais **sinceramente** possível. Lembra-te que as tuas respostas são **confidenciais**.

**Este questionário vai ser lido por um computador, por isso pedimos-te:**

1. Assinala a tua resposta preenchendo a bolinha (Assim: ●)
2. Não escrevas nada fora da bolinha
3. Se te enganares, risca essa bolinha (Assim: ✕) e marca a que queres (Assim: ●)
4. Escreve com uma caneta preta
5. Responde a todas as perguntas

\* **agradecemos desde já a tua colaboração.**

Quando terminares, põe o questionário dentro do envelope, fecha-o e deixa-o em cima da tua mesa. Se tiveres alguma dúvida sobre as perguntas, por favor, coloca-a a quem te entregou este questionário. Se quiseres saber mais sobre este estudo, por favor, contacta a equipa responsável: [opina.opina@gmail.com](mailto:opina.opina@gmail.com)

:-)



Faculdade de Psicologia e de Ciências da Educação  
UNIVERSIDADE DE AÇORES

Q.A.R.I.P.P.T.



## A seguir vais ler algumas perguntas sobre Tabaco.

Escolhe apenas uma resposta para cada pergunta.

### 1. Sobre os efeitos do tabaco sabes...

- Nada  Muito pouco  Algumas coisas  Muito  Tudo

### 2. Na tua opinião, fumar...

- Não tem riscos para a saúde  
 Tem poucos riscos para a saúde  
 Tem alguns riscos para a saúde  
 Tem muitos riscos para a saúde

### 3. A seguir vais ler afirmações que algumas pessoas fazem sobre o tabaco. Para cada frase diz qual é a tua opinião.

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. As pessoas que fumam têm uma "maneira de ser" mais forte	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Deveria ser proibido fumar em todos os locais fechados	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. As pessoas que fumam têm mais estilo do que as pessoas que não fumam	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. A venda de tabaco deveria ser proibida	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Fumar tabaco é uma maneira errada de nos acalmarmos em situações que nos põem nervosos	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
6. Não há mal nenhum em fumar alguns cigarros por dia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.

### 4. O que achas que te pode acontecer por fumares tabaco? (Se não fumas, pensa no que te poderia acontecer se fumasses)

	Sim	Não	Não Sei		Sim	Não	Não Sei
1. Ter problemas na escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	7. Sentir-me mais relaxado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter problemas com os meus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	8. Divertir-me mais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ter problemas com os meus amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9. Ser mais popular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Ficar viciado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. Ficar mais confiante e seguro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Ter problemas de dinheiro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. Sentir-me enjoado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Ter mais amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. Ter melhores notas nos testes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

A preencher pelo investigador

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5. Achas que comprar tabaco é...

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

6. Quantos dos teus amigos fumam?

- Nenhum  Alguns  Metade  Quase todos  Todos

7. Imagina que os teus amigos te oferecem um cigarro e tu não queres fumar. Dizer "Não" para ti seria...

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

8. O teu melhor amigo...

- Nunca fumou tabaco  
 Fumou, mas já não fuma  
 Fuma de vez em quando  
 Fuma todos os fins-de-semana  
 Fuma todos os dias  
 Não sei se fuma

9. O que achas que aconteceria se o teu melhor amigo soubesse que tu fumas? (Se não fumas, pensa no que poderia acontecer se fumasses)

- Achava bem que eu fumasse  
 Não achava bem que eu fumasse, mas continuava a ser meu amigo  
 Não achava bem que eu fumasse e deixava de ser meu amigo  
 Não se importava

10. O que achas que aconteceria se os teus pais soubessem que tu fumas? (Se não fumas, pensa no que poderia acontecer se fumasses)

- Não se importavam  
 Não achavam bem que eu fumasse e castigavam-me  
 Não achavam bem que eu fumasse, mas deixavam-me fumar  
 Proíbiam-me de fumar

11. Já alguma vez fumaste?

- Sim  
 Não → Achas que daqui a um ano vais começar a fumar?  Talvez sim  Talvez não  Não sei

↳ Se respondeste "Não", passa para a pergunta n.º 18



12. Com que idade fumaste pela primeira vez?

- 11 anos ou menos  12 anos  13 anos  14 anos  15 anos  16 anos ou mais

13. Actualmente fumas?

- Sim → Achas que daqui a um ano vais continuar a fumar?  Talvez sim  Talvez não  Não sei  
 Não → Achas que daqui a um ano vais voltar a fumar?  Talvez sim  Talvez não  Não sei

Se respondeste "Não", passa para a pergunta n.º 18

14. Fumaste na última semana?

- Sim  Não

15. Fumaste no último mês?

- Sim  Não

16. Normalmente, quando é que fumas?

- Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais

17. Normalmente, quantos cigarros é que fumas num dia?

- Menos de 1 cigarro  3 a 5 cigarros  10 a 14 cigarros  21 a 30 cigarros  
 1 a 2 cigarros  6 a 9 cigarros  15 a 20 cigarros  Mais de 30 cigarros

**A seguir vais ler algumas perguntas sobre Álcool.**

Escolhe apenas uma resposta para cada pergunta.

18. Sobre os efeitos do álcool sabes...

- Nada  Muito pouco  Algumas coisas  Muito  Tudo

19. Na tua opinião, beber bebidas alcoólicas...

- Não tem riscos para a saúde  
 Tem poucos riscos para a saúde  
 Tem alguns riscos para a saúde  
 Tem muitos riscos para a saúde

**20. A seguir vais ler afirmações que algumas pessoas fazem sobre as bebidas alcoólicas. Para cada frase diz-nos qual é a tua opinião.**

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. Não há mal nenhum em beber bebidas alcoólicas se isso fizer com que a pessoa se sinta melhor	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. É mais fácil relacionarmo-nos com as outras pessoas depois de termos bebido bebidas alcoólicas	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. Acho bem que o consumo de bebidas alcoólicas em locais públicos seja proibido	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. Quem for apanhado a conduzir com excesso de álcool no sangue deve ser preso	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Beber bebidas alcoólicas é perigoso para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
6. Deveria ser proibida a compra e o consumo de bebidas alcoólicas a jovens com menos de 18 anos	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
7. Em certas ocasiões o consumo de álcool pode ajudar a fazer amizades	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
8. A escola deveria organizar actividades que ajudassem os alunos a tomar decisões responsáveis relativamente ao consumo de álcool	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.

**21. O que achas que te pode acontecer por beberes bebidas alcoólicas? (Se não bebes, pensa no que te poderia acontecer se bebesses)**

	Sim	Não	Não Sei		Sim	Não	Não Sei
1. Ter problemas na escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9. Divertir-me mais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter problemas com a polícia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. Ser mais popular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ter problemas com os meus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. "Esquecer" os meus problemas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Ter problemas com os meus amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. Fazer alguma coisa que depois me arrependa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Ficar viciado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13. Ficar mais confiante e seguro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Ter problemas de dinheiro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14. Ficar com uma ressaca	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Ter mais amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15. Sentir-me enjoado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Sentir-me mais relaxado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Ter melhores notas nos testes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**22. Achas que comprar bebidas alcoólicas é...**

- Muito fácil  Fácil  Mais ou menos fácil  Díficil  Muito difícil

**23. Quantos dos teus amigos bebem?**

- Nenhum  Alguns  Metade  Quase todos  Todos

**24. Imagina que os teus amigos te oferecem uma bebida alcoólica e tu não queres beber. Dizer "Não" para ti seria...**

- Muito fácil  Fácil  Mais ou menos fácil  Díficil  Muito difícil

**25. O teu melhor amigo...**

- Nunca bebeu bebidas alcoólicas  
 Bebeu bebidas alcoólicas, mas já não bebe  
 Bebe de vez em quando  
 Bebe todos os fins-de-semana  
 Bebe todos os dias  
 Não sei se bebe bebidas alcoólicas

**26. O que achas que aconteceria se o teu melhor amigo soubesse que tu bebes? (Se não bebes, pensa no que poderia acontecer se bebesses)**

- Achava bem que eu bebesse  
 Não achava bem que eu bebesse, mas continuava a ser meu amigo  
 Não achava bem que eu bebesse e deixava de ser meu amigo  
 Não se importava

**27. O que achas que aconteceria se os teus pais soubessem que tu bebes? (Se não bebes, pensa no que poderia acontecer se bebesses)**

- Não se importavam  
 Não achavam bem que eu bebesse e castigavam-me  
 Não achavam bem que eu bebesse, mas deixavam-me beber  
 Proíbiam-me de beber

**28. Já alguma vez bebeste bebidas alcoólicas?**

- Sim  
 Não → **Achas que daqui a um ano vais começar a beber?**  Talvez sim  Talvez não  Não sei

↳ **Se respondeste "Não", passa para a pergunta n.º 35**

29. Com que idade bebeste bebidas alcoólicas pela primeira vez?

11 anos ou menos  12 anos  13 anos  14 anos  15 anos  16 anos ou mais

30. Actualmente bebes bebidas alcoólicas?

Sim → Achas que daqui a um ano vais continuar a beber?  Talvez sim  Talvez não  Não sei  
 Não → Achas que daqui a um ano vais voltar a beber?  Talvez sim  Talvez não  Não sei

Se respondeste "Não", passa para a pergunta n.º 35

31. Bebeste bebidas alcoólicas na última semana?

Sim  Não

32. Bebeste bebidas alcoólicas no último mês?

Sim  Não

33. Normalmente, quando é que bebes bebidas alcoólicas?

Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais

34. Normalmente, quantas bebidas é que bebes num dia? Para cada bebida assinala as quantidades que bebes.

	0	1-2	3-5	6-9	Mais de 9
Cerveja (imperiais / minis / latas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vinho (copos)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocktails alcoólicos (Todas as bebidas que misturem álcool com sumos. Exemplo: caipirinha, vodka-laranja, whisky-cola)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**[ A seguir vais ler algumas perguntas sobre Haxixe. ]**

(é o mesmo que cannabis, hax, charro, ganza, chamon).  
Escolhe apenas uma resposta para cada pergunta.

