

ORIGINAL ARTICLE

Tobacco smoking among students in an urban area in Northern Italy

D. PANATTO¹, D. AMICIZIA¹, A. DOMNICH¹, P.L. LAI¹, M.L. CRISTINA¹, A. SIGNORI¹, S. BOCCALINI², K. SULAJ¹, R. GASPARINI¹

¹ Department of Health Sciences, University of Genoa, Italy; ² Department of Public Health, University of Florence, Italy

Key words

Smoking • Adolescents • Students • Social predictors • Smoking initiation

Summary

Introduction. Tobacco smoking, which usually begins in teenage, is one of the most important lifestyle risk factors for chronic diseases and a major public health problem worldwide.

The aims of the study were to determine the prevalence of tobacco smoking and the mean age of initiation among adolescents in Genoa (Italy) and to identify some socio-demographic predictors that could be associated with the onset of smoking.

Materials and methods. 2,301 randomly selected students (14-19 years old) in Genoa completed an ad hoc questionnaire. The Kaplan-Meier method was used to evaluate the instantaneous risk of experimenting with smoking. A multivariate logistic regression model was used to determine whether current or previous smoking status was associated with socio-demographic characteristics.

Results. 59.5% of respondents had tried smoking, while 35.6% defined themselves as current smokers. No difference

in current smoking prevalence emerged between males and females (35.2% and 35.9%, respectively, $p = 0.83$). The mean age on initiation was 13.5 years for males and 13.9 years for females. The instantaneous probability of trying smoking changed with age, reaching a maximum at 14 years. Subjects who tried smoking before this age were more inclined to continue smoking.

The probability of being a current smoker was significantly higher among students from unmarried-parent families and those attending vocational and technical secondary schools.

Conclusions. There is a great need for the activation of new health promotion interventions and enforcement of those already existing, in order to raise awareness of the damage caused by smoking among adolescents, especially those belonging to high-risk groups.

Introduction

Cigarette smoking is one of the most important lifestyle risk factors for chronic diseases [1], which are responsible for a high number of deaths worldwide [2]. Throughout the world, more than 5 million deaths each year are due to tobacco smoking and, if the current rising trend persists, this figure is expected to reach a billion by the end of the 21st century [3]. Tobacco smoking has been classified by the International Agency for Research on Cancer (IARC) as having a Group I carcinogenic effect in humans, and about 70 carcinogens have been identified in tobacco smoke [4]. The leading smoking-attributable diseases are cancers and respiratory and cardiovascular diseases [5]. Gallus et al. reported 71,445 deaths (52,707 males and 18,738 females) attributable to smoking in 2010 in Italy (12.5% of total mortality). These deaths are due to lung cancer, other malignant neoplasms, cardiovascular disease and non-neoplastic respiratory diseases [6].

Tobacco smoking is a major public health problem worldwide. The majority of smokers start smoking in adolescence and approximately two thirds try smoking by the age of 15 [7]. The hazards of smoking depend on a variety of factors, such as age on initiation, the num-

ber of cigarettes smoked per day, degree of inhalation, nicotine and tar content, and filter type [5]. Cigarette smoking among the young is associated with numerous health problems during childhood/adolescence and with an increase in health problems in adulthood [1, 8].

The age at which an individual starts smoking determines the probability of addiction, the likelihood of stopping and the risk of adverse health outcomes [9]. In a recent survey conducted in the United Kingdom (UK), 53% of adolescents reported having smoked at least one whole cigarette by the age of 16 years [10]. The Health Behavior in School-aged Children (HBSC) study, carried out in Europe, reported the following weekly smoking prevalence rates among the young: 2% among 11-year-olds, 8% among 13-year-olds and 24% among 15-year-olds [11].

