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Sexual risky behaviour among Slovak adolescents and young adults

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**Sexual risky behaviour
among Slovak adolescents
and young adults:
social and psychological factors**

Ondrej Kalina

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Thesis University of Groningen, the Netherlands – with summary in Slovak and Dutch

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Introduction

Sexual behaviour and sexuality are very important for adolescents' health and well-being. Adolescents have their first relational and sexual experiences, and have to learn what they like and dislike, how to make sexual experiences mutually rewarding, and how to prevent potentially negative consequences of having sex. Ideally these experiences are safe and pleasurable for both partners. Positive sexual experiences are associated with general well-being, and thereby contribute to public health more generally (Whipple, 2007). However, sex also entails risk of unintended pregnancy, sexually transmitted infection (STIs), and sexual coercion. Therefore emotional, medical, and financial costs of these risks highlight the importance of studying sexual development (De Graaf et al., 2011) to promote and increase the sexual health of young people.

This chapter provides general information about sexual health and sexual risk behaviour among adolescents and young adults. It also describes the current knowledge concerning the influence of three major factors (psychological, behavioural, and social) on sexual risk behaviour. At the end we describe the aim of the study and its research question, as well as the structure of this thesis.

1.1 Sexual health

Despite that the term sexual health has become increasingly used the understanding and definition of sexual health behaviour is not straight forward. Several definitions and aspects of healthy and unhealthy sexual behaviour can be found in recent literature sources. Some researchers, from a strictly medical point view see safe sexual behaviour only in terms of prevention of STIs and unintended pregnancy (Kane & Wellings, 1999; Krivohlavy, 2003). The Family Planning Association defines sexual health as: *...enjoying the sexual activity you want without causing yourself or anyone else suffering or physical or mental health*. In more detail, the World Health Organization (WHO) defines sexual health as: *... a state of physical, emotional, mental and social well-being. In relation to sexuality it is not merely the absence of disease, dysfunction, or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, and violence* (WHO, 2012). At first sight we can see that sexual health is not just about the occurrence or prevention of negative outcomes, such as sexually transmitted infections

(STIs) and unintended pregnancies. It really is something more, which is reflected by the previous definitions which express that sexual health is also about enjoyment and pleasure (Coleman et al., 2007).

1.2 Sexual risk behaviour in adolescence and young adults

Adolescents and young adults in particular have been found to be the group at the highest risk for negative health consequences related to sexual risk-taking behaviour, including STIs like e.g. chlamydia, gonorrhoea, syphilis, human immunodeficiency virus (HIV), and the occurrence of unintended pregnancies (Aggleton, 1995). The key markers and indicators of sexual risk behaviour (SRB) include an early age of sexual initiation, inadequate contraception use, promiscuous behaviour and sexual contact with an unknown partner (Kirby et al., 2010).

The potential risks associated with sexual behaviour among 15 year olds are mainly linked to the emotional and behavioural characteristics of this developmental period (Gabhainn et al., 2009). It is known that early sex has implications for one's self-perception, social status and future health behaviour. Unprotected or poorly protected sexual intercourse increases the risk of unintended pregnancy with its myriad of possible unfavourable outcomes for this age group, including abortion, early motherhood and adoption – each of which presents educational, economic, social and health challenges (Ellison, 2003). Moreover, for those not employing barrier methods of protection, there is also the risk of STIs with serious short and long-term attendant medical, health and social implications (Gabhainn et al., 2009).

Condoms and hormonal contraceptive pills are considered the most appropriate methods of protection from STIs and from unintended pregnancies, respectively. Possible use of dual methods – both contraceptive pill and condom at the same time – confers an effective protection against pregnancy and a moderately effective protection against STIs (Blythe et al., 2007). The adequacy and effectiveness of contraception methods depends on many interacting factors related to the contraceptive itself (e.g. efficacy, availability, cost, convenience); the sexual activity (e.g. type of sexual behaviour, frequency of intercourse, risk of STIs); the person and/or partner (e.g. age, ethnicity, culture, religious beliefs, educational level, family characteristics); the broader context (e.g. historical, cultural, religious and social context) (Sales et al., 2007; Heavey et al., 2008) and inter-personal relationship dynamics (e.g. the duration of relationship, age difference between partners, trust) (Gabhainn et al., 2009). Moreover recent literature (Pitts & Emans, 2008; Bonny et al., 2011; Gronich et al., 2011; Isley & Kaunitz, 2011; Gordon & Pitts, 2012) showed a potential side effect of contraception pills on migraine headaches, thrombosis risk, hypertension, weight gain, and obesity. However, the evidence about these issues is not consistent and the causality is not clear. Nevertheless, following the previous findings, for very young adolescents it seems to be unwise to engage in sexual intercourse and if so the type of contraception has to be carefully

chosen to prevent unfavourable health outcomes.

The most recent international study which explored sexual behaviour of school age adolescents in 42 European and North American countries (Currie et al., 2012) showed that adolescents from the Central European region including Slovakia reported the lowest rates of sexual activity. Adolescents of 15 years of age were less experienced with sexual intercourse (10% girls and 15% boys) than their peers from most Western countries (HBSC average in 2010: 23% girls and 29% boys) while the average age of sexual initiation in the Slovak population is 17.8 years (Harris Interactive, 2009). The differences regarding contraception use are less striking at the age of 15. Condom use during last sexual intercourse was reported by 76% of the girls and 77% of the boys in comparison to the HBSC average of 76% of the girls and 79% of the boys (Durex, 2012). The hormonal contraception use among 15 years Slovak girls steeply increased from 3% in 2006 (Currie et al., 2008) to 22% in 2010 while the HBSC average in 2010 was 26% (Currie et al., 2012).

Despite having the lowest rates of STIs in Europe, patterns in sexual behaviour among adolescents and young adults in Central and Eastern Europe seem to be changing. A decrease of the age at which they become sexually active is evident, particularly among females, leading to a narrowing of the gap between boys and girls regarding the time of sexual initiation (Rabusic & Kepakova, 2003). Moreover the young adolescent girls reported increased levels of hormone contraceptive pills.

1.3 Factors associated with sexual risk behaviour among adolescents and young adults

Several models have been developed to describe and schematize the various factors associated with sexual risk behaviour among adolescents. Our approach in this thesis was inspired by Bronfenbrenner's Ecological Systems Theory, which emphasizes the reciprocal relation among multiple systems associated with a person's behaviour (Bronfenbrenner, 1989). According to this perspective, an accurate and comprehensive understanding of adolescent sexual risk behaviour must necessarily include some knowledge of both the personal and the social factors which may contribute to the decision to become sexually active and subsequently, the decision to engage in risk/promoting or risk reducing sexual behaviour (Kotchick et al., 2001).

We assume that psychological factors (e.g. extroversion, well-being, self-esteem), behavioural factors (e.g. early sexual onset, alcohol and tobacco use) and social factors (e.g. family structure, parental monitoring and support) are significantly linked to adolescents and young adult sexual risk behaviour.

1.3.1 Psychological and behavioural factors

Psychological factors

Psychological factors like self-esteem, well-being, religiousness and personal values have been shown to be associated with sexual behaviour but findings regarding this from the Central European region are missing (Mann et al., 2004). Self-esteem plays an important role in risk-taking behaviour, that may also be relevant for SRB but evidence regarding this is still inconclusive (Mann et al., 2004). Several studies (Davies et al., 2003; Lejuez et al., 2004; Preston et al., 2004) support the link between low self-esteem and sexual risk behaviour (e.g. early sexual intercourse, inconsistent contraceptive and condom use) and the consequences of sexual risk behaviour such as unwanted pregnancies and STI. Low self-esteem was related to sexual risk behaviour in a sample of adults residing in a residential drug-treatment program (Lejuez et al., 2004) and low self-esteem predicted sexual risk behaviour in a sample of rural men as well (Preston et al., 2004). Magnani (2001) reported that low self-esteem predicted both early onset of sexual activity and unprotected sex on a large cross-sectional sample of adolescents in Peru. In general, it seems that high self-esteem is positively associated with less sexual risk behaviour. However, Spencer (2002) found that the probability of having sex was increased by high self-esteem in boys but by low self-esteem in girls, contrary to Paul (2000) who found that girls with higher self-esteem were more likely to have had an earlier first sexual intercourse compared to those with a low self-esteem. Moreover, a review of studies which explored the role of self-esteem on sexual behaviour showed that 60% of the studies found no associations between both variables and thus, an expected protective role of self-esteem was not shown.

A number of other factors, such as the educational aspiration level and psychological well-being, have been hypothesized as being associated with (sexual) risk behaviour, but the evidence remains inconclusive. A higher aspiration level has mostly been shown to be associated with less sexual risk behaviour (Bonell et al., 2005), but the few studies which have examined the association between the attitude to school and teenage pregnancy have provided inconsistent findings (Mott et al., 1996). Also some other studies demonstrate the important roles of psychological factors, particularly stress, anxiety and depressive mood, on adolescents' health risk behaviour (Callas et al., 2004; Klavs et al., 2005). Therefore if mental health is a positive attribute for health in general then mental health promotion is a strong reason for healthy and valuable adolescent's development.

Associations between personality traits and sexual risk taking have been replicated across multiple studies (Hagger-Johnson et al., 2011). Eysenck found that extraverts tended to endorse more favourable attitudes than did introverts toward having multiple sex partners and trying out different sexual positions. Extraverts also engaged in sexual intercourse at younger ages than introverts, as well as having sex more frequently and with more partners than introverts did (Eysenck, 1975). Similar associations between extraversion and more promiscuous sexual desires have been found by others (Costa et al.,

1992). Extraversion also has been linked to promiscuous sexual behaviour (Pinkerton & Abramson, 1995; Schmitt & Buss, 2000) and to unsafe sexual practices (McCown, 1991).

Neuroticism is rooted in negative emotionality, including anxiety, depression, and anger (Widiger & Costa, 1994). Neuroticism has been correlated with several features of problematic sexuality, including sexual dissatisfaction and marital distress (Gottman et al., 2002). It was found that people who score high in neuroticism tend to have more permissive sexual attitudes (Lameiras Fernandez & Rodriguez Castro, 2003) and engage in more sexual risk-taking including the practice of unsafe sexual practices (McCown, 1991).

The most consistent predictor of sexual risk taking is sensation seeking (Hagger-Johnson et al., 2011). Sensation seeking is a trait that overlaps considerably with conscientiousness and some elements of extraversion in the comprehensive 'big five' model of personality (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness) (Bogg & Roberts, 2004). Low conscientiousness shares variance with impulsive sensation seeking, and extraversion overlaps with need for activity and sociability (Zuckerman, 1993). Because it was a later addition to the big five, fewer studies have examined conscientiousness as a risk factor for sexual risk taking. Several recent studies have however replicated findings in the expected direction; with lower conscientiousness scores predicting increased sexual risk taking (Trobst et al., 2002; Schmitt, 2004; Hagger-Johnson et al., 2011). The contribution of extraversion is fairly consistently replicated, with higher extraversion scores associated with increased risk. This effect does however appear more robust in relation to multiple sexual partners *per se* rather than condom use specifically (Bourdage et al., 2007; Schmitt & Shackelford, 2008).

In summary, several psychological factors that have been found to relate to an adolescents and young adults sexual status have also been found to be associated with their sexual risk behaviour. However, some variables are not associated consistently with sexual behaviour such as the relation between adolescent sexual risk behaviour and knowledge about sexual risk factors and perceived personal vulnerability to undesirable outcomes of sexual activity (Kotchick et al., 2001). More research is also needed to examine the role of self-esteem, self-efficacy, and general psychological health in the promotion of safer sexual practices.

Behavioural factors

Sexual risk taking behaviour has been reported together with a number of other behaviours (van Nieuwenhuijzen et al., 2009), including delinquency, substance use, and other indices of sexual activity in general (HalpernFelsher et al., 1996; Staton et al., 1999; Kotchick et al., 2001; Patrick & Maggs, 2009; Cavazos-Rehg et al., 2010).

Sexual risk behaviour and other types of health risk behaviour

The belief that alcohol causally disinhibits sexual behaviour is firmly ingrained. Most people believe that drinking increases the likelihood of sexual activity, enhances sexual experience, and promotes riskier sexual behaviour. Young people sometimes attribute risky sexual experiences to the fact that they were drinking and report drinking (or plying their partner with alcohol) to exploit alcohol's alleged disinhibiting effects on sexual behaviour (Cooper, 2006).

Consistent with such belief, empirical research has generally supported this idea, with alcohol consumption being positively related to engaging in high-risk sexual behaviours (Leigh & Stall, 1993) including deciding not to use condoms (Conner et al., 1999) and engaging in casual sex (Conner & Flesch, 2001). These types of behaviour are more likely to occur when one or both sexual partners are under the influence of alcohol or drugs (Cooper, 2006; Parkes et al., 2007). For example, the average alcohol consumption was correlated with engaging in high-risk sexual behaviours (Anderson & Dahlberg, 1992), the use of alcohol with sexual activity was correlated with the frequency of high-risk sexual behaviours (Leigh, 1990), and the use of alcohol is related to the likelihood of sex on a first date (Cooper & Orcutt, 1997). Moreover, a study by MacDonald (1996) found that alcohol decreases the likelihood of condom use during casual sex. Also binge-drinking teens have been found approximately three times less likely to use condoms, and recent marijuana users are almost two times less likely to use condoms (Tapert et al., 2001). The use of marijuana, cocaine or other illicit drugs by adolescents has been shown to be associated with increased rates of sexual intercourse in general, having multiple sexual partners and lower rates of condom use, particularly for users of illicit stimulant drugs (Lowry et al., 1994).

Sexual risk behaviour and other aspects of sexual behaviour

However, not only other risk behaviours (alcohol or drug use) correlate with sexual risk behaviour, but also the other aspects of sexual behaviour. An early age of sexual initiation is considered as a main pattern of sexual risk behaviour that is particularly important in adolescence. It seems also to be correlated with others aspects of sexual risk behaviour such as a higher number of sexual partners, inconsistent contraception use, unintended pregnancies, higher rates of STIs and further gynaecological problems. Although, to indicate what is the accurate age for first sexual intercourse is a very ambitious task, because numerous indicators have to be taken into account. One of the most important factors is the physical and mental maturity of adolescents.

Adolescents' physical immaturity contributes to an increased risk of acquiring STIs compared with adults. Female adolescents, for example, do not have the same ability to combat STIs as adults, because their cervix is less able to exclude infections from the upper genital tract until two to three years after menarche. The risk is so great that a sexually active 15 years old girl has a ten times higher risk of acquiring pelvic inflammatory disease (PID) compared with a 24 year old woman (Duncan et al., 1990).

As mentioned in the previous paragraph, early sexual initiation seems to be a strong predictor of further sexual behaviour. Early sexual activity can have consequences for young people's health and well-being, in particular if it occurs prior to being physically and mentally mature enough to cope with it (Godeau et al., 2008). Moreover early initiation of sexual behaviour has been associated with adverse health outcomes such as increased risk of STIs and unintended pregnancies (Godeau et al., 2008), poor mental health (Sabia & Rees, 2008) and lower academic performance (Sabia, 2007). Early sexual activity, particularly when associated with inconsistent or non-use of contraception, has serious short and long-term health-compromng consequences, as such activity happens before young people are developmentally equipped to handle the consequences. Moreover early sexual initiation has been associated with other risk behaviours such as smoking tobacco (mainly for girls), higher levels of drunkenness and cannabis use and frequent evenings out with friends. In addition, early sexual intercourse has been associated with more frequent psychosomatic complaints among boys and lower health-related quality of life among girls.

1.3.2 Social factors

Social variables, including family structure, parenting practices, and peers were frequently found as relevant factors regarding SRB of adolescents and young adults (DiClemente et al., 2001; Sieverding et al., 2005; Wight et al., 2006; Potard et al., 2008; De Graaf et al., 2010).

Familial environment is a multidimensional construct comprised of heterogeneous psychological and social factors (DiClemente et al., 2001). The family system and its influences on adolescent sexual behaviour can be divided into two primary categories: family structure variables (single parenting, socioeconomic status, parental education) and process variables (parental monitoring and support, connectedness, communication between parents and child and quality of relationship). In general, the process variables received more attention than the family structure category (Kotchick et al., 2001). However, there is evidence that structural factors, such as single parenting, SES, and parenting education, should not be ignored.

Family structure

According to the family structure several studies have shown that living with parents is protective against SRB (Metzler et al., 1994). While these results show that living with at least one parent serves a protective role, other findings suggest that living with two parents can further protect adolescents from engaging in SRB. According to a study by Klavs (2005) the main factor associated with early sexual intercourse was not living with both parents up to the age of 15. Devine (1993) found that parental divorce during early adolescence was a significant predictor of sexual risk behaviour for females in later adolescence. Several studies confirmed that family structure can influence also other types of health risk behaviour. A study on Slovak young

adolescents found that parental divorce may increase the likelihood of drunkenness more than other factors such as low parental support and poor socioeconomic position (Tomcikova et al., 2009). However, a study by Langille (2003) found no significant associations between the family arrangement and sexual behaviours, except between living with both parents and contraception use.

Parenting

Parenting practices comprise a constellation of dynamically interrelated factors including but not limited to parental supervision, affect, communication, and involvement (Bersamin et al., 2008). The influence of parents on adolescent behaviour is multifaceted and cannot be understood by isolating and focusing on a single construct (Dishion & McMahon, 1998).

A number of studies have found associations between aspects of parenting and sexual behaviour e.g. (Borawski et al., 2003; Bersamin et al., 2008; De Graaf et al., 2011). Parental monitoring and parental support are the two most studied aspects of parental processes associated with sexual risk behaviour of adolescents. Parental support can be characterized by warmth, responsiveness and child-centeredness. Monitoring is usually defined as the parents' knowledge of their child's whereabouts. According to previous studies there are indications that both a high level of parental monitoring and support are associated with a later age of first sexual intercourse (Bersamin et al., 2008); with a more consistent contraceptive use (De Graaf et al., 2010); with a more consistent condom use (Huebner & Howell, 2003); and with lower levels of STIs (Crosby et al., 2002). However, most of these studies explored parental monitoring and parental support without differentiation between the mother and father. Moreover, parental monitoring and support were mostly explored as single variables. Therefore, information about which of the parents is more/less likely to influence a child's sexual behaviour is rather unclear.

Peers and others

According to Wierson and Forehand (1993) adolescents are in the process of developing their own identities and establishing complex social network shifts from the family to the social environments. This broad environmental scope targeting variables such as peers, neighbourhoods, and school conditions. However, these factors received the least empirical attention in the literature on the sexual behaviour of adolescents (Kotchick et al., 2001).

During adolescence, peers become a crucial source of modelling, reinforcement, and support concerning their own behaviour, value and beliefs system (Forehand & Wierson, 1993). Therefore peers' behaviours and attitudes are related to adolescent sexual risk behaviour – especially those adolescents whose peers are sexually active are more likely to be sexually active themselves (Miller et al., 2000). Moreover, signs of SRB among adolescents' peer groups (e.g. pregnancy, inconsistent condom use) were related to increased adolescent sexual risk (Gillmore et al., 1997). In a more subjectively way, adolescents' perception of their peers' behaviours was

related to sexual risk-taking. Brown (1992) found that consistent condom use was associated with the perception of consistent condom use among friends and peers.

It was repeatedly found that involvement with deviant peer groups (e.g. using alcohol and drug use or being delinquent) was related to the participation in high risk sexual practices (Metzler et al., 1994; Miller et al., 2000). In addition, a study by Scaramella (1998) showed that deviant peer affiliations comprised a strong pathway to sexual risk in the overall model of adolescent sexual risk behaviour.

Peers during adolescence are the preferential sources of information about sexuality. Therefore, their behavior may serve as reference norm for others with high potential of impact (Potard et al., 2008). The perception of their peers on the subject of sexual behaviours is an important normative predictor of intention (Hollander, 2001) with regard to the beginning of sexual relations and engaging in sexuality (Prinstein et al., 2003; Sieving et al., 2006), including oral sex (Halpern-Felsher et al., 1996). Peers can also have a positive influence by enticing youths to apply contraceptive measures and to use condoms for protection against STIs (Lagana, 1999; Bobrova et al., 2005).

1.4 Aim of the study and research questions

The central aim of this thesis is to explore the relationship between sexual risk behaviour of adolescents and young adults and social factors (family structure, parental education, parental support, parental monitoring, social support from friends), psychological factors (extroversion, neuroticism, self-esteem, well-being, educational aspiration, values, religiousness), and behavioural factors (alcohol use, tobacco use, sexual behaviour). These relations have been assessed in a number of studies, each answering a separate research question. The model as presented below (see Figure 1.1) describes the relations which were examined within the framework of this thesis.

Based on this model and on the previous literature, the following research questions have been explored.

Research question 1:

Does the later sexual initiation, longer-lasting relationships and the use of a condom during first sexual intercourse promote more healthy sexual behaviour later on among young adults?

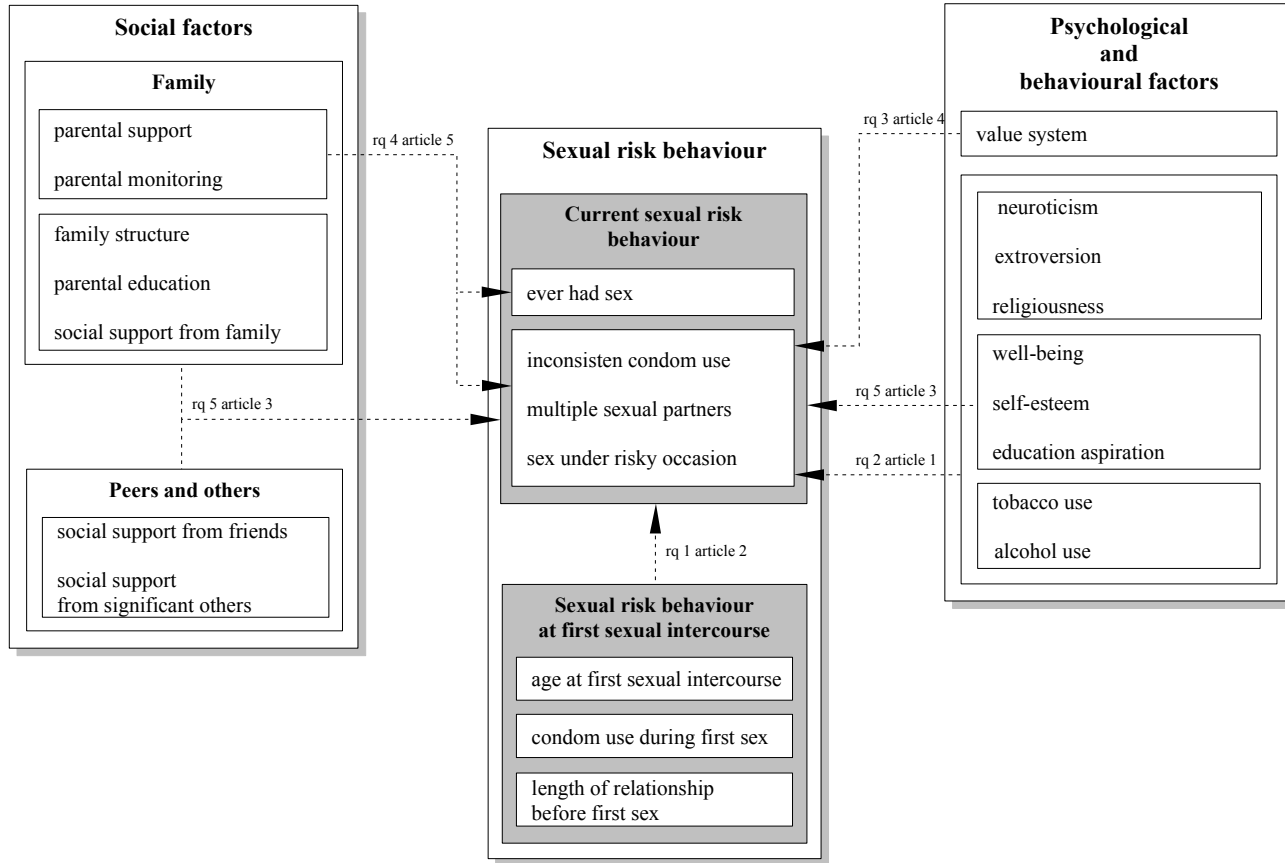
Research question 2:

Do psychological (well-being, self-esteem, extroversion, neuroticism and religiousness) and behavioural (alcohol use, tobacco use and early sexual initiation) factors contribute to sexual risk behaviour of young adults?

Research question 3:

Do different types of value orientation associate with different types of sexual behaviour young adults?

Figure 1.1 Model of the relationships examined in this thesis



Research question 4:

Does the parental monitoring and support play a different role in sexual risk behaviour among adolescents?

Research question 5:

Do psychosocial factors defined as self-esteem, well-being, educational aspiration, family structure, parental education and social support contribute to sexual risk behaviour of adolescents?

1.5 Outline of the thesis

This thesis is divided into eight chapters.

Chapter 1 provides a general introduction to the issues of sexual health and sexual risk behaviour. The chapter continues with a brief overview on psychological (e.g. self-esteem, well-being), behavioural (e.g. alcohol use) and social factors (e.g. family processes, family structure) and their associations to sexual risk behaviour. At the end of the chapter the model with the studied variables and the research questions of the thesis are presented.