35. Sabes o que é haxixe?

Sim  Não → Se respondeste "Não", passa para a pergunta n.º 53

**36. Sobre os efeitos do haxixe sabes...**

Nada  Muito pouco  Algumas coisas  Muito  Tudo

**37. Na tua opinião, fumar haxixe...**

Não tem riscos para a saúde  
 Tem poucos riscos para a saúde  
 Tem alguns riscos para a saúde  
 Tem muitos riscos para a saúde

**38. A seguir vais ler afirmações que algumas pessoas fazem sobre o haxixe. Para cada frase diz qual é a tua opinião.**

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. Não há mal nenhum em fumar haxixe desde que a pessoa se sinta bem	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Fumar haxixe é mau para a saúde mesmo que seja só para experimentar	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. O consumo de haxixe deveria ser legalizado	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. O haxixe não é prejudicial para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Quem fuma haxixe deve ir para a cadeia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

*Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.*

**39. O que achas que te pode acontecer por fumares haxixe? (Se não fumas haxixe, pensa no que te poderia acontecer se fumasses)**

	Sim	Não	Não Sei		Sim	Não	Não Sei
1. Ter problemas na escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9. Divertir-me mais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter problemas com a policia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. Ser mais popular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ter problemas com os meus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. "Esquecer" os meus problemas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Ter problemas com os meus amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. Fazer alguma coisa que depois me arrependa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Ficar viciado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13. Ficar mais confiante e seguro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Ter problemas de dinheiro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14. Ficar com uma ressaca	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Ter mais amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15. Sentir-me enjoado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Sentir-me mais relaxado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Ter melhores notas nos testes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

40. Achas que comprar haxixe é...

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

41. Quantos dos teus amigos fumam haxixe?

- Nenhum  Alguns  Metade  Quase todos  Todos

42. Imagina que os teus amigos te oferecem um "charro" e tu não queres fumar. Dizer "Não" para ti seria...

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

43. O teu melhor amigo...

- Nunca fumou haxixe  
 Fumou haxixe, mas já não fuma  
 Fuma haxixe de vez em quando  
 Fuma haxixe todos os fins-de-semana  
 Fuma haxixe todos os dias  
 Não sei se fuma haxixe

44. O que achas que aconteceria se o teu melhor amigo soubesse que tu fumas haxixe? (Se não fumas haxixe, pensa no que poderia acontecer se fumasses)

- Achava bem que eu fumasse haxixe  
 Não achava bem que eu fumasse haxixe, mas continuava a ser meu amigo  
 Não achava bem que eu fumasse haxixe e deixava de ser meu amigo  
 Não se importava

45. O que achas que aconteceria se os teus pais soubessem que tu fumas haxixe? (Se não fumas haxixe, pensa no que poderia acontecer se fumasses)

- Não se importavam  
 Não achavam bem que eu fumasse haxixe e castigavam-me  
 Não achavam bem que eu fumasse haxixe, mas deixavam-me fumar  
 Proíbiam-me de fumar haxixe

46. Já alguma vez fumaste haxixe?

Sim

Não → Achas que daqui a um ano vais começar a fumar haxixe?  Talvez sim  Talvez não  Não sei

→ Se respondeste "Não", passa para a pergunta n.º 53

47. Com que idade fumaste haxixe pela primeira vez?

11 anos ou menos  12 anos  13 anos  14 anos  15 anos  16 anos ou mais

48. Actualmente fumas haxixe?

Sim → Achas que daqui a um ano vais continuar a fumar haxixe?  Talvez sim  Talvez não  Não sei

Não → Achas que daqui a um ano vais voltar a fumar haxixe?  Talvez sim  Talvez não  Não sei

→ Se respondeste "Não", passa para a pergunta n.º 53

49. Fumaste haxixe na última semana?

Sim  Não

50. Fumaste haxixe no último mês?

Sim  Não

51. Normalmente, quando é que fumas haxixe?

Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais

52. Normalmente, quantos "charros" é que fumas num dia?

Menos de 1 charro  1 a 2 charros  3 a 5 charros  6 a 9 charros  Mais de 9 charros



**A seguir vais ler algumas perguntas sobre Ecstasy.**

(é o mesmo que pastilha, MDMA).

Escolhe apenas uma resposta para cada pergunta.

53. Sabes o que é ecstasy?

Sim  Não → Se respondeste "Não", passa para a pergunta n.º 71

54. Sobre os efeitos do ecstasy sabes...

Nada  Muito pouco  Algumas coisas  Muito  Tudo

55. Na tua opinião, tomar ecstasy...

Não tem riscos para a saúde  
 Tem poucos riscos para a saúde  
 Tem alguns riscos para a saúde  
 Tem muitos riscos para a saúde

56. A seguir vais ler afirmações que algumas pessoas fazem sobre o ecstasy. Para cada frase diz qual é a tua opinião.

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. Não há mal nenhum em tomar ecstasy desde que a pessoa se sinta bem	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Tomar ecstasy é mau para a saúde mesmo que seja só para experimentar	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. O consumo de ecstasy deveria ser legalizado	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. O ecstasy não é prejudicial para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Quem consome ecstasy deve ir para a cadeia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.



**57. O que achas que te pode acontecer por tomares ecstasy? (Se não tomas ecstasy, pensa no que te poderia acontecer se tomasses)**

	Sim	Não	Não Sei		Sim	Não	Não Sei
1. Ter problemas na escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9. Divertir-me mais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter problemas com a polícia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. Ser mais popular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ter problemas com os meus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. "Esquecer" os meus problemas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Ter problemas com os meus amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. Fazer alguma coisa que depois me arrependa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Ficar viciado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13. Ficar mais confiante e seguro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Ter problemas de dinheiro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14. Ficar com uma ressaca	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Ter mais amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15. Sentir-me enjoado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Sentir-me mais relaxado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Ter melhores notas nos testes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**58. Achas que comprar ecstasy é...**

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

**59. Quantos dos teus amigos tomam ecstasy?**

- Nenhum  Alguns  Metade  Quase todos  Todos

**60. Imagina que os teus amigos te oferecem uma "pastilha" de ecstasy e tu não queres tomar. Dizer "Não" para ti seria...**

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

**61. O teu melhor amigo...**

- Nunca tomou ecstasy  
 Tomou ecstasy, mas já não toma  
 Toma ecstasy de vez em quando  
 Toma ecstasy todos fins-de-semana  
 Toma ecstasy todos os dias  
 Não sei se toma ecstasy

**62. O que achas que aconteceria se o teu melhor amigo soubesse que tu tomas ecstasy? (Se não tomas ecstasy, pensa no que poderia acontecer se tomasses)**

- Achava bem que eu tomasse ecstasy  
 Não achava bem que eu tomasse ecstasy, mas continuava a ser meu amigo  
 Não achava bem que eu tomasse ecstasy e deixava de ser meu amigo  
 Não se importava

63. O que achas que aconteceria se os teus pais soubessem que tu tomas ecstasy? (Se não tomas ecstasy, pensa no que poderia acontecer se tomasse)

- Não se importavam
- Não achavam bem que eu tomasse ecstasy e castigavam-me
- Não achavam bem que eu tomasse ecstasy, mas deixavam-me tomar
- Proíbiam-me de tomar ecstasy

64. Já alguma vez tomaste ecstasy?

- Sim
- Não → Achas que daqui a um ano vais começar a tomar ecstasy?  Talvez sim  Talvez não  Não sei

↳ Se respondeste "Não", passa para a pergunta n.º 71

65. Com que idade tomaste ecstasy pela primeira vez?

- 11 anos ou menos
- 12 anos
- 13 anos
- 14 anos
- 15 anos
- 16 anos ou mais

66. Actualmente tomas ecstasy?

- Sim → Achas que daqui a um ano vais continuar a tomar ecstasy?  Talvez sim  Talvez não  Não sei
- Não → Achas que daqui a um ano vais voltar a tomar ecstasy?  Talvez sim  Talvez não  Não sei

↳ Se respondeste "Não", passa para a pergunta n.º 71

67. Tomaste ecstasy na última semana?

- Sim
- Não

68. Tomaste ecstasy no último mês?

- Sim
- Não

69. Normalmente, quando é que tomas ecstasy?

- Todos os dias
- Só aos fins-de-semana
- Só em ocasiões especiais

70. Normalmente, quantas "pastilhas" de ecstasy é que tomas num dia?

- 1 a 2 pastilhas    3 a 5 pastilhas    Mais de 5 pastilhas

**A seguir vais ler algumas perguntas sobre Cocaína.**

(é o mesmo que coca, branca, gulosa, neve).  
Escolhe apenas uma resposta para cada pergunta.

71. Sabes o que é cocaína?

- Sim    Não → **Se respondeste "Não", passa para a pergunta n.º 89**

72. Sobre os efeitos da cocaína sabes...

- Nada    Muito pouco    Algumas coisas    Muito    Tudo

73. Na tua opinião, consumir cocaína...

- Não tem riscos para a saúde  
 Tem poucos riscos para a saúde  
 Tem alguns riscos para a saúde  
 Tem muitos riscos para a saúde

74. A seguir vais ler afirmações que algumas pessoas fazem sobre a cocaína. Para cada frase diz qual é a tua opinião.

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. Não há mal nenhum em consumir cocaína desde que a pessoa se sinta bem	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Consumir cocaína é mau para a saúde mesmo que seja só para experimentar	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. O consumo de cocaína deveria ser legalizado	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. A cocaína não é prejudicial para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Quem consome cocaína deve ir para a cadeia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

Negreiros, J. (1998). *Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas*. Adaptado de Jorge Negreiros. Porto.

**75. O que achas que te pode acontecer por consumires cocaína? (Se não consumes cocaína, pensa no que te poderia acontecer se consumisses)**

	Sim	Não	Não Sei		Sim	Não	Não Sei
1. Ter problemas na escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	9. Divertir-me mais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter problemas com a polícia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	10. Ser mais popular	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Ter problemas com os meus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	11. "Esquecer" os meus problemas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Ter problemas com os meus amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	12. Fazer alguma coisa que depois me arrependa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Ficar viciado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	13. Ficar mais confiante e seguro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Ter problemas de dinheiro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	14. Ficar com uma ressaca	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Ter mais amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	15. Sentir-me enjoado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Sentir-me mais relaxado	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	16. Ter melhores notas nos testes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**76. Achas que comprar cocaína é...**

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

**77. Quantos dos teus amigos consomem cocaína?**

- Nenhum  Alguns  Metade  Quase todos  Todos

**78. Imagina que os teus amigos te oferecem cocaína e tu não queres consumir. Dizer "Não" para ti seria...**

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

**79. O teu melhor amigo...**

- Nunca consumiu cocaína  
 Consumiu cocaína, mas já não consome  
 Consome cocaína de vez em quando  
 Consome cocaína todos os fins-de-semana  
 Consome cocaína todos os dias  
 Não sei se consome cocaína

**80. O que achas que aconteceria se o teu melhor amigo soubesse que tu consumes cocaína? (Se não consumes cocaína, pensa no que poderia acontecer se consumisses)**

- Achava bem que eu consumisse cocaína
- Não achava bem que eu consumisse cocaína, mas continuava a ser meu amigo
- Não achava bem que eu consumisse cocaína e deixava de ser meu amigo
- Não se importava

**81. O que achas que aconteceria se os teus pais soubessem que tu consumes cocaína? (Se não consumes cocaína, pensa no que poderia acontecer se consumisses)**

- Não se importavam
- Não achavam bem que eu consumisse cocaína e castigavam-me
- Não achavam bem que eu consumisse cocaína, mas deixavam-me consumir
- Proíbiam-me de consumir cocaína

**82. Já alguma vez consumiste cocaína?**

- Sim
- Não → Achas que daqui a um ano vais começar a consumir cocaína?  Talvez sim  Talvez não  Não sei

**Se respondeste "Não", passa para a pergunta n.º 89**

**83. Com que idade consumiste cocaína pela primeira vez?**

- 11 anos ou menos
- 12 anos
- 13 anos
- 14 anos
- 15 anos
- 16 anos ou mais

**84. Actualmente consumes cocaína?**

- Sim → Achas que daqui a um ano vais continuar a consumir cocaína?  Talvez sim  Talvez não  Não sei
- Não → Achas que daqui a um ano vais voltar a consumir cocaína?  Talvez sim  Talvez não  Não sei

**Se respondeste "Não", passa para a pergunta n.º 89**

**85. Consumiste cocaína na última semana?**

- Sim
- Não

86. Consumiste cocaína no último mês?

Sim  Não

87. Normalmente, quando é que consumes cocaína?

Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais

88. Normalmente, quanta cocaína é que consumes num dia?

Menos de um quarto de grama  Meio grama a um grama  
 Um quarto de grama a meio grama  Mais de um grama