The process of becoming a smoker develops through phases of preparation, initiation, experimentation, regular smoking and addiction, with progression from the first to the fifth phase lasting on average 2-3 years [12]. Adolescent smoking may be associated with socio-demographic, environmental, behavioral and personal factors [13]. The individual's level of education may also influence smoking initiation, the more highly educated being less likely to smoke [14]. The question of whether

a lower socio-economic status of parents influences the onset of smoking in their children remains open. Several studies have documented an inverse relationship between adolescent smoking and parental socioeconomic variables, such as education and social class, in that a higher level of adolescent smoking has been observed in families with lower socioeconomic status [13, 15]. Other studies, however, have not found such a link [16, 17].

In order to implement early health-promotion measures, especially among high-risk groups, it is essential to ascertain the prevalence of tobacco smoking among adolescents, the ages when smoking is first experienced and becomes regular, and related risk factors.

The aims of the present study were to determine the prevalence of smoking and the mean age on initiation among adolescents in Genoa (Italy) and to identify socio-demographic predictors that could be associated with the onset of smoking.

Materials and methods

STUDY DESIGN AND POPULATION

This cross-sectional study was conducted in Genoa, Italy, between 2008 and 2010. About 30% of the city's secondary schools (high schools, technical schools and vocational schools) were randomly selected to participate in the study. Within each school, nearly 10% of the students were recruited by age-class (14-16 years and 17-19 years) by means of a randomized stratified sampling method. The boards of each school gave a permission for the testing the students.

As schooling is obligatory up to the age of 16 years in Italy, we recruited a higher number of subjects in the 14-16-year age-class (2:1) [18].

SMOKER DEFINITION

We have adopted the World Health Organization (WHO) definition of smoker that defines a smoker as a person who smokes either daily or occasionally [19].

QUESTIONNAIRE

We use an anonymous *ad hoc* questionnaire to record socio-demographic characteristics (gender, age, nationality, type of educational institution attended, family context, parents' education) and smoking habits (past and present smoking habits, age on first smoking experience). Questionnaires were self-administered and, in order to encourage openness and honesty in the answers, confidentiality and secrecy were ensured by avoiding any questions regarding the identity of the respondents. During administration of the questionnaire, physicians were available to explain the questions.

All questionnaires were checked on the basis of quality control.

SOCIO-DEMOGRAPHIC CHARACTERISTICS

Nationality, which was self-defined by the participants, was categorized as Italian or Foreign.

The type of family was subdivided into traditional and non-traditional. We considered married-parent families to be traditional, while any other family structure (e.g. single-parent family, remarried parent, etc) was defined as a non-traditional family. This distinction was prompted by the fact that several studies have reported different patterns of smoking among adolescents from families in which the parents are not married [20-22].

The educational level of the mother and father was classified as: high (high-school level or higher) or medium/low (middle-school level or lower).

The educational level of the participants was determined according to the type of educational institution attended. In Italy, the second phase of secondary education is broken down into 3 types of institution: high school, technical school and vocational school. High school is usually attended by students who want to continue their education at university; graduation from a technical school qualifies the individual to practice a technically skilled profession (e.g. chartered surveyor, accountant); vocational schools offer specialized training for specific occupations, such as electricians, designers etc. The data were dichotomized into two groups: (i) low educational level, which comprised vocational/technical schools and (ii) high educational level, which comprised high schools. This subdivision was based on the fact that, according to the Italian National Statistics Institute (ISTAT), more than 95% of high-school graduates continue their education at university, while the percentage of graduates from vocational (29%) and technical schools (53%) who try to enter university is significantly lower [23].

STATISTICAL ANALYSIS

Quantitative variables are expressed as means and standard deviations (SD), and qualitative variables as frequencies and percentages with 95% Confidence Intervals (95% CI). Student's t test was used to estimate differences in age on first smoking experience between the different categories. The Kaplan-Meier product-limit method was used to evaluate the hazard rate of trying smoking at any age for males and females. The hazard rate is the instantaneous probability of smoking onset [9,24]. In particular, age of the first cigarette was chosen as a dependent variable (for subjects declared to experiment with smoking at least once) while subjects who had never smoked were registered as censored observations. Fisher's exact test was performed to compare current smoking status among males and females and to ascertain whether there was a difference in smoking continuation between subjects who tried the first cigarette before or after the age of 14 years. Univariate logistic regression was first performed to determine whether smoking status (current and previous) was associated with gender, age-class, nationality, type of family, and parents' and participants' educational level. Multivariate logistic regression was then performed in order to reduce confounding biases. The multivariate analysis