Chapter 2 provides information about the design of the study. It also describes the 3 types of study samples used in this thesis. Furthermore it provides a short description of the measures which were used.

Chapter 3 explores the associations between some factors and first sexual intercourse (age and condom use during sexual debut, the length of relationship before sexual debut) and also with current sexual risk behaviour among young adults.

Chapter 4 focuses on psychological (well-being, self-esteem, extroversion, neuroticism and religiousness) and behavioural (alcohol use, tobacco use and early sexual initiation) factors and their associations with sexual risk behaviour among young adults.

Chapter 5 explores the associations between different types of value orientation and sexual risk behaviour among young adults.

Chapter 6 explores the different role of parental processes (monitoring and support) on sexual risk behaviour of adolescents.

Chapter 7 explores whether psychosocial factors (as self-esteem, well-being, educational aspiration, family structure, parental education and social support) may contribute to sexual risk behaviour of adolescents.

Chapter 8 discusses the main findings and possible implications for future research and practice.

References

- Aggleton, P. (1995). Young-people and aids. *Aids Care-Psychological and Socio-Medical Aspects of Aids/hiv*, 7(1), 77-80.
- Anderson, J. E., & Dahlberg, L. L. (1992). High-risk sexual-behavior in the general-population - results from a national survey, 1988-1990. *Sexually Transmitted Diseases*, 19(6), 320-325.

- Bersamin, M., Todd, M., Fisher, D. A., Hill, D. L., Grube, J. W., & Walker, S. (2008). Parenting practices and adolescent sexual behavior: A longitudinal study. *Journal of Marriage and Family*, 70(1), 97-112.
- Blythe, M. J., Diaz, A., & American Academy of Pediatrics Committee on Adolescence. (2007). Contraception and adolescents. *Pediatrics*, 120(5), 1135-48.
- Bobrova, N., Sergeev, O., Grechukhina, T., & Kapiga, S. (2005). Social-cognitive predictors of consistent condom use among young people in moscow. *Perspectives on Sexual and Reproductive Health*, 37(4), 174-178.
- Bogg, T., & Roberts, B. W. (2004). Conscientiousness and health-related behaviors: A meta-analysis of the leading behavioral contributors to mortality. *Psychological Bulletin*, 130(6), 887-919.
- Bonell, C., Allen, E., Strange, V., Copas, A., Oakley, A., Stephenson, J., et al. (2005). The effect of dislike of school on risk of teenage pregnancy: Testing of hypotheses using longitudinal data from a randomised trial of sex education. *Journal of Epidemiology and Community Health*, 59(3), 223-230.
- Bonny, A. E., Secic, M., & Cromer, B. A. (2011). Relationship between weight and bone mineral density in adolescents on hormonal contraception. *Journal of Pediatric and Adolescent Gynecology*, 24(1), 35-38.
- Borawski, E., Ievers-Landis, C., Lovegreen, L., & Trapl, E. (2003). Parental monitoring, negotiated unsupervised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health*, 33(2), 60-70.
- Bourdage, J. S., Lee, K., Ashton, M. C., & Perry, A. (2007). Big five and HEXACO model personality correlates of sexuality. *Personality and Individual Differences*, 43(6), 1506-1516.
- Bronfenbrenner, U. (1989). Ecological systems theory *Annals of Child Development*, 6, 187-249.
- Brown, L. K., Diclemente, R. J., & Park, T. (1992). Predictors of condom use in sexually active adolescents. *Journal of Adolescent Health*, 13(8), 651-657.
- Callas, P. W., Flynn, B. S., & Worden, J. K. (2004). Potentially modifiable psychosocial factors associated with alcohol use during early adolescence. *Addictive Behaviors*, 29(8), 1503-1515.
- Cavazos-Rehg, P. A., Krauss, M. J., Spitznagel, E. L., Schootman, M., Cottler, L. B., & Bierut, L. J. (2010). Associations between multiple pregnancies and health risk behaviors among U.S. adolescents. *Journal of Adolescent Health*, 47(6), 600-603.
- Coleman, J. A., Hendry, L. B., & Marion Kloep. (2007). *Adolescence and health*. Chichester [England]: John Wiley & Sons.
- Conner, M., & Flesch, D. (2001). Having casual sex: Additive and interactive effects of alcohol and condom availability on the determinants of intentions. *Journal of Applied Social Psychology*, 31(1), 89-112.

-
- Conner, M., Graham, S., & Moore, B. (1999). Alcohol and intentions to use condoms: Applying the theory of planned behaviour. *Psychology & Health, 14*(5), 795-812.
- Cooper, M. L. (2006). Does drinking promote risky sexual behavior? A complex answer to a simple question. *Current Directions in Psychological Science, 15*(1), 19-23.
- Cooper, M. L., & Orcutt, H. K. (1997). Drinking and sexual experience on first dates among adolescents. *Journal of Abnormal Psychology, 106*(2), 191-202.
- Costa, P. T. J., Fagan, P. J., Piedmont, R. L., Ponticas, Y., & Wise, T. N. (1992). The five-factor model of personality and sexual functioning in outpatient men and women. *Psychiatric Medicine, 10*(2), 199-215.
- Crosby, R., DiClemente, R., Wingood, G., & Harrington, K. (2002). HIV/STD prevention benefits of living in supportive families: A prospective analysis of high risk african-american female teens. *American Journal of Health Promotion, 16*(3), 142-145.
- Currie, C., Gabhainn, S. N., Godeau, E., Roberts, C., Smith, R., Currie, D., et al. (2008). Inequalities in young peoples's health: International report from HBSC 2005/06 survey. WHO policy series: Health policy for children and adolescents. Copenhagen: WHO Regional Office for Europe.
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., et al. (2012). 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. Copenhagen: WHO Regional Office for Europe.
- Davies, S. L., DiClemente, R. J., Wingood, G. M., Harrington, K. F., Crosby, R. A., & Sionean, C. (2003). Pregnancy desire among disadvantaged african american adolescent females. *American Journal of Health Behavior, 27*(1), 55-62.
- De Graaf, H., Vanwesenbeeck, I., Woertman, L., Keijsers, L., Meijer, S., & Meeus, W. (2010). Parental support and knowledge and adolescents' sexual health: Testing two mediational models in a national dutch sample. *Journal of Youth and Adolescence, 39*(2), 189-198.
- De Graaf, H., Vanwesenbeeck, I., Woertman, L., & Meeus, W. (2011). Parenting and adolescents' sexual development in western societies A literature review. *European Psychologist, 16*(1), 21-31.
- Devine, D., Long, P., & Forehand, R. (1993). A prospective-study of adolescent sexual-activity - description, correlates, and predictors. *Advances in Behaviour Research and Therapy, 15*(3), 185-209.
- DiClemente, R. J., Wingood, G. M., Crosby, R., Sionean, C., Cobb, B. K., Harrington, K., et al. (2001). Parental monitoring: Association with adolescents' risk behaviors. *Pediatrics, 107*(6), 1363-1368.

- Dishion, T. J., & McMahon, R. J. (1998). Parental monitoring and the prevention of child and adolescent problem behavior: A conceptual and empirical formulation. *Clinical Child and Family Psychology Review*, 1(1), 61-75.
- Duncan, M. E., Tibaux, G., Pelzer, A., Reimann, K., Peutherer, J. F., Simmonds, P., et al. (1990). 1st coitus before menarche and risk of sexually-transmitted disease. *Lancet*, 335(8685), 338-340.
- Durex. (2012). Face of global sex report 2005. Retrieved 5/16/2012, 2012, from <http://www.durexnetwork.org/en-GB/research/faceofglobalsex/Pages/Home.aspx>
- Ellison, M. A. (2003). Authoritative knowledge and single women's unintentional pregnancies, abortions, adoption, and single motherhood: Social stigma and structural violence. *Medical Anthropology Quarterly*, 17(3), 322-347.
- Eysenck, H. J. (1975). Psychological theories and behavior-therapy. *Psychological Medicine*, 5(3), 219-221.
- Forehand, R., & Wierson, M. (1993). The role of developmental factors in planning behavioral interventions for children - disruptive behavior as an example. *Behavior Therapy*, 24(1), 117-141.
- Gabhainn, S. N., Baban, A., Boyce, W., & Godeau, E. (2009). How well protected are sexually active 15-year olds? cross-national patterns in condom and contraceptive pill use 2002-2006. *International Journal of Public Health*, 54, 209-215.
- Gillmore, M. R., Lewis, S. M., Lohr, M. J., Spencer, M. S., & White, R. D. (1997). Repeat pregnancies among adolescent mothers. *Journal of Marriage and the Family*, 59(3), 536-550.
- Godeau, E., Vignes, C., Duclos, M., Navarro, F., Cayla, F., & Grandjean, H. (2008). Factors associated with early sexual initiation: French data from the international survey health behaviour in school-aged children (HBSC)/WHO. *Gynecologie Obstetrique & Fertilité*, 36(2), 176-182.
- Gordon, C. M., & Pitts, S. A. B. (2012). Approach to the adolescent requesting contraception. *Journal of Clinical Endocrinology & Metabolism*, 97(1), 9-15.
- Gottman, J., Swanson, C., & Swanson, K. (2002). A general systems theory of marriage: Nonlinear difference equation modeling of marital interaction. *Personality and Social Psychology Review*, 6(4), 326-340.
- Gronich, N., Lavi, I., & Rennert, G. (2011). Higher risk of venous thrombosis associated with drospirenone-containing oral contraceptives: A population-based cohort study. *Canadian Medical Association Journal*, 183(18), E1319-E1325.
- Hagger-Johnson, G., Bewick, B. M., Conner, M., O'Connor, D. B., & Shickle, D. (2011). Alcohol, conscientiousness and event-level condom use. *British Journal of Health Psychology*, 16, 828-845.

-
- HalpernFelsher, B. L., Millstein, S. G., & Ellen, J. M. (1996). Relationship of alcohol use and risky sexual behavior: A review and analysis of findings. *Journal of Adolescent Health, 19*(5), 331-336.
- Heavey, E. J., Moysich, K. B., Hyland, A., Druschet, C. M., & Sill, M. W. (2008). Differences in contraceptive choice among female adolescents at a state-funded family planning clinic. *Journal of Midwifery & Womens Health, 53*(1), 45-52.
- Hollander, D. (2001). Perceptions of peer behavior predict whether peruvian adolescents have had sex. *International Family Planning Perspectives, 27*(3), 157-158.
- Huebner, A., & Howell, L. (2003). Examining the relationship between adolescent sexual risk-taking and perceptions of monitoring, communication, and parenting styles. *Journal of Adolescent Health, 33*(2), 71-78.
- Isley, M. M., & Kaunitz, A. M. (2011). Update on hormonal contraception and bone density. *Reviews in Endocrine & Metabolic Disorders, 12*(2), 93-106.
- Kane, R., & Wellings, K. (1999). Integrated sexual health services: The views of medical professionals. *Culture, Health & Sexuality, 1*(2), 131-145.
- Kirby, D., Raine, T., Thrush, G., Yuen, C., Sokoloff, A., & Potter, S. C. (2010). Impact of an intervention to improve contraceptive use through follow-up phone calls to female adolescent clinic patients. *Perspectives on Sexual and Reproductive Health, 42*(4), 251-257.
- Klavs, I., Rodrigues, L. C., Wellings, K., Weiss, H. A., & Hayes, R. (2005). Increased condom use at sexual debut in the general population of Slovenia and association with subsequent condom use. *Aids, 19*(11), 1215-1223.
- Kotchick, B. A., Shaffer, A., & Forehand, R. (2001). Adolescent sexual risk behavior: A multi-system perspective. *Clinical Psychology Review, 21*(4), 493-519.
- Krivohlavy, J. (2003). *Psychologie zdravi* (2nd ed.). Praha: Portal.
- Lagana, L. (1999). Psychosocial correlates of contraceptive practices during late adolescence. *Adolescence, 34*(135), 463-482.
- Lameiras Fernandez, M., & Rodriguez Castro, Y. (2003). Age and sex differences in self-esteem among spanish adolescents. *Psychological Reports, 93*(3 Pt 1), 876-8.
- Langille, D. B., Curtis, L., Hughes, J., & Murphy, G. T. (2003). Association of socio-economic factors with health risk behaviors among high school students in rural nova scotia. *Canadian Journal of Public Health-Revue Canadienne De Sante Publique, 94*(6), 442-447.
- Leigh, B. C. (1990). The relationship of sex-related alcohol expectancies to alcohol-consumption and sexual-behavior. *British Journal of Addiction, 85*(7), 919-928.
- Leigh, B. C., & Stall, R. (1993). Substance use and risky sexual-behavior for exposure to hiv - issues in methodology, interpretation, and prevention. *American Psychologist, 48*(10), 1035-1045.

- Lejuez, C. W., Simmons, B. L., Aklin, W. M., Daughters, S. B., & Dvir, S. (2004). Risk-taking propensity and risky sexual behavior of individuals in residential substance use treatment. *Addictive Behaviors, 29*(8), 1643-1647.
- Lowry, R., Holtzman, D., Truman, B. I., Kann, L., Collins, J. L., & Kolbe, L. J. (1994). Substance use and hiv-related sexual behaviors among us high-school-students - are they related. *American Journal of Public Health, 84*(7), 1116-1120.
- MacDonald, T. K., Zanna, M. P., & Fong, G. T. (1996). Why common sense goes out the window: Effects of alcohol on intentions to use condoms. *Personality and Social Psychology Bulletin, 22*(8), 763-775.
- Magnani, R. J., Seiber, E. E., Gutierrez, E. Z., & Vereau, D. (2001). Correlates of sexual activity and condom use among secondary-school students in urban peru. *Studies in Family Planning, 32*(1), 53-66.
- Mann, M., Hosman, C. M. H., Schaalma, H. P., & de Vries, N. K. (2004). Self-esteem in a broad-spectrum approach for mental health promotion. *Health Education Research, 19*(4), 357-372.
- McCown, W. (1991). Contributions of the epn paradigm to hiv prevention – a preliminary-study. *Personality and Individual Differences, 12*(12), 1301-1303.
- Metzler, C. W., Noell, J., Biglan, A., Ary, D., & Smolkowski, K. (1994). The social-context for risky sexual-behavior among adolescents. *Journal of Behavioral Medicine, 17*(4), 419-438.
- Miller, K. S., Forehand, R., & Kotchick, B. A. (2000). Adolescent sexual behavior in two ethnic minority groups: A multisystem perspective. *Adolescence, 35*(138), 313-333.
- Mott, F. L., Fondell, M. M., Hu, P. N., KowaleskiJones, L., & Menaghan, E. G. (1996). The determinants of first sex by age 14 in a high-risk adolescent population. *Family Planning Perspectives, 28*(1), 13-18.
- Parkes, A., Wight, D., Henderson, M., & Hart, G. (2007). Explaining associations between adolescent substance use and condom use. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine, 40*(2), 18.
- Patrick, M. E., & Maggs, J. L. (2009). Does drinking lead to sex? daily alcohol-sex behaviors and expectancies among college students. *Psychology of Addictive Behaviors, 23*(3), 472-481.
- Paul, C., Fitzjohn, J., Herbison, P., & Dickson, N. (2000). The determinants of sexual intercourse before age 16. *Journal of Adolescent Health, 27*(2), 136-147.
- Pinkerton, S. D., & Abramson, P. R. (1995). Decon-making and personality-factors in sexual risk-taking for hiv aids - a theoretical integration. *Personality and Individual Differences, 19*(5), 713-723.
- Pitts, S. A. B., & Emans, S. J. (2008). Controversies in contraception. *Current Opinion in Pediatrics, 20*(4), 383-389.

-
- Potard, C., Courtois, R., & Rusch, E. (2008). The influence of peers on risky sexual behaviour during adolescence. *European Journal of Contraception and Reproductive Health Care*, 13(3), 264-270.
- Preston, D. B., D'Augelli, A. R., Kassab, C. D., Cain, R. E., Schulze, F. W., & Starks, M. T. (2004). The influence of stigma on the sexual risk behavior of rural men who have sex with men. *Aids Education and Prevention*, 16(4), 291-303.
- Prinstein, M. J., Meade, C. S., & Cohen, G. L. (2003). Adolescent oral sex, peer popularity, and perceptions of best friends' sexual behavior. *Journal of Pediatric Psychology*, 28(4), 243-249.
- Rabusic, L., & Kepakova, K. (2003). Adolescent sexual behavior and the HIV/AIDS risk in the czech republic. *Revija Za Sociologiju*, 34, 189-206.
- Sabia, J. J. (2007). Reading, writing, and sex: The effect of losing virginity on academic performance. *Economic Inquiry*, 45(4), 647-670.
- Sabia, J. J., & Rees, D. I. (2008). The effect of adolescent virginity status on psychological well-being. *Journal of Health Economics*, 27(5), 1368-1381.
- Sales, J. M., DiClemente, R. J., Rose, E. S., Wingood, G. M., Klein, J. D., & Woods, E. R. (2007). Relationship of STD-related shame and stigma to female adolescents' condom-protected intercourse. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, 40(6), 6.
- Scaramella, L. V., Conger, R. D., Simons, R. L., & Whitbeck, L. B. (1998). Predicting risk for pregnancy by late adolescence: A social contextual perspective. *Developmental Psychology*, 34(6), 1233-1245.
- Schmitt, D. P. (2004). The big five related to risky sexual behaviour across 10 world regions: Differential personality associations of sexual promiscuity and relationship infidelity. *European Journal of Personality*, 18(4), 301-319.
- Schmitt, D. P., & Buss, D. M. (2000). Sexual dimensions of person description: Beyond or subsumed by the big five? *Journal of Research in Personality*, 34(2), 141-177.
- Schmitt, D. P., & Shackelford, T. K. (2008). Big five traits related to short-term mating: From personality to promiscuity across 46 nations. *Evolutionary Psychology*, 6(2), 246-282.
- Sieverding, J. A., Adler, N., Witt, S., & Ellen, J. (2005). The influence of parental monitoring on adolescent sexual initiation. *Archives of Pediatrics & Adolescent Medicine*, 159(8), 724-729.
- Sieving, R. E., Eisenberg, M. E., Pettingell, S., & Skay, C. (2006). Friends' influence on adolescents' first sexual intercourse. *Perspectives on Sexual and Reproductive Health*, 38(1), 13-19.
- Spencer, J. M., Zimet, G. D., Aalsma, M. C., & Orr, D. P. (2002). Self-esteem as a predictor of initiation of coitus in early adolescents. *Pediatrics*, 109(4), 581-584.

Staton, M., Leukefeld, C., Logan, T. K., Zimmerman, R., Lynam, D., Milich, R., et al. (1999). Risky sex behavior and substance use among young adults. *Health & Social Work, 24*(2), 147-154.

Tapert, S. F., Aarons, G. A., Sedlar, G. R., & Brown, S. A. (2001). Adolescent substance use and sexual risk-taking behavior. *Journal of Adolescent Health, 28*(3), 181-189.

Tomcikova, Z., Geckova, A. M., Orosova, O., van Dijk, J. P., & Reijneveld, S. A. (2009). Parental divorce and adolescent drunkenness: Role of socioeconomic position, psychological well-being and social support. *European Addiction Research, 15*(4), 202-208.

Trost, K. K., Herbst, J. H., Masters, H. L., & Costa, P. T. (2002). Personality pathways to unsafe sex: Personality, condom use, and HIV risk behaviors. *Journal of Research in Personality, 36*(2), 117-133.

van Nieuwenhuijzen, M., Junger, M., Velderman, M. K., Wiefferink, K. H., Paulussen, T. W. G. M., Hox, J., et al. (2009). Clustering of health-compromising behavior and delinquency in adolescents and adults in the dutch population. *Preventive Medicine, 48*(6), 572-578.

Whipple, B. (2007). The health benefits of sexual expression. In A. F. Tepper, & A. F. Owens (Eds.), *Sexual health (volume 1: Psychological foundation (pp. 17-41 ed.,). Westport: CT: Praeger Publishers.*

WHO. (2012). Sexual health Retrieved 5/16/2012, 2012, from http://www.who.int/topics/sexual_health/en/

Widiger, T. A., & Costa, P. T. (1994). Personality and personality-disorders. *Journal of Abnormal Psychology, 103*(1), 78-91.

Wight, D., Williamson, L., & Henderson, M. (2006). Parental influences on young people's sexual behaviour: A longitudinal analysis. *Journal of Adolescence, 29*(4), 473-494.

Zuckerman, M. (1993). P-impulsive sensation seeking and its behavioral, psychophysiological and biochemical correlates. *Neuropsychobiology, 28*(1-2), 30-36.

Data sources

Samples

Three different samples are used in this thesis. A short description of these three study samples and information about their use in the separate chapters is given in the following text.

The first study was carried out on 882 first-year students at two universities located in Kosice (230,000 inhabitants), the P.J. Safarik University (7,000 students) and the Technical University (12,000 students). These students completed during a compulsory lecture a questionnaire concerning their health behaviour under the guidance of field workers. The students were recruited from a list of randomly selected study groups provided by the faculties concerned and their participation was voluntary. Of the 882 students included, 7 left the room before the beginning and 43 were excluded afterwards because they left major parts of the questionnaire incomplete (altogether 50). A total of 832 responded (94.3%), 355 male and 477 female, aged 19-28 years with 90% of the students aged 19-23 years (mean 20.5; SD 1.4). All procedures concerning the data collection were explained to the respondents before the data collection. The Ethics Committee of the Medical Faculty of the P.J. Safarik University approved this study. This sample was used in the Chapters 3, 4 and 5.

The second study sample explored 3,725 elementary school adolescents in the 8th and 9th grades from elementary schools from three cities – Bratislava (600,000 inhabitants; Western Slovakia), Zilina (156,000 inhabitants, Northern Slovakia), Kosice (240,000 inhabitants, Eastern Slovakia) as well as other smaller cities (10,000-40,000 inhabitants) in the eastern region of Slovakia. The schools and classes were selected randomly in each region. School directors were asked for participation. After their consent and the consent of their parents, data were collected by a team of trained researches and research assistants in October, November and December 2006. Respondents filled in a questionnaire on a voluntary and anonymous basis without the presence of the teacher during two regular 45-minutes lessons. The overall response rate was 93%. Non-response was primarily due to illness or another type of absence. The population consisted of 49% boys, with a mean age of 14.3 years (SD 0.65; range 11-17 years). All respondents younger than 13 and older than 16 years old were excluded in order to make the sample more homogenous and to avoid age extremes which could have an impact on the results. After this exclusion the final study

sample consisted of 3,694 adolescents (mean age 14.3 years, SD 0.62). The local Ethics Committee approved the study. This sample was used in Chapter 6.

The third study sample was obtained from the Slovak part of the 2009/2010 Health Behaviour in School-aged Children (HBSC) study, a multinational study conducted in collaboration with the World Health Organization (Currie et al., 2010). The data were collected in a way similar to the previously described sample. Trained researchers and research assistants collected the data in the absence of a teacher during regular class time, according to the methodology of the HBSC-study. Parents were informed about the study via the school administration and could opt out if they disagreed. Participation in the study was fully voluntary and confidential, with no explicit incentives provided for participation. The total Slovak sample consisted from 8,491 adolescents from the 5th to the 9th grade, representing 79.5% of the original sample of 10,680 youths. Respondents were divided into three age categories – 11, 13 and 15-years olds in order to make the sample more homogenous and to avoid extremes which could have an impact on the results. The sample consisted of 49% boys, with a mean age of 14.3 years (SD 0.65; range 11-17 years). The local Ethics Committee approved the study. This sample was used in Chapter 7.

Table 2.1 Description of data samples

		Sample 1	Sample 2	Sample 3
Chapter(s)		3, 4, 5	6	7
Sample size		832	3694	8491
Data collection	year	2004	2006	2010
Gender	male (%)	42.7	49.0	49.0
Age	mean	20.5	14.3	14.3
	SD	1.4	0.62	0.65
Response rate	(%)	94.3	93.0	79.5

Measures

The central dependent variable in this thesis was the concept of sexual risk behaviour assessed by several indicators such as inconsistent condom use, multiple sexual partners, sex under risky occasions and sex with an unknown partner. The patterns during first sexual intercourse such as age and condom use during the first intercourse and the length of the relationship before the first sexual intercourse were used as predictors of further sexual behaviour in Chapter 3. A brief description concerning the variables used and their coding is presented in Table 2.2.

The independent variables used in this thesis concerned: personality factors (*Eysenck Personal Questionnaire*); Self-esteem (*Rosenberg self-esteem scale*); Well-being (*General Health Questionnaire*); Social support (*Perceived Social Support Scale*); Value orientation (*Rokeach's Personal Value Survey*); parental processes (*Parental Bonding Instrument, Parental monitoring scale*); behavioural factors (*age and condom use during sexual onset, alcohol and tobacco use*).