**A seguir vais ler algumas perguntas sobre outras drogas.**

89. Alguma vez consumiste alguma destas drogas?

	Sim	Não
LSD (ácidos, trips)	<input type="radio"/>	<input type="radio"/>
Anfetaminas (speeds, anfes, cristal)	<input type="radio"/>	<input type="radio"/>
GHB (ecstasy líquido)	<input type="radio"/>	<input type="radio"/>
Heroína (cavalo, pó, heroa)	<input type="radio"/>	<input type="radio"/>
Cogumelos Mágicos	<input type="radio"/>	<input type="radio"/>
Ketamina (special K)	<input type="radio"/>	<input type="radio"/>
Inalantes (colas, tintas, sprays, diluentes)	<input type="radio"/>	<input type="radio"/>
Esteróides anabolizantes (body builders)	<input type="radio"/>	<input type="radio"/>
Comprimidos para dormir	<input type="radio"/>	<input type="radio"/>
Comprimidos calmantes	<input type="radio"/>	<input type="radio"/>
Comprimidos para a depressão	<input type="radio"/>	<input type="radio"/>

**Se respondeste "Não" para TODAS as drogas, passa para a pergunta número 91.**

**90. Quantas vezes nos últimos 12 MESES consumiste cada uma destas drogas? Para cada droga, assinala as quantidades que consumiste.**

	0	1-2	3-5	6-9	10-19	20-39	40 ou mais
LSD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anfetaminas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GHB	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heroína	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cogumelos Mágicos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ketamina	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inalantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Esteróides anabolizantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprimidos para dormir	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprimidos calmantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Comprimidos para a depressão	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**A seguir vais ler algumas perguntas sobre como te tens sentido.**  
Escolhe apenas uma resposta para cada pergunta.

**91. Sobre a tua saúde e actividade física...**

**Em geral, como descreves a tua saúde?**

1.  Excelente  Muito boa  Boa  Má  Muito má

**Pensa na última semana ...**

	nada	pouco	moderada-mente	muito	totalmente
2. Sentiste-te bem e em forma?	nada <input type="radio"/>	pouco <input type="radio"/>	moderada-mente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>
3. Estiveste fisicamente activo (ex: correste, fizeste escalada, andaste de bicicleta)?	nada <input type="radio"/>	pouco <input type="radio"/>	moderada-mente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>
4. Foste capaz de correr bem?	nada <input type="radio"/>	pouco <input type="radio"/>	moderada-mente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>

**Pensa na última semana ...**

	nunca	raramente	algumas vezes	frequentemente	sempre
5. Sentiste-te cheio(a) de energia?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>

The KIDSCREEN Group, 2004; EG Grants Number: QL-G-CT-2000-00751  
KIDSCREEN -52, Child and Adolescent Version. Tradução e Adaptação: Matos, Gaspar Calmeiro & KIDSCREEN Group Europe (2005)  
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### 92. Sobre os teus sentimentos...

Pensa na última semana ...	nada	pouco	moderadamente	muito	totalmente
1. A tua vida tem sido agradável?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Sentiste-te bem por estar vivo(a)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Sentiste-te satisfeito(a) com a tua vida?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
4. Estiveste de bom humor?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Sentiste-te alegre?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Divertiste-te?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 93. Sobre o teu estado de humor geral...

Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
1. Sentiste que fizeste tudo mal?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Sentiste-te triste?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Sentiste-te tão mal que não quiseste fazer nada?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Sentiste que tudo na tua vida estava a correr mal?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Sentiste-te farto(a)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Sentiste-te sozinho(a)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Sentiste-te debaixo de pressão ("stressado/a")?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The KIDSCREEN Group, 2004; EC Grants Number: GLG-CT-2000-00751  
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#### 94. Sobre ti próprio...

Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
1. Sentiste-te feliz com a tua maneira de ser?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Sentiste-te contente com as tuas roupas?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Sentiste-te preocupado(a) com a tua aparência?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Sentiste inveja da aparência de outros rapazes e raparigas?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Gostarias de mudar alguma coisa no teu corpo?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 95. Sobre o teu tempo livre...

Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
1. Tiveste tempo suficiente para ti próprio(a)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Foste capaz de fazer actividades que gostas de fazer no teu tempo livre?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Tiveste oportunidades suficientes para estar ao ar livre?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Tiveste tempo suficiente para te encontrares com os teus amigos(as)?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Foste capaz de escolher o que fazer no teu tempo livre?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

#### 96. Sobre a tua família, ambiente familiar e vizinhança...

Pensa na última semana ...	nada	pouco	moderadamente	muito	totalmente
1. Os teus pais compreendem-te?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Sentiste-te amado(a) pelos teus pais?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
3. Sentiste-te feliz em casa?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
4. Os teus pais tiveram tempo suficiente para ti?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
5. Os teus pais trataram-te com justiça?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
6. Foste capaz de conversar com os teus pais quando quiseste?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>

#### 97. Sobre questões económicas...

Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
1. Tiveste dinheiro suficiente para fazer as mesmas actividades que os teus amigos(as)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
2. Tiveste dinheiro suficiente para as tuas despesas?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>

Pensa na última semana ...	nada	pouco	moderadamente	muito	totalmente
3. Tiveste dinheiro suficiente para fazer actividades com os teus amigos(as)?	nada <input type="radio"/>	pouco <input type="radio"/>	moderadamente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>

#### 98. Sobre os teus amigos...

Pensa na última semana ...	nunca	raramente	algumas vezes	frequentemente	sempre
1. Passaste tempo com os teus/tuas amigos(as)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
2. Fizeste actividades com outros rapazes e raparigas?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
3. Divertiste-te com os teus/tuas amigos(as)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
4. Tu e os teus/tuas amigos(as) ajudaram-se uns aos outros?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
5. Sentiste-te capaz de falar sobre tudo com os teus/tuas amigos(as)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>
6. Sentiste que podes confiar nos(as) teus/tuas amigos(as)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequentemente <input type="radio"/>	sempre <input type="radio"/>

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**99. Sobre o ambiente escolar e aprendizagem...**

Pensa na última semana ...	nada	pouco	moderada-mente	muito	totalmente
1. Sentiste-te feliz na escola?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Foste bom/boa aluno(a) na escola?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Sentiste-te satisfeito(a) com os teus professores?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Pensa na última semana ...	nunca	raramente	algumas vezes	frequente-mente	sempre
4. Sentiste-te capaz de prestar atenção?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Gostaste de ir à escola?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Tiveste uma boa relação com os teus professores?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**100. Sobre provocação...**

Pensa na última semana ...	nunca	raramente	algumas vezes	frequente-mente	sempre
1. Tens sentido medo de outros rapazes ou raparigas?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Outros rapazes ou raparigas gozaram contigo?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Outros rapazes ou raparigas provocaram-te?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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**101. Da seguinte lista, diz quais foram as situações que viveste nos últimos SEIS MESES. Para as situações que viveste diz se elas foram positivas ou negativas.**

	SIM		NÃO
	Positivo	Negativo	
1. Um familiar teu adoeceu gravemente ou teve um acidente grave	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Morreu um familiar teu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Morreu um amigo teu	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Morreu ou perdeste o teu animal de estimação	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Um familiar teu foi preso	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Aumentaram as discussões entre os teus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Aumentaram as discussões entre ti e os teus pais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Os teus pais separaram-se ou divorciaram-se	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. O teu pai (ou mãe) casou ou juntou-se com outra pessoa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. O teu pai (ou mãe) ficou desempregado(a)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Mudaste de casa	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Mudaste de escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Chumbaste numa ou mais disciplinas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Chumbaste num teste, exame ou prova importante	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Tiveste problemas com o Director de Turma ou com outros professores	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Desististe da escola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Tiveste problemas com a polícia	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Aumentaram as discussões entre ti e o(a) teu/tua namorado(a)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Terminaste um namoro	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Tiveste problemas com os teus amigos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Uma amiga tua engravidou	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**[ A seguir vais ler algumas perguntas sobre ti e a tua família. ]**  
Escolhe apenas uma resposta para cada pergunta.

**102. Tu és:**

Rapaz    Rapariga

**103. Quantos anos tens?**

- 12 anos  13 anos  14 anos  15 anos  16 anos  17 anos  18 anos

**104. Andas na escola?**

- Sim → Em que ano andas?  5º  6º  7º  8º  9º  10º  11º  12º  
 Não → Qual foi o último ano em que andaste na escola?  5º  6º  7º  8º  9º  10º  11º  12º

**105. Qual é a tua nacionalidade?**

- Portuguesa  
 Brasileira  
 Angolana/Cabo-verdiana/Guineense/Moçambicana/São-Tomense  
 Ucrânia/Romena/Moldava/Russa  
 Chinesa/Indiana  
 Outra

**106. Qual é a nacionalidade do teu pai?**

- Portuguesa  
 Brasileira  
 Angolana/Cabo-verdiana/Guineense/Moçambicana/São-Tomense  
 Ucrânia/Romena/Moldava/Russa  
 Chinesa/Indiana  
 Outra  
 Não sei

**107. Qual é a nacionalidade da tua mãe?**

- Portuguesa  
 Brasileira  
 Angolana/Cabo-verdiana/Guineense/Moçambicana/São-Tomense  
 Ucrânia/Romena/Moldava/Russa  
 Chinesa/Indiana  
 Outra  
 Não sei

**108. Qual é a escolaridade do teu pai?**

- Nunca andou na escola
- 1º ciclo (1º, 2º, 3º e 4º ano)
- 2º ciclo (5º e 6º ano)
- 3º ciclo (7º, 8º e 9º ano)
- Secundário (10º, 11º e 12º ano)
- Ensino Profissional
- Ensino Superior
- Não sei

**109. Qual é a escolaridade da tua mãe?**

- Nunca andou na escola
- 1º ciclo (1º, 2º, 3º e 4º ano)
- 2º ciclo (5º e 6º ano)
- 3º ciclo (7º, 8º e 9º ano)
- Secundário (10º, 11º e 12º ano)
- Ensino Profissional
- Ensino Superior
- Não sei

**110. Com quem vives? Assinala todas as pessoas com quem vives.**

- Pai
- Mãe
- Padrasto
- Madrasta
- Irmão(s)
- Avós
- Outros familiares
- Instituição de acolhimento

# OLÁ como estás?

Queremos pedir a tua colaboração num estudo sobre alguns aspectos importantes para jovens da tua idade, tais como: amigos, escola, família, tempos livres, saúde, consumo de tabaco, álcool e outras drogas.

Para isso CONVIDAMOS–TE a preencher este questionário.

As tuas respostas são totalmente **confidenciais** (ou seja, ninguém que tu conheças vai saber o que respondeste). Não escrevas nada que possa servir para te identificar.

A tua participação neste estudo é completamente voluntária, por isso, **SE NÃO QUISERES PREENCHER** este questionário, devolve-o em branco a quem to entregou.

## Se decidires colaborar,

demora o tempo que precisares para responder.

Pedimos-te que respondas a todas as perguntas. Este questionário não é um teste, por isso não há respostas certas nem erradas. Se nenhuma das opções de resposta corresponder ao que queres, escolhe a opção que se aproximar mais da tua resposta.