considered significant variables obtained from the univariate analysis, in order to determine any association of each variable with current smoking status and previous smoking experience. Statistical analysis was performed by means of the SPSS 17.0 (SPSS, Chicago) software. A $p < 0.05$ was considered significant.

Results

A total of 2,500 students aged 14-19 years were invited to participate in the study, 61 of whom declined (response rate of 97.6% [95% CI: 96.9-98.1]). As few students refused to participate, the reasons for refusal were not investigated. The study therefore involved 2,439 students (926 males and 1,513 females). We excluded 138 questionnaires from the analysis on the basis of quality control. Thus, the pool of eligible participants consisted of 2,301 students (901 males [39.2%, 95% CI: 37.2-41.2] and 1,400 females [60.8%, 95% CI: 58.8-62.8]). The mean age of participants was 15.8 (SD 1.6) years (males: 15.6 [SD 1.6]; females: 16.0 [SD 1.6]). The socio-demographic characteristics of participants are reported in Table I.

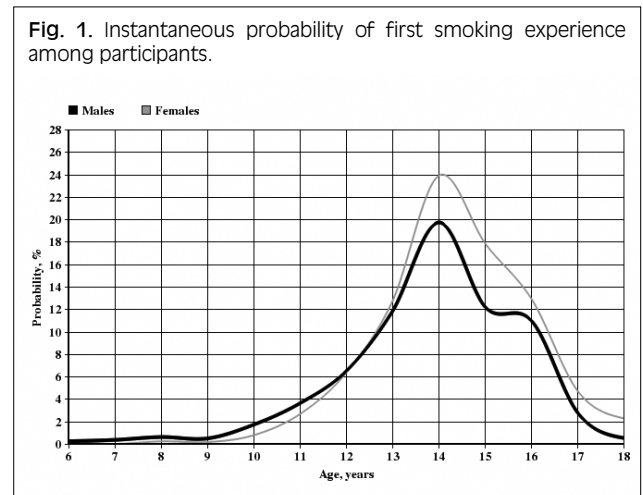
Of the students interviewed, 59.5% (95% CI: 57.4-61.6) stated having experimented with cigarette smoking at least once, and 35.6% (95% CI: 33.3-38.0) defined themselves as current smokers. The prevalence of smoking at the time of the study was similar among males and females (males: 35.2% [95% CI: 31.4-39.1]; females: 35.9% [95% CI: 32.9-38.9], $p=0.83$).

The mean age on first smoking experience was 13.5 (SD 1.7) years among current smokers and 13.8 (SD 1.8) years among subjects who had tried smoking at least once; this difference proved statistically significant ($p < 0.001$). Subjects who tried their first cigarette before 14 years of age were more inclined ($p < 0.001$) to continue smoking than those who experimented with

smoking at the age of 14 years or later (56.0% [95% CI: 51.5-60.5] vs. 41.6% [95% CI: 38.0-42.2]).

The mean age on first smoking experience differed significantly ($p < 0.001$) between males (13.5 years, SD 1.9) and females (13.9 years, SD 1.7). There was no difference in the mean age on first smoking experience between Italians and foreigners (13.8 and 13.9 years, respectively, $p = 0.72$), between students from traditional and non-traditional families (13.8 years for both), between low/medium and high educational level of the mother (13.8 years for both), between low/medium and high educational level of the father (13.9 and 13.8 years, respectively, $p = 0.38$), or between the educational levels of students: low educational level and high educational level (13.8 years for both).