Table 2.2 Indicators of sexual risk behaviour used in this thesis

	Chapter 3 Young adults	Chapter 4 Young adults	Chapter 5 Young adults	Chapter 6 Adolescents	Chapter 7 Adolescents
Condom use during last sexual intercourse	Na	Na	Na	No	Na
Current condom use	Not always	Not always	Not always	Na	Not always
Multiple sexual partners	4 or more	4 or more	4 or more	Na	4 or more
Sex under risky occasion	Under alcohol or drug	Under alcohol or drug	Na	Na	Under alcohol or drug
Sex with an unknown partner	Yes	Na	Yes	Na	Na
Condom use during sexual onset	No	Na	Na	Na	Na
Length of relation before first sexual intercourse	Less than 1 month	Na	Na	Na	Na
Age of first sex	16 and less	16 and less	Na	Ever had sex	Na

Na – not applicable

Sexual risk behavior among university students: safer start-safer life?

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Submitted

Abstract

Aim was to explore sexual behavior of university students as well as the relation between safer onset of sexual life and future safer sexual behavior.

A questionnaire was self-administered by 832 first-year university students (42.7% boys, mean age 20.5). Logistic regression explored: 1-respondent's age at sexual debut; 2-length of relationship preceding sexual debut; 3-condom use during sexual debut and risky sexual behavior.

Later sexual initiation, longer-lasting relationship and condom use during sexual debut contributed to lower probability of risky sexual behavior.

Moment of sexual debut seems to be an indicator of safe sexual behavior later on.

Introduction

The number of papers about sexual behavior from Central Europe has increased, but most of them pertain to younger age groups or general population (Pinter & Tomori, 2000; Gyarmathy et al., 2002; Rabusic & Kepakova, 2003; Vazsonyi et al., 2006). Recent and solid data concerning sexual behavior of young adolescents come in particular from the Health Behavior in School-aged Children (HBSC) studies 2010 and 2012, but these studies provide us only basic insight into (early) sexual initiation and factors of sexual behavior among young adolescents (Currie et al., 2008; Currie et al., 2012). For effective preventive strategies, additional information is needed on other aspects of sexual behavior such as: (early) sexual debut (Kuzman et al., 2007); teenage pregnancy (Klavs et al., 2006); contraceptive behavior (Klavs et al., 2005); parental supervision and family structure and sexual behavior (Lenciauskiene & Zaborskis, 2008), and knowledge on potential consequences of risky sexual behavior such as HIV/AIDS and Chlamydia trachomatis (Klavs et al., 2002). However, with regard to Central Europe, recent information on sexual behavior in late adolescence and young adulthood is limited to two studies. Bozicevic et al.

(2006) explored patterns of sexual behavior and reported symptoms of sexually transmitted infections (STI), and Stulhofer et al. (2007) explored predictors of condom use, both in young adulthood.

Information on sexual behavior in late adolescence may help to target preventive interventions on groups at greatest risk. To be effective, interventions must take into account the sexual behavior of the target population. It is important to be informed about sexual initiation, prevalent sexual activities, relationships that precede sexual activities, condom use and the prevalence of STI in the target population.

Risky sexual behavior seems to be relatively stable from the moment of sexual initiation (Millstein & Moscicki, 1995; Centers for Disease Control and Prevention (CDC), 2006). Girls reporting sexual intercourse before 16 years of age had significantly more symptoms and signs of lower genital tract infection than those who became sexually active later (Lawrence & Scott, 1996). When compared to later starting sexual activity, early sexual activity has been linked to a greater number of sexual partners, inconsistent condom use and increased risk of both teen pregnancy and STI. Lawrence and Scott (1996) found that youths who used a condom from the onset of sexual activity were more likely to have used a condom during their most recent sexual intercourse.

This study aimed to assess the sexual risk behavior of young Slovak university students, and its association with behavior in early adolescence. The impact of later sexual initiation, longer-lasting relationships and the use of a condom during first sexual intercourse on sexual risk behavior (multiple sexual partners, sex under alcohol or drug influence and inconsistent condom use) were explored. We focused on university students because they represent a group which can be expected to have left parental supervision and are thus able to report rather explicitly on sexual behavior. Further, developments in sexual risky behavior (SRB) in Slovakia are likely to represent those in the entire Central Europe region.

Methods

Sample

The sample consisted of 882 first-year students at two universities located in Kosice (230,000 inhabitants): the P.J. Safarik University (7,000 students) and the Technical University (12,000 students) who during a compulsory lecture completed a questionnaire concerning health behavior under the guidance of field workers. Students were recruited from a list of randomly selected study groups provided by the faculties concerned and their participation in the study was voluntary. All procedures concerning data collection were explained to respondents before data collection. The Ethics Committee of the Medical Faculty of P.J. Safarik University approved this study. Of the 882 students included, 7 left the room before the beginning and 43 were excluded afterwards because they left major parts of the questionnaire

incomplete (altogether 50). A total of 832 responded (94.3%), 355 male and 477 female, aged 19-28 years with 90% of the students aged 19-23 years (mean 20.5; SD 1.4). Out of these, 45.1% studied at the science faculty, 34.8% at the technical faculty and 20.1% at the medical faculty. More than half of the respondents had completed grammar school, and the majority of the students lived in student halls of residence or with their parents.

Table 3.1 Background characteristics of the sample and sexual orientation (n=832)

	Boys (n=355)		Girls (n=477)	
	n	%	n	%
Type of faculty				
Science	120	33.8	255	53.5
Medical	58	16.3	109	22.9
Technical	177	49.9	113	23.7
Type of education				
Grammar school	205	57.7	311	65.1
Technical school	124	34.9	139	29.3
Vocational school	26	7.4	27	5.7
Accommodation				
With parents	138	38.9	171	35.8
Hall of residence	125	35.2	191	40.0
Private house	48	13.6	67	14.0
Other	44	12.4	48	10.1
Sexual orientation				
Heterosexual	302/307	98.4	423/428	98.8
Homosexual	0/307	0.0	1/428	0.2
Bisexual	2/300	0.7	1/428	0.2
Not sure yet	3/307	1.0	3/428	0.7
Sexual intercourse ever	184/300	61.3	271/428	63.3

Only valid percentages are presented; to clarify this, we added information on the sample concerned for each variable with missing values.

Measurements

The questions asked were related to (1) sexual initiation, (2) sexual behavior, (3) condom use, (4) sexually transmitted infections (5) the students' sexual orientation.

Sexual initiation - Respondents were asked (1) whether they had ever had coitus, (yes / no); (2) at what age they had their first coitus (16 or younger/ 17 or older); (3) whether they had given or received oral sex (cunnilingus or fellatio) before their first coitus, (yes/no), and (4) how long their relationship lasted before the first sexual intercourse took place (less than 1 month/ 1 month and more).

Sexual behavior - Respondents were asked (1) if they had ever had oral sex (yes/no); (2) if they had ever had anal sex (yes/no); (3) if they had ever had sex with an unknown partner (with someone you just met) (yes/no), (4) if they had ever had sex under the influence of alcohol or drugs (yes/no); and (5) how many sexual partners they had had in their lifetime (three or fewer/ four or more).

Condom use - Respondents were asked (1) whether they (or their partner) had used a condom during their first sexual intercourse (yes/no); (2) how often they used condoms (always / almost always, occasionally, never).

STI - Respondents were asked (1) if they had ever thought that they had a STI (yes/no); (2) if they had ever had a STI (yes/no); (3) which STI they knew of; (4) which three STIs are most common in Slovakia; (5) if they would require their partners to undergo an examination for the presence of the most common venereal diseases before marriage or a long-lasting relationship (yes / no/ do not know).

Sexual orientation - Respondents were asked (1) what their sexual orientation was (heterosexual, homosexual, bisexual, not sure yet).

Statistical analyses

First, we examined type of study, previous education, accommodation, sexual orientation and knowledge concerning STI for all respondents (n=832). In the further analyses, we included only respondents who reported having had sexual intercourse (n=455). We assessed their current sexual behavior and sexual history by gender. Gender differences were tested using chi-square tests. Next, we assessed the association of current risky sexual behavior (having sex in risky occasions, multiple sexual partners, inconsistent condom use) with respondents' age at first sexual intercourse, the length of the relationship preceding the first sexual intercourse and condom use during first sexual intercourse. We did this by using logistic regression models, adjusted for age and gender, for each of the three outcomes. All analyses were performed with SPSS 14.0 (www.spss.com).

Results

Sexual initiation

Of all the respondents, 61% of boys and 63% of girls reported having had coitus. The mean age of first sexual intercourse was 17.7 (SD \pm 1.4). One-fifth of those who reported having had sex reported that it happened before the age of 17. To a considerable extent, oral sex was reported to have preceded vaginal intercourse (Table 3.2).

Current sexual behavior

Up to 83% of the students reported experience with oral sex. Less prevalent was experience with anal sex (up to 19%). Only one-quarter of the respondents reported having had four or more sexual partners in their lifetime, and an even smaller proportion (16%) among them reported having had sex with an unknown person. However, significantly more boys (44%) than girls (33%) reported having had sex under alcohol or drug influence (Table 3.2).

Condom use

More than half of the respondents reported condom use during their first sexual intercourse. The prevalence of current condom use was much lower. Significantly more boys (27.6%) than girls (19.3%) reported using condoms always (Table 3.2).

Table 3.2 Sexual behavior (sexual initiation, condom use, other sexual practices and sexual relationship) by gender

	Boys (n=184)		Girls (n=271)		P-value *
	n	%	n	%	
Sexual initiation					
Sexual intercourse before age 17	36/176	20.5	51/255	20.0	0.908
Oral sex before first sexual intercourse	70/156	44.9	83/232	35.8	0.072
Condom use					
During first sexual intercourse	106/183	57.9	146/264	55.3	0.952
Current use	50/181	27.6	50/259	19.3	0.040
Other sexual practices					
Ever had oral sex	113/137	82.5	182/219	83.1	0.748
Ever had anal sex	19/151	12.6	44/229	19.2	0.089
Ever had sex under drug or alcohol influence	81/183	44.3	87/265	32.8	0.014
Sexual relationship					
Duration of relationship prior to first sexual intercourse					
1 month and more	124/183	67.8	227/266	85.3	0.001
Less than month	59/183	32.2	39/266	14.7	
Four or more sexual partners	45/170	26.5	54/251	21.5	0.239
Sex with unknown person	26/158	16.5	23/232	9.9	0.056

*Pearson chi-square

Students' knowledge about STI

In both samples (sexually experienced and inexperienced) almost 15% of the respondents could not name any STI, and 35% of them did not know which STI was the most common in Slovakia. About 70% of respondents listed AIDS, syphilis and gonorrhoea, while less than 10% included chlamydia in their list. Similarly, AIDS, syphilis and gonorrhoea were reported as the most frequent STI in Slovakia, while only about 6% of respondents included chlamydia on this list (Table 3.3).

Predictors of safe sexual behavior

Students, who reported having had sex for the first time at the age of 17 or later were significantly less likely to report sex under alcohol or drug influence and multiple sexual partners as well. Similarly, those who reported a longer-lasting relationship prior to sexual intercourse were significantly less likely to report sex under alcohol or drug influence and multiple sexual partners. Students who used a condom during their first sexual intercourse were significantly less likely to report inconsistent condom use (Table 3.4).

Table 3.3 Experience with and knowledge about sexually transmitted infections among Slovak first year university by gender and sexual experience

	Boys (n=184) experienced		Boys (n=171) inexperienced		Girls (n=271) experienced		Girls (n=206) inexperienced	
	n	%	n	%	n	%	n	%
Suspicion of STI	10/143	7.0	0	0	12/212	5.7	0	0
Reported STI	2/144	1.4	0	0	2/217	0.9	0	0
Best known STI								
AIDS	164/184	89.1	105/116	90.5	251/271	92.6	145/157	92.4
Syphilis	147/184	79.9	99/116	85.3	221/271	81.5	128/157	81.5
Gonorrhoea	143/184	77.7	98/116	84.5	209/271	77.9	117/157	74.5
Chlamydia	15/184	8.2	3/116	2.6	44/271	16.2	19/157	12.1
Most frequent STI								
AIDS	84/184	45.7	57/116	49.1	122/271	45.0	83/157	52.9
Syphilis	101/184	54.9	60/166	51.7	122/271	45.0	76/157	48.4
Gonorrhoea	97/184	52.7	57/116	49.1	118/271	43.5	76/157	48.4
Chlamydia	8/184	4.3	1/116	0.9	27/271	10.0	13/157	8.3
Require partner's examination for STI	19/143	13.3	5/27	18.5	29/212	13.7	8/53	15.01.12

Table 3.4 Predictors of sexual risk behavior among sexually active students (n=455)

	Sex on risky occasions			Multiple sexual partners			Inconsistent condom use		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Age at first coitus									
16 or younger	1.00			1.00			1.00		
17 or older	0.39	0.25-0.70	0.001	0.25	0.14-0.45	0.001	0.82	0.41-1.64	0.572
Relationship before first sexual intercourse									
Less than month	1.00			1.00			1.00		
1 month and more	0.17	0.10-0.31	0.001	0.27	0.13-0.50	0.001	0.67	0.34-1.31	0.67
Condom use during first sexual intercourse									
No	1.00			1.00			1.00		
Yes	0.69	0.43-1.13	0.139	0.60	0.35-1.04	0.069	0.25	0.14-0.47	0.001
Gender									
Boys	1.00			1.00			1.00		
Girls	0.60	0.37-1.17	0.122	0.77	0.44-1.34	0.354	1.60	0.95-2.70	0.079

OR = odds ratio; CI = confidence interval

Discussion

Our findings show that more than 60% of university students had already had sex when they entered university and 20% of them reported having had sexual intercourse before the age of 17. While 57% of students said that they had used a condom at coital debut, less than one third of them reported consistent current condom use. A considerable number of students reported having sex under alcohol or drug influence, particularly boys. In general, we can conclude that students' knowledge concerning STI is poor, which was clearly demonstrated by the fact that they thought HIV infection was the most common STI in Slovakia, while the real threat of chlamydia was underestimated. Regarding safer sexual behavior, significant associations were found between behavior at sexual initiation (later age of first sexual intercourse, longer duration of relationship prior to first sex, condom use during first sexual intercourse) and safer sexual behavior later on.

Compared with U.S. studies (Mardh et al., 2000; von Sadvoszky et al., 2002; Netting & Burnett, 2004; Kaestle et al., 2005; Oswalt et al., 2005; Ompad et al., 2006) and European studies (Narring et al., 2000; Wellings et al., 2001; Schubotz, 2004; Bozicevic et al., 2006) Slovak University students are less sexually experienced. This confirms findings from the HBSC study (Currie et al., 2008). However, Grunseit et al (2005) found almost the same rate of sexual experience in a study on Australian first year university students as we found.

In our study more boys than girls reported consistent current condom use, which is defined as always using a condom during sexual intercourse. This definition was used because each intercourse without a condom is risky in terms of STI infection or unintended pregnancy, and using this strict definition might explain the difference between figures for other studies reporting 17-51%. In general there is not a big difference between boy and girl condom use during vaginal intercourse, and the students' belief that their partners were uninfected with STI strongly influenced their decision to use a condom during vaginal or anal sex.

Apart from lack of knowledge about risk behavior and the inability to identify real risks in specific situations, insufficient coping and self-control strategies might offer another explanation for risky sexual behavior. Therefore, circumstances during first sexual intercourse or information levels about STI may not fully predict later sexual behavior. While HIV infection was reported as the most well-known and most frequent STI in Slovakia, the real threat of Chlamydia (second most common STI after syphilis) was underestimated by students both with and without sexual experience. Recent research has suggested that a variety of media sources and strategies that include mass media communication and the Internet can be used effectively to increase knowledge and change attitudes about sexual health issues. Media interventions seem to be more effective in achieving these goals when these efforts are sustained over time.

In our sample, more than 20% of both boys and girls reported having their first sexual intercourse before the age of 17. This contrasts with Vazsonyi's study (2006) where 32% of Hungarian, 24% of Slovenian, 36% of

Dutch and 40% of Swiss late adolescents reported sexual initiation as early as before age 15. But it should be pointed out that Vazsonyi's study covers the general adolescent population, while our sample is a specific segment (mostly high socioeconomic groups) of this population at a higher age. In this study, boys, in comparison to girls, had significantly shorter relationships before coital debut and reported having two and more sexual partners known to them for less than a month as well. As in other studies (Kirby et al., 1999; Miller et al., 1999; Mardh et al., 2000; Stulhofer et al., 2007) in our sample those who started having sexual intercourse later (17 and older) were less likely to report multiple sexual partners and sex under alcohol or drug influence and inconsistent condom use. Moreover, as this duration increased, the likelihood of risky sexual behavior (sex under alcohol or drug influence and multiple sexual partners) decreased. It seems that the circumstances of the first sexual intercourse, particularly the age of coital debut and the duration of dating prior to the sexual intercourse, could positively influence subsequent sexual behavior.

An important strength of this study is its random selection and very high response rate (95%), so selection bias is unlikely to have played an important role. In addition, implementing specific measures to guarantee confidentiality, as described in the methods section, decreased the likelihood of information bias in our study. The main limitation of this study is the cross-sectional design itself, which limits its potential for causal inferences. It should also be noted that our sample only included first-year university students; our findings therefore may not apply to other young adults and should be confirmed by the assessment of other groups of youngsters in Central Europe.

This study shows that risk behavior during sexual initiation predicts risk behavior later in life, and for this reason it becomes clear that interventions focusing on healthy sexual behavior should be provided as early in life as possible and preferably before sexual initiation takes place. Because risk behavior is highly prevalent in this study and is an important health issue, information on such behavior should be given via different strategies, and mass-media might reach the target population efficiently. The efficacy of the media, including the Internet, could offer a way for distributing all kinds of information concerning sexuality to adolescents and young adults. Moreover, we should not forget the influence of school, parents and peers for prevention. Encouraging consistent condom use during vaginal and anal intercourse is an important part of interventions aiming at improving sexual health. The coincidence of sexual risk behavior with substance use increases the importance of interventions focused not only on one type of risk behavior but on the whole complex of health related behaviors.

Conclusion

Safer initiation of sexual life seems to be associated with safer sexual practices later in life. Interventions focusing on healthy sexual behavior are needed. Based on the data from this study, we advocate interventions aimed at younger ages, before sexual initiation takes place. Knowledge about sexual behavior in students might help us tailor such interventions.

References

- Bozicevic, I., Stulhofer, A., Ajdukovic, D., & Kufirin, K. (2006). Patterns of sexual behaviour and reported symptoms of STI/RTIs among young people in Croatia - implications for interventions' planning. *Collegium Antropologicum*, 30, 63-70.
- Centers for Disease Control and Prevention (CDC). (2006). Trends in HIV-related risk behaviors among high school students--United States, 1991-2005. *MMWR. Morbidity and Mortality Weekly Report*, 55(31), 851-4.
- Currie, C., Gabhainn, S. N., Godeau, E., Roberts, C., Smith, R., Currie, D., et al. (2008). Inequalities in young peoples's health: International report from HBSC 2005/06 survey. WHO policy series: Health policy for children and adolescents. Copenhagen: WHO Regional Office for Europe.
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., et al. (2012). 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. Copenhagen: WHO Regional Office for Europe.
- Grunseit, A., Richters, J., Crawford, J., Song, A., & Kippax, S. (2005). Stability and change in sexual practices among first-year Australian university students (1990-1999). *Archives of Sexual Behavior*, 34(5), 557-568
- Gyarmathy, V. A., Thomas, R. P., Mikl, J., McNutt, L. A., Morse, D. L., DeHovitz, J., et al. (2002). Sexual activity and condom use among eastern European adolescents - the study of Hungarian adolescent risk behaviours. *International Journal of STD & AIDS*, 13(6), 399-405.
- Kaestle, C. E., Halpern, C. T., Miller, W. C., & Ford, C. A. (2005). Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults. *American Journal of Epidemiology*, 161(8), 774-780.
- Kirby, D., Brener, N. D., Brown, N. L., Peterfreund, N., Hillard, P., & Harest, R. (1999). The impact of condom distribution in Seattle schools on sexual behavior and condom use. *American Journal of Public Health*, 89(2), 182-187.
- Klavns, I., Rodrigues, L. C., Weiss, H. A., & Hayes, R. (2006). Factors associated with early sexual debut in Slovenia: Results of a general population survey. *Sexually Transmitted Infections*, 82(6), 478-483.

-
- Klavs, I., Rodrigues, L. C., Wellings, K., Kese, D., & Svab, I. (2002). Feasibility of testing for chlamydia trachomatis in a general population sexual behaviour survey in slovenia. *International Journal of STD & AIDS*, 13, 5-8.
- Klavs, I., Rodrigues, L. C., Wellings, K., Weiss, H. A., & Hayes, R. (2005). Increased condom use at sexual debut in the general population of slovenia and association with subsequent condom use. *Aids*, 19(11), 1215-1223.
- Kuzman, M., Simetin, I. P., & Fraelic, I. P. (2007). Early sexual intercourse and risk factors in croatian adolescents. *Collegium Antropologicum*, 31, 121-130.
- Lawrence, J. S., & Scott, C. P. (1996). Examination of the relationship between african american adolescents' condom use at sexual onset and later sexual behavior: Implications for condom distribution programs. *AIDS Education and Prevention : Official Publication of the International Society for AIDS Education*, 8(3), 258-66.
- Lenciauskiene, I., & Zaborskis, A. (2008). The effects of family structure, parent-child relationship and parental monitoring on early sexual behaviour among adolescents in nine european countries. *Scandinavian Journal of Public Health*, 36(6), 607-618.
- Mardh, P. A., Creatsas, G., Guaschino, S., Hellberg, D., Henry-Suchet, J., & European Chlamydia Epidemiology Group. (2000). Correlation between an early sexual debut, and reproductive health and behavioral factors: A multinational european study. *The European Journal of Contraception & Reproductive Health Care : The Official Journal of the European Society of Contraception*, 5(3), 177-82.
- Miller, K., Forehand, R., & Kotchick, B. (1999). Adolescent sexual behavior in two ethnic minority samples: The role of family variables. *Journal of Marriage and the Family*, 61(1), 85-98.
- Millstein, S. G., & Moscicki, A. B. (1995). Sexually-transmitted disease in female adolescents - effects of psychosocial factors and high-risk behaviors. *Journal of Adolescent Health*, 17(2), 83-90.
- Narring, F., Wydler, H., & Michaud, P. A. (2000). First sexual intercourse and contraception: A cross-sectional survey on the sexuality of 16-20-year-olds in switzerland. *Schweizerische Medizinische Wochenschrift*, 130(40), 1389-1398.
- Netting, N. S., & Burnett, M. L. (2004). Twenty years of student sexual behavior: Subcultural adaptations to a changing health environment. *Adolescence*, 39(153), 19-38.
- Ompad, D. C., Strathdee, S. A., Celentano, D. D., Latkin, C., Poduska, J. M., Kellam, S. G., et al. (2006). Predictors of early initiation of vaginal and oral sex among urban young adults in baltimore, maryland. *Archives of Sexual Behavior*, 35(1), 53-65.
- Oswalt, S. B., Cameron, K. A., & Koob, J. J. (2005). Sexual regret in college students. *Archives of Sexual Behavior*, 34(6), 663-669.

- Pinter, B., & Tomori, M. (2000). Sexual behavior of secondary-school students in slovenia. *The European Journal of Contraception & Reproductive Health Care : The Official Journal of the European Society of Contraception*, 5(1), 71-6.
- Rabusic, L., & Kepakova, K. (2003). Adolescent sexual behavior and the HIV/AIDS risk in the czech republic. *Revija Za Sociologiju*, 34, 189-206.
- Schubotz, D. (2004). Sexual behaviour of young people in northern ireland: First sexual experience. *Critical Public Health*, 14(2), 177-190.
- Stulhofer, A., Graham, C., Bozicevic, I., Kufirin, K., & Ajdukovic, D. (2007). HIV/AIDS-related knowledge, attitudes and sexual behaviors as predictors of condom use among young adults in croatia. *International Family Planning Perspectives*, 33(2), 58-65.
- Vazsonyi, A. T., Trejos-Castillo, E., & Huang, L. (2006). Risky sexual behaviors, alcohol use, and drug use: A comparison of eastern and western european adolescents. *The Journal of Adolescent Health: Official Publication of the Society for Adolescent Medicine*, 39(5), 11.
- von Sadvoszky, V., Keller, M. L., & McKinney, K. (2002). College students' perceptions and practices of sexual activities in sexual encounters. *Journal of Nursing Scholarship*, 34(2), 133-138.
- Wellings, F., Nanchahal, K., Macdowall, W., McManus, S., Erens, B., Mercer, C. H., et al. (2001). Sexual behaviour in britain: Early heterosexual experience. *Lancet*, 358(9296), 1843-1850.

Psychological and behavioural factors associated with sexual risk behaviour among Slovak students

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Abstract

Knowledge about the prevalence of sexual risk behaviour (SRB) in adolescence is needed to prevent unwanted health consequences. Studies on SRB among adolescents in Central Europe are rare and mostly rely on a single indicator for SRB. This study aims to assess the association of behavioural and psychological factors with three types of SRB in adolescents in Central Europe.

We obtained data on behavioural factors (having been drunk during previous month, smoking during previous week, early sexual initiation), psychological factors (self-esteem, well-being, extroversion, neuroticism, religiousness), and SRB (intercourse under risky conditions, multiple sexual partners, and inconsistent condom use) in 832 Slovak university students (response 94.3%).