Para que este estudo possa ser útil, é importante que respondas o mais **sinceramente** possível. Lembra-te que as tuas respostas são **confidenciais**.

**Este questionário vai ser lido por um computador, por isso pedimos-te:**

1. Assinala a tua resposta preenchendo a bolinha (Assim: ● )
2. Não escrevas nada fora da bolinha
3. Se te enganares, risca essa bolinha (Assim: ✕) e marca a que queres (Assim: ● )
4. Escreve com uma caneta preta
5. Responde a todas as perguntas

\* **agradecemos desde já a tua colaboração.**

Quando terminares, põe o questionário dentro do envelope, fecha-o e deixa-o em cima da tua mesa. Se tiveres alguma dúvida sobre as perguntas, por favor, coloca-a a quem te entregou este questionário. Se quiseres saber mais sobre este estudo, por favor, contacta a equipa responsável: [opina.opina@gmail.com](mailto:opina.opina@gmail.com)

:-)



Faculdade de Psicologia  
e de Ciências da Educação  
UNIVERSIDADE DE LEIRIA

Q.A.R.I.P.P.T.

## A seguir vais ler algumas perguntas sobre Tabaco.

Escolhe apenas uma resposta para cada pergunta.

### 1. Na tua opinião, fumar...

- Não tem riscos para a saúde       Tem alguns riscos para a saúde  
 Tem poucos riscos para a saúde       Tem muitos riscos para a saúde

### 2. A seguir vais ler afirmações que algumas pessoas fazem sobre o tabaco. Para cada frase diz qual é a tua opinião.

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. As pessoas que fumam têm uma "maneira de ser" mais forte	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Deveria ser proibido fumar em todos os locais fechados	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. As pessoas que fumam têm mais estilo do que as pessoas que não fumam	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. A venda de tabaco deveria ser proibida	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Fumar tabaco é uma maneira errada de nos acalmarmos em situações que nos põem nervosos	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
6. Não há mal nenhum em fumar alguns cigarros por dia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

*Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.*

### 3. O que achas que te pode acontecer por fumares tabaco? (Se não fumas, pensa no que te poderia acontecer se fumasses)

	Sim	Não	Não Sei
1. Ter problemas (na escola, com os meus pais, com os meus amigos e/ou com a polícia)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter vantagens (ter mais amigos, divertir-me mais, ser mais popular, ficar mais confiante e seguro e/ou sentir-me mais relaxado)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### 4. Achas que comprar tabaco é...

- Muito fácil     Fácil     Mais ou menos fácil     Difícil     Muito difícil

### 5. O teu melhor amigo...

- Nunca fumou tabaco       Fuma todos os fins-de-semana  
 Fumou, mas já não fuma       Fuma todos os dias  
 Fuma de vez em quando       Não sei se fuma

A preencher pelo investigador

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**6. O que achas que aconteceria se o teu melhor amigo soubesse que tu fumas? (Se não fumas, pensa no que poderia acontecer se fumasses)**

- Achava bem que eu fumasse
- Não achava bem que eu fumasse, mas continuava a ser meu amigo
- Não achava bem que eu fumasse e deixava de ser meu amigo
- Não se importava

**7. O que achas que aconteceria se os teus pais soubessem que tu fumas? (Se não fumas, pensa no que poderia acontecer se fumasses)**

- Não se importavam
- Não achavam bem que eu fumasse e castigavam-me
- Não achavam bem que eu fumasse, mas deixavam-me fumar
- Proíbiam-me de fumar

**8. Já alguma vez fumaste?**

- Sim    Não → **Se respondeste "Não" passa para a pergunta nº 14**

**9. Com que idade fumaste pela primeira vez?**

- 11 anos ou menos    12 anos    13 anos    14 anos    15 anos    16 anos ou mais

**10. Actualmente fumas?**

- Sim    Não

**11. Quando foi a última vez que fumaste?**

- Última semana    Último mês    Último ano    Há mais de um ano

**12. Normalmente, quando é que fumas?**

- Todos os dias    Só aos fins-de-semana    Só em ocasiões especiais    Já não fumo

**13. Normalmente, quantos cigarros é que fumas num dia?**

- Menos de 1 cigarro    3 a 5 cigarros    10 a 14 cigarros    21 a 30 cigarros    Já não fumo
- 1 a 2 cigarros    6 a 9 cigarros    15 a 20 cigarros    Mais de 30 cigarros

**14. Achas que daqui a um ano vais estar a fumar?**

- Talvez sim    Talvez não    Não sei

**A seguir vais ler algumas perguntas sobre Álcool.**  
Escolhe apenas uma resposta para cada pergunta.

**15. Na tua opinião, beber bebidas alcoólicas...**

- Não tem riscos para a saúde    Tem alguns riscos para a saúde  
 Tem poucos riscos para a saúde    Tem muitos riscos para a saúde

**16. A seguir vais ler afirmações que algumas pessoas fazem sobre as bebidas alcoólicas. Para cada frase diz-nos qual é a tua opinião.**

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. Não há mal nenhum em beber bebidas alcoólicas se isso fizer com que a pessoa se sinta melhor	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. É mais fácil relacionarmo-nos com as outras pessoas depois de termos bebido bebidas alcoólicas	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. Acho bem que o consumo de bebidas alcoólicas em locais públicos seja proibido	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. Quem for apanhado a conduzir com excesso de álcool no sangue deve ser preso	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Beber bebidas alcoólicas é perigoso para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
6. Deveria ser proibida a compra e o consumo de bebidas alcoólicas a jovens com menos de 18 anos	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
7. Em certas ocasiões o consumo de álcool pode ajudar a fazer amizades	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
8. A escola deveria organizar actividades que ajudassem os alunos a tomar decisões responsáveis relativamente ao consumo de álcool	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.

**17. O que achas que te pode acontecer por beberes bebidas alcoólicas? (Se não bebes, pensa no que te poderia acontecer se bebesses)**

	Sim	Não	Não Sei
1. Ter problemas (na escola, com os meus pais, com os meus amigos e/ou com a polícia)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter vantagens (ter mais amigos, divertir-me mais, ser mais popular, ficar mais confiante e seguro e/ou sentir-me mais relaxado)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**18. Achas que comprar bebidas alcoólicas é...**

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

**19. O teu melhor amigo...**

- Nunca bebeu bebidas alcoólicas  Bebe todos os fins-de-semana  
 Bebeu bebidas alcoólicas, mas já não bebe  Bebe todos os dias  
 Bebe de vez em quando  Não sei se bebe bebidas alcoólicas

**20. O que achas que aconteceria se o teu melhor amigo soubesse que tu bebes? (Se não bebes, pensa no que poderia acontecer se bebesses)**

- Achava bem que eu bebesse  
 Não achava bem que eu bebesse, mas continuava a ser meu amigo  
 Não achava bem que eu bebesse e deixava de ser meu amigo  
 Não se importava

**21. O que achas que aconteceria se os teus pais soubessem que tu bebes? (Se não bebes, pensa no que poderia acontecer se bebesses)**

- Não se importavam  
 Não achavam bem que eu bebesse e castigavam-me  
 Não achavam bem que eu bebesse, mas deixavam-me beber  
 Proíbiam-me de beber

**22. Já alguma vez bebeste bebidas alcoólicas?**

- Sim  Não → Se respondeste "Não" passa para a pergunta nº 28

**23. Com que idade bebeste bebidas alcoólicas pela primeira vez?**

- 11 anos ou menos  12 anos  13 anos  14 anos  15 anos  16 anos ou mais

**24. Actualmente bebes bebidas alcoólicas?**

- Sim  Não

**25. Quando foi a última vez que bebeste bebidas alcoólicas?**

- Última semana  Último mês  Último ano  Há mais de um ano

**26. Normalmente, quando é que bebes bebidas alcoólicas?**

- Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais  Já não bebo

**27. Normalmente, quantas bebidas é que bebes num dia? Para cada bebida assinala as quantidades que bebes.**

- Já não bebo

	0	1-2	3-5	6-9	Mais de 9
Cerveja (imperiais / minis / latas)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vinho (copos)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shots	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocktails alcoólicos (Todas as bebidas que misturem álcool com sumos. Exemplo: caipirinha, vodka-laranja, whisky-cola)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**28. Achas que daqui a um ano vais beber bebidas alcoólicas?**

- Talvez sim  Talvez não  Não sei

**A seguir vais ler algumas perguntas sobre Haxixe.**

(é o mesmo que cannabis, hax, charro, ganza, chamon).  
Escolhe apenas uma resposta para cada pergunta.

**29. Na tua opinião, fumar haxixe...**

- Não tem riscos para a saúde  Tem alguns riscos para a saúde  
 Tem poucos riscos para a saúde  Tem muitos riscos para a saúde

**30. A seguir vais ler afirmações que algumas pessoas fazem sobre o haxixe. Para cada frase diz qual é a tua opinião.**

	Discordo totalmente	Discordo	Não concordo nem discordo	Concordo	Concordo totalmente
1. Não há mal nenhum em fumar haxixe desde que a pessoa se sintá bem	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Fumar haxixe é mau para a saúde mesmo que seja só para experimentar	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. O consumo de haxixe deveria ser legalizado	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. O haxixe não é prejudicial para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Quem fuma haxixe deve ir para a cadeia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.

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**31. O que achas que te pode acontecer por fumares haxixe? (Se não fumas haxixe, pensa no que te poderia acontecer se fumasses)**

	Sim	Não	Não Sei
1. Ter problemas (na escola, com os meus pais, com os meus amigos e/ou com a polícia)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter vantagens (ter mais amigos, divertir-me mais, ser mais popular, ficar mais confiante e seguro e/ou sentir-me mais relaxado)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**32. Achas que comprar haxixe é...**

- Muito fácil  Fácil  Mais ou menos fácil  Difícil  Muito difícil

**33. O teu melhor amigo...**

- Nunca fumou haxixe  
 Fumou haxixe, mas já não fuma  
 Fuma haxixe de vez em quando  
 Fuma haxixe todos os fins-de-semana  
 Fuma haxixe todos os dias  
 Não sei se fuma haxixe

**34. O que achas que aconteceria se o teu melhor amigo soubesse que tu fumas haxixe? (Se não fumas haxixe, pensa no que poderia acontecer se fumasses)**

- Achava bem que eu fumasse haxixe  
 Não achava bem que eu fumasse haxixe, mas continuava a ser meu amigo  
 Não achava bem que eu fumasse haxixe e deixava de ser meu amigo  
 Não se importava

**35. O que achas que aconteceria se os teus pais soubessem que tu fumas haxixe? (Se não fumas haxixe, pensa no que poderia acontecer se fumasses)**

- Não se importavam  
 Não achavam bem que eu fumasse haxixe e castigavam-me  
 Não achavam bem que eu fumasse haxixe, mas deixavam-me fumar  
 Proíbiam-me de fumar haxixe

36. Já alguma vez fumaste haxixe?

Sim  Não → Se respondeste "Não" passa para a pergunta nº 42

37. Com que idade fumaste haxixe pela primeira vez?

11 anos ou menos  12 anos  13 anos  14 anos  15 anos  16 anos ou mais

38. Actualmente fumas haxixe?

Sim  Não

39. Quando foi a última vez que fumaste haxixe?

Última semana  Último mês  Último ano  Há mais de um ano

40. Normalmente, quando é que fumas haxixe?

Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais  Já não fumo haxixe

41. Normalmente, quantos "charros" é que fumas num dia?

Menos de 1 charro  3 a 5 charros  Mais de 9 charros  
 1 a 2 charros  6 a 9 charros  Já não fumo haxixe

42. Achas que daqui a um ano vais fumar haxixe?

Talvez sim  Talvez não  Não sei

**A seguir vais ler algumas perguntas sobre Cocaína.**

(é o mesmo que coca, branca, gulosa, neve).