The instantaneous probability of trying smoking changed substantially with age for both males and females (Fig. 1). Indeed, between the ages of 6 and 11 years, the risk of trying smoking was seen to increase slowly; after the



Tab. I. Socio-demographic characteristics of participants.

| Variable | | Number (%) | 95% CI |
|-----------------------------|------------------------|--------------|-----------|
| Nationality | Italian | 2,174 (94.5) | 93.5-95.3 |
| | Foreign | 81 (3.5) | 2.8-4.3 |
| | Not available | 46 (2.0) | - |
| Age-class, years | 14-16 | 1,536 (66.8) | 64.8-68.6 |
| | 17-19 | 765 (33.2) | 31.3-35.2 |
| Family context | Traditional family | 1,888 (82.1) | 80.4-83.6 |
| | Non-traditional family | 311 (13.5) | 12.2-15.0 |
| | Not available | 102 (4.4) | - |
| Type of secondary school | Vocational school | 321 (14.0) | 12.6-15.4 |
| | Technical school | 189 (8.2) | 7.2-9.4 |
| | High school | 1,564 (68.0) | 66.0-69.8 |
| | Not available | 227 (9.9) | - |
| Mother's level of education | High | 1,631 (70.9) | 69.0-72.7 |
| | Medium/low | 501 (21.8) | 20.1-23.5 |
| | Not available | 169 (7.3) | - |
| Father's level of education | High | 1,480 (64.3) | 62.3-66.2 |
| | Medium/low | 590 (25.7) | 23.9-27.5 |
| | Not available | 231 (10.0) | - |

Tab. II. Univariate logistic regression for the main variables.

| Current smoking status | | | |
|--|------|-----------|---------|
| Variable | OR | 95% CI | p value |
| Females vs. males | 1.03 | 0.83-1.27 | 0.79 |
| 17-19 years vs. 14-16 years | 1.97 | 1.59-2.43 | <0.001 |
| Foreigners vs. Italians | 0.96 | 0.54-1.71 | 0.88 |
| Non-traditional family vs. traditional family | 1.62 | 1.22-2.15 | 0.001 |
| Low/medium vs. high level of mother's education | 1.44 | 1.12-1.84 | <0.01 |
| Low/medium vs. high level of father's education | 1.31 | 1.04-1.65 | <0.05 |
| Low educational level vs. high educational level of participants | 1.56 | 1.22-1.98 | <0.001 |
| Smoking experience | | | |
| Females vs. males | 1.27 | 1.07-1.52 | <0.01 |
| 17-19 years vs. 14-16 years | 1.81 | 1.50-2.19 | <0.001 |
| Foreigners vs. Italians | 1.02 | 0.63-1.65 | 0.94 |
| Non-traditional vs. traditional family | 2.21 | 1.67-2.94 | <0.001 |
| Low/medium vs. high level of mother's education | 1.26 | 1.02-1.57 | <0.05 |
| Low/medium vs. high level of father's education | 1.31 | 1.07-1.61 | <0.01 |
| Low educational level vs. high educational level of participants | 1.88 | 1.50-2.34 | <0.001 |

age of 12 years, there was a rapid increase, the maximum value (23.9% for females and 19.7% for males) being reached at 14 years. Subsequently, the risk diminished progressively, though this diminution was less marked between the ages of 15 and 16 years, especially among males.

Univariate logistic regression showed a significantly higher probability of being a smoker/experimenting smoking for higher age (17-19 years), non-traditional family context, low/medium education of parents, lower education of participants, and sex (for previous smoking experience only) (Tab. II). However, on multivariate logistic regression, only age, type of family and participants' educational level remained significant (Tab. III).

Discussion

Participation in the study was very high and the students showed considerable interest in smoking-related issues. The majority of interviewees stated that they had smoked at least once in their life. The prevalence of cig-

arette smoking among our respondents was higher than in some studies conducted in Italy in the same period as our research. Indeed, Gallus et al. reported a prevalence of 25.1% for 15-24-year-old males and 18.4% for 15-24-year-old females [6]. A survey conducted by the Italian Institute of Health (ISS) reported a prevalence of 21.9% among subjects aged 15-24 years [25] and Tramacere et al. found current-smoker prevalence rates among subjects aged 15-24 years of 29.6% and 23.3% in males and females, respectively [26].