Among those with sexual experience (62%), inconsistent condom use was the most prevalent risk behaviour (81% in females, 72% in males). With the exception of having been drunk in males, no factor was associated with inconsistent condom use. Regarding the other types of SRB, early sexual initiation was most strongly associated. In addition, other, mostly behavioural, factors were associated, in particular having been drunk.

Results suggest that behavioural factors are more closely related to SRB than psychological factors. Associations differ by type of SRB and gender but offer few clues to target risk groups for inconsistent condom use. Results show a high need for health-promotion programmes in early adolescence that target SRB in conjunction with other health risk behaviours such as alcohol abuse.

Introduction

Studies on sexual behaviour from Central and Eastern Europe (CEE) are scarce. The lack of information on sexual behaviour is most salient regarding late adolescence and young adulthood, when young people start to live without direct parental supervision. The best recent information available is based on the Health Behaviour in School-aged Children (HBSC) studies 2001/2002 and 2005/2006 (Currie et al., 2004). In both studies (Slovakia is not included in the first one) adolescents from Central and Eastern Europe reported that they were less experienced with sexual intercourse, used contraception pills or condoms during their most recent sexual intercourse to a lesser degree and initiated sexual intercourse later in life than their peers from most Western countries. However, patterns in the sexual behaviour of adolescents and young adults in Central and Eastern Europe seem to be changing. A decrease in the age at which they become sexually active is evident, particularly among females, leading to a narrowing of the gap between boys and girls regarding the time of sexual initiation.

In the context of sexually-transmitted infections (STI), many studies show the inconsistent use of prophylactic methods (e.g. condoms) to be the main risk factor (Kegeles et al., 1988; Moore & Rosenthal, 1992; Morrison et al., 1994). However, early sexual intercourse, having multiple sexual partners and the association with substance use should also be considered as significant risk factors in this age group. Although each of these factors can be considered as an aspect of risk-taking, none by itself is valid as an operationalisation of risk behaviour (Metzler et al., 1994; Sieving et al., 1997); yet all have become important topics in health promotion.

The association of sexual risk behaviour (SRB) with a number of other risk behaviours, including substance use, is evident. Use of marijuana, cocaine or other illicit drugs by adolescents has been shown to be associated with increased rates of sexual intercourse in general, having multiple sexual partners and lower rates of condom use, particularly for users of illicit stimulant drugs (Lowry et al., 1994). Binge-drinking teens are approximately three times less likely to use condoms, and recent marijuana users are almost two times less likely to use condoms (Tapert et al., 2001). The increasing prevalence of alcohol, drugs and tobacco use among Slovak adolescents as reported in the ESPAD (European School Survey Project on Alcohol and Other Drugs) reports of 1995, 1999, 2003, 2007 (Hibell et al., 1997; Hibell et al., 2000; Hibell et al., 2004; Hibell et al., 2008) and the lack of scientific studies in this field in CEE countries led us to explore the association among this behaviour and sexual risk behaviour.

Early sexual initiation is related to multiple aspects of SRB, including inconsistent condom use, early pregnancy and a greater number of sexual partners (Smith, 1997; Kotchick et al., 2001). Moreover, it is also a predictor of future gynaecological problems. Girls who reported having sexual intercourse before age 16 had significantly more symptoms such as vaginal discharge and pruritus and signs such as abnormal discharge, erythema of the

vaginal mucosa and lower genital tract infections than girls who first experienced sexual intercourse after age 19 (Mardh et al., 2000). It was found that 81% of sexually experienced youth aged 12-14 wished they had waited longer to have sex, compared with 55% of sexually experienced 15 to 19-year-olds (Albert et al., 2003). Because of this we expect higher levels of SRB among those who report early sexual initiation.

SRB and other health-endangering behaviours may be considered the result of a number of determinants, which range from causal factors very close to the behaviour like attitudes and perceived social norms (Jessor, 1987; Jessor, 1991) to more distant causal factors like personality (Reitman et al., 1996; Hoyle, 2000; Kotchick et al., 2001) or even socioeconomic position (Santelli et al., 2000). As such, they may have shared causes with problem behaviour, as suggested by Jessor (Jessor, 1987; Jessor, 1991). Thus, we might expect, for example, a co-occurrence with other problem behaviours, (Lowry et al., 1994; Petridou et al., 1997) or with psychological factors.

A study by Reitman (1996) which explored the role of self-efficacy and self-esteem found that adolescents who believe they could take "effective precautionary action to avoid HIV" had fewer sexual partners and reported more condom use than peers who had lower self-efficacy scores (Reitman et al., 1996). Low self-esteem has also been associated with inconsistent use of contraceptives among adolescent girls (Kotchick et al., 2001). Various indicators of psychosocial distress, which frequently occur along with low self-esteem, have been found to be associated with more frequent sexual activity (Orr et al., 1991; Luster & Small, 1994; Harvey & Spigner, 1995; Tubman et al., 1996). Furthermore, several studies included religiousness among the factors associated with SRB, although the results from these studies are not consistent.

Summing up, the aim of our study was to explore the association of behavioural (drinking, smoking, early sexual intercourse) as well as psychological factors (self-esteem, psychological well-being, extroversion, neuroticism, religiousness) with three aspects of SRB: (1) sexual intercourse under risky conditions, (2) multiple sexual partners and (3) inconsistent condom use among late adolescents.

Methods

Sample

Data were collected in April and November 2004. The sample consisted of 882 first-year students at two universities located in Kosice (230,000 inhabitants) P.J. Safarik University (7,000 students) and the Technical University (12,000 students) who during a compulsory lecture completed a questionnaire concerning health behaviour under the guidance of field workers. Students were recruited from a list of randomly selected study groups provided by the faculties concerned and their participation was voluntary. All procedures concerning data collection were explained to

respondents before data collection. The Ethics Committee of the Medical Faculty of the P.J. Safarik University approved this study. Of the 882 students included, 7 left the room before the beginning and 43 were excluded afterwards because they left major parts of the questionnaire incomplete (altogether 50). A total of 832 responded (94.3%), 355 male and 477 female, aged 19-28 years with 90% of the students aged 19-23 years (mean 20.5; SD 1.4). Out of these, 45.1% studied at the science faculty, 34.8% at the technical faculty and 20.1% at the medical faculty. More than half of the respondents had completed grammar school, and the majority of the students lived in student halls of residence or with their parents.

Measures

Regarding SRB, respondents were asked (1) if they had had sex (penetration of vagina by the penis) after a short relationship or under the influence of drugs or alcohol (yes / no to any of the three conditions); (2) how many sexual partners they had had in their life (3 and less / 4 or more); (3) how often they used condoms (always / almost always, occasionally, never).

Behavioural factors concerned binge drinking, smoking and early experience of sexual intercourse. Respondents were asked (1) how many times they had been drunk during the previous month (never / 1 or more); (2) how many cigarettes they had smoked during the previous week (none/ one or more) and (3) at what age they had had sexual intercourse for the first time. Those who had been drunk at least once during last month, smoked at least one cigarette per week and had sex before the age of 16 were indicated as behaving riskily. Categorisations regarding number of sexual partners, drunkenness and smoking were similar to ones that have been used previously (Santelli et al., 1998; Tuinstra et al., 1998; Edwards et al., 1999; Mardh et al., 2000; Geckova et al., 2002; Howard & Wang, 2004; Sleskova et al., 2005).

Regarding *psychological factors*, self-esteem was assessed using the Rosenberg self-esteem scale (Rosenberg, 1965). The scale consists of 10 items (5 positive and 5 negative). Each item has a four-point scale ranging from “strongly agree” to “strongly disagree”. For each question, the respondents choose the statement that most closely applies to them. The sum score for self-esteem varies from 10 to 40, a higher score indicating higher self-esteem. This variable was trichotomised into high (30 to 40), middle (20 to 29) and low (10 to 19).

Psychological well-being was measured with the shortened 12-item version of the General Health Questionnaire (GHQ12)(Goldberg & Hillier, 1979). The separate items focus on various aspects of respondents' psychological dispositions, for example problems with sleep, strain, happiness or stress. The questions compare how the respondents' present state differs from their usual state. The GHQ12 was scored using a four-point Likert scale (0, 1, 2, 3) with sum scores ranging from 0-36. A higher sum score means lower psychological well-being. The values were trichotomised into high (0 to 11), middle (12 to 23) and low (24 to 36) psychological well-being.

Extroversion and neuroticism were measured with an abbreviated form of the revised Eysenck Personal Questionnaire (Navratil et al., 2003). Extroversion was measured with a 6-item scale (yes/no) as was neuroticism. The sum score for extroversion/neuroticism varies from 6 to 12, with a higher score indicating lower levels of extroversion/neuroticism. Both variables were categorized into three levels: high (6 to 7), middle (8 to 10) and low (11 to 12) extroversion/neuroticism.

One item of the Questionnaire for Instrumental and Terminal Values (Rokeach, 1983) was used to measure religiousness. Respondents were asked to evaluate how important salvation (feeling of redemption, eternal life) is for them (1-extremely important, 2-strongly important, 3-important, 4-less important and 5-unimportant). A higher score for this value indicates lower religiousness in the respondent. This variable was categorized into two levels: high (extremely important and strongly important) and low (important, less important and unimportant).

Statistical analyses

We first examined the proportion of students that had had sexual intercourse. Next, for those who had had intercourse at least once (n=455), we examined, using logistic regression, the association of each indicator of SRB with behavioural and psychological factors separately for males and females. We computed crude odds ratios for each type of SRB in relation to each factor. Subsequently, we determined the mutually adjusted associations of factors with SRB by forward selection procedures, starting with all factors that had a statistically significant crude odds ratio. We repeated these analyses with addition of age into the models, which yielded very similar results (not shown). All analyses were done with SPSS software, version 14.00.

Results

Table 4.1 presents a descriptive view of the behavioural and psychological factors separately for males and females. Of the 832 respondents, 455 reported having had sexual intercourse. Out of these, 44% of males versus 33% of females said they had had sex under risky conditions; 27% of males versus 21% of females said they had had 4 or more sexual partners in their life; 72% of males versus 81% of females reported inconsistent condom use and 9% of males versus 5% of females had had sex before age 16.

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Table 4.1 Sexual risk behaviour and other risk behaviour (n=832)

	Male (n=184)		Female (n=271)	
	Number	%	Number	%
Sexual experience *				
Yes	184	61.3	271	63.3
Having sex before age of 16				
Yes	15	8.5	13	5.1
Having sex under risky conditions				
Yes	81	44.3	87	32.8
Multiple sexual partners				
Yes	45	26.5	54	21.4
Inconsistent condom use				
Yes	131	72.4	209	80.7
Being drunk at least once during last month				
Yes	88	48.1	79	29.3
Smoking one cigarette at least once per week				
Yes	80	44.2	101	38.3
Self-esteem				
High	51	28.7	66	25.3
Middle	100	56.2	134	51.3
Low	27	15.2	61	23.4
Psychological well-being				
High	51	27.9	56	20.9
Middle	102	55.7	132	49.3
Low	30	16.4	80	29.9
Extroversion				
Low	21	11.9	36	14.1
Middle	87	49.4	114	44.7
High	68	38.6	105	41.2
Neuroticism				
Low	60	32.8	47	17.9
Middle	90	49.2	131	49.8
High	33	18.0	85	32.3
Religiousness				
Strongly important	65	43.0	95	42.6
Unimportant	86	57.0	128	57.4

* from whole sample - males (n=355), females (n=477)

Tables 4.2 and 4.3 present the results of the logistic regression models analysing the associations of each indicator of SRB with the behavioural and psychological factors separately for males and females. Statistically significant ($p < 0.05$) associations are summarized below.

Sex under risky conditions

Males and females who reported having been drunk at least once in the previous month or having had sex before the age of 16 were more likely to engage in sex under risky conditions. Moreover, girls who reported smoking and higher extroversion were more likely to engage in such types of sexual risk behaviour (see Tables 4.2, 4.3). Introducing these variables in a multiple logistic regression model with forward selection resulted in all of them being selected. The resulting mutually adjusted odds ratios are presented in Table 4.4.

Table 4.2 Determinants of SRB in males (n=184): odds ratios (OR) and 95%-confidence intervals (CI)

	Sex in risky conditions				Multiple sexual partners				Inconsistent condom use			
	n	%	OR	95% CI	n	%	OR	95% CI	n	%	OR	95% CI
Being drunk at least once during last month												
No	32	33.7	1.00		17	19.3	1.00		61	64.9	1.00	
Yes	48	55.2	2.42**	1.33-4.41	28	34.6	2.21*	1.10-4.44	69	80.2	2.20*	1.11-4.33
Smoke at least one cigarette per week												
No	44	43.6	1.00		17	18.3	1.00		69	69.0	1.00	
Yes	36	45.6	1.09	0.60-1.96	27	36.5	2.57	1.27-5.21	60	76.9	1.50	0.76-2.94
Having sex before age of 16												
No	66	41.0	1.00		37	23.9	1.00		114	70.8	1.00	
Yes	12	80.0	5.76**	1.56-21.20	8	66.7	6.38**	1.82-22.39	13	86.7	2.68	0.58-12.34
Self-esteem												
High	19	37.3	1.00		16	33.3	1.00		33	66.0	1.00	
Middle	46	46.5	1.46	0.73-2.92	23	25.3	0.68	0.32-1.45	76	77.6	1.78	0.84-3.78
Low	12	44.4	1.35	0.52-3.48	5	19.2	0.48	0.15-1.50	18	66.7	1.03	0.38-2.78
Well-being												
High	20	40.0	1.00		14	32.6	1.00		33	66.0	1.00	
Middle	50	49.0	1.44	0.73-2.87	23	24.0	0.65	0.30-1.44	77	77.0	1.73	0.82-3.64
Low	10	33.3	0.75	0.29-1.93	8	26.7	0.75	0.27-2.11	20	66.7	1.03	0.40-2.69
Extroversion												
Low	7	33.3	1.00		3	14.3	1.00		14	70.0	1.00	
Middle	33	38.4	1.25	0.46-3.41	14	17.7	1.29	0.33-4.99	59	69.4	0.97	0.34-2.81
High	36	52.9	2.25	0.81-6.27	26	40.6	4.11*	1.10-15.37	50	73.5	1.19	0.40-3.57
Neuroticism												
Low	25	41.7	1.00		15	27.3	1.00		47	78.3	1.00	
Middle	43	48.3	1.31	0.68-2.53	21	25.0	0.89	0.41-1.92	58	66.7	0.55	0.26-1.18
High	13	39.4	0.91	0.38-2.17	9	29.0	1.09	0.41-2.90	25	75.8	0.86	0.32-2.36
Religiousness												
Strongly important	30	46.9	1.00		22	36.1	1.00		45	70.3	1.00	
Unimportant	42	48.8	1.08	0.57-2.07	17	21.8	0.49	0.23-1.05	63	75.0	1.21	0.59-2.49

* $p < .05$. ** $p < .01$ *** $p < .001$

Table 4.3 Determinants of SRB in females (n=271): odds ratios (OR) and 95%-confidence intervals (CI)

	Sex in risky conditions				Multiple sexual partners				Inconsistent condom use			
	n	%	OR	95% CI	n	%	OR	95% CI	n	%	OR	95% CI
Being drunk at least once during last month												
No	45	24.2	1.00		34	19.1	1.00		141	77.9	1.00	
Yes	41	52.6	3.47***	1.99-6.06	20	27.4	1.60	0.85-3.02	68	87.2	1.93	0.91-4.09
Smoke at least one cigarette per week												
No	33	20.9	1.00		21	14.0	1.00		118	76.1	1.00	
Yes	53	53.0	4.27***	2.47-7.40	33	34.7	3.27***	1.75-6.11	86	88.7	2.45*	1.18-5.08
Having sex before age of 16												
No	73	30.2	1.00		47	19.8	1.00		189	79.7	1.00	
Yes	11	84.6	12.73***	2.75-58.89	7	53.8	4.72**	1.51-14.69	12	92.3	3.05	0.39-24.02
Self-esteem												
High	21	31.8	1.00		14	21.9	1.00		51	79.7	1.00	
Middle	47	35.6	1.19	0.63-2.22	28	22.0	1.01	0.49-2.09	102	79.1	0.96	0.46-2.02
Low	16	27.6	0.82	0.38-1.77	11	21.2	0.96	0.39-2.34	50	87.7	1.82	0.67-4.94
Well-being												
High	19	33.9	1.00		15	27.3	1.00		42	75.0	1.00	
Middle	39	30.2	0.84	0.43-1.65	28	23.1	0.80	0.39-1.66	101	81.5	1.46	0.69-3.12
Low	29	37.7	1.18	0.57-2.42	11	15.1	0.47	0.20-1.13	64	84.2	1.78	0.75-4.22
Extroversion												
Low	6	17.1	1.00		2	5.9	1.00		26	76.5	1.00	
Middle	29	25.9	1.69	0.64-4.48	18	16.8	3.24	0.71-14.73	88	78.6	1.13	0.45-2.81
High	48	47.1	4.30**	1.64-11.23	33	34.7	8.52**	1.92-37.76	81	83.5	1.56	0.60-4.06
Neuroticism												
Low	12	25.5	1.00		9	20.0	1.00		35	77.8	1.00	
Middle	43	33.3	1.46	0.69-3.09	27	21.3	1.08	0.46-2.52	107	83.6	1.46	0.63-3.39
High	31	38.3	1.81	0.82-4.00	18	24.7	1.31	0.53-3.23	60	75.9	0.90	0.38-2.16
Religiousness												
Strongly important	25	26.3	1.00		10	11.0	1.00		75	79.8	1.00	
Unimportant	48	38.1	1.72	0.96-3.08	36	29.5	3.39**	1.58-7.28	98	79.0	0.96	0.49-1.85

* $p < .05$. ** $p < .01$ *** $p < .001$

Multiple sexual partners

The risk of multiple sexual partners was associated with more psychological factors among females. Males reporting having been drunk at least once in the preceding month or reporting sexual experience before age 16 were more likely to have had more than 3 sexual partners in their life. Extroversion was associated with multiple sexual partners among males, with a rather high though not statistically significant OR for the 'high extroversion' category.

Females reporting smoking or reporting sexual experience before age 16 were more likely to have had more than 3 sexual partners. Females reporting high extroversion and religiousness as unimportant were more likely to have had multiple sexual partners in comparison to their peers reporting a low level of extroversion or a high level of religiousness. Introducing these variables into a multiple logistic regression model with forward selection resulted in all of them being significant, except for having sex before age of 16 in the female sample. The resulting mutually adjusted odds ratios are presented in Table 4.4.

Inconsistent condom use

Only one behavioural factor in males (being drunk) and one in females (smoking) was associated with inconsistent condom use. Introducing this variable into a multiple logistic regression model with forward selection resulted in selection of only this variable.

Discussion

This study on SRB in young adults in CEE shows that the occurrence of SRB in Slovak young adults varies from 21 to 81% of sexually experienced respondents (n=455), depending on the indicator used. The most frequently reported SRB is inconsistent condom use, despite the fact that consistent condom use is one of the most efficient ways of protection. The occurrence of sexual intercourse under risky conditions is also very high, varying between 33-44% of the sexually experienced. From 5 to 9% of respondents reported having already had sex before age 16, and 27% of males and 21% of females reported having had multiple sexual partners.

From an international point of view, Slovak students have their sexual initiation exceptionally late, and the number of their sexual partners is low. On the other hand, similar to other studies, no gender differences were found in the prevalence of having sex. These findings fit with those from the HBSC study, where a lower proportion of sexually experienced individuals was reported among 14 and 15 years old adolescents in Central European countries (Hungary, Czech Republic, Croatia, Poland) compared with adolescents from Western or Northern European countries (Currie et al., 2004).

Table 4.4 Factors associated with SRB after forward selection: odds ratios (OR) and 95% confidence intervals (CI)¹

	Sex in risky conditions		Multiple sexual partners	
	OR	95% CI	OR	95% CI
Males				
Being drunk at least once during last month				
No	1.00	**	1.00	**
Yes	2.48	1.32-4.64	2.25	1.04-4.88
Having sex before age of 16				
No	1.00	**	1.00	**
Yes	5.97	1.58-22.53	6.41	1.73-23.80
Extroversion				
Low			1.00	*
Middle			1.22	0.29-5.10
High			3.50	0.87-14.13
Females				
Being drunk at least once during last month				
No	1.00	**		
Yes	2.41	1.30-4.46		
Smoke at least one cigarette per week				
No	1.00	***	1.00	*
Yes	3.00	1.66-5.44	2.55	1.20-5.40
Having sex before age of 16				
No	1.00	*	1.00	
Yes	7.18	1.46-35.38	3.57	0.91-14.02
Extroversion				
Low	1.00	*	1.00	**
Middle	1.42	0.48-4.17	2.80	0.56-14.16
High	2.96	1.03-8.48	8.22	1.69-40.03
Religiousness				
Extremely important			1.00	*
Unimportant			2.82	1.24-6.45

¹ ORs in bold indicates that overall a variable contributes to the logistic model at * $p < .05$, ** $p < .01$ *** $p < .001$

In line with several other studies (Fullilove et al., 1993; Cooper et al., 1994; Millstein & Moscicki, 1995; Brown et al., 2001), our study shows that alcohol use is one of the most consistent predictors of SRB. This finding supports the explanations that less self-control leads to risk behaviour and that certain people have a psychological predisposition to seek sensation and are thus more likely than others to engage in a variety of risk behaviours (Zuckerman, 1988). However, without contextual information about this event, we cannot clearly state that alcohol or drug use has a causal relation to SRB. It should be noted that our measurement of having sex under risky conditions covers lifetime history, which might be the reason for the high proportion, but on the other hand, lifetime history in this age group represents only about 4 years of life. Future analyses should go more deeply into the dimensions of a relationship like trust, intimacy, commitment and communication and their effect on behaviour. Our approach is important especially among the young population, where the age of the first contact with alcohol consumption is rapidly dropping (Currie et al., 2004).

The study results also revealed relevant differences between male and female sexual behaviour. Males report mostly behavioural factors as significant predictors for sex under risky conditions and multiple sexual partners. On the other hand, females add psychological factors. Their lower levels of extroversion and higher levels of religiousness are associated with fewer sexual partners, in accordance with other studies (Bingham & Crockett, 1996; Crockett et al., 1996), where religiousness seems to be a protective factor against a high number of sexual partners among girls. On the border of statistical significance was the association between a high level of religiousness and a low probability of having sex under risky conditions. Thus, it is probably not only religiousness that plays an important role. Several studies have shown that girls who report a high importance of religiousness probably live in such psychosocial and cultural environments (personality, relationships, family, friends, and school) that opportunities for SRB are rather limited (Moser et al., 2007; Wink et al., 2007). On the other hand religiousness had no significant association with sex under risky conditions or inconsistent condom use, which suggests that among those who have already had sexual intercourse, religiousness does not play a role. We can conclude, then, that despite the high importance of religiousness among students, their sexual behaviour reflects strategies more risky than safe.

Inconsistent condom use has been frequently reported as a major pattern of SRB. Only those who reported consistent condom use were defined as a safe group; all others were defined as a risk group. This strict criterion comes from the assumption that each intercourse without a condom is risky in terms of STI infection or unintended pregnancy. Of course, such a definition cannot be used in each age group, but among first year university students, 90% of whom are in the 19-23 age range and where it is difficult to expect stable and long lasting sexual partnerships or unprotected intercourse with the aim of becoming pregnant, this methodical criterion should fit. Despite the high rates of inconsistent condom use in our sample (72.4% of males and 80.7 % of females), we only found an association with drinking in males and smoking in females. These results are in accordance with previous research (Mcewan et al., 1992; Castilla et al., 1999; Tapert et al., 2001), which showed alcohol consumption to be negatively associated with condom use. Nevertheless, recent studies have recognized the importance of examining how sexual relationships themselves influence condom use. It is possible that alcohol only has an effect on condom use at specific phases in a relationship (HalpernFelsher et al., 1996).

Studies which explored the role of alcohol use on condom use (Leigh, 2002; Dye & Upchurch, 2006; Leigh et al., 2008) and studies which assessed the length of a relationship (Kraft & Rise, 1991) or the type of relationship (Senf & Price, 1994) did not find any association between alcohol consumption and condom use. Moreover, these results do not support the persistent notion that alcohol causes people to engage in sexual risk that they would avoid when sober. Instead, people tend to follow their usual pattern of condom use, regardless of alcohol use (Leigh et al., 2008). Such inconsistent findings regarding condom use and drinking suggest the possible effect of a third factor which affects both variances, and that any relationship between

condom use and drinking is disputable. Mental health problems, developmental factors, disposition to risk taking and sensation seeking, familial influences and general tolerance for deviance have all been reported as possible third variances in literature sources (Hamburg et al., 1975; Zuckerman & Neeb, 1979; Jessor et al., 1980; Tschann et al., 1994). Consequently, an association between alcohol use and condom use could be attributable to these factors and not to any relationship between alcohol and condom use (HalpernFelsher et al., 1996). Nevertheless, our results suggest that behavioural factors are more closely related to SRB than psychological ones.

Methodological considerations

This study has several strengths and limitations. Due to possible methodological problems, studies of sexual behaviour in CEE countries are rare. We obtained a very high response rate (94%), however, by using the setting of lectures, so selection bias is very unlikely to occur. We cannot exclude information bias, however, though we did use specific measures to guarantee confidentiality. These measures have been shown to yield valid outcomes.