Escolhe apenas uma resposta para cada pergunta.

43. Na tua opinião, consumir cocaína...

Não tem riscos para a saúde  
 Tem poucos riscos para a saúde  
 Tem alguns riscos para a saúde  
 Tem muitos riscos para a saúde



**44. A seguir vais ler afirmações que algumas pessoas fazem sobre a cocaína. Para cada frase diz qual é a tua opinião.**

	<b>Discordo totalmente</b>	<b>Discordo</b>	<b>Não concordo nem discordo</b>	<b>Concordo</b>	<b>Concordo totalmente</b>
1. Não há mal nenhum em consumir cocaína desde que a pessoa se sinta bem	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
2. Consumir cocaína é mau para a saúde mesmo que seja só para experimentar	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
3. O consumo de cocaína deveria ser legalizado	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
4. A cocaína não é prejudicial para a saúde	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>
5. Quem consome cocaína deve ir para a cadeia	Discordo totalmente <input type="radio"/>	Discordo <input type="radio"/>	Não concordo nem discordo <input type="radio"/>	Concordo <input type="radio"/>	Concordo totalmente <input type="radio"/>

*Negreiros, J. (1998). Escala de atitudes gerais em relação ao álcool, tabaco e drogas ilícitas. Adaptado de Jorge Negreiros. Porto.*

**45. O que achas que te pode acontecer por consumires cocaína? (Se não consumes cocaína, pensa no que te poderia acontecer se consumisses)**

	<b>Sim</b>	<b>Não</b>	<b>Não Sei</b>
1. Ter problemas (na escola, com os meus pais, com os meus amigos e/ou com a polícia)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Ter vantagens (ter mais amigos, divertir-me mais, ser mais popular, ficar mais confiante e seguro e/ou sentir-me mais relaxado)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**46. Achas que comprar cocaína é...**

- Muito fácil    Fácil    Mais ou menos fácil    Difícil    Muito difícil

**47. O teu melhor amigo...**

- Nunca consumiu cocaína    Consome cocaína todos os fins-de-semana  
 Consumiu cocaína, mas já não consome    Consome cocaína todos os dias  
 Consome cocaína de vez em quando    Não sei se consome cocaína

**48. O que achas que aconteceria se o teu melhor amigo soubesse que tu consumes cocaína? (Se não consumes cocaína, pensa no que poderia acontecer se consumisses)**

- Achava bem que eu consumisse cocaína  
 Não achava bem que eu consumisse cocaína, mas continuava a ser meu amigo  
 Não achava bem que eu consumisse cocaína e deixava de ser meu amigo  
 Não se importava

**49. O que achas que aconteceria se os teus pais soubessem que tu consumes cocaína? (Se não consumes cocaína, pensa no que poderia acontecer se consumisses)**

- Não se importavam
- Não achavam bem que eu consumisse cocaína e castigavam-me
- Não achavam bem que eu consumisse cocaína, mas deixavam-me consumir
- Proíbiam-me de consumir cocaína

**50. Já alguma vez consumiste cocaína?**

- Sim  Não → **Se respondeste "Não" passa para a pergunta nº 56**

**51. Com que idade consumiste cocaína pela primeira vez?**

- 11 anos ou menos  12 anos  13 anos  14 anos  15 anos  16 anos ou mais

**52. Actualmente consumes cocaína?**

- Sim  Não

**53. Quando foi a última vez que consumiste cocaína?**

- Última semana  Último mês  Último ano  Há mais de um ano

**54. Normalmente, quando é que consumes cocaína?**

- Todos os dias  Só aos fins-de-semana  Só em ocasiões especiais  Já não consumo cocaína

**55. Normalmente, quanta cocaína é que consumes num dia?**

- Menos de um quarto de grama  Meio grama a um grama  Já não consumo cocaína  
 Um quarto de grama a meio grama  Mais de um grama

**56. Achas que daqui a um ano vais consumir cocaína?**

- Talvez sim  Talvez não  Tão sei



**A seguir vais ler algumas perguntas sobre outras drogas.**

**57. Alguma vez consumiste alguma destas drogas?**

	Sim	Não
1. Ecstasy (pastilha, MDMA)	<input type="radio"/>	<input type="radio"/>
2. LSD (ácidos, trips)	<input type="radio"/>	<input type="radio"/>
3. Anfetaminas (speeds, anfes, cristal)	<input type="radio"/>	<input type="radio"/>
4. GHB (ecstasy líquido)	<input type="radio"/>	<input type="radio"/>
5. Heroína (cavalo, pó, heroa)	<input type="radio"/>	<input type="radio"/>
6. Cogumelos Mágicos	<input type="radio"/>	<input type="radio"/>
7. Ketamina (special K)	<input type="radio"/>	<input type="radio"/>
8. Inalantes (colas, tintas, sprays, diluentes)	<input type="radio"/>	<input type="radio"/>
9. Esteróides anabolizantes (body builders)	<input type="radio"/>	<input type="radio"/>
10. Comprimidos para dormir	<input type="radio"/>	<input type="radio"/>
11. Comprimidos calmantes	<input type="radio"/>	<input type="radio"/>
12. Comprimidos para a depressão	<input type="radio"/>	<input type="radio"/>

**Se respondeste "Não" para TODAS as drogas, passa para a pergunta número 59.**

**58. Quantas vezes nos últimos 12 MESES consumiste cada uma destas drogas? Para cada droga, assinala as quantidades que consumiste.**

	0	1-2	3-5	6-9	10-19	20-39	40 ou mais
1. Ecstasy (pastilha, MDMA)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. LSD	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Anfetaminas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. GHB	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Heroína	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Cogumelos Mágicos	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Ketamina	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Inalantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Esteróides anabolizantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Comprimidos para dormir	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Comprimidos calmantes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Comprimidos para a depressão	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**A seguir vais ler algumas perguntas sobre como te tens sentido.**

Escolhe apenas uma resposta para cada pergunta.

**59. Pensa na última semana ...**

1. Sentiste-te bem e em forma?	nada <input type="radio"/>	pouco <input type="radio"/>	moderada- mente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>
2. Sentiste-te cheio(a) de energia?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>
3. Sentiste-te triste?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>
4. Sentiste-te sozinho(a)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>
5. Tiveste tempo suficiente para ti próprio(a)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>
6. Foste capaz de fazer actividades que gostas de fazer no teu tempo livre?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>
7. Os teus pais trataram-te com justiça?	nada <input type="radio"/>	pouco <input type="radio"/>	moderada- mente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>
8. Divertiste-te com os teus/tuas amigos(as)?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>
9. Foste bom/boa aluno(a) na escola?	nada <input type="radio"/>	pouco <input type="radio"/>	moderada- mente <input type="radio"/>	muito <input type="radio"/>	totalmente <input type="radio"/>
10. Sentiste-te capaz de prestar atenção?	nunca <input type="radio"/>	raramente <input type="radio"/>	algumas vezes <input type="radio"/>	frequente- mente <input type="radio"/>	sempre <input type="radio"/>

**A seguir vais ler algumas perguntas sobre ti.**  
Escolhe apenas uma resposta para cada pergunta.

**60. Tu és:**

- Rapaz  Rapariga

**61. Quantos anos tens?**

- Menos de 12 anos  13 anos  15 anos  17 anos  Mais de 18 anos  
 12 anos  14 anos  16 anos  18 anos

**(A preencher pela equipa do projecto)**

**A. Indique, por favor, o tipo de actividades em que o jovem participou e o respectivo grau de participação:**

	Baixo <25%	Médio baixo 25% a 50%	Médio elevado 50% a 75%	Elevado >75%
1. Treino de competências pessoais e sociais	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Acções de sensibilização sobre tabaco	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Acções de sensibilização sobre álcool	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Acções de sensibilização sobre outras drogas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Actividades educativas/culturais/lúdico/pedagógicas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Acompanhamento psicossocial	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Grupos de pares	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Campanhas de prevenção	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**B. Os pais (ou equiparados) deste jovem estiveram envolvidos em actividades de educação parental?**

- Sim  Não

**C. Os professores deste jovem estiveram envolvidos em actividades de formação?**

- Sim  Não

A aplicação do “Questionário de Avaliação dos Resultados e do Impacto de Projetos de Prevenção das Toxicodependências” pressupõe o cumprimento sequencial dos seguintes procedimentos:

### 1) Codificação do questionário

Cada questionário terá um código alfanumérico, que deve ser transcrito para a primeira página do questionário. Este código é gerado da seguinte forma:

1º) colocar iniciais da Entidade Promotora

(ex.: Associação de Desenvolvimento Local ; as iniciais serão ADL)

2º) colocar as iniciais do local onde decorre a aplicação

(ex.: Escola de 2º e 3º ciclo de Ensino Básico Júlio Resende, as iniciais serão só JR)

(ex.: Bairro da Quinta da Fonte, as iniciais serão só QF)

3º) colocar a referência do grupo no qual decorre a aplicação

(ex.: 7º ano, turma B, as iniciais serão 7B)

4º) colocar as iniciais do nome completo do respondente

(ex.: João Miguel Sousa Franco, as iniciais serão JMSF)

5º) colocar o número correspondente ao momento de avaliação

*Avaliação pré-teste:* colocar o número 1

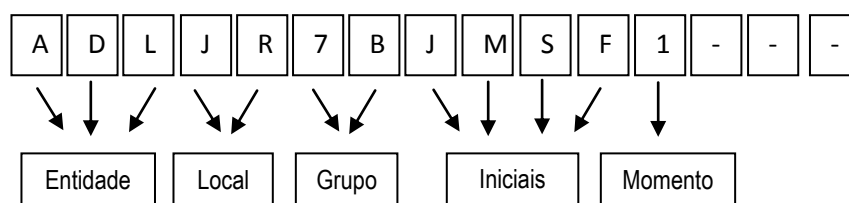
*Avaliação intermédia:* colocar o número 2

*Avaliação pós-teste:* colocar o número 3

*Avaliação follow-up (6 meses):* colocar o número 4

*Avaliação follow-up (12 meses):* colocar o número 5

Neste caso, o Código seria o seguinte:



O código alfanumérico deverá ser gerado e transcrito para a primeira página do questionário antes da aplicação do questionário.