The higher percentages in our study than in the three above-mentioned studies could be associated with the different definition of "current smoker" used in different studies. For instance, our "current smoker" definition was a person who smokes either daily or occasionally [19], while in the study conducted by Gallus et al., a current smoker was defined as someone who had smoked 100 or more cigarettes in his/her life [6]. The different forms of questionnaire administration may also influence the data collected. For instance, it has been shown that household surveys yield lower adolescent smoking rates than school-based surveys [27, 28].

Tab. III. Multivariate logistic regression for the main variables considered.

| Current smoking status | | | |
|--|------|-----------|---------|
| Variable | OR | 95% CI | p value |
| 17-19 years vs. 14-16 years | 1.96 | 1.53-2.51 | <0.001 |
| Non-traditional vs. traditional family | 1.44 | 1.02-2.04 | <0.05 |
| Low/medium vs. high level of mother's education | 1.16 | 0.85-1.56 | 0.35 |
| Low/medium vs. high level of father's education | 1.06 | 0.81-1.40 | 0.67 |
| Low educational level vs. high educational level of participants | 1.39 | 1.06-1.81 | <0.05 |
| Smoking experience | | | |
| Females vs. males | 1.11 | 0.90-1.35 | 0.33 |
| 17-19 years vs. 14-16 years | 1.69 | 1.36-2.10 | <0.001 |
| Non-traditional vs. traditional family | 2.22 | 1.57-3.14 | <0.001 |
| Low/medium vs. high level of mother's education | 1.04 | 0.81-1.35 | 0.73 |
| Low/medium vs. high level of father's education | 1.11 | 0.87-1.40 | 0.40 |
| Low educational level vs. high educational level of participants | 1.75 | 1.37-2.40 | <0.001 |

Our findings are in line with those of other studies. The Italian data from the HBSC study revealed prevalence rates of current smoking among 15-year-olds of 23% and 22% for females and males, respectively [11]; our study found a prevalence rate of current smoking among 15-year-olds of 20.7% (data not shown). A study conducted among 13-18-year-old students in Lombardy (Northern Italy) found prevalence rates of current smoking of 26.5% among 15-year-olds and 33.2% among 18-year-olds [29].

The mean age at which our respondents had first experienced smoking was 13.8 years, and the majority had smoked by the age of 16. This finding is in line with previous research in Italy and other Western European countries [11]. Moreover, in our study, males started smoking earlier than females. This finding is also in line with other research. Indeed, the European Tobacco Control Report revealed that boys started smoking earlier in almost all countries [11].

Subjects who experienced cigarette smoking before 14 years of age were more likely to carry on smoking than those who tried their first cigarette at the age of 14 years or later [9, 30].

Figure 1 shows that the risk trying smoking increases after the age of 11 years, and that this increase occurs after students move from elementary school to the first phase of secondary education; subsequently, the highest risk occurs after students transfer from the first phase to the second phase of secondary education (at the age of 14 years). Other researchers have also reported this trend [9].

On moving from childhood to adolescence, and in the first phase of adolescence, profound biological, social and relational changes take place. As personal identity forms, adolescents distance themselves from the family and forge closer bonds with peer groups, which become a new point of reference. Thus, adolescents feel the need to share emotions and experiences with their peers in order to feel part of the group. In terms of lifestyle, peer-group influence is a factor of primary importance and, according to previous research, the social exchange of cigarettes is one of the main sources of smoking among teenagers [31, 32]. In general, the influence of peer smoking is stronger than that of parental smoking, and this difference increases over time. However, the beneficial effect of having non-smoking friends seems to be greater than the deleterious effect of having friends who smoke [30]. Thus, the process of emulation and identification with the peer group could also be exploited as a strategy for the prevention of smoking [33].