Regarding multiple sexual partners among males, the combination of 95%-confidence intervals of both the 'middle' and the 'high' categories of extroversion comprising '1' (i.e. are not statistically significant different from the reference category) but at the same time extroversion contributing to the model with statistical significance seems odd. It can be explained by the fact that the associations of the middle and the high categories with the outcome differ quite a lot too. The latter has been taken into account regarding the overall p-value, but not regarding the comparison of these separate categories with the same reference category (i.e. 'low') and the resulting 95%-confidence intervals. This holds for any logistic regression in which dummy coding is used for separate categories (like we did).

Implications

Our findings support the hypothesis that risk behaviours tend to cumulate, e.g. sexual risk behaviour may coincide with binge drinking and smoking. However, one of our indicators for SRB (having sex under risky conditions, e.g. after a short relationship or under the influence of drug or alcohol consumption) may overlap with one of the explored independent variables (being drunk). To understand whether alcohol has an effect on adolescents' condom use, future research should consider whether adolescents are drinking at the time that the decision is made, because it may be that alcohol negates any skill learned while sober (HalpernFelsher et al., 1996).

Additional research is needed to assess whether other factors so we may suppose that smoking or binge drinking increase the contribute to consistent use of condoms, such as the level of health awareness, self-efficacy and anxiety related to health risk, or participation in SRB while accepting the risk involved in such behaviour. However, we did not find any associations

between self-esteem and consistent or inconsistent condom use, which contrasts with the findings of several studies (Pleck et al., 1990; McNair et al., 1998). Particularly in this case, our findings should be interpreted with this special aspect in mind. However, we confirmed the associations of drinking and smoking on SRB, probability of SRB, or, in other words, that they are risk indicators with regard to SRB in any case.

Conclusions

The overall findings of our study suggest that the specification of SRB into three indicators contributes to a better understanding and description of SRB. All three indicators provide a specific and different view on adolescent sexual behaviour. Consequently, several significant differences were found between the indicators, which suggest an important variance in SRB and allows several recommendations to be formulated. Systematic prevention should be focused on the high incidence of sexual risk behaviour among young people, which indicates the need for health promotion programmes not only on smoking, alcohol and drugs, for example, but that sexual risk behaviour should also be integrated into prevention programmes. Due to the accumulation of risk behaviour among young people, focusing on prevention in a related set of unhealthy behaviours instead of a single type of unhealthy behaviour will be very important, particularly in early adolescence. Moreover, results show a high need for health promotion programmes in early adolescence that target SRB in conjunction with other health-related risk behaviours such as alcohol abuse.

References

- Albert, B., Brown, S., & Flanigan, C. (2003). 14 and younger: The sexual behavior of young adolescents (summary). Washington: National Campaign to Prevent Teen Pregnancy.
- Bingham, C. R., & Crockett, L. J. (1996). Longitudinal adjustment patterns of boys and girls experiencing early, middle, and late sexual intercourse. *Developmental Psychology*, 32(4), 647-658.
- Brown, T. L., Parks, G. S., Zimmerman, R. S., & Phillips, C. M. (2001). The role of religion in predicting adolescent alcohol use and problem drinking. *Journal of Studies on Alcohol*, 62(5), 696-705.
- Castilla, J., Barrio, G., Belza, M. J., & de la Fuente, L. (1999). Drug and alcohol consumption and sexual risk behaviour among young adults: Results from a national survey. *Drug and Alcohol Dependence*, 56(1), 47-53.
- Cooper, M. L., Peirce, R. S., & Huselid, R. F. (1994). Substance use and sexual risk-taking among black-adolescents and white adolescents. *Health Psychology*, 13(3), 251-262.
- Crockett, L. J., Bingham, C. R., Chopak, J. S., & Vicary, J. R. (1996). Timing of first sexual intercourse: The role of social control, social learning, and problem behavior. *Journal of Youth and Adolescence*, 25(1), 89-111.

- Currie, C., Roberts, C., Morgan, A., Smith, R., Settertobulte, W., Samdal, O., et al. (2004). *Young people's health in context: International report from the HBSC 2001/02 survey*. Copenhagen: WHO Regional Office for Europe.
- Dye, C., & Upchurch, D. M. (2006). Moderating effects of gender on alcohol use: Implications for condom use at first intercourse. *Journal of School Health, 76*(3), 111-116.
- Edwards, A., Curtis, S., & Sherrard, J. (1999). Survey of risk behaviour and HIV prevalence in an english prison. *International Journal of STD & AIDS, 10*(7), 464-466.
- Fullilove, M. T., Golden, E., Fullilove, R. E., Lennon, R., Porterfield, D., Schwarcz, S., et al. (1993). Crack cocaine use and high-risk behaviors among sexually active black-adolescents. *Journal of Adolescent Health, 14*(4), 295-300.
- Geckova, A., van Dijk, J. P., van Ittersum-Gritter, T., Groothoff, J. W., & Post, D. (2002). Determinants of adolescents' smoking behaviour: A literature review. *Central European Journal of Public Health, 10* (3), 79-87.
- Goldberg, D. P., & Hillier, V. F. (1979). Scaled version of the general health questionnaire. *Psychological Medicine, 9* (1), 139-145.
- HalpernFelsher, B. L., Millstein, S. G., & Ellen, J. M. (1996). Relationship of alcohol use and risky sexual behavior: A review and analysis of findings. *Journal of Adolescent Health, 19*(5), 331-336.
- Hamburg, B. A., Kraemer, H. C., & Jahnke, W. (1975). Hierarchy of drug-use in adolescence - behavioral and attitudinal correlates of substantial drug-use. *American Journal of Psychiatry, 132*(11), 1155-1163.
- Harvey, S. M., & Spigner, C. (1995). Factors associated with sexual-behavior among adolescents - a multivariate-analysis. *Adolescence, 30* (118), 253-264.
- Hibell, B., Anderson, B., Ahlstrom, S., Balakireva, O., Bjarnason, T., Kokkevi, A., et al. (2000). *The 1999 ESPAD report. alcohol and other drugs use among students in 30 european countries*. Stockholm: Swedish Council for Information on Alcohol and Other Drugs.
- Hibell, B., Anderson, B., Beck, F., Choquet, M., Kokkevi, A., Fotiou, A., et al. (2008). *The ESPAD report 2007. alcohol and drug use among european 17-18 year old students*. Stockholm: Swedish Council for Information on Alcohol and Other Drugs.
- Hibell, B., Anderson, B., Bjarnason, T., Ahlstrom, S., Balakireva, O., Kokkevi, A., et al. (2004). *The ESPAD report 2003. alcohol and other drug use among students in 35 european countries*. Stockholm: Swedish Council for Information on Alcohol and Other Drugs.
- Hibell, B., Bjarnason, T., Kokkevi, A., Morgan, M., & Narusk, A. (1997). *The 1995 ESPAD report. alcohol and other drug use among students in 26 european countries*. Stockholm: Swedish Council for Information on Alcohol and Other Drugs .

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- Howard, D. E., & Wang, M. Q. (2004). Multiple sexual-partner behavior among sexually active US adolescent girls. *American Journal of Health Behavior, 28*(1), 3-12.
- Hoyle, R. H. (2000). Personality processes and problem behavior. *Journal of Personality, 68*(6), 953-966.
- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction, 82*(4), 331-342.
- Jessor, R. (1991). Risk behavior in adolescence - a psychosocial framework for understanding and action. *Journal of Adolescent Health, 12*(8), 597-605.
- Jessor, R., Chase, J. A., & Donovan, J. E. (1980). Psychosocial correlates of marijuana use and problem drinking in a national sample of adolescents. *American Journal of Public Health, 70*(6), 604-613.
- Kegeles, S. M., Adler, N. E., & Irwin, C. E. (1988). Sexually active adolescents and condoms - changes over one year in knowledge, attitudes and use. *American Journal of Public Health, 78*(4), 460-461.
- Kotchick, B. A., Shaffer, A., & Forehand, R. (2001). Adolescent sexual risk behavior: A multi-system perspective. *Clinical Psychology Review, 21*(4), 493-519.
- Kraft, P., & Rise, J. (1991). Contraceptive behavior of norwegian adolescents. *Health Education Research, 6*(4), 431-441.
- Leigh, B. C. (2002). Alcohol and condom use - A meta-analysis of event-level studies. *Sexually Transmitted Diseases, 29*(8), 476-482.
- Leigh, B. C., Vanslyke, J. G., Hoppe, M. J., Rainey, D. T., Morrison, D. M., & Gillmore, M. R. (2008). Drinking and condom use: Results from an event-based daily diary. *Aids and Behavior, 12*(1), 104-112.
- Lowry, R., Holtzman, D., Truman, B. I., Kann, L., Collins, J. L., & Kolbe, L. J. (1994). Substance use and hiv-related sexual behaviors among us high-school-students - are they related. *American Journal of Public Health, 84*(7), 1116-1120.
- Luster, T., & Small, S. A. (1994). Factors associated with sexual risk-taking behaviors among adolescents. *Journal of Marriage and the Family, 56*(3), 622-632.
- Mardh, P. A., Creatsas, G., Guaschino, S., Hellberg, D., Henry-Suchet, J., & European Chlamydia Epidemiology Group. (2000). Correlation between an early sexual debut, and reproductive health and behavioral factors: A multinational european study. *The European Journal of Contraception & Reproductive Health Care : The Official Journal of the European Society of Contraception, 5*(3), 177-82.
- Mcewan, R. T., Mccallum, A., Bhopal, R. S., & Madhok, R. (1992). Sex and the risk of hiv-infection - the role of alcohol. *British Journal of Addiction, 87*(4), 577-584.
- McNair, L. D., Carter, J. A., & Williams, M. K. (1998). Self-esteem, gender, and alcohol use: Relationships with HIV risk perception and behaviors in college students. *Journal of Sex & Marital Therapy, 24*(1), 29-36.

- Metzler, C. W., Noell, J., Biglan, A., Ary, D., & Smolkowski, K. (1994). The social-context for risky sexual-behavior among adolescents. *Journal of Behavioral Medicine*, 17(4), 419-438.
- Millstein, S. G., & Moscicki, A. B. (1995). Sexually-transmitted disease in female adolescents - effects of psychosocial factors and high-risk behaviors. *Journal of Adolescent Health*, 17(2), 83-90.
- Moore, S., & Rosenthal, D. (1992). The social-context of adolescent sexuality - safe sex implications. *Journal of Adolescence*, 15(4), 415-435.
- Morrison, D. M., Baker, S. A., & Gillmore, M. R. (1994). Sexual risk behavior, knowledge, and condom use among adolescents in juvenile detention. *Journal of Youth and Adolescence*, 23(2), 271-288.
- Moser, A. M., Reggiani, C., & Urbanetz, A. (2007). Risky sexual behavior among university students in health science courses. *Revista Da Associacao Medica Brasileira*, 53(2), 116-121.
- Navratil, M., McGuckin, C., Lewis, C. A., Shevlin, M., & Francis, L. J. (2003). Confirmatory factor analysis of the czech translation of abbreviated form of the revised exsenck personality questionnaire (EPQR-A) among czech students. *Ceskoslovenska Psychologie*, 47(5), 451-459.
- Orr, D. P., Beiter, M., & Ingersoll, G. (1991). Premature sexual-activity as an indicator of psychosocial risk. *Pediatrics*, 87(2), 141-147.
- Petridou, E., Zavitsanos, X., Dessypris, N., Frangakis, C., Mandyla, M., Doxiadis, S., et al. (1997). Adolescents in high-risk trajectory: Clustering of risky behavior and the origins of socioeconomic health differentials. *Preventive Medicine*, 26(2), 215-219.
- Pleck, J. H., Sonenstein, F. L., & Ku, L. C. (1990). Contraceptive attitudes and intention to use condoms in sexually experienced and inexperienced adolescent males. *Journal of Family Issues*, 11(3), 294-312.
- Reitman, D., StLawrence, J. S., Jefferson, K. W., Alleyne, E., Brasfield, T. L., & Shirley, A. (1996). Predictors of african american adolescents' condom use and HIV risk behavior. *Aids Education and Prevention*, 8(6), 499-515.
- Rokeach, M. (1983). A value approach to the prevention and reduction of drug abuse. *NIDA Research Monograph*, 47, 172-94.
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, New Jersey: Princeton University Press.
- Santelli, J. S., Brener, N. D., Lowry, R., Bhatt, A., & Zabin, L. S. (1998). Multiple sexual partners among US adolescents and young adults. *Family Planning Perspectives*, 30(6), 271-275.
- Santelli, J. S., Lowry, R., Brener, N. D., & Robin, L. (2000). The association of sexual behaviors with socioeconomic status, family structure, and race/ethnicity among US adolescents. *American Journal of Public Health*, 90(10), 1582-1588.
- Senf, J. H., & Price, C. Q. (1994). Young-adults, alcohol and condom use - what is the connection. *Journal of Adolescent Health*, 15(3), 238-244.

-
- Sieving, R., Resnick, M. D., Bearinger, L., Remafedi, G., Taylor, B. A., & Harmon, B. (1997). Cognitive and behavioral predictors of sexually transmitted disease risk behavior among sexually active adolescents. *Archives of Pediatrics & Adolescent Medicine*, 151(3), 243-251.
- Sleskova, M., Salonna, F., Geckova, A. M., van Dijk, J. P., & Groothoff, J. W. (2005). Health status among young people in slovakia: Comparisons on the basis of age, gender and education. *Social Science & Medicine*, 61(12), 2521-2527.
- Smith, C. A. (1997). Factors associated with early sexual activity among urban adolescents. *Social Work*, 42(4), 334-346.
- Tapert, S. F., Aarons, G. A., Sedlar, G. R., & Brown, S. A. (2001). Adolescent substance use and sexual risk-taking behavior. *Journal of Adolescent Health*, 28(3), 181-189.
- Tschann, J. M., Adler, N. E., Irwin, C. E., Millstein, S. G., Turner, R. A., & Kegeles, S. M. (1994). Initiation of substance use in early adolescence - the roles of pubertal timing and emotional distress. *Health Psychology*, 13(4), 326-333.
- Tubman, J. G., Windle, M., & Windle, R. C. (1996). The onset and cross-temporal patterning of sexual intercourse in middle adolescence: Prospective relations with behavioral and emotional problems. *Child Development*, 67(2), 327-343.
- Tuinstra, J., Groothoff, J. W., Van den Heuvel, W. J. A., & Post, D. (1998). Socio-economic differences in health risk behavior in adolescence: Do they exist? *Social Science & Medicine*, 47(1), 67-74.
- Wink, P., Ciciolla, L., Dillon, M., & Tracy, A. (2007). Religiousness, spiritual seeking, and personality: Findings from a longitudinal study. *Journal of Personality*, 75(5), 1051-1070.
- Zuckerman, M. (1988). Sensation seeking and behavior disorders. *Archives of General Psychiatry*, 45(5), 502-503.
- Zuckerman, M., & Neeb, M. (1979). Sensation seeking and psychopathology. *Psychiatry Research*, 1(3), 255-264.

Social oriented values are associated with lower levels of sexual risky behaviour

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Submitted

Abstract

There is strong evidence that values play an important role on basic patterns of human behaviour, but evidence still lacks for sexual behaviour. This study examines the relationship between values orientation and sexual behaviour of young adults.

The Rokeach values questionnaire (18 terminal values – desirable end states; 18 instrumental values – desirable modes of conduct) and a questionnaire on sexual behaviour (lifetime number of sexual partners, condom use, sex with an unknown person) were administered to 832 students (355 males; 20.5 years). Six factors were extracted from the Rokeach questionnaire. Logistic regression was performed on students with sexual experience (n=455) using the measures of sexual risk behaviour as outcomes and each of the value factors as separate predictor.

Students with high scores on the value factors Social Orientation (Capable, Clean, Obedient, Polite, Responsible, Honest) and Sense of Fellowship (Broadminded, Helpful, Forgiving) were less likely to report risky sexual behaviour than students with low scores on these value factors.

Considering socially oriented values to be more important is associated with less risky sexual behaviour. Promotion of safe sexual behaviours should comprise health values.

Introduction

Values are strong cognitive, emotionally significant guiding and organising principles in an individual's life, they substantially shape both their current and future health behaviours (Young & West, 2010), and this may also hold for sexual behaviour. Rokeach sees a value system as an enduring organization of beliefs concerning preferable modes or conduct or end-states of existence along a continuum of relative importance (Stronck, 1985).

In correspondence with Rokeach's value system theory it was assumed (Chernoff & Davison, 1999) that people's underlying core values would be relatively (1) stable and enduring, (2) limited in number, and (3) capable of being measured in terms of personal importance.

Several studies have shown that specific value orientations are associated with risky health behaviours (Kristiansen, 1985; Nagel et al., 1995; Foreyt et al., 1997; Chernoff & Davison, 1999; Goodwin et al., 2002; Piko, 2005) with two of these specifically concerning sexual behaviour. However, the labels for the values concerned varied e.g. *Sense of accomplishment*, *Broadminded*, *Independent or Freedom*. Nagel (1995) found that those who did not use tobacco were more concerned with the values *World of peace* and having *Sense of accomplishment*. Such nonusers were also less interested in material comforts, pleasure, and having an exciting life. Foreyt (1997) found that individuals who use tobacco seem to have different value characteristics than do nonusers. Kristiansen (1985) found that smokers gave more priority to being *Broadminded* than non-smokers. Smokers were also more concerned with *Freedom*, being *Independent* and not being *Obedient*, suggesting that smokers' behaviour can be described as flexible or unconstrained. These results suggested that smokers and non-smokers might have different value priorities. Chang (2005) found that smokers and non-smokers differ in personal values: *Hedonic Gratification* values predicted more favourable attitudes towards smoking, and *Idealism* predicted more negative attitudes.

Chernoff & Davison (1999) found that higher risk taking respondents reported significantly different value priorities than did lower risk taking respondents, including a greater priority to the value an *Exciting life*, and a lesser importance to the values *Self-controlled*, *Helpful*, *Honest*, *Loving*, *Equality*, and a *World at peace*. Therefore Chernoff and Davison (1999) suggested that health-endangering behaviour may be positively associated with the values *Risk-taking*, *Impulsivity*, and *Sensation seeking*, and negatively associated with other-oriented values (i.e., *Concern for others*).

The aim of this study is to examine the relationship between value orientation and sexual behaviour of young adults. We expect that participants with more social oriented values will show less sexual risky behaviour than those with less social oriented values.

Methods

Sample and procedure

The sample consisted of 882 first-year students at two universities located in Kosice (230,000 inhabitants) P.J. Safarik University (7,000 students) and the Technical University (12,000 students) who during a compulsory lecture completed a questionnaire concerning health behaviour under the guidance of field workers. Students were recruited via random selection from a list of study groups provided by the faculties concerned and their participation was voluntary. All procedures concerning data collection were explained

to respondents before data collection. The Ethics Committee of the Medical Faculty of the P.J. Safarik University approved this study.

Of the 882 students included, 7 left the room before the beginning and 43 were excluded afterwards because they left major parts of the questionnaire incomplete (altogether 50). A total of 832 responded (94.3%), 355 male and 477 female, aged 19-28 years with 90% of the students aged 19-23 years (mean 20.5; SD 1.4). Out of these, 45.1% studied at the science faculty, 34.8% at the technical faculty and 20.1% at the medical faculty. More than half of the respondents had completed grammar school, and the majority of the students lived in student halls (38.0%) or with their parents (37.1%).

Measures

Sexual behaviour - Regarding sexual behaviour, respondents were first asked if they had had sex (penetration of vagina by the penis) (yes / no). Further questions on sexual behaviour concerned (1) how many sexual partners they had had in their life (3 and less / 4 or more); (2) how often they used condoms (always / almost always, occasionally, never); (3) if they had had sex with an unknown person (yes / no). Those who reported more than 4 sexual partners, inconsistent condom use, and had sex with an unknown partner were reported as having sexual risky behaviour (SRB).

By combining the previous three types of sexual behaviour another four variables were constructed: (1) multiple sexual partners and sex with an unknown person; (2) multiple sexual partners and inconsistent condom use; (3) sex with unknown partner and inconsistent condom use; (4) multiple sexual partners, sex with an unknown person and inconsistent condom use. All four types of combination variables were dichotomized as both apply/none. All other combinations were set at missing for that variable.

Values - Values were measured by Rokeach's Personal Value Survey was used (Rokeach, 1973). The Personal Value Survey includes terminal values, i.e., desired end-states, and instrumental values, i.e., methods used by individuals to achieve desired end-states. The questionnaire includes as terminal values *Comfortable life, Exciting life, Sense of accomplishment, World at peace, World of beauty, Equality, Family security, National security, Freedom, Happiness, Inner harmony, Pleasure, Self-respect, Social recognition, Mature love, Health, True Friendship, and Wisdom*. As instrumental values it includes *Being ambitious, Broad-minded, Capable, Cheerful, Clean, Courageous, Forgiving, Helpful, Honest, Imaginative, Independent, Intellectual, Obedient, Polite, Logical, Loving, Responsible, and Self-controlled*.

The Rokeach questionnaire can be applied in two ways, ipsative in which values are rank-ordered and non-ipsative in which all values are measured independently from each other. In this study the independent way of measuring was used. Participants were asked to rate the importance of each value from terminal and instrumental scale on a 5-point Likert scale, from Not at all important (1) to Maximum important (5).

Statistical analyses

The analyses were limited to the 455 respondents who reported having had sexual intercourse as we were interested in the importance of values regarding risky vs. safe sexual behaviour, but not in the importance of values regarding initiation of sexual behaviour. We first assessed their current sexual behaviour and sexual history by gender. Gender differences were tested using chi-square test. Next, we performed a factor analysis on the Rokeach questionnaire to reduce the number of variables. We omitted variables with Kaiser-Meyer-Olkin (KMO) statistics lower than 0.6 or with communalities lower than 0.4 (McCallum & Peterson, 2012), leading to the elimination of nine items. The resulting KMO measure of sampling adequacy was 0.908, highly above the recommended value of 0.6. Moreover, the diagonals of the anti-image correlation matrix were all over 0.84, supporting the inclusion of each item in the factor analysis. We then could extract six factors with loadings from 0.366 to 0.787. Finally we performed logistic regression analyses using the measures of SRB as outcomes and each of the factors as separate predictor. All statistical analyses were performed using SPSS 15.

Results

Sexual behaviour

Table 5.1 presents information on sexual behaviour separately for males and females. 43% of males versus 31% of females said they had had 4 or more sexual partners in their life; 72% of males versus 81% of females reported inconsistent condom use, and 17% of males versus 10% of females had had sex with an unknown person.

Values

Table 5.2 presents the mean ratings for the 18 terminal and 18 instrumental values. *Family security*, *Mature love*, *Health and Wisdom* were the highest rated terminal values. *World of beauty and Comfortable life* were the lowest rated. Among the instrumental values, *Loving*, *honest and Responsible* were rated highest, whereas *Helpful*, *Ambitious and Forgiving* were among the lowest rated.

Table 5.3 presents the six factors that could be extracted from the items, further denoted on the basis of their contents as Self contentment, Self confidence, Social interest, Sense of fellowship, Concern for society, Self actualization). Factor loadings varied from 0.366 to 0.787.

Table 5.1 Self reported sexual behaviour

		Total % (N)	Male % (N)	Female % (N)	Gender difference (p)
Sexual experience					ns
	yes	62.5 (455)	61.3 (184)	63.3 (271)	
Number of sexual partners					*
	lower risk (3 and less)	63.7 (269)	57.1 (97)	68.3 (172)	
	higher risk (4 and more)	36.0 (152)	42.9 (73)	31.3 (79)	
Condom use					ns
	lower risk (always)	22.7 (100)	24.6 (50)	19.3 (50)	
	higher risk (often, sometimes, never)	77.3 (340)	72.4 (131)	80.7 (209)	
Sex with unknown person					*
	lower risk (no)	87.4 (341)	83.5 (132)	90.1 (209)	
	higher risk (yes)	12.6 (49)	16.5 (26)	9.9 (23)	
Cumulative risk indicators					
Number of partners and unknown partner					
	lower risk	90.1 (314)	87.5 (119)	91.9 (192)	ns
	higher risk	9.9 (34)	12.5 (17)	8.1 (17)	
Number of partners and condom use					ns
	lower risk	69.5 (290)	66.3 (112)	71.8 (178)	
	higher risk	30.5 (127)	33.7 (57)	28.2 (70)	
Sex with unknown partner and condom use					ns
	lower risk	89.7 (323)	86.3 (126)	92.1 (197)	
	higher risk	10.3 (37)	13.6 (20)	7.9 (17)	
Number of partners, condom use and age of first intercourse					ns
	lower risk	89.1 (368)	88.6 (148)	89.4 (220)	
	higher risk	10.9 (45)	11.4 (19)	10.6 (26)	

* $p < .05$; ns = not statistically significant

Table 5.2 Means and standard deviations (SD) for Terminal and Instrumental Values

	mean	SD
Terminal values		
Comfortable life	3.7	0.9
Exciting life	3.8	0.9
Sense of accomplishment	3.9	0.8
World at peace	4.4	0.9
Equality	3.8	0.9
World of beauty	4.2	1.0
Family security	4.6	0.7
Freedom	4.4	0.9
Happiness	4.5	0.7
Inner harmony	4.4	1.0
Mature love	4.6	0.7
National security	4.1	1.0
Pleasure	4.1	0.8
Self-respect	4.1	0.8
Social recognition	3.8	0.9
True friendship	4.6	0.7
Wisdom	4.3	0.7
Health	4.4	0.8
Instrumental values		
Ambitious	3.4	0.9
Broad-minded	3.6	0.9
Capable	3.7	0.8
Cheerful	4.0	1.0
Clean	4.1	0.9
Courageous	3.8	0.8
Forgiving	3.4	0.9
Helpful	3.2	0.9
Honest	4.2	0.9
Imaginative	3.6	0.9
Independent	3.8	1.0
Intellectual	3.9	0.9
Logical	3.7	0.9
Loving	4.4	0.8
Obedient	3.6	0.9
Polite	4.0	0.8
Responsible	4.2	0.8
Self-controlled	3.6	0.9

SD=standard deviation; Participants rated the importance of each value on a 5-point scale, from Not at all important (1) to Extremely important (5). Higher scores indicate higher importance.