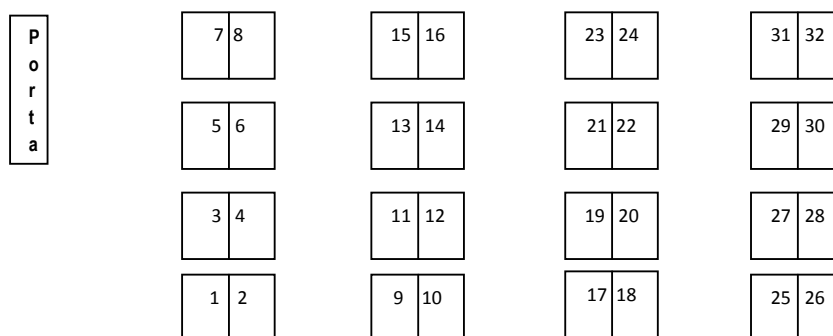
Nos casos em que não seja possível transcrever o código alfanumérico antes da aplicação, a equipa deverá registar com precisão a forma como os respondentes se distribuíram pela sala e proceder ao preenchimento dos códigos imediatamente após a aplicação dos questionários.

## 2) Distribuição ordenada dos respondentes

Independentemente de se tratar de uma aplicação em grupo ou individual, esta deverá decorrer em sala designada para o efeito, que reúna condições de iluminação e sonorização que permitam a concentração exigida neste tipo de tarefa.

Caso se trate de uma aplicação em grupo, os respondentes terão que estar sentados por uma ordem pré-estabelecida de modo a que a equipa que aplica o questionário o distribua fazendo corresponder o questionário ao respondente que se pretende, atendendo a que o código alfanumérico já está atribuído.

Para este efeito, os respondentes deverão ser sentados de acordo com a ordem da lista de alunos fornecida pelos professores, começando da esquerda para a direita, da primeira para a última fila, conforme esquema que se segue:



**Quadro**

Caso falte algum aluno, o seu lugar deverá ser deixado vazio e na “Folha de Registo da Aplicação”, no espaço designado para “Outras ocorrências dignas de relato”, deverá ser registado o seu código alfanumérico, com a referência de que não esteve presente na aplicação. Se, numa aplicação em grupo, houver necessidade de se proceder a uma aplicação mais individualizada, essa ocorrência deverá ser registada da mesma forma na “Folha de Registo da Aplicação”.

Caso se trate de uma aplicação individual, não há necessidade de aplicar o procedimento acima descrito, devendo apenas haver o cuidado de confirmar se o questionário que é entregue tem o código alfanumérico correctamente preenchido.

### **3) Distribuição dos questionários e dos envelopes com a tarefa de distração**

Estando os alunos sentados de acordo com o procedimento acima descrito, a equipa deverá iniciar a distribuição do questionário pela ordem da lista, para que os questionários sejam entregues aos respondentes respectivos, colocar em cima de cada mesa um envelope A4 com a folha da actividade de distração dentro (um envelope por cada aluno) e explicar aos alunos:

“Bom dia. Vamos pôr em cima das vossas mesas estes questionários e estes envelopes, mas pedimos que não os abram já.”

### **4) Explicação das instruções**

Depois de distribuírem os envelopes com a folha de actividade de distração, deverão passar a explicar as instruções de preenchimento do questionário:

“Como já sabem, durante os próximos meses irão fazer parte do projecto [designar o nome do projecto].

Antes de começarem gostaríamos de vos pedir que preencham um questionário sobre alguns aspectos importantes para jovens da vossa idade, tais como: amigos, escola, família, tempos livres, saúde, consumo de tabaco, álcool e outras drogas.

As vossas respostas são completamente confidenciais, ou seja, ninguém que vocês

conheçam vai saber o que é que responderam; nem os vossos professores, nem os vossos pais. As pessoas que vão ver estes questionários não sabem quem vocês são e nem virão a saber.

Se repararem, na primeira folha do questionário estão uns quadradinhos que têm umas letras e uns números; algures no meio estão as iniciais do vosso nome. Estas iniciais não servem para nós vos identificarmos, servem só para as pessoas que vão ver os questionários poderem juntar o que vocês vão preencher hoje com os que vão preencher daqui a algum tempo, quando o projecto estiver a meio e depois, quando o projecto acabar.

A vossa colaboração é voluntária, por isso, se não quiserem, não têm que preencher este questionário. Basta que mo devolvam em branco.

O questionário é um pouco longo, mas as perguntas são muito simples e para responder, basta assinalar a resposta que escolheram; não têm que escrever nada; é só pintarem as bolinhas.

Este questionário não é um teste, por isso não há respostas certas nem erradas. O que queremos saber é a vossa opinião. Se nenhuma das opções de resposta for exactamente o que vocês querem, escolham a que for mais parecida.

Para que este nosso trabalho possa ser útil, é muito importante que respondam a todas as perguntas e que respondam sinceramente. Lembrem-se que ninguém que vocês conheçam ou que vos conheça vai saber o que responderam.”

Este questionário vai ser lido por um computador, por isso, para responder às perguntas têm que preencher a bolinha que corresponde à resposta que escolheram [exemplificar no quadro]. Se se enganarem, façam uma cruz em cima da bolinha [exemplificar no quadro] e preencham a que querem [exemplificar no quadro]. É importante que não escrevam nada fora das bolinhas e que respondam a todas as perguntas. Usem a caneta preta que vos vou dar a seguir.

Se tiverem alguma dúvida, levantem o braço e esperem que eu vá ter convosco.

Quando terminarem de preencher o questionário, abram o envelope que pusemos em cima da vossa mesa e tirem de lá de dentro [escolher a instrução a dar em função da

modalidade de actividade de distração seleccionada]:

a) uma folha que tem uma “sopa de letras” e tentem descobrir as palavras que lá estão [instrução se a actividade de distração for a “sopa de letras”]

b) uma folha branca, onde devem fazer um desenho ou escrever uma composição sobre o tema “Drogas” [instrução se a actividade de distração for “actividade livre”]

Depois de tirarem a folha de dentro do envelope, ponham o questionário lá dentro e depois fechem o envelope. Basta pôr a pala do envelope para dentro e deixem-no estar em cima da vossa mesa.

Obrigada pela vossa colaboração que é muito importante para o trabalho que estamos a fazer.”

#### **5) Explicação dos filtros de resposta**

Transmitidas as instruções, passe ao esclarecimento do processo de resposta às perguntas que apresentam filtro de resposta:

“Antes de começarem a preencher o questionário quero só que o abram na página 2 e que olhem para a pergunta número 11. Nesta pergunta “Já alguma vez fumaste?” podem responder “Sim” ou “Não”. Os que nunca fumaram vão responder “Não”. Certo? À frente do “Não” vêm que está uma setinha para a frente que quer dizer que têm que responder à pergunta “Achas que daqui a um ano vais começar a fumar?”. E escolhem uma das opções “Talvez sim”, “Talvez não” ou “Não sei”. Depois, seguindo a outra setinha para baixo veêm escrito a vermelho: “Se respondeste “Não” passa para a pergunta número 18”. Isso quer dizer que não vão responder a nenhuma das perguntas da 12 à 17. Ou seja, passam directamente para a pergunta 18. Certo?

Os já fumaram alguma vez, vão responder “Sim” à pergunta 11 e depois vão responder à pergunta 12 e 13. Certo? Depois na pergunta 13 pergunta-se “Actualmente fumas?” e aqui os que actualmente fumam vão escolher o “Sim” e, mais uma vez seguindo a setinha para a frente vão responder à pergunta “Achasque daqui a um ano vais continuar a fumar?”. E escolhem uma das opções “Talvez sim”, “Talvez não” ou “Não sei”. Depois passam para a pergunta 14 e continuam a preencher o questionário. Certo?



Os que actualmente não fumam vão responder “Não” à pergunta 13 e, mais uma vez seguindo a setinha para a frente vão responder à pergunta “Achas que daqui a um ano vais voltar a fumar?”. E escolhem uma das opções “Talvez sim”, “Talvez não” ou “Não sei”. Depois, seguindo a setinha para baixo vão ver escrito a vermelho: “Se respondeste “Não” passa para a pergunta número 18”. Isso quer dizer que não vão responder às perguntas 14, 15, 16 e 17. Ou seja, passam directamente para a pergunta 18. Compreenderam? Alguém tem dúvidas?”

Caso haja dúvidas, responder em conformidade.

#### **6) Início da aplicação dos questionários**

Quando não houver mais dúvidas, dê a instrução para que iniciem o preenchimento do questionário:

“Bom, estão preparados? Então podem começar a preencher o questionário. Não se esqueçam que quando acabarem de preencher o questionário devem abrir o envelope que está em cima da vossa mesa, tirar a folha que está lá dentro para fazerem a actividade e pôr o questionário dentro do envelope. Se tiverem dúvidas, levantem o braço para nos chamar. Podem começar.”

#### **7) Decorrer da aplicação dos questionários**

No decorrer da aplicação, sempre que alguma dos respondentes colocar uma dúvida, dirija-se a ele, esclareça a dúvida e registe-a na “Folha de Registo de Aplicação” em espaço próprio para o efeito.

Decorridos 45 minutos do início da aplicação, inicie uma ronda pela sala a fim de aferir se a maioria dos respondentes já terminou o preenchimento do questionário, ou seja, se já se encontra a fazer a actividade de distracção.

#### **8) Finalização da aplicação dos questionários**

Quando verificar que todos os respondentes estão a fazer a actividade de distracção,

informe que faltam 2 minutos para terminar:

“Gostaria de vos informar que faltam dois minutos para terminarmos. Acabem o que estão a fazer e ponham a folha em cima da mesa. Podem deixar os envelopes em cima das mesas. Obrigado a todos pela vossa colaboração.”

### **9) Registo do processo de aplicação do questionário**

No final de cada aplicação deverá preencher a “Folha de Registo de Aplicação”, indicando:

- 1) Dados referentes à aplicação: nome dos técnicos responsáveis pela aplicação, região, designação da entidade, designação do projecto, local de aplicação, número total de questionários aplicados, data da aplicação, hora de início e de término da aplicação e duração da mesma;
- 2) Dúvidas colocadas pelos respondentes no decorrer da aplicação e resposta fornecida: caso se verifiquem dúvidas repetidas, só é necessário referir cada dúvida uma vez;
- 3) Outras ocorrências dignas de relato: devem ser reportados todos os acontecimentos que possam, directa ou indirectamente, interferir com a aplicação do questionário conforme definida no protocolo de aplicação, nomeadamente: aplicações individualizadas, aplicações decorridas em dois momentos, etc.

### **10) Armazenamento dos questionários preenchidos**

Os questionários deverão ser retirados de dentro dos envelopes, retiradas as capas e agrupados por aplicação, juntamente com a “Folha de Registo de Aplicação” respectiva. Os questionários deverão ser enviados para a Equipa de Investigação e as capas deverão ser guardadas pela equipa para utilizar nas aplicações seguintes.