After the age of 14 years, the risk of trying smoking decreases rapidly; interestingly, the decline in the risk of starting smoking appears to be less marked between the ages of 15 and 16 years, especially among males; this might be explained by the fact that 16 is the legal age limit for the purchase of tobacco products in Italy.

Our study highlights the importance of social and demographic factors that determine smoking habits. Regarding age, our study found a significantly higher prevalence of smoking among older students (17-19 years)

than younger ones. Moreover, the highest percentage of smoking was seen among students attending vocational and technical secondary schools, a finding consistent with those of other studies [34, 35]. In addition, regular smoking proved to be statistically associated with a non-traditional type of family. Again, this is in line with previous research, which has suggested a higher risk of taking up smoking among adolescents living in single-parent families [21, 22] and step-parent families [20, 22]. Many authors have found that adolescents from less educated families are at greater risk of starting smoking [36]. This is very probably linked with the fact that parents with a low socio-economic status are more likely to be smokers [37], and parental smoking is a well-known predictor of smoking among offspring [38, 39]. In our study, a lower level of parental education was statistically associated with a higher prevalence of smoking among offspring in the univariate regression model; on multivariate regression, however, it did not prove significant.

In agreement with these observations and the WHO recommendations, curbing smoking should be an integral part of health policy objectives; these should include promoting healthy lifestyles and preventing the damage caused by smoking, through the adoption of multi-sector strategies and raising awareness among young people [40]. Moreover, in order to target adolescents at high risk of starting smoking, promotional and educational interventions should take into account differences in social, cultural, geographical and economic contexts. In this regard, the Italian Ministry of Health has activated a project "Gaining Health - Making healthy choices easier" ("*Guadagnare Salute - Rendere facili le scelte salutari*") which provides multi-sector intervention to promote healthy lifestyles, not only by persuading smokers to give up smoking or to smoke less, but also by discouraging young people from starting [41]. The key points of this program are: the implementation of educational campaigns that target subjects by age, sex, family and work contexts; school-based programs; regulation of the sale of tobacco products; raising consumer awareness; the promotion of specific educational programs on smoking among doctors, healthcare workers and voluntary associations; strengthening anti-smoking centers and the development of initiatives for women (mothers and pregnant women). Indeed, our study reveals a great need for the prompt activation and enforcement of these interventions, the message to young people being that they can be successful and appreciated without smoking, and that smoking is harmful to the health of everyone.

The present study displays some limitations. First, our questionnaire did not contain items on the type and intensity of smoking (such as number of cigarettes smoked). Second, we did not investigate other social and environmental factors (such as parents' and friends' smoking) that can prompt young people to start smoking.

In conclusion the findings of our study highlight the fact that tobacco smoking is a major problem among adolescents and that the early onset of smoking is linked to a

high probability of continuing to smoke. Therefore, reducing smoking among adolescents is one of the most important challenges for public health authorities.

Finally, our study revealed great interest in smoking and smoking-related issues among adolescents. It would therefore be useful to introduce programs of health education into the secondary school curriculum, in order to promote a healthy lifestyle. Furthermore, a

potentially effective approach may be the adoption of the peer education method, which has had great success in other programs of health promotion among young people.

ACKNOWLEDGEMENTS

The study was supported by the Department of Health Sciences – Genoa University (Italy).