Table 5.3 Extracted 6 factors and values loading

Values	Factors					
	F1 Self contentment	F2 Social orientation	F3 Concern for society	F4 Self confidence	F5 Self actualization	F6 Sense of fellowship
Independent					.744	
Intellectual					.784	
Logical					.780	
Freedom					.324	
World of peace			.759			
World of beauty			.758			
Equality			.692			
National security			.539			
Freedom			.366			
Clean		.508				
Capable		.594				
Obedient		.787				
Polite		.655				
Responsible		.554				
Honest		.389				
Broadminded						.634
Helpful						.717
Forgiving						.701
Loving				.573		
Happiness				.555		
Family security				.591		
True friendship				.571		
Mature love				.645		
Freedom				.309		
Self-respect	.658					
Pleasure	.608					
Social recognition	.732					
Health	.563					
Wisdom	.471					
Freedom	.311					
Eigenvalue	7.59	2.19	1.89	1.52	1.14	1.04
Explained variance	28%	8%	7%	6%	4%	4%

Table 5.4 Association of value factors with indicators of sexual risky behaviour

Factors	Indicators of more risky sexual behaviours						
	More than 4 sexual partners	Inconsistent condom use	Sex with an unknown person	More than 4 partners and unknown partner	More than 4 partners and inconsistent condom use	Inconsistent condom use and sex with unknown partner	More than 4 partners, inconsistent condom use and sex with unknown partner
	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)	OR (CI)
F1-Self contentment	ns	ns	ns	ns	ns	ns	ns
F2-Social orientation	0.60 (0.50-0.82)***	ns	0.54(0.38-0.76)***	0.57(0.38-0.85)**	0.66 (0.50-0.85)**	0.41(0.24-0.69)***	0.55(0.35-0.84)**
F3-Concern for society	0.75 (0.60-0.94)***	ns	ns	ns	ns	ns	ns
F4-Self confidence	ns	ns	ns	ns	ns	ns	ns
F5-Self actualization	ns	ns	ns	ns	ns	ns	ns

* $p < .05$, ** $p < .01$, *** $p < .001$; OR = odds ratio; CI = confidence interval; ns = not statistically significant

Values and sexual risky behaviour

Table 5.4 presents the associations of the six value factors with SRB. It shows that the factors Social orientation (*Clean, Capable, Obedient, Polite, Responsible, Honest*) and Sense of fellowship (*Broadminded, Helpful, Forgiving*) have statistically significant associations with SRB. A higher score of Social orientation was significantly associated with less SRB except condom use; and high score in Sense of Fellowship was significantly associated with lower level of SRB except condom use and the number of sexual partners. The factor Concern for society (*World of peace, World of beauty, Equality, National security, Freedom*) was associated with less sexual partners only. In all associations, higher scores on the mentioned factors were associated with lower chances to report SRB. Condom use, explored as a single variable was not significantly associated with any of the factors. However, combined with other SRB it was significantly associated with several value factors.

Discussion

The aim of this study was to examine the relationship between values orientation and sexual behaviour of young adults. We expected that participants with more social oriented values will show less sexual risky behaviour compared with those with less social oriented values. Our results seem to confirm these differences but not regarding all measured values. The most robust associations were found in the Social Orientation factor (*Clean, Capable, Obedient, Polite, Responsible, Honest*) and the Sense of Fellowship factor (*Broadminded, Helpful, Forgiving*). In all significant associations, the higher the importance of particular factors the less sexual risky behaviour.

We found that SRB was inversely related to the factors Social orientation and Sense of fellowship which reflect values focused on the well-being of others. Participants taking a higher risk (number of partners, sex with an unknown person and all cumulative indicators) consistently gave a lower priority to such values, both those reflecting social orientation on a personal level, e.g. *Responsible, Loving and Honest*, and social orientation on a societal level, e.g. *Equality, Justice and a World of peace*. This is consistent with Chernoff & Davison's (1999) finding that the values *Honest, Loving and Helpful* were less important for those who perform a sexual risky behaviour. The reason for the consistently lower preferences for these values might be that people with sexual risky behaviour seem to be less concerned with the well-being of others. This confirms assumptions originally put forward by Morash (1983). Moreover, social-oriented values and beliefs have been associated with higher levels of empathy, moral reasoning and prosocial behaviour (Eisenberg et al., 1995).

We found no differences by sexual behaviour regarding some values for which Chernoff and Davison previously found many differences. Chernoff and Davison (1999) found that college students with high risk levels of SRB reported significantly different value priorities than their lower-risk peers: the high-risk students gave less priority to caution, restrain, self discipline, and

concern for the well-being of others. The authors found that risky sexual behaviour was associated with higher importance of *Exciting life* and less importance of *Self-controlled, Loving and Equality*. We did not find these associations. *Exciting life* even had such weak correlations that it was eliminated from the factor analyses, whereas Chernoff and Davison (1999) claimed that the importance of the value of *Exciting life* might lead to a high probability of sexual risk behaviour. An explanation for this difference may be that we reduced the number of values by factor analysis, which may have yielded more stable findings.

Other studies on the associations between values and health behaviour also showed the importance of social values. Piko (2005) found that a higher health and social value orientation was related to a lower level of smoking, alcohol and drug use, what might be explained by social values protecting young people from risk behaviour. Chang (2005) found that social oriented values such as *Equality, National security and World at peace* were associated with unfavourable attitudes towards smoking behaviour. These findings are consistent with the study of Joireman et al., that young adults with a prosocial value orientation were less likely to report health endangered behaviour (Joireman et al., 2001). However, a recent study by Young and West (2010) found no significant associations between social values and substance use.

Interestingly, the self oriented factors such as *Self contentment, Self confidence and Self actualization* were not significantly related to any sexual risky or safe behaviour in our sample. This contrasts a previous study showing that young adults with intrinsic life goals (e.g., self-acceptance, internal development, friendship and social relationship) tend to report lower frequencies of health risk behaviours (Williams et al., 2000). However, in Chernoff & Davison (1999) study students who gave a high priority to the self-oriented value *Health* reported a similar level of sexual risky or safe behaviour. We may assume that young people who perform risky sexual behaviour did not see their own behaviour as inconsistent with the idea that *Health* is an important value.

Strengths and limitations

This study has several strengths and limitations. We obtained a very high response rate (94%), limiting the likelihood of selection bias, and we included students from a range of studies. We cannot exclude information bias, however, though we did use specific measures to guarantee confidentiality. These measures have been shown to yield valid outcomes. Another limitation of this study beside the self-report nature of data is the cross-sectional design itself, which limits the potential for inferences on causality. It should also be noted that our sample included only adolescents from cities in one region; our findings therefore may not apply to adolescents living in rural areas and should be confirmed by the assessment of other groups of adolescents.

Implications

Our results support the hypothesis that a stronger orientation on social values is associated with less risky sexual behaviour. This may support interventions aiming to promote safe sexual behaviour among adolescents for prevention among adolescents. An example of such an intervention might be value self confrontation (Rokeach, 1973) which has been shown to promote smoking-cessation and weight-reduction (Schwartz & Inbarsaban, 1988).

Our study showed an association between social values and less risky sexual behaviour. More research is needed to explore how types of values models (extrinsic vs. intrinsic values or instrumental vs. terminal values) are associated with other health-related behaviours. Moreover, the stability over time of this association is unclear as well as the causal pathway by which values are associated with health-related behaviours. Apparently, longitudinal studies are most apt to study this.

Conclusion

In conclusion, value orientations seem to be associated with SRB. This may provide new routes for prevention.

References

- Chang, C. C. (2005). Personal values, advertising, and smoking motivation in taiwanese adolescents. *Journal of Health Communication*, 10(7), 621-634.
- Chernoff, R. A., & Davison, G. C. (1999). Values and their relationship to HIV/AIDS risk behavior among late-adolescent and young adult college students. *Cognitive Therapy and Research*, 23(5), 453-468.
- Eisenberg, N., Carlo, G., Murphy, B., & Vancourt, P. (1995). Prosocial development in late adolescence - a longitudinal-study. *Child Development*, 66(4), 1179-1197.
- Foreyt, J. P., Goodrick, G. K., Schaefer, C., Jackson, A. S., Squires, W. G., & Poston, W. S. C. (1997). Personality characteristics of current and former smokeless tobacco users. *American Journal of Health Behavior*, 21(4), 299-309.
- Goodwin, R., Realo, A., Kozlova, A., Luu, L. A. N., & Nizharadze, G. (2002). Values and sexual behaviour in central and eastern europe. *Journal of Health Psychology*, 7(1), 45-56.
- Joireman, J. A., Lasane, T. P., Bennett, J., Richards, D., & Solaimani, S. (2001). Integrating social value orientation and the consideration of future consequences within the extended norm activation model of proenvironmental behaviour. *British Journal of Social Psychology*, 40, 133-155.
- Kristiansen, C. M. (1985). Smoking, health behavior, and values – a replication, refinement, and extension. *Addictive Behaviors*, 10(3), 325-328.

- McCallum, E. B., & Peterson, Z. D. (2012). Investigating the impact of inquiry mode on self-reported sexual behavior: Theoretical considerations and review of the literature. *Journal of Sex Research*, 49(2-3), 212-226.
- Morash, M. (1983). An explanation of juvenile delinquency: The integration of moral-reasoning theory and sociological knowledge. In W. S. Laufer, & J. M. Day (Eds.), *Personality theory, moral development, and criminal behaviour* (pp. 385-409). Lexington: Lexington Books.
- Nagel, L., Mayton, D. M., & Walner, T. (1995). Value differences across tobacco use levels. *Health Values*, 19(6), 39-44.
- Piko, B. F. (2005). Adolescents' health-related behaviors in the light of their value orientations. *Substance use & Misuse*, 40(6), 735-742.
- Rokeach, M. (1973). *The nature of human values*. New York: Free Press.
- Schwartz, S. H., & Inbarsaban, N. (1988). Value self-confrontation as a method to aid in weight-loss. *Journal of Personality and Social Psychology*, 54(3), 396-404.
- Stronck, D. R. (1985). The value-systems of students in a teacher-education program. *Social Indicators Research*, 17(1), 87-95.
- Williams, G. C., Cox, E. M., Hedberg, V. A., & Deci, E. L. (2000). Extrinsic life goals and health-risk behaviors in adolescents. *Journal of Applied Social Psychology*, 30(8), 1756-1771.
- Young, R., & West, P. (2010). Do 'good values' lead to 'good' health-behaviours? longitudinal associations between young people's values and later substance-use. *BMC Public Health*, 10, 165.

Mother's and father's monitoring are more important than parental social support regarding sexual risk behaviour among 15 years old adolescents.

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Abstract

There is strong evidence that parental processes such as monitoring and social support play an important role in regard to sexual risk behaviour among adolescents. We wished to explore the influence of both parents' monitoring and support on sexual risk behaviour among adolescent boys and girls.

Questionnaires concerning sexual risk behaviour, parental support and parental monitoring were administered to 15-year-old students (n=1343; 628 boys; Health Behaviour of School-aged Children 2009/2010). Crude and adjusted logistic regression models were performed using the measures of sexual risk behaviour as outcomes.

Parental monitoring was more strongly associated with sexual risk behaviour than parental social support. In particular, lower monitoring by the father was significantly associated with early first sexual intercourse among girls and with not using condom during last intercourse among boys. Lower monitoring by the mother was associated only with not using condom during last intercourse among boys.

Parental monitoring and parental support may effectively delay the age of first sexual intercourse and increase the frequency of condom use among adolescents. Differences between mothers' and fathers' parenting processes on sexual risk behaviour of adolescents are discussed.

Introduction

Sexual behaviour of adolescents is strongly influenced by parenting practices (Lenciauskiene & Zaborskis, 2008; Scharf & Mayselless, 2008; Coley et al.,

2009; De Graaf et al., 2010; Falk et al., 2010; De Graaf et al., 2011; De Graaf et al., 2012). Sexual risk behaviour (SRB) during this stage of life may affect future life through unintended pregnancies and sexually transmitted infections (STIs). Parenting practices concern a system of interrelated practices like monitoring (e.g., attention, tracking and structuring context), behaviour management (e.g., negotiation, problem solving, limit-setting) and influencing social cognitions (e.g., motivation, values, goals and norms) (Borawski et al., 2003). However, studies which explored the link between parenting practices and sexual activity were often limited to only one parenting practice, such as monitoring (Romer et al., 1999; Stanton et al., 2000; DiClemente et al., 2001). Other important parenting dimensions (e.g., parental support, social cognitions, parental trust) have been explored less frequently despite their potentially important influence (Stattin & Kerr, 2000; Donenberg et al., 2002; De Graaf et al., 2012).

Parental support and parental monitoring are important parenting styles in the model proposed by Maccoby and Martin (1983). Parental support can be characterised by warmth, responsiveness and child-centredness. Monitoring is usually defined as the parents' knowledge of their child's whereabouts. Knowledge of the child's whereabouts does not necessarily require supervision (De Graaf et al., 2011). Some authors claim that this knowledge comes rather from the child's spontaneous disclosure than from active supervision (Stattin & Kerr, 2000), though there is an assumption that these parental practices and children's disclosure influence one another in a reciprocal manner (Kerr et al., 1999).

Most studies have found stricter parental monitoring to be associated with a delay of first sexual intercourse and with consistent contraceptive and condom use as well (DiClemente et al., 2001; Pedersen et al., 2003; Rose et al., 2005; De Graaf et al., 2010). Studies which explored both maternal and paternal monitoring yielded heterogeneous findings. In one Japanese study, intensive mother monitoring was associated with later first sexual intercourse for girls, but no associations were found between father monitoring and the sexual behaviour of both boys and girls (Nagamatsu et al., 2008). In contrast, one study on nine countries found that boys who reported a low level of maternal monitoring were at a higher risk of engaging in early risk behaviour than girls, while low paternal monitoring was associated with early sexual behaviour only for girls (Lenciauskiene & Zaborskis, 2008).

Studies on the association of parental support with sexual behaviour have mostly found that high parental support (warmth, responsiveness and child-centeredness) was associated with a delay of first sexual intercourse (Dittus & Jaccard, 2000; Longmore et al., 2001; Fingerson, 2005; De Graaf et al., 2012). According to one study, these associations seem to be stronger in the youngest age groups (Lammers et al., 2000), while other studies have found that these associations were stronger for girls (Davis & Friel, 2001; McNeely et al., 2002; Nagamatsu et al., 2008). Study of De Graaf et al (2012) shows that low levels of family cohesion precipitates romantic initiation which seems to mediate sexual initiation, but this findings were confirmed only among early adolescent girls. However, results about the associations between parental support and condom use are inconsistent. Talking to the

mother about important things in life was positively associated with more consistent condom use for girls before age 18 (Hutchinson, 2002). Other studies have found that young people are more likely to use contraception if they are more satisfied with their maternal relationship or have a positive communication style with both parents. It has also been found that more satisfaction with the relationship with the mother might delay sexual onset of adolescents (Jaccard et al., 1998). Furthermore, a better quality of relationship with the mother was associated with a later entrance into a sexually romantic relationship among girls. Some other studies have confirmed these associations only for steady partners (Miller et al., 1999), casual partners (Crosby et al., 2002), girls only (De Graaf et al., 2005) or did not find any statistically significant associations at all (Werner-Wilson, 1998).

To sum up: there are indications that both a high level of parental monitoring and support are associated with: (1) a later age of first sexual intercourse (Johnson & Tyler, 2007; Bersamin et al., 2008); (2) more consistent contraceptive use (Coley et al., 2008a; Coley et al., 2008b); (3) more consistent condom use (DiClemente et al., 2001a; DiClemente et al., 2001b; Huebner & Howell, 2003); (4) and lower levels of STIs (De Graaf et al., 2005). However, most of these studies explored parental monitoring and parental support without differentiation between the mother and father. Moreover, parental monitoring and support were mostly explored as single variables. Therefore, information about which of the parents is more/less likely to influence a child's sexual behaviour is rather unclear. Finally, gender-specific information at the child's level about parental monitoring and support is contradictory. Thus, the aim of this study is to explore the relationship between parental monitoring and parental support and sexual risk behaviour among boys and girls.

Methods

Sample and procedure

We used data from the 2009/2010 Health Behaviour of School-aged Children (HBSC) study. The HBSC-study is a World Health Organization collaborative cross-national study in which 43 countries participate and which collects data on 11-, 13-, and 15-year-old boys' and girls' health and well-being, social environments and health behaviours every four years. A similar methodology is used in all countries, including a two-stage sampling of first schools and then students within schools, and the use of standardised questionnaires including an obligatory and an optional part. In general in HBSC, data are collected using classroom-administered self-completed questionnaires in each participating school, with central requirements in terms of sampling, questionnaire items and survey administration being set out in a standardised research protocol. More details can be found on the HBSC website (<http://www.hbsc.org>).

Data were collected through a school-based survey using classroom-administered self-completed questionnaires in each participating school, with central requirements in terms of sampling, questionnaire items and survey administration being set out in a standardised research protocol. The present analyses are based on data gathered from 15-year-old students in Slovakia in May and June of 2010. From a list of schools provided by the Slovak Institute for Education Information and Prognoses, 134 schools were randomly chosen with probabilities proportional to the number of students per school and with stratification per region ($n=8$). If a selected school had more than one class per grade, one of the classes was selected at random. This yielded a randomly composed list of schools to be approached. Schools were then approached according to their rank on the list, until the required number of students was obtained. The sample represents the 15-year-old population of pupils attending schools in Slovakia. We contacted 108 schools, and 106 schools took part in our survey, representing a little over a 98% school response rate. The HBSC protocol requires collecting data from a sample representative for 11, 13 and 15-year-old children. In Slovakia, children usually enter school at the age of 7 years (1st grade). Data were collected in 5 grades to tap advanced as well as held-back children of age 11, 13 and 15 years. Only those aged 15 filled out questions on sexual behaviour. Classes from the 5th to 9th grades were selected randomly, one from each grade per school. We obtained data from 8,491 adolescents from the 5th to 9th grade, representing 79.5% of the original sample of 10,680 youths. Non-response was primarily due to illness (10.3%). In this study we explored only 15-year-old students ($n=1605$) to obtain a higher homogeneity of the sample. From those, 124 were excluded because of missing answers on the sexual intercourse question, and 138 were excluded because of missing answers concerning parental monitoring and parental support. The final sample of 1343 15-year-old adolescents consisted of 628 boys and 715 girls. The urban/rural share in the sample was as follows: 28.5% of the respondents were attending schools located in villages, hamlets or rural areas (less than 3 000 inhabitants), 19.9% in small towns (3 000-15 000 inhabitants), 39.7% in a town (15 000-100 000 inhabitants) and 11.9% in a city (100 000 – 1 000 000 inhabitants).

The study was approved by the Ethics Committee of the Faculty of Medicine at the P.J. Safarik University in Kosice. Parents were informed about the study via the school administration and could opt out if they disagreed. Participation in the study was fully voluntary and confidential, with no explicit incentives provided for participation. Questionnaires were administered by trained research assistants, in the absence of a teacher, during regular class time.

Measures

Sexual risk behaviour – Regarding sexual risk behaviour (SRB) respondents were asked: (1) If they had had sexual intercourse (yes / no); (2) If they used a condom during their last sexual intercourse (yes / no).

Parental monitoring – Parental monitoring was measured by five questions separately for mother and father monitoring (Brown et al., 1993). In the HBSC version each item has a four-point scale ranging from 1 (she/he knows a lot), 2 (she/he knows a little), 3 (she/he does not know anything) to 4 (does not have or see father/mother) (Currie et al., 2012). For each question, the respondents choose the statement that most closely applies to them. Items are listed in Table 6.1.

Parental support – Parental support was measured using six items for both parents separately from the Parental Bonding Instrument (Parker et al., 1979), which was included in the HBSC survey to measure parental support/warmth. Each item has a four-point scale ranging from 1 (almost always), 2 (sometimes), 3 (never) to 4 (does not have or see father/mother). For each question, the respondents choose the statement that most closely applies to them. Items are listed in Table 6.1.

Statistical analyses

First we applied factor analyses on the ten questions concerning parental monitoring and the 12 questions concerning parental support. In order to maximise the explanatory power of the extracted factors, we applied Varimax rotation, i.e., the selection of contributing questions was done in such a way that a maximum of their variance was explained by these factors. For each factor, the eigenvalue indicates the percentage of the variance in all questions accounted for by the factor concerned. Next, we performed logistic regression analyses using the measures of SRB as outcomes and each of the factors as a predictor. We first computed bivariate associations, leading to crude ORs separately for boys and girls. Next, we computed ORs with adjustment for all other parenting variables separately for boys and girls. We used routine statistical procedures which did not account for a potential classroom effects as previous multilevel analyses showed this effect to be negligible for other outcomes (smoking, alcohol, and physical activity) in the same dataset. All statistical analyses were done using SPSS 15.

Results

For parental monitoring, the Kaiser-Meyer-Olkin (KMO) statistic (indicating the appropriateness of the factor analysis on a range of 0-1 with a higher value indicating the factors found to be more appropriate) was 0.835, and the communalities were greater than 0.549 for all variables. The communality of a given variable is an estimate of the percentage of variance of that variable explained by all factors as found. Two interpretable factors were extracted with Eigenvalues of 5.054 and 1.877, which accounted for 69% of the total variance. The two extracted components, items and item loadings of rotated factor matrix are presented in Table 6.1. Component 1, the factor called Father monitoring, contains only questions concerning the father, and component 2, the factor called Mother monitoring, contains only questions concerning the mother; higher scores indicate more monitoring.

For parental support, the Kaiser-Meyer-Olkin (KMO) statistics was 0.858, and the communalities were greater than 0.425 for all variables. Two interpretable factors were extracted with eigenvalues 5.266 and 2.649, which accounted for 66% of the total variance. The two extracted components, items and item loadings of rotated factor matrix are presented in Table 6.1. Component 1, the factor called Father support, contains only questions concerning the father, and component 2, the factor called Mother support, contains only questions concerning the mother; higher scores indicate more support.

Table 6.1 Parental monitoring and parental support – factor analyses

	Component	
	1	2
Parental monitoring		
How much does your mother really know about...?		
who your friends are	.172	.737
how you spend your money	.174	.720
where you are after school	.162	.772
where you go at night	.172	.785
what you do with your free time	.193	.746
How much does your father really know about...?		
who your friends are	.860	.155
how you spend your money	.854	.189
where you are after school	.876	.215
where you go at night	.861	.244
what you do with your free time	.872	.208
Eigenvalue	5.054	1.877
Explained variance	69%	
Parental support		
My mother...		
helps me as much as I need	.092	.764
lets me do the things I like doing	.058	.713
is loving	.113	.778
understands my problems and worries	.153	.784
likes me to make my own decisions	.082	.647
makes me feel better when I am upset	.162	.709
My father....		
helps me as much as I need	.897	.127
lets me do the things I like doing	.880	.110
is loving	.885	.131
understands my problems and worries	.860	.141
likes me to make my own decisions	.833	.102
makes me feel better when I am upset	.840	.155
Eigenvalue	5.266	2.649
Explained variance	66%	

Table 6.2 presents a crude model with associations between parental support, parental monitoring and sexual risk behaviour. Girls who reported lower levels of social support from both mother and father and lower levels of mother and father monitoring were more likely to report having had sexual intercourse. Regarding condom use, a lower level of mother monitoring was associated with no condom use during last sexual intercourse among boys.