A aplicação do “Questionário de Avaliação dos Resultados e do Impacto de Projetos de Prevenção das Toxicodependências” pressupõe o cumprimento sequencial dos seguintes procedimentos:

### 1) Codificação do questionário

Cada questionário terá um código alfanumérico, que deve ser transcrito para a primeira página do questionário. Este código é gerado da seguinte forma:

1º) colocar iniciais da Entidade Promotora

(ex.: Associação de Desenvolvimento Local ; as iniciais serão ADL)

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(ex.: Bairro da Quinta da Fonte, as iniciais serão só QF)

3º) colocar a referência do grupo no qual decorre a aplicação

(ex.: 7º ano, turma B, as iniciais serão 7B)

4º) colocar as iniciais do nome completo do respondente

(ex.: João Miguel Sousa Franco, as iniciais serão JMSF)

5º) colocar o número correspondente ao momento de avaliação

*Avaliação pré-teste:* colocar o número 1

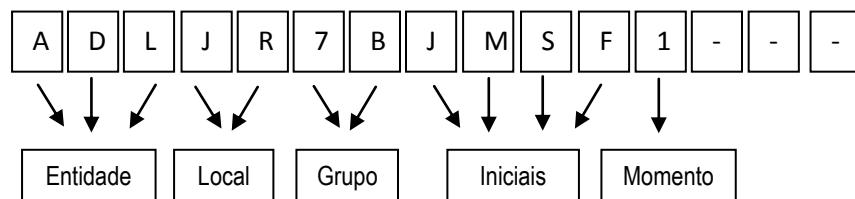
*Avaliação intermédia:* colocar o número 2

*Avaliação pós-teste:* colocar o número 3

*Avaliação follow-up (6 meses):* colocar o número 4

*Avaliação follow-up (12 meses):* colocar o número 5

Neste caso, o Código seria o seguinte:



O código alfanumérico deverá ser gerado e transcrito para a primeira página do questionário antes da aplicação do questionário.

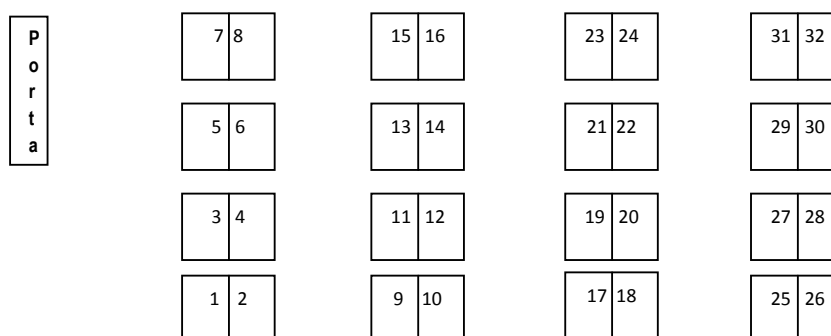
Nos casos em que não seja possível transcrever o código alfanumérico antes da aplicação, a equipa deverá registar com precisão a forma como os respondentes se distribuíram pela sala e proceder ao preenchimento dos códigos imediatamente após a aplicação dos questionários.

## 2) Distribuição ordenada dos respondentes

Independentemente de se tratar de uma aplicação em grupo ou individual, esta deverá decorrer em sala designada para o efeito, que reúna condições de iluminação e sonorização que permitam a concentração exigida neste tipo de tarefa.

Caso se trate de uma aplicação em grupo, os respondentes terão que estar sentados por uma ordem pré-estabelecida de modo a que a equipa que aplica o questionário o distribua fazendo corresponder o questionário ao respondente que se pretende, atendendo a que o código alfanumérico já está atribuído.

Para este efeito, os respondentes deverão ser sentados de acordo com a ordem da lista de alunos fornecida pelos professores, começando da esquerda para a direita, da primeira para a última fila, conforme esquema que se segue:



**Quadro**

Caso falte algum aluno, o seu lugar deverá ser deixado vazio e na “Folha de Registo da Aplicação”, no espaço designado para “Outras ocorrências dignas de relato”, deverá ser registado o seu código alfanumérico, com a referência de que não esteve presente na aplicação. Se, numa aplicação em grupo, houver necessidade de se proceder a uma aplicação mais individualizada, essa ocorrência deverá ser registada da mesma forma na “Folha de Registo da Aplicação”.

Caso se trate de uma aplicação individual, não há necessidade de aplicar o procedimento acima descrito, devendo apenas haver o cuidado de confirmar se o questionário que é entregue tem o código alfanumérico correctamente preenchido.

### **3) Distribuição dos questionários e dos envelopes com a tarefa de distração**

Estando os alunos sentado de acordo com o procedimento acima descrito, a equipa deverá iniciar a distribuição do questionário pela ordem da lista, para que os questionários sejam entregues aos respondentes respectivos, colocar em cima de cada mesa um envelope A4 com a folha da actividade de distração dentro (um envelope por cada aluno) e explicar aos alunos:

“Bom dia. Vamos pôr em cima das vossas mesas estes questionários e estes envelopes, mas pedimos que não os abram já.”

### **4) Explicação das instruções**

Depois de distribuírem os envelopes com a folha de actividade de distração, deverão passar a explicar as instruções de preenchimento do questionário:

“Como já sabem, durante os próximos meses irão fazer parte do projecto [designar o nome do projecto].

Antes de começarem gostaríamos de vos pedir que preencham um questionário sobre alguns aspectos importantes para jovens da vossa idade, tais como: amigos, escola, família, tempos livres, saúde, consumo de tabaco, álcool e outras drogas.

As vossas respostas são completamente confidenciais, ou seja, ninguém que vocês

conheçam vai saber o que é que responderam; nem os vossos professores, nem os vossos pais. As pessoas que vão ver estes questionários não sabem quem vocês são e nem virão a saber.

Se repararem, na primeira folha do questionário estão uns quadradinhos que têm umas letras e uns números; algures no meio estão as iniciais do vosso nome. Estas iniciais não servem para nós vos identificarmos, servem só para as pessoas que vão ver os questionários poderem juntar o que vocês vão preencher hoje com os que vão preencher daqui a algum tempo, quando o projecto estiver a meio e depois, quando o projecto acabar.

A vossa colaboração é voluntária, por isso, se não quiserem, não têm que preencher este questionário. Basta que mo devolvam em branco.

O questionário é um pouco longo, mas as perguntas são muito simples e para responder, basta assinalar a resposta que escolheram; não têm que escrever nada; é só pintarem as bolinhas.

Este questionário não é um teste, por isso não há respostas certas nem erradas. O que queremos saber é a vossa opinião. Se nenhuma das opções de resposta for exactamente o que vocês querem, escolham a que for mais parecida.

Para que este nosso trabalho possa ser útil, é muito importante que respondam a todas as perguntas e que respondam sinceramente. Lembrem-se que ninguém que vocês conheçam ou que vos conheça vai saber o que responderam.”

Este questionário vai ser lido por um computador, por isso, para responder às perguntas têm que preencher a bolinha que corresponde à resposta que escolheram [exemplificar no quadro]. Se se enganarem, façam uma cruz em cima da bolinha [exemplificar no quadro] e preencham a que querem [exemplificar no quadro]. É importante que não escrevam nada fora das bolinhas e que respondam a todas as perguntas. Usem a caneta preta que vos vou dar a seguir.

Se tiverem alguma dúvida, levantem o braço e esperem que eu vá ter convosco.

Quando terminarem de preencher o questionário, abram o envelope que pusemos em cima da vossa mesa e tirem de lá de dentro [escolher a instrução a dar em função da

modalidade de actividade de distração seleccionada]:

a) uma folha que tem uma “sopa de letras” e tentem descobrir as palavras que lá estão [instrução se a actividade de distração for a “sopa de letras”]

b) uma folha branca, onde devem fazer um desenho ou escrever uma composição sobre o tema “Drogas” [instrução se a actividade de distração for “actividade livre”]

Depois de tirarem a folha de dentro do envelope, ponham o questionário lá dentro e depois fechem o envelope. Basta pôr a pala do envelope para dentro e deixem-no estar em cima da vossa mesa.

Obrigada pela vossa colaboração que é muito importante para o trabalho que estamos a fazer.”

#### **5) Explicação dos filtros de resposta**

Transmitidas as instruções, passe ao esclarecimento do processo de resposta às perguntas que apresentam filtro de resposta:

“Antes de começarem a preencher o questionário quero só que o abram na página 2 e que olhem para a pergunta número 11. Nesta pergunta “Já alguma vez fumaste?” podem responder “Sim” ou “Não”. Os que nunca fumaram vão responder “Não”. Certo? À frente do “Não” vêm que está uma setinha para a frente que quer dizer que têm que responder à pergunta “Achas que daqui a um ano vais começar a fumar?”. E escolhem uma das opções “Talvez sim”, “Talvez não” ou “Não sei”. Depois, seguindo a outra setinha para baixo veêm escrito a vermelho: “Se respondeste “Não” passa para a pergunta número 18”. Isso quer dizer que não vão responder a nenhuma das perguntas da 12 à 17. Ou seja, passam directamente para a pergunta 18. Certo?

Os já fumaram alguma vez, vão responder “Sim” à pergunta 11 e depois vão responder à pergunta 12 e 13. Certo? Depois na pergunta 13 pergunta-se “Actualmente fumas?” e aqui os que actualmente fumam vão escolher o “Sim” e, mais uma vez seguindo a setinha para a frente vão responder à pergunta “Achasque daqui a um ano vais continuar a fumar?”. E escolhem uma das opções “Talvez sim”, “Talvez não” ou “Não sei”. Depois passam para a pergunta 14 e continuam a preencher o questionário. Certo?

Os que actualmente não fumam vão responder “Não” à pergunta 13 e, mais uma vez seguindo a setinha para a frente vão responder à pergunta “Achas que daqui a um ano vais voltar a fumar?”. E escolhem uma das opções “Talvez sim”, “Talvez não” ou “Não sei”. Depois, seguindo a setinha para baixo vão ver escrito a vermelho: “Se respondeste “Não” passa para a pergunta número 18”. Isso quer dizer que não vão responder às perguntas 14, 15, 16 e 17. Ou seja, passam directamente para a pergunta 18. Compreenderam? Alguém tem dúvidas?”

Caso haja dúvidas, responder em conformidade.

#### **6) Explicação da questão nº101**

Depois de explicar os filtros de resposta, passe a explicar a estrutura de resposta à questão nº101:

“Queremos ainda que abram o questionário na página 22 e que olhem para a pergunta número 101. Esta pergunta diz “Da seguinte lista, diz quais foram as situações que viveste nos últimos seis meses. Para as situações que viveste diz se elas foram positivas ou negativas.” Aqui o que queremos é que nos digam quais foram, desta lista, as coisas que vos aconteceram nos últimos seis meses, ou seja, desde [dizer o mês]. [Escrever no quadro o item 11 e as opções “Positivo”, “Negativo” e “Não”, para exemplificar] Por exemplo, aqui no número 11, diz “Mudaste de casa”. Se não mudaram, vão pintar a bolinha do “Não” [exemplificar no quadro]. Se mudaram, têm que pensar se a mudança de casa foi positiva ou negativa para vocês, isto é, se foi uma coisa boa ou uma coisa má. Se foi boa, ou seja, positiva, pintam a bolinha do “Positivo” [exemplificar no quadro]; se foi má, ou seja, negativa, pintam a bolinha do “Negativo” [exemplificar no quadro]. Compreenderam? Alguém tem dúvidas?”

Caso haja dúvidas, responder em conformidade.

#### **7) Início da aplicação dos questionários**

Quando não houver mais dúvidas, dê a instrução para que iniciem o preenchimento do questionário:



“Bom, estão preparados? Então podem começar a preencher o questionário. Não se esqueçam que quando acabarem de preencher o questionário devem abrir o envelope que está em cima da vossa mesa, tirar a folha que está lá dentro para fazerem a actividade e pôr o questionário dentro do envelope. Se tiverem dúvidas, levantem o braço para nos chamar. Podem começar.”