References

- [1] Centers for Disease Control and Prevention (CDC). *Annual smoking-attributable mortality, years of potential life lost, and productivity losses - United States, 2000-2004*. MMWR Morb Mortal Wkly Rep 2008;57:1226-8.
- [2] Maaten S, Kephart G, Kirkland S, et al. *Chronic disease risk factors associated with health service use in the elderly*. BMC Health Serv Res 2008;8:237.
- [3] World Health Organization (WHO). *WHO Report on the Global Tobacco Epidemic 2009: Implementing Smoke-Free Environments*. Geneva: WHO Document Production Services, 2008.
- [4] International Agency for Research on Cancer (IARC). *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans Volume 83. Tobacco Smoke and Involuntary Smoking*. Lyon: WHO Press, 2004.
- [5] Ezzati M, Lopez AD. *Estimates of global mortality attributable to smoking in 2000*. Lancet 2003;362:847-52.
- [6] Gallus S, Mutarak R, Martínez-Sánchez JM, et al. *Smoking prevalence and smoking attributable mortality in Italy, 2010*. Prev Med 2010;52:434-8.
- [7] Henry SL, Jamner LD, Whalen CK. *I (should) Need a Cigarette: Adolescent Social Anxiety and Cigarette Smoking*. Ann Behav Med 2012;43:383-93.
- [8] Centers for Disease Control and Prevention (CDC). *Preventing tobacco use among young people: a report of the surgeon general (Executive Summary)*. MMWR Morb Mortal Wkly Rep 1994;43:(RR-4).
- [9] Unger JB, Chen X. *The role of social networks and media receptivity in predicting age of smoking initiation: a proportional hazards model of risk and protective factors*. Addict Behav 1999;24:371-81.
- [10] Heron J, Hickman M, Macleod J, et al. *Characterizing patterns of smoking initiation in adolescence: comparison of methods for dealing with missing data*. Nicotine Tob Res 2011;13:1266-75.
- [11] World Health Organization (WHO), Regional Office for Europe. *Health policy for children and adolescent, n°6. Social determinants of health and well-being among young people. Health behaviour in school-aged children (HBSC) study: International Report from the 2009/2010 survey*. http://www.euro.who.int/__data/assets/pdf_file/0003/163857/Social-determinants-of-health-and-well-being-among-young-people.pdf [Accessed on 7 Jan 2013].
- [12] Elders MJ, Perry CL, Eriksen MP, et al. *The report of the Surgeon General: Preventing tobacco use among young people (commentary)*. Am J Public Health 1994;84:543-7.
- [13] Tyas SL, Pederson LL. *Psychosocial factors related to adolescent smoking: a critical review of the literature*. Tob Control 1998;7:409-20.
- [14] Göhlmann S. *The Determinants of Smoking Initiation - Empirical Evidence for Germany, Ruhr Economic Papers N°27*. Berlin: The German Socio-Economic Panel, 2007.
- [15] Farkas AJ, Distefan JM, Choi WS, et al. *Does parental smoking cessation discourage adolescent smoking?* Prev Med 1999;28:213-8.
- [16] Tuinstra J, Groothoff JW, van den Heuvel WJ, et al. *Socio-economic differences in health risk behavior in adolescence: do they exist?* Soc Sci Med 1998;47:67-74.
- [17] Epstein JA, Williams C, Botvin GJ, et al. *Psychosocial predictors of cigarette smoking among adolescents living in public housing developments*. Tob Control 1999;8:45-52.
- [18] *Disposizione per la formazione del bilancio annuale e pluriennale dello Stato (legge finanziaria 2007). Legge 27 dicembre 2006 n. 296 comma 622. (Act 296 of 27 December 2006 – the 2007 Finance Act)*. Gazzetta Ufficiale 2006;244,Supplemento Ordinario.
- [19] World Health Organization (WHO). *WHO Policy on Non-Recruitment of Smokers or Other Tobacco Users: Frequently Asked Questions*. http://www.who.int/employment/FAQs_smoking_English.pdf [Accessed on 7 Jan 2013].
- [20] Flewelling RL, Bauman KE. *Family Structure as a Predictor of Initial Substance Use and Sexual Intercourse in Early Adolescence*. J Marriage Fam 1990;52:171-81.
- [21] Miller P. *Family structure, personality, drinking, smoking and illicit drug use: a study of UK teenagers*. Drug Alcohol Depend 1997;45:121-9.
- [22] Bjarnason T, Davidaviciene AG, Miller P, et al. *Family structure and adolescent cigarette smoking in eleven European countries*. Addiction 2003;98:815-24.
- [23] Istituto Nazionale di Statistica (ISTAT). *I diplomati e lo studio: Anno 2007*. (National Institute of Statistics. Graduates and study: Year 2007). http://www3.istat.it/salastampa/comunicati/non_calendario/20091112_00/testointegrale20091112.pdf [Accessed on 7 Jan 2013].
- [24] Pagano M, Gauvreau K. *Principles of biostatistics*. New York: Duxbury Press, 1993.
- [25] Ministero della Salute. *Rapporto sul fumo in Italia 2012*. www.salute.gov.it/dettaglio/dettaglioNews.jsp?id=2044&tipo=new [Accessed on 7 Jan 2013].
- [26] Tramacere I, Gallus S, Pacifici R, et al. *Smoking in young and adult population, Italy 2009*. Tumori 2011;97:423-7.
- [27] Craig R, Mindell J. *Health Survey for England 2006. Volume 2: Obesity and other risk factors in children*. Leeds: The Information Centre, 2008.
- [28] Griesler PC, Kandel DB, Schaffran C, et al. *Adolescents' Inconsistency in Self-Reported Smoking: A Comparison of Reports in School and in Household Settings*. Public Opin Q 2008;72:260-90.
- [29] Sacco S, Devoti G, Bonfanti M, et al. *Smoking habits among 13-18 year-old students in Lombardy*. Epidemiol Prev 2008;32:294-300.
- [30] Dong-Chul S, Yan H. *Systematic Review of Social Network Analysis in Adolescent Cigarette Smoking Behavior*. Journal of School Health 2011;82:21-7.
- [31] Forster J, Chen V, Blaine T, et al. *Social exchange of cigarettes by youth*. Tob Control 2003;12:148-54.
- [32] Mutarak R, Gallus S, Franchi M, et al. *Why do smokers start?* Eur J Cancer Prev 2013;22:181-6.
- [33] Croce M, Gemmi A. *Peer Education. adolescenti protagonisti nella prevenzione (Peer Education. Adolescents as protagonists in prevention)*. Milano: Franco Angeli, 2006.