Table 6.2 Crude associations between parental support and parental monitoring and sexual experience and condom use by gender: odds ratios and 95% confidence intervals

	Ever had sex – yes		Condom use – no	
	Boys (n=89) OR(CI)	Girls (n=70) OR(CI)	Boys (n=32) OR(CI)	Girls (n=27) OR(CI)
Mother support	1.14(0.94-1.38)	1.48(1.21–1.81)***	1.04(0.77-1.40)	1.14(0.79-1.64)
Father support	1.15(0.93-1.42)	1.38(1.12–1.71)**	1.04(0.71-1.53)	1.28(0.82-1.98)
Mother Monitoring	1.23(1.01-1.50)*	1.52(1.23–1.87)***	1.45(1.01–2.07)*	1.19(0.79-1.79)
Father Monitoring	1.11(0.89-1.39)	1.59(1.28–1.98)***	1.38(0.94-2.04)	1.52(0.96-2.41)

* $p < .05$, ** $p < .01$, *** $p < .001$; OR = odds ratio; CI = confidence interval

Table 6.3 presents the adjusted model for all variables. Lower monitoring from father was significantly associated with early first sexual intercourse among girls and with not using condom during last intercourse among boys. Lower monitoring from mother was associated only with boys not using condom during last intercourse. Social support from either father or mother was not associated with any type of SRB. Compared to the crude model, the effect of social support from either mother or father on the probability of having sex among girls disappeared in the adjusted model. Similarly, the effect of mother monitoring on the probability of having sex in boys as well as in girls disappeared in the adjusted model. On the other hand, the effect of father monitoring on condom use by boys became significant in the adjusted model.

Table 6.3 Adjusted association model for all variables between parental support and parental monitoring and sexual experience and condom use by gender

	Ever had sex – yes		Condom use – no	
	Boys (n=89) OR(CI)	Girls (n=70) OR(CI)	Boys (n=32) OR(CI)	Girls (n=27) OR(CI)
Mother support	1.03(0.82-1.30)	1.21(0.92-1.61)	0.98(0.68-1.42)	1.03(0.66-1.61)
Father support	1.15(0.82-1.62)	0.88(0.60-1.29)	0.57(0.29-1.11)	0.85(0.40-1.80)
Mother Monitoring	1.21(0.96-1.52)	1.32(0.99-1.76)	1.53(1.01-2.34)*	1.15(0.70-1.90)
Father Monitoring	0.99(0.69-1.42)	1.77(1.19-2.65)**	2.14(1.09-4.20)*	1.73(0.80-3.73)

* $p < .05$, ** $p < .01$, *** $p < .001$; OR = odds ratio; CI = confidence interval

Discussion

The aim of this study was to examine the relationship between parental monitoring and parental support from both parents and SRB among boys and girls. We found that both low parental (mother and father) monitoring and support were strongly associated with early onset of sexual behaviour among girls. Moreover, low mother monitoring was associated with early first sexual

behaviour and not using condom during last intercourse among boys. Adjustment for the other parenting variables shows that low father monitoring exerted on girls and boys was associated with early sexual onset and not using condom during last intercourse, respectively. Moreover, low mother monitoring was associated with not using condom during last intercourse among boys. In this adjusted model no associations were found between parental support and SRB.

Role of parental monitoring

A simple reason for the greater influence of parental monitoring in comparison with parental support on SRB might be that if parents with children in this particular age group monitor their whereabouts, the children may simply have fewer opportunities to have sex at an early age. It is often not planned and is thus dependent on having an opportunity to stay together as a couple during the night, etc.

Our results on parental monitoring are in line with previous studies that found high parental monitoring associated with delay of first sexual intercourse and with condom use. However, when we compare our results to studies which explored monitoring separately from mothers and fathers, the story slightly differs. Lenciauskiene and Zaborskis (2008), in a study on nine European countries, found that weak maternal monitoring had a higher impact on boys' early sexual behaviour, while weak paternal monitoring had a higher impact on girls. Our study can confirm that paternal monitoring is important but associated especially with girls' and not with boys' early sexual intercourse. Moreover, maternal monitoring showed very weak or no associations with boys or girls early sexual intercourse. Also, studies by Coley et al. (2009) and by Rodgers (1999) found that a father's parenting (e.g. monitoring) plays an important role in adolescents sexual risk behaviour, especially among girls. However, study by Ramirez-Valles (2002) 40 observed that a father's parenting was strongly associated with timing of first intercourse among boys but not among girls. Like in other countries involved in the HBSC study, Slovak adolescents more frequently find it easy to talk with their mother than with their father, and whereas there are no gender differences in reporting easy communication with the mother, there are more boys than girls reporting easy communication with the father (Currie et al., 2012).

According to ours and previous results we may state that girls in adolescence seem to be more sensitive to monitoring, especially from fathers. Or in other words, parenting, particularly a father's monitoring may be more protective for girls than for boys. There are several possible explanations for such behaviour: (1) girls in regard to their sexual behaviour are more likely than boys' to respond to active parenting (Rodgers, 1999; Ream & Savin-Williams, 2005); (2) differences between parenting and children's behaviour can be explained by girls' greater responsiveness to emotional support and communication with parents (Eisenberg et al., 2008); (3) according to Parke (2002), fathers play a special role in socialising the social facets of the child's functioning and in promoting individuation and differentiation. Moreover, fathers in comparison to mothers seems to be more important in supporting

the sex-types roles of children and teaching the child discipline, autonomy and individuation (Ross, 1977).

Role of parental support

We found that social support was more weakly associated with SRB than has been proposed by other authors (Johnson & Tyler, 2007; Bersamin et al., 2008). However, in the crude model, when both variables (father / mother monitoring / support) were explored separately, our results (mother and father support delay girls' first intercourse) were in line with those of most other studies (Davis & Friel, 2001; Pedersen et al., 2003). But, in the adjusted model mother's and father's support were no longer significantly associated with any type of SRB. This may indicate the central role of parental monitoring regarding SRB, with other factors being mostly associated with monitoring. Nevertheless, it might be assumed that parental support is inevitable for effective parental monitoring in this age group.

Therefore, we support the idea of Grossmann et al. (2002) and Russell & Saebel (1997) that fathers play an especially salient role in promoting the exploratory side of their daughters' development and provide them a safe arena wherein to learn to interact with the other sex. Moreover, it was suggested that girls are assumed to learn feminine behaviours by complementing their father's masculine behaviour (Russell & Saebel, 1997). According to this, the quality of the relationship with the father may serve as a reference to other relationships, including romantic relationships. This was confirmed by Dalton (2006), whose study among college students reported that fathers' parenting was related to the quality of the current relationship with a romantic partner.

Strengths and limitations

This study has several strengths and limitations. The first strength is the size of study sample, which represents different regions in Slovakia. The second is the design of this study, where we separately compare parental support and monitoring with SRB of adolescents. We also should mention that we achieved a very high response rate (79.5%), limiting the likelihood of selection bias. We cannot exclude information bias, however, though we did use specific measures to guarantee confidentiality. These measures have been shown to yield valid outcomes. The main limitation of this study, beside the self-report nature of data, is the cross-sectional design itself, which limits the potential for inferences on causality. In this model we assumed that parental processes preceded sexual behaviour and sexual health, but a reverse pathway could also exist. We also did not include into the explored model any other sociological and psychological variables which may provide an extensive explanation for developing certain sexual behaviour. Exploring these processes and variables provides an opportunity for futures studies. In addition, it seems interesting to explore the moderating effect of support on parental monitoring.

An early age of sexual initiation is considered to be an aspect of sexual

risk behaviour that is very important in adolescence, and it seems to be correlated to others aspects of sexual risky behaviour such as a higher number of sexual partners, inconsistent contraception use, unintended pregnancies, higher rates of STIs and further gynaecological problems (Duncan et al., 1990; Smith 1997; Mardh et al., 2000; Kotchick et al., 2001; Kalina, 2012). Some findings from the grey literature have reported that the mean age of sexual debut in Slovakia is 17.8 years (Durex Network Research Unit 2009), nearly three years later compared to the age of our sample, indicating that our sample represents those more advanced with sexual experience. How much our findings might be applicable to late adolescence needs to be explored further, but some studies indicate an important role of family environment, including parental monitoring and support, on the sexual behaviour of late adolescents (Manlove et al. 2012).

Implications

Adolescents from families with low parental monitoring and support should in particular be the target group for health promotion and prevention programmes. It is important to strengthen a positive family environment as it may be protective against early sexual initiation and risky sexual behaviour. In addition to controlling the child's whereabouts, parents should try to optimise conditions for the child to disclose information about his or her own experiences (Stattin & Kerr, 2000). To know how adolescents feel and think can result in a dialogue that may encourage children to share their lives with parents. Moreover, very little is known about differences in the mother's versus the father's views of their adolescents' sexual behavior, where parents' views may serve as source of new information. A closer focus on parental monitoring seems to be most effective when aiming to reduce adolescent SRB.

Conclusion

Parental monitoring and parental support may effectively delay the age at first sexual intercourse and increase the frequency of condom use among adolescents. Yet parenting by father or mother may have a different degree of effect on the sexual risk behaviour of their children. Seemingly it is parental monitoring, rather than parental support, that influences the sexual behaviour of adolescents. Paternal monitoring affects aspects of sexual behaviour among boys (condom use) different from those in girls (initiation of sexual activity). Presumably the quality of monitoring relies on that of communication (Clark et al., 2008), which is very much related to parental support in terms of warmth, responsiveness and child-centredness. This pathway may explain the differences in the crude and adjusted models, where monitoring is the key variable associated with sexual risk behaviour among adolescents.

References

- Bersamin, M., Todd, M., Fisher, D. A., Hill, D. L., Grube, J. W., & Walker, S. (2008). Parenting practices and adolescent sexual behavior: A longitudinal study. *Journal of Marriage and Family*, 70(1), 97-112.
- Borawski, E., Ievers-Landis, C., Lovegreen, L., & Trapl, E. (2003). Parental monitoring, negotiated unsupervised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health*, 33(2), 60-70.
- Brown, B. B., Mounts, N., Lamborn, S. D., & Steinberg, L. (1993). Parenting practices and peer group affiliation in adolescence. *Child Development*, 64(2), 467-482.
- Clark, D. B., Kirisci, L., Mezzich, A., & Chung, T. (2008). Parental supervision and alcohol use in adolescence: Developmentally specific interactions. *Journal of Developmental and Behavioral Pediatrics*, 29(4), 285-292.
- Coley, R. L., Medeiros, B. L., & Schindler, H. S. (2008a). Using sibling differences to estimate effects of parenting on adolescent sexual risk behaviors. *Journal of Adolescent Health*, 43(2), 133-140.
- Coley, R. L., Votruba-Drzal, E., & Schindler, H. S. (2008b). Trajectories of parenting processes and adolescent substance use: Reciprocal effects. *Journal of Abnormal Child Psychology*, 36(4), 613-625.
- Coley, R. L., Votruba-Drzal, E., & Schindler, H. S. (2009). Fathers' and mothers' parenting predicting and responding to adolescent sexual risk behaviors. *Child Development*, 80(3), 808-827.
- Crosby, R., DiClemente, R., Wingood, G., & Harrington, K. (2002). HIV/STD prevention benefits of living in supportive families: A prospective analysis of high risk african-american female teens. *American Journal of Health Promotion*, 16(3), 142-145.
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., et al. (2012). 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. Copenhagen: WHO Regional Office for Europe.
- Dalton, W. T., Frick-Horbury, D., & Kitzmann, K. M. (2006). Young adults' retrospective reports of parenting by mothers and fathers: Associations with current relationship quality. *Journal of General Psychology*, 133(1), 5-18.
- Davis, E., & Friel, L. (2001). Adolescent sexuality: Disentangling the effects of family structure and family context. *Journal of Marriage and Family*, 63(3), 669-681.
- De Graaf, H., Meijer, S., Poelman, J., & Vanwesenbeeck, I. (2005). Sexual health of young people in the netherlands in the year 2005. Delf, The Netherlands: Eburon.

- De Graaf, H., Vanwesenbeeck, I., Woertman, L., Keijsers, L., Meijer, S., & Meeus, W. (2010). Parental support and knowledge and adolescents' sexual health: Testing two mediational models in a national dutch sample. *Journal of Youth and Adolescence*, 39(2), 189-198.
- De Graaf, H., Vanwesenbeeck, I., Woertman, L., & Meeus, W. (2011). Parenting and adolescents' sexual development in western societies A literature review. *European Psychologist*, 16(1), 21-31.
- De Graaf H., van de Schoot R., Woertman L., Hawk S.T., Meeus W. (2012). Family Cohesion and Romantic and Sexual Initiation: A Three Wave Longitudinal Study. *Journal of Youth and Adolescence*, 41(4):583 -592.
- DiClemente, R. J., Wingood, G. M., Crosby, R., Sionean, C., Cobb, B. K., Harrington, K., et al. (2001). Parental monitoring: Association with adolescents' risk behaviors. *Pediatrics*, 107(6), 1363-1368.
- Dittus, P., & Jaccard, J. (2000). Adolescents' perceptions of maternal disapproval of sex: Relationship to sexual outcomes. *Journal of Adolescent Health*, 26(4), 268-278.
- Donenberg, G., Wilson, H., Emerson, E., & Bryant, F. (2002). Holding the line with a watchful eye: The impact of perceived parental permissiveness and parental monitoring on risky sexual behavior among adolescents in psychiatric care. *Aids Education and Prevention*, 14(2), 138-157.
- Duncan, S.C., Strycker, L.A., Duncan, T.E. (1999). Exploring associations in developmental trends of adolescent substance use and risky sexual behavior in a high-risk population. *Journal of Behavioral Medicine*, 22(2), 21-34.
- Eisenberg, M. E., Neumark-Sztainer, D., Fulkerson, J. A., & Story, M. (2008). Family meals and substance use: Is there a long-term protective association? RID D-8574-2011. *Journal of Adolescent Health*, 43(2), 151-156.
- Falk, G., Ivarsson, A., & Brynhildsen, J. (2010). Teenagers' struggles with contraceptive use - what improvements can be made? *European Journal of Contraception and Reproductive Health Care*, 15(4), 271-279.
- Fingerson, L. (2005). Do mothers' opinions matter in teens' sexual activity? *Journal of Family Issues*, 26(7), 947-974.
- Grossmann, K., Grossmann, K. E., Fremmer-Bombik, E., Kindler, H., Scheuerer-Engelisch, H., & Zimmermann, P. (2002). The uniqueness of the child-father attachment relationship: Fathers' sensitive and challenging play as a pivotal variable in a 16-year longitudinal study. *Social Development*, 11(3), 307-331.
- Huebner, A., & Howell, L. (2003). Examining the relationship between adolescent sexual risk-taking and perceptions of monitoring, communication, and parenting styles. *Journal of Adolescent Health*, 33(2), 71-78.
- Hutchinson, M. (2002). The influence of sexual risk communication between parents and daughters on sexual risk behaviors. *Family Relations*, 51(3), 238-247.

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- Jaccard, J., Dittus, P., & Gordon, V. (1998). Parent-adolescent congruency in reports of adolescent sexual behavior and in communications about sexual behavior. *Child Development*, 69(1), 247-261.
- Johnson, K. A., & Tyler, K. A. (2007). Adolescent sexual onset: An intergenerational analysis. *Journal of Youth and Adolescence*, 36(7), 939-949.
- Kalina O. (2012) Sexual risky behaviour among Slovak adolescents and young adults: social and psychological factors. (PhD thesis University of Groningen).
- Kerr, M., Stattin, H., & Trost, K. (1999). To know you is to trust you: Parents' trust is rooted in child disclosure of information. *Journal of Adolescence*, 22(6), 737-752.
- Kotchick, B.A., Shaffer, A., Forehand, R. (2001). Adolescent sexual risk behavior: A multi-system perspective. *Clinical Psychology Review*, 21(5): 493-519.
- Lammers, C., Ireland, M., Resnick, M., & Blum, R. (2000). Influences on adolescents' decision to postpone onset of sexual intercourse: A survival analysis of virginity among youths aged 13 to 18 years. *Journal of Adolescent Health*, 26(1), 42-48.
- Lenciauskiene, I., & Zaborskis, A. (2008). The effects of family structure, parent-child relationship and parental monitoring on early sexual behaviour among adolescents in nine European countries. *Scandinavian Journal of Public Health*, 36(6), 607-618.
- Longmore, M., Manning, W., & Giordano, P. (2001). Preadolescent parenting strategies and teens' dating and sexual initiation: A longitudinal analysis. *Journal of Marriage and Family*, 63(2), 322-335.
- Maccoby, E., & Martin, J. (1983). Socialization in the context of the family. parent-child interaction. In E. M. Hetherington (Ed.), *Handbook of child psychology* (pp. 1-101). New York: Wiley.
- Mardh, P.A., Creatas, G., Guaschino, S. (2000). Correlation between an early sexual debut, and reproductive health and behavioral factors: a multinational European study. *European Journal of Contraception and Reproductive Health Care*, 5(4), 177-82.
- McNeely, C., Shew, M., Beuhring, T., Sieving, R., Miller, B., & Blum, R. (2002). Mothers' influence on the timing of first sex among 14-and 15-year-olds. *Journal of Adolescent Health*, 31(3), 256-265.
- Miller, K., Forehand, R., & Kotchick, B. (1999). Adolescent sexual behavior in two ethnic minority samples: The role of family variables. *Journal of Marriage and the Family*, 61(1), 85-98.
- Nagamatsu, M., Saito, H., & Sato, T. (2008). Factors associated with gender differences in parent-adolescent relationships that delay first intercourse in Japan. *Journal of School Health*, 78(11), 601-606.
- Parke, R. (2002). Substance-abusing fathers: Descriptive, process and methodological perspectives. *Addiction*, 97(9), 1118-1119.

- Parker, G., Tupling, H., & Brown, L. B. (1979). Parental bonding instrument. *British Journal of Medical Psychology*, 52(MAR), 1-10.
- Pedersen, W., Samuelsen, S., & Wichstrom, L. (2003). Intercourse debut age: Poor resources, problem behavior, or romantic appeal? A population-based longitudinal study. *Journal of Sex Research*, 40(4), 333-345.
- Ramirez-Valles, J., Zimmerman, M. A., & Juarez, L. (2002). Gender differences of neighborhood and social control processes - A study of the timing of first intercourse among low-achieving, urban, african american youth. *Youth & Society*, 33(3), 418-441.
- Ream, G. L., & Savin-Williams, R. C. (2005). Reciprocal associations between adolescent sexual activity and quality of youth-parent interactions. *Journal of Family Psychology*, 19(2), 171-179.
- Rodgers, K. B. (1999). Parenting processes related to sexual risk-taking behaviors of adolescent males and females. *Journal of Marriage and the Family*, 61(1), 99-109.
- Romer, D., Stanton, B., Galbraith, J., Feigelman, S., Black, M., & Li, X. (1999). Parental influence on adolescent sexual behavior in high-poverty settings. *Archives of Pediatrics & Adolescent Medicine*, 153(10), 1055-1062.
- Rose, A., Koo, H., Bhaskar, B., Anderson, K., White, G., & Jenkins, R. (2005). The influence of primary caregivers on the sexual behavior of early adolescents. *Journal of Adolescent Health*, 37(2), 135-144.
- Ross, J. M. (1977). Toward fatherhood: The epigenesis of paternal identity during a boy's first decade. *International Review of Psychoanalysis*, (4), 327-347.
- Russell, A., & Saebel, J. (1997). Mother-son, mother-daughter, father-son, and father-daughter: Are they distinct relationships? *Developmental Review*, 17(2), 111-147.
- Scharf, M., & Maysless, O. (2008). Late adolescent girls' relationships with parents and romantic partner: The distinct role of mothers and fathers. *Journal of Adolescence*, 31(6), 837-855.
- Smith, C.A. (1997). Factors associated with early sexual activity among urban adolescents. *Social Work*, 42(5), 334-346.
- Stanton, B., Li, X., Galbraith, J., Cornick, G., Feigelman, S., Kaljee, L., et al. (2000). Parental underestimates of adolescent risk behavior: A randomized, controlled trial of a parental monitoring intervention. *Journal of Adolescent Health*, 26(1), 18-26.
- Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development*, 71(4), 1072-1085.
- Werner-Wilson, R. (1998). Gender differences in adolescent sexual attitudes: The influence of individual and family factors. *Adolescence*, 33(131), 519-531.

Psychosocial factors associated with sexual behaviour in early adolescence

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Abstract

To compare the psychosocial characteristics of sexually inexperienced adolescents with those of youths who had had sex, whether safe or unsafe.

We gathered information on self-esteem, well-being, social support, family structure, educational aspiration, parental education and sexual behaviour of 2318 adolescents (mean-age 14.3 years) attending elementary school in Slovakia. Those who reported having had first sex after a relationship shorter than one month, who reported sex after alcohol consumption, who had had four or more sexual partners or who inconsistently used a condom were considered to have engaged in unsafe sex.

Respondents who were younger, female, reported living in an intact family or having a higher level of social support from family were more likely to still be virgins. Adolescents who had sex, whether safe or unsafe, had similar psychosocial characteristics. Those who reported a higher level of positive self-esteem or social support from friends, but a lower level of well-being, social support from family or educational aspiration were more likely to engage in unsafe sex.

Psychosocial features of adolescents who reported having had unsafe sex were similar to those of adolescents who had had safe sex but differed from the characteristics of adolescents who reported not to have started sexual activity.

Introduction

Adolescents often have little knowledge of sexually transmitted infections (STIs), use condoms or other contraceptives inconsistently when having sex, and may have multiple sexual partners over a short period of time, thus exposing themselves to an increased risk of STI and unintended pregnancy (Centers for Disease Control and Prevention (CDC), 2006; Avery & Lazdane,

2008). Sexual risk behaviour (SRB) tends to cumulate with other forms of health risk behaviour like the use of alcohol or drugs (Leigh, 2002; Dye & Upchurch, 2006). Finally, psychosocial factors like self-esteem, well-being, religiousness, social support and family structure have been shown to be associated with sexual behaviour, but evidence regarding this from Central Europe is scarce, with the exception of prevalence data (Vazsonyi et al., 2006; Vukovic & Bjegovic, 2007; Kalina et al., 2009). According to the Health Behaviour of School-aged Children (HBSC) report 2005/2006, in Slovakia, 11% of girls and 13% of boys aged 15 years reported having had sex as compared to averages of 24% for girls and 30% for boys across all countries that participate in the HBSC study (Gabhainn et al., 2009). Studies comparing adolescents with and without sexual experience in terms of psychosocial factors are also lacking.

From health behaviour theories, including the Social Cognitive Theory (Bandura, 1986) and the Theory of Planned Behaviour (Ajzen, 1987), possible mechanisms can be derived by which self-esteem may affect sexual risk behaviour, both directly and mediated through substance use. These theories suggest that problem behaviours, including both substance use and sexual risk, are determined by dynamic and reciprocal interactions with personality characteristics (such as self-esteem) and environmental factors (such as societal expectations). However, self-esteem should be seen not only as a single factor but also in the framework of a multidimensional theory, considering its connection with other factors as well. *Positive self-esteem* could be seen as an essential feature of mental health and also as a protective factor in the field of health and social behaviour. In contrast, *negative self-esteem* could play an important role in the development of a range of mental disorders and social problems, such as depression, anxiety, violence, high-risk behaviours and substance use (Mann et al., 2004).

Self-esteem plays an important role in risk-taking behaviour; this may also apply to SRB, but evidence regarding this is still inconclusive (Goodson & Buhi, 2007). Several studies (Davies et al., 2003; Lejuez et al., 2004; Preston et al., 2004) support the link between low self-esteem and SRB (e.g., early sexual intercourse, inconsistent contraceptive and condom use) and the latter's possible consequences such as unwanted pregnancy and STI. Lejuez et al. (2004) reported that low self-esteem was related to risky sexual behaviour in a sample of adults participating in a residential drug-treatment programme. Preston et al. (2004) found that low self-esteem predicted SRB in a sample of rural men. Magnani et al. (2001) conducted a large cross-sectional study of adolescents in Peru, and reported that low self-esteem predicted both early onset of sexual activity and unprotected sex. Wild et al. (2004) found on the basis of a large cross-sectional sample of South African adolescents that low self-esteem was related to a number of risky behaviours, including unprotected sex.

In general, it seems that high self-esteem is positively associated with less risky sexual behaviour. However, Spencer et al. (2002) found that the probability of having sex was linked with high self-esteem in boys but with low self-esteem in girls, though in a study by Paul et al. (2000) girls with higher self-esteem were likely to have had early first sexual intercourse.

It has been hypothesised that other factors, such as educational aspiration level and psychological well-being, are associated with (sexual) risk behaviour, but the evidence is incomplete. A higher aspiration level has mostly been shown to be associated with less SRB (Bonell et al., 2005), but the few studies which have examined the association between attitude to school and teenage pregnancy have provided inconsistent findings (Mott et al., 1996). Some studies demonstrate the important roles of certain psychological factors, particularly stress, anxiety and depressive mood, on adolescents' health risk behaviour (Callas et al., 2004; Klavs et al., 2005). If mental health is a positive attribute for health in general, then mental health promotion might contribute much to adolescent health in general.

Parents and family composition play a crucial role in defining the normative behaviour of children (Aspy et al., 2007). Parents are important role models for their children, who tend to develop similar behaviours. Living with at least one parent serves a protective role; living with both parents protects adolescents from engaging in SRB even more so (Metzler et al., 1994). According to Klavs et al. (2006), not living with both parents up to the age of 15 is a factor associated with early sexual intercourse. Devine et al. (1993) found that parental divorce during early adolescence was a significant predictor of SRB for girls in later adolescence. However, Langille et al. (2003) did not observe any significant associations between family composition and sexual behaviours, except between living with both parents and contraception use.

Our study aimed at comparing psychological and social characteristics of sexually inexperienced adolescents with those of youths who had had sex, whether safe or unsafe.