#### **8) Decorrer da aplicação dos questionários**

No decorrer da aplicação, sempre que alguma dos respondentes colocar uma dúvida, dirija-se a ele, esclareça a dúvida e registe-a na “Folha de Registo de Aplicação” em espaço próprio para o efeito.

Decorridos 45 minutos do início da aplicação, inicie uma ronda pela sala a fim de aferir se a maioria dos respondentes já terminou o preenchimento do questionário, ou seja, se já se encontra a fazer a actividade de distracção.

#### **9) Finalização da aplicação dos questionários**

Quando verificar que todos os respondentes estão a fazer a actividade de distracção, informe que faltam 2 minutos para terminar:

“Gostaria de vos informar que faltam dois minutos para terminarmos. Acabem o que estão a fazer e ponham a folha em cima da mesa. Podem deixar os envelopes em cima das mesas. Obrigado a todos pela vossa colaboração.”

#### **10) Registo do processo de aplicação do questionário**

No final de cada aplicação deverá preencher a “Folha de Registo de Aplicação”, indicando:

- 1) Dados referentes à aplicação: nome dos técnicos responsáveis pela aplicação, região, designação da entidade, designação do projecto, local de aplicação, número total de questionários aplicados, data da aplicação, hora de início e de término da aplicação e duração da mesma;

2) Dúvidas colocadas pelos respondentes no decorrer da aplicação e resposta fornecida: caso se verifiquem dúvidas repetidas, só é necessário referir cada dúvida uma vez;

3) Outras ocorrências dignas de relato: devem ser reportados todos os acontecimentos que possam, directa ou indirectamente, interferir com a aplicação do questionário conforme definida no protocolo de aplicação, nomeadamente: aplicações individualizadas, aplicações decorridas em dois momentos, etc.

#### **11) Armazenamento dos questionários preenchidos**

Os questionários deverão ser retirados de dentro dos envelopes, retiradas as capas e agrupados por aplicação, juntamente com a “Folha de Registo de Aplicação” respectiva.

Os questionários deverão ser enviados para a Equipa de Investigação e as capas deverão ser guardadas pela equipa para utilizar nas aplicações seguintes.

## Appendix K– Standardised Administering Report

### Folha de Registo de Aplicação de Questionários

Nome do técnico: _____	
_____	
Região:	Norte <input type="radio"/> Centro <input type="radio"/> Lisboa <input type="radio"/> Alentejo <input type="radio"/> Algarve <input type="radio"/>
Entidade: _____	
Projecto: _____	
Local de aplicação: _____	
Número total de questionários aplicados: ____	Data da aplicação: ____/____/____
Hora de início: ____:____	Hora de término: ____:____ Duração da aplicação: ____:____

Dúvidas colocadas no decorrer da aplicação:

Dúvida	Resposta

Outras ocorrências relevantes:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



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## Appendix L– Prevention Interventions' Description

Table L1 <i>Prevention Intervention Description: Agency 1</i>	
Parameter	Description
Specific purposes	To develop social skills, self-esteem, and self-concept; To promote healthy life styles; To promote adaptive drugs-related attitudes, knowledge, and behaviours; To decrease deviant behaviours; To decrease social interaction problems; and To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Non-standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs. Activity 3: Teachers training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	2 staff members: 1 degree in psychology; 1 degree in social work. All staff with specific training in addictive behaviours.
Control group	Collected in the same school as experimental group.

Table L2 <i>Prevention Intervention Description: Agency 2</i>	
Parameter	Description
Specific purposes	To develop social skills, self-esteem, and autonomy; To promote healthy life styles; To prevent school dropout; To disseminate information about drug addiction; and To prevent risky behaviours.
Activities assessed	Activity 1: Standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs. Activity 3: Cultural, educational and leisure activities. Activity 4: Individual support. Activity 5: Drug prevention campaigns.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	3 staff members: 1 degree in psychology; 1 degree in first grade teaching; 1 table tennis coach. Staff without specific training or former experience in addictive behaviours or drug prevention.
Control group	Collected in the same school as experimental group.

Table L3  
Prevention Intervention Description: Agency 3

Parameter	Description
Specific purposes	To develop social skills; To promote healthy leisure activities; To reduce school dropout and school failure; and To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs. Activity 3: Cultural, educational and leisure activities. Activity 4: Individual support. Activity 5: Peer-to-peer activities. Activity 6: Drug prevention campaigns. Activity 7: Teachers training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	2 staff members: 1 degree in psychology; 1 degree in educational sciences. Staff with specific training and former experience in addictive behaviours and drug prevention.
Control group	Not collected in the same school as experimental group.

Table L4  
Prevention Intervention Description: Agency 4 (PH)

Parameter	Description
Specific purposes	To develop social skills, self-esteem, self-concept, and autonomy; To disseminate information about psychoactive substances; To reduce school dropout; To improve family-school relationship; and To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs. Activity 3: Cultural, educational and leisure activities. Activity 4: Individual support. Activity 5: Peer-to-peer activities. Activity 6: Drug prevention campaigns. Activity 7: Teachers training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	5 staff members: 2 degree in psychology; 2 degree in educational sciences; 1 degree in philosophy. 1 staff member with former experience in addictive behaviours.
Control group	Not collected

Table L5 <i>Intervention Description: Agency 5</i>	
Parameter	Description
Specific purposes	To develop social skills and self-concept; To increase knowledge about risk behaviours; To reduce school failure and school dropout; To increase parenting skills; To improve family bonding; To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs. Activity 3: Cultural, educational and leisure activities. Activity 4: Individual support. Activity 5: Parental training. Activity 6: Teachers training.
Target group	Selective.
Setting	Community setting; within groups.
Staff	2 staff members: 1 degree in psychology; 1 degree in educational sciences. 1 staff member with former experience in drug prevention.
Control group	Not collected in the same setting as experimental group.

Table L6 <i>Prevention Intervention Description: Agency 6</i>	
Parameter	Description
Specific purposes	To develop social skills; To prevent risky behaviours; To reduce school failure and school dropout.
Activities assessed	Activity 1: Non-standardised social skills training. Activity 2: Informative sessions on alcohol and other drugs.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	Three staff members: two degree in psychology; one degree in social work. Staff without specific former experience in addictive behaviours or drug prevention.
Control group	Collected in the same school as experimental group.

Table L7 <i>Prevention Intervention Description: Agency 7</i>	
Parameter	Description
Specific purposes	To develop social skills, self-esteem, and self-concept; To promote healthy life styles; To increase family bonding; To reduce school failure and school dropout.
Activities assessed	Activity 1: Non-standardised social skills training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	3 staff members: 1 degree in psychology; 1 degree in educational sciences; 1 degree in sociology. 2 staff members with specific training and former experience in addictive behaviours and drug prevention.
Control group	Collected in the same school as experimental group.

Table L8 <i>Prevention Intervention Description: Agency 8</i>	
Parameter	Description
Specific purposes	To develop social skills; To promote healthy life styles; To promote self-esteem and self-concept; To increase the range of healthy leisure activities.
Activities assessed	Activity 1: Non-standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs. Activity 3: Cultural, educational and leisure activities. Activity 4: Peer-to-peer activities. Activity 5: Drug prevention campaigns.
Target group	Selective.
Setting	Community setting; within groups.
Staff	4 staff members: 2 degree in psychology; 1 degree in educational sciences; 1 degree in sociology. Staff without specific former experience in addictive behaviours or drug prevention.
Control group	Not collected in the same school as experimental group.

Table L9 <i>Prevention Intervention Description: Agency 9</i>	
Parameter	Description
Specific purposes	To develop social skills; To promote adaptive drugs-related knowledge; To promote healthy life styles; To increase school achievement.
Activities assessed	Activity 1: Standardised social skills training. Activity 2: Informative sessions on tobacco, alcohol and other drugs.
Target group	Selective.
Setting	School setting; within groups.
Staff	2 staff members: 1 degree in psychology; 1 degree in social service. Staff without specific former experience in addictive behaviours or drug prevention.
Control group	Not collected.

Table L10 <i>Prevention Intervention Description: Agency 10</i>	
Parameter	Description
Specific purposes	To develop social skills; To promote self-esteem; To increase drugs-related knowledge; To decrease aggressive behaviours; and To decrease interpersonal problems.
Activities assessed	Activity 1: Non-standardised social skills training; Activity 2: Informative sessions on tobacco, alcohol and other drugs;
Target group	Selective.
Setting	School setting; within groups.
Staff	4 staff members: 2 degree in psychology; 1 degree in first grade teacher; 1 degree in social work. 3 staff with specific training and former experience in addictive behaviours or drug prevention.
Control group	Not collected in the same school as experimental group.



Table L11 <i>Prevention Intervention Description: Agency 11</i>	
Parameter	Description
Specific purposes	To develop social skills; To promote self-esteem; To reduce school failure and school dropout; To increase school bonding; To increase family bonding.
Activities assessed	Activity 1: Non-standardised social skills training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	4 staff members: 2 degree in psychology; 1 degree in educational sciences; 1 degree in sociology. Staff without specific former experience in addictive behaviours or drug prevention.
Control group	Collected in the same school as experimental group.

Table L12 <i>Prevention Intervention Description: Agency 12</i>	
Parameter	Description
Specific purposes	To develop social skills; To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Non-standardised social skills training; Activity 2: Teachers training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	3 staff members: 1 degree in psychology; 1 degree in social work; 1 animator. Staff with specific training in drug prevention.
Control group	Not collected.

Table L13  
*Prevention Intervention Description: Agency 13*

<b>Parameter</b>	<b>Description</b>
Specific purposes	To develop social skills; To promote healthy leisure activities; To decrease deviant behaviours; To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Standardised social skills training; Activity 2: Cultural, educational and leisure activities; Activity 3: Individual support; Activity 4: Teachers training.
Target group	Universal.
Setting	School setting; within classrooms.
Staff	4 staff members: 2 degree in psychology; 2 degree in sports. 1 staff member with specific training in drug prevention.
Control group	Collected in the same school as experimental group.

Table L14  
*Prevention Intervention Description: Agency 14*

<b>Parameter</b>	<b>Description</b>
Specific purposes	To develop social skills; To promote adaptive drugs-related knowledge; To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Non-standardised social skills training; Activity 2: Informative sessions on tobacco, alcohol and other drugs; Activity 3: Individual support; Activity 4: Drug prevention campaigns; and Activity 5: Teachers training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	4 staff members: 2 degree in psychology; 2 degree in social work. 4 staff with specific former experience in addictive behaviours or drug prevention.
Control group	Not collected.

Table L15

*Prevention Intervention Description: Agency 15*

<b>Parameter</b>	<b>Description</b>
Specific purposes	To develop social skills; To promote adaptive drugs-related attitudes, knowledge, and behaviours; To prevent risky behaviours; To reduce deviant behaviour; To prevent school failure and school dropout; To increase teachers' skills to prevent substance use.
Activities assessed	Activity 1: Non-standardised social skills training; Activity 2: Informative sessions on tobacco, alcohol and other drugs; Activity 3: Cultural, educational and leisure activities; Activity 4: Individual support; Activity 5: Drug prevention campaigns; and Activity 6: Teachers training.
Target group	Selective.
Setting	School setting; within classrooms.
Staff	5 staff members: 2 degree in psychology; 2 degree in social work; 1 degree in educational sciences. Staff with specific former experience in addictive behaviours or drug prevention.
Control group	Collected within the same school as experimental group.