- [34] Kim H, Kim EK, Choi ES, et al. *The determinants of adolescent smoking by gender and type of school in Korea*. J Prev Med Public Health 2006;39:379-88.
- [35] Talay F, Altin S. *The impact of gender, family and type of school on smoking in adolescents in Eyup, Istanbul, Turkey*. West Indian Med J 2008;57:141-6.
- [36] Soteriades ES, DiFranza JR. *Parent's Socioeconomic Status, Adolescents' Disposable Income, and Adolescents' Smoking Status in Massachusetts*. Am J Public Health 2003;93:1155-60.
- [37] Laaksonen M, Rahkonen O, Karvonen S, et al. *Socioeconomic status and smoking: analysing inequalities with multiple indicators*. Eur J Public Health 2005;15:262-9.
- [38] Jackson C, Henriksen L. *Do as I say: parent smoking, antismoking socialization, and smoking onset among children*. Addict Behav 1997;22:107-14.
- [39] Conrad KM, Flay BR, Hill D. *Why children start smoking cigarettes: predictors of onset*. Br J Addict 1992;87:1711-24.
- [40] World Health Organization (WHO). *2008-2013 Action Plan for the Global Strategy for the Prevention and Control of Noncommunicable Diseases*. Geneva: WHO Document Production Services, 2008.
- [41] Ministero della Salute. *Guadagnare Salute - Rendere facili le scelte salutari*. (Ministry of Health. *Gaining Health - Making healthy choices easier*). http://www.salute.gov.it/imgs/C_17_pubblicazioni_605_allegato.pdf [Accessed on 7 Jan 2013].

■ Received on January 7, 2013. Accepted on March 7, 2013.

■ Correspondence: Donatella Panatto, Department of Health Science, University of Genoa, via Pastore, 1 16132 Genoa, Italy Tel. +39 010 3538109 - Fax +39 010 3538541 - E-mail: panatto@unige.it