Methods

Sample and procedure

We gathered data on adolescents in the 8th and 9th grades of elementary schools representing the entire Slovak Republic. Schools were selected from the major cities of Bratislava (around 425,000 inhabitants, Western Slovakia), Zilina (around 157,000 inhabitants, Northern Slovakia) and Kosice (around 240,000 inhabitants, Eastern Slovakia) and from smaller cities (20,000–40,000 inhabitants) in the eastern region of Slovakia. The Ethics Committee of the Medical Faculty of the P.J. Safarik University approved this survey. The study sample consisted of 3725 adolescents (response rate: 93.5%) aged 11–17 years (mean age 14.3 years, SD 0.65), of whom 49% were boys. Non-response was due to absence for illness or another reason. To make the sample more homogeneous and to avoid the influence of age extremes, we limited our analyses to students aged 13–16 years with complete data on SRB and psychosocial factors. This reduced the study sample to 2318 students (mean age 14.3 years, SD 0.62). One quarter (23.8%) of the sample came from Bratislava, 15.8% from Zilina, 31.4% from

Kosice, and 29.0% from other eastern region cities.

The schools and classes were selected randomly in each region. Directors of the schools were asked for participation. After their approval and that of parents was obtained, a team of trained researchers and research assistants collected the data between October and December 2006. The questionnaires were administered in the Slovak language during two consecutive regular 45-minute lessons (90 minutes in total), on a voluntary basis, without identifying data, and in the absence of teachers. We did not gather any information about names or addresses, and pupils could opt out any time. This was explained to them verbally and was also described in the introduction to the questionnaire.

Measures

Outcome variables

Regarding sexual behaviour and SRB, respondents were asked: (1) if they had ever had coitus (penetration of the vagina by the penis); (2) about the length of the relationship before first sex (less than a day/less than a month/less than 12 months/more than one year), (3) if they had had sex under the influence of alcohol (yes/no); (4) how many sexual partners they had had in their life (number of partners); (5) whether they used condoms during their most recent intercourse (yes/no). Risky sexual behaviour was defined as: (a) having first sex after a relationship shorter than one month, (b) having sex after alcohol consumption, (c) having had four or more sexual partners, or (d) not using condoms during the most recent last intercourse. Next, the outcome variable categories (having no sex, having safe sex and having unsafe sex) were constructed through a combination of the previous items. Those who reported behaving riskily in at least one aspect were considered to have had unsafe sex.

Psychological factors

Self-esteem was assessed by means of the Rosenberg self-esteem scale (Rosenberg, 1965). A forward-backward translated and psychometrically evaluated Slovak version of the questionnaire was used (Sarkova et al., 2006a; Halama, 2008). The scale consists of ten items (five positive and five negative ones) that form scales of positive self-esteem and negative self-esteem. Each item has a four-point scale ranging from 'strongly agree' to 'strongly disagree'. For each question, the respondents choose the statement that most closely applies to them. The sum score for the negative and positive scale of self-esteem varies from 5–20. A higher score on the positive scale indicates higher positive self-esteem and on the negative scale a higher negative SE. In our data Cronbach's alpha was 0.74 for the positive self-esteem subscale and 0.65 for the negative self-esteem subscale.

Psychological well-being was measured with the shortened 12-item version of the General Health Questionnaire (GHQ-12) (Goldberg & Hillier, 1979). A forward-backward translated and psychometrically evaluated

Slovak version of the questionnaire was employed (Sarkova et al., 2006a). The separate items focus on various aspects of respondents' psychological dispositions, for example, problems with sleep, strain, happiness or stress. The questions compare how the respondents' present state differs from their usual state. In this study two dimensions of the GHQ-12 were used according to Sarkova et al. (2006b), namely, the anxiety/depression and problems in social functioning domains. The GHQ-12 was scored using a four-point Likert scale (0, 1, 2, 3), with sum scores for both domains anxiety/depression and problems in social functioning ranging from 0–18 for each domain. A higher score means lower psychological well-being. In our data Cronbach's alpha was 0.82 for anxiety/depression and 0.60 for problems in social functioning.

Regarding *educational aspiration*, participants were asked what kind of school they wished to complete (university/secondary or elementary).

Social factors

Family structure. Respondents were asked (1) whether their parents were divorced (yes/no) and (2) whether their family was complete (living with mother or stepmother and father or stepfather in one household: yes/no). Those who stated that their parents were divorced ($n = 465$) or that they were living with one parent only ($n = 345$) were categorised as belonging to broken-up families.

Education level of parents. Regarding parental educational background, respondents were asked (1) about their mother's highest achieved level of education (elementary or apprentice/secondary/university) and (2) their father's highest achieved level of education (elementary or apprentice/secondary/university). These two variables were joined into one: the highest parental (mother or father) education level (elementary or apprentice/secondary/university).

Social support. This was measured using the revised 12-item Perceived Social Support Scale (Blumenthal et al., 1987). The questionnaire contains 12 items employing a five-point Likert-type format (1 = strongly disagree; 5 = strongly agree). The developers distinguish three sources of perceived support, namely, from family, friends, and important others. A higher score on all three scales indicates higher social support. In our data, Cronbach's alpha was 0.92 for perceived support from family, 0.91 from friends, and 0.85 from important others.

Statistical analysis

First, we analysed the sexual experience and type of sexual experience for all 2318 respondents. Gender differences were tested by means of chi-square tests and t-tests (Table 7.1). Multinomial logistic regression was used to assess the association of predictor variables (psychological and social factors) with sexual risk behaviour (no sex, safe sex, and unsafe sex). Having had no sex was used as the reference category. We did not find any statistically significant interactions of variables by gender in multinomial regression, and

hence excluded these interactions from the model. This regression resulted in odds ratios for the degree to which both remaining categories, unsafe sex and safe sex, were more or less likely than having had no sex, for adolescents in a given category of the psychological and social factors. We first assessed the crude effects for each predictor variable, and then the multivariate effects were adjusted for the effects of all other predictor variables. All analyses were performed with the SPSS 15.0 package.

Table 7.1 Descriptive statistics for sexual behavior and psychosocial factors tested by gender

	Boys (n=1038)		Girls (n= 1280)		p-value
	n	%	n	%	
Kind of sexual intercourse					
No	907	87.4	1187	92.7	<0.001 ^b
Safe	31	3.0	19	1.5	
Unsafe	100	9.6	74	5.8	
Aspiration level					
Low	367	35.4	355	27.7	<0.001 ^b
	Mean	SD	Mean	SD	
Positive self-esteem[#]	15.56	2.19	14.64	2.40	<0.001 ^a
Negative self-esteem[#]	11.45	2.73	12.71	2.80	<0.001 ^a
Anxiety/depression[#]	10.73	3.95	12.82	4.28	<0.001 ^a
Problems in social functioning[#]	11.44	2.37	12.03	2.66	<0.001 ^a
Social support from family[#]	21.52	5.40	22.08	5.39	<0.01 ^a
Social support from friends[#]	20.43	5.41	23.10	4.91	<0.001 ^a
Social support from others[#]	21.98	5.35	23.51	4.62	<0.001 ^a
	n	%	n	%	
Family structure					
Broken up	234	22.5	316	24.7	ns
Parental education					<0.001 ^b
High	492	47.4	512	40.0	
Middle	469	45.2	620	48.4	
Low	77	7.4	148	11.6	

^a Independent sample t-test; ^b Pearson chi-square; SD: standard deviation; ns: not significant; [#]higher score = higher level of positive self-esteem, higher level of negative self-esteem, lower level of psychological well-being (either anxiety/depression or problems in social functioning), higher level of social support.

Results

Of the 224 respondents who had had sex:

- 76 (33.9%) reported having had sex for the first time after a relationship of less than one month duration,
- 108 (48.2%) stated they had had sex after consumption of alcohol,
- 44 (19.6%) had had four or more sexual partners, and
- 84 (37.5%) had not used condoms at their most recent last intercourse.

We found significant gender differences in all of the study variables, except family structure (Table 7.1). Males in comparison to females were older and had more frequently experienced coitus. They reported a higher level of self-esteem (higher level of positive self-esteem, lower level of

negative self-esteem), a higher level of psychological well-being (lower anxiety/depression, fewer problems in social functioning) and, more frequently, a low educational aspiration level. Moreover, they reported a higher educational level of their parents and less social support from family, friends and important others.

Table 7.2 shows the crude associations of psychological and social factors with unsafe sex or safe sex compared to no sex, which was the reference category. Respondents who were younger, female, or reported living in an intact family were more likely to still be virgins. Those who reported lower well-being (anxiety/depression or problems in social functioning), or a lower level of social support from family were more likely to have had unsafe sex.

Table 7.3 shows the mutually adjusted associations of psychological and social factors with unsafe or safe sex compared to the no-sex category. Respondents who were younger, female, reported living in an intact family or having greater social support from their family were more likely to still be virgins. Those who reported a higher level of positive self-esteem or social support from friends, but a lower level of well-being (anxiety/depression), social support from their family or low educational aspiration were more likely to be engaged in unsafe sexual behaviour. Differences between the reference category and the unsafe and safe sex categories group were greatest for family structure, family social support and educational aspiration level. Adolescents reporting less social support from their family were more likely to behave unsafely compared to the no-sex category; however, the difference between the reference category and the unsafe and safe sex categories increased when adjusted for the effects of the other variables. We also tested the differences between the unsafe and the safe group, but the outcome was not significant (not presented in the table).

Discussion

We found that family structure and social support from the family discriminate between adolescents who *have had* sex (either unsafe or safe) and adolescents who *have not*, but that these variables *do not* discriminate between adolescents who have had *unsafe sex* and those who have had *safe sex*. Those who reported living in an intact family and receiving higher social support from their family were more likely not to have had sexual intercourse. Regarding psychological factors, we found that a higher likelihood of having had unsafe sex was associated with a higher level of positive self-esteem, a higher level of anxiety/depression, and a low educational aspiration level. With regard to social factors, we found that a higher likelihood of having had unsafe sex was associated with a higher level of social support from friends.

Some studies indicate that high levels of self-esteem are protective against several types of sexual risk behaviours (Ethier et al., 2006; Gullette & Lyons, 2006). In most of these studies self-esteem was measured by means of the global self-esteem scale (Rosenberg, 1965). However, in our study we

Table 7.2 Crude associations of psychological and social factors with risky and safe sex, compared to no sex as reference category

Variable	Unsafe sex n=174		Safe sex n=50		No sex N=2094		P ^a
	n	OR (95% CI)	n	OR (95% CI)	n	OR	
Age		2.19 (1.69-2.84)		2.10 (1.32-3.34)			<0.001
Gender							<0.001
Females	74	1	19	1	1187	1	
Males	100	1.77(1.29-2.42)	31	2.16 (1.20-3.80)	907	1	
Positive self-esteem [#]		1.04 (0.98-1.11)		1.08 (0.96-1.23)		1	ns
Negative self-esteem [#]		1.03 (0.97-1.09)		0.99 (0.89-1.09)		1	ns
Anxiety/depression [#]		1.05 (1.02-1.09)		1.01 (0.95-1.08)		1	<0.05
Problems in social functioning [#]		1.06 (1.00-1.13)		0.94 (0.84-1.06)		1	<0.05
Aspiration level							<0.001
Low	80	1	20	1	622	1	
High (university)	94	0.50 (0.36-0.68)	30	0.63 (0.36-1.13)	1472	1	
Social support from family [#]		0.96 (0.93-0.98)		0.96 (0.91-1.00)		1	<0.01
Social support from friends [#]		1.02 (0.93-0.98)		0.99 (0.94-1.05)		1	ns
Social support from others [#]		1.00 (0.97-1.03)		0.98 (0.93-1.03)		1	ns
Family structure							<0.001
Incomplete	70	1	36	1	437	1	
Complete	104	0.42 (0.30-0.58)	79	0.59 (0.39-0.89)	1621	1	
Parental education							ns
Elementary	17	1	5	1	203	1	
Secondary	91	1.12 (0.65-1.92)	29	1.22 (0.47-3.18)	969	1	
University	66	0.86 (0.49-1.49)	16	0.71 (0.26-1.95)	922	1	

^ap-value for inclusion of the variable in the model; ns: not significant; Statistically significant odds ratios ($p < 0.05$) are in bold; OR: odds ratio; CI: confidence interval; [#]higher score - higher level of positive self-esteem, higher level of negative self-esteem, lower level of psychological well-being (either anxiety/depression or problems in social functioning), higher level of social support.

Table 7.3 Mutually adjusted associations of psychological and social factors with risky and safe sex, compared to no sex as reference category. The associations of psychological and social factors after putting them in one model

Variable	Risky sex N=135		Safe sex N=115		No sex N=2058		P ^a
	n	OR (95% CI)	n	OR (95% CI)	n	OR	
Age		1.87 (1.43-2.45)		1.85 (1.15-2.96)			<0.001
Gender							<0.001
	Females	74	1	19	1	1187	1
	Males	100	2.19 (1.52-3.15)	31	2.33 (1.22-4.48)	907	1
Positive self-esteem [#]					1.10 (0.95-1.28)		1
Negative self-esteem [#]		0.99 (0.92-1.06)		0.98 (0.86-1.11)		1	ns
Anxiety/depression [#]		1.07 (1.02-1.12)		1.07 (0.98-1.16)		1	<0.05
Problems in social functioning [#]		1.03 (0.96-1.11)		0.92 (0.81-1.04)		1	ns
Aspiration level							<0.01
	Low	80	1	20	1	622	1
	High (university)	94	0.56 (0.40-0.79)	30	0.82 (0.44-1.50)	1472	1
Social support from family [#]			0.93 (0.89-0.97)		0.93 (0.87-0.99)		1
Social support from friends [#]			1.08 (1.02-1.14)		1.05 (0.96-1.15)		1
Social support from others [#]			1.01 (0.96-1.07)		1.00 (0.91-1.10)		1
Family structure							<0.001
	Broken up	70	1	36	1	437	1
	Complete	104	0.45 (0.32-0.62)	79	0.43 (0.24-0.77)	1621	1
Parental education							ns
	Elementary	17	1	5	1	203	1
	Secondary	91	1.30 (0.73-2.29)	29	1.33 (0.49-3.60)	969	1
	University	66	1.14 (0.62-2.08)	16	0.80 (0.27-2.37)	922	1

^ap-value for inclusion of the variable in the model; ns: not significant; Statistically significant odds ratios ($p < 0.05$) are in bold; OR: odds ratio; CI: confidence interval; #higher score - higher level of positive self-esteem, higher level of negative self-esteem, lower level of psychological well-being (either anxiety/depression or problems in social functioning), higher level of social support.

used both a positive and a negative subscale of self-esteem, and found that adolescents reporting high levels of positive self-esteem are more likely to engage in risky sexual practices (rather than not to engage in sex) compared with those with low levels of positive self-esteem. These findings are partially in line with those of Spencer et al. (2002) and Paul et al. (2000), which indicated that higher scores of self-esteem were associated with more sexual activity among boys and girls. However, these studies resorted to a single global scale for self-esteem that differs from the subscales we used. Moreover, in our study negative self-esteem was not associated with any type of sexual behaviour. Therefore, we may suppose that a positive perception of one's self brings more confidence into sexual initiation. After this initiation, positive self-esteem is not further associated with either a safe or a risky sexual behaviour.

As we had done for self-esteem we used two separate subscales – instead of one general (global) scale – for measuring psychological well-being. This approach revealed that only high levels of depression/anxiety are associated with a higher probability of SRB compared with having no sex, whereas the problems in the social functioning factor remains insignificant. This is partially in line with the findings of Mazzaferro et al. (2006), who observed that adolescent girls with high levels of depression were more likely to report SRB. According to these authors (Mazzaferro et al., 2006) adolescent girls are more vulnerable to psychosocial risk factors than young adults, this vulnerability being possibly associated with psychosocial skills which are not yet sufficiently developed at this age.

Respondents who plan to study at the university are less likely to have sexual intercourse, which is in line with the findings of studies that explored the role of educational aspiration and teenage pregnancy (Bonell et al., 2005). Only girls were studied; the role of educational aspiration among males was not investigated. In this relationship the role of parental educational background may also play a role. However, in our study, adolescents' sexual behaviour was not linked to the education levels of their parents. This is in contrast to studies by Carvajal et al. (1999) and Santelli et al. (2000), which showed higher education of parents to be a factor associated with a lower likelihood of having had sexual intercourse.

We found that those who reported living in a divorced or broken-up family were more likely to have had sex, either safe or unsafe. This finding is consistent with previous research of Santelli et al. (2000) but not with that of Vukovic et al. (2007). The latter authors concluded that family structure was not related to having been sexually active, but only to sexual risk behaviour.

Social support by the family and support from friends played different roles. While youths who report much family support are less likely to initiate sexual activity, those with greater support from their friends are more likely to have had sex. Also Mazzaferro et al. (2006) had shown that deficient social support is associated with SRB. However, in their study social support was scored as one factor; it was not specified by whom the social support was provided. From our results we may conclude that in this age group the specific sources of social support are quite important, as behaviours differ depending on the source.

Strengths and limitations

This study has several strengths and limitations. We obtained a very high response rate (94%), by using the setting of lectures, so that selection bias is very unlikely to have occurred. Moreover, the research sample, covering all regions of the country and focusing on adolescents, provides useful information concerning sexual behaviour at an early age, and its links with psychosocial factors. However, although we did use specific measures to guarantee confidentiality, we cannot rule out information bias. The main limitation of this study, in addition to the self-reported nature of the data, is its cross-sectional design which limits the potential for inferences on causality. It should also be noted that our sample included only adolescents from cities. Our findings therefore may not apply to adolescents living in rural areas and should be confirmed by the assessment of other groups of adolescents. As we focus on young teenagers, the number of those who had had sex is relatively small, which could limit the significance of our study as well.

Implications

Our results show that adolescents' sexual behaviour is very sensitive to their psychosocial environment. According to our results, adolescents with safe and risky sexual practices do not differ with respect to psychosocial factors. In addition to sexual education highlighting the need for consistent use of condoms, avoidance of STIs, and desirability of lasting relationships, prevention should also address psychosocial influences. Further research is needed on the role of psychological well-being and, in particular, on that of negative/positive self-esteem. It seems that the use of two separate indicators instead of one gives a better explanation of the association between psychological well-being, self-esteem and the patterns of sexual behaviour. This may greatly contribute to the prevention of sexual risk behaviour and thus be of benefit to public health.

References

- Ajzen, I. (1987). Attitudes, traits, and actions - dispositional prediction of behavior in personality and social-psychology. *Advances in Experimental Social Psychology*, 20, 1-63.
- Aspy, C. B., Vesely, S. K., Oman, R. F., Rodine, S., Marshall, L., & McLeroy, K. (2007). Parental communication and youth sexual behaviour. *Journal of Adolescence*, 30(3), 449-466.
- Avery, L., & Lazdane, G. (2008). What do we know about sexual and reproductive health of adolescents in europe? *European Journal of Contraception and Reproductive Health Care*, 13(1), 58-70.
- Bandura, A. (1986). The explanatory and predictive scope of self-efficacy theory. *Journal of Social and Clinical Psychology*, 4(3), 359-373.

Blumenthal, J. A., Burg, M. M., Barefoot, J., Williams, R. B., Haney, T., & Zimet, G. (1987). Social support, type-a behavior, and coronary-artery disease. *Psychosomatic Medicine*, 49(4), 331-340.

Bonell, C., Allen, E., Strange, V., Copas, A., Oakley, A., Stephenson, J., et al. (2005). The effect of dislike of school on risk of teenage pregnancy: Testing of hypotheses using longitudinal data from a randomised trial of sex education. *Journal of Epidemiology and Community Health*, 59(3), 223-230.

Callas, P. W., Flynn, B. S., & Worden, J. K. (2004). Potentially modifiable psychosocial factors associated with alcohol use during early adolescence. *Addictive Behaviors*, 29(8), 1503-1515.

Carvajal, S. C., Parcel, G. S., Basen-Engquist, K., Banspach, S. W., Coyle, K. K., Kirby, D., et al. (1999). Psychosocial predictors of delay of first sexual intercourse by adolescents. *Health Psychology*, 18(5), 443-452.

Centers for Disease Control and Prevention (CDC). (2006). Trends in HIV-related risk behaviors among high school students--united states, 1991-2005. *MMWR.Morbidity and Mortality Weekly Report*, 55(31), 851-4.

Davies, S. L., DiClemente, R. J., Wingood, G. M., Harrington, K. F., Crosby, R. A., & Sionean, C. (2003). Pregnancy desire among disadvantaged african american adolescent females. *American Journal of Health Behavior*, 27(1), 55-62.

Devine, D., Long, P., & Forehand, R. (1993). A prospective-study of adolescent sexual-activity - description, correlates, and predictors. *Advances in Behaviour Research and Therapy*, 15(3), 185-209.

Durex. Face of global sex report 2005. 2012; Available at: <http://www.durexnetwork.org/en-GB/research/faceofglobalsex/Pages/Home.aspx>.

Dye, C., & Upchurch, D. M. (2006). Moderating effects of gender on alcohol use: Implications for condom use at first intercourse. *Journal of School Health*, 76(3), 111-116.

Ethier, K. A., Kershaw, T. S., Lewis, J. B., Milan, S., Niccolai, L. M., & Ickovics, J. R. (2006). Self-esteem, emotional distress and sexual behavior among adolescent females: Inter-relationships and temporal effects. *Journal of Adolescent Health*, 38(3), 268-274.

Gabhainn, S. N., Baban, A., Boyce, W., & Godeau, E. (2009). How well protected are sexually active 15-year olds? cross-national patterns in condom and contraceptive pill use 2002-2006. *International Journal of Public Health*, 54, 209-215.

Goldberg, D. P., & Hillier, V. F. (1979). Scaled version of the general health questionnaire. *Psychological Medicine*, 9(1), 139-145.

Goodson, P., & Bui, E. R. (2007). Behavioral skills and adolescent sexual risk behavior - reply. *Journal of Adolescent Health*, 41(2), 212-212.

Gullette, D. L., & Lyons, M. A. (2006). Sensation seeking, self-esteem, and unprotected sex in college students. *Janac-Journal of the Association of Nurses in Aids Care*, 17(5), 23-31.

-
- Halama, P. (2008). Confirmatory factor analysis of rosenberg self-esteem scale in a sample of slovak high school and university students. *Studia Psychologica*, 50(3), 255-266.
- Kalina, O., Geckova, A. M., Jarcuska, P., Orosova, O., van Dijk, J. P., & Reijneveld, S. A. (2009). Psychological and behavioural factors associated with sexual risk behaviour among slovak students. *Bmc Public Health*, 9, 15.
- Klavs, I., Rodrigues, L. C., Weiss, H. A., & Hayes, R. (2006). Factors associated with early sexual debut in slovenia: Results of a general population survey. *Sexually Transmitted Infections*, 82(6), 478-483.
- Klavs, I., Rodrigues, L. C., Wellings, K., Weiss, H. A., & Hayes, R. (2005). Increased condom use at sexual debut in the general population of slovenia and association with subsequent condom use. *Aids*, 19(11), 1215-1223.
- Langille, D. B., Curtis, L., Hughes, J., & Murphy, G. T. (2003). Association of socio-economic factors with health risk behaviors among high school students in rural nova scotia. *Canadian Journal of Public Health-Revue Canadienne De Sante Publique*, 94(6), 442-447.
- Leigh, B. C. (2002). Alcohol and condom use - A meta-analysis of event-level studies. *Sexually Transmitted Diseases*, 29(8), 476-482.
- Lejuez, C. W., Simmons, B. L., Aclin, W. M., Daughters, S. B., & Dvir, S. (2004). Risk-taking propensity and risky sexual behavior of individuals in residential substance use treatment. *Addictive Behaviors*, 29(8), 1643-1647.
- Magnani, R. J., Seiber, E. E., Gutierrez, E. Z., & Vereau, D. (2001). Correlates of sexual activity and condom use among secondary-school students in urban peru. *Studies in Family Planning*, 32(1), 53-66.
- Manlove, J., Wildsmith, E., Ikramullah, E. (2012). Family environments and the relationship context of first adolescent sex: Correlates of first sex in a casual versus steady relationship. *Social Science Research*, 41(3), 861-75.
- Mann, M., Hosman, C. M. H., Schaalma, H. P., & de Vries, N. K. (2004). Self-esteem in a broad-spectrum approach for mental health promotion. *Health Education Research*, 19(4), 357-372.
- Mazzaferro, K. E., Murray, P. J., Ness, R. B., Bass, D. C., Tyus, N., & Cook, R. L. (2006). Depression, stress, and social support as predictors of high-risk sexual behaviors and STIs in young women. *Journal of Adolescent Health*, 39(4), 601-603.
- Metzler, C. W., Noell, J., Biglan, A., Ary, D., & Smolkowski, K. (1994). The social-context for risky sexual-behavior among adolescents. *Journal of Behavioral Medicine*, 17(4), 419-438.
- Mott, F. L., Fondell, M. M., Hu, P. N., KowaleskiJones, L., & Menaghan, E. G. (1996). The determinants of first sex by age 14 in a high-risk adolescent population. *Family Planning Perspectives*, 28(1), 13-18.
- Paul, C., Fitzjohn, J., Herbison, P., & Dickson, N. (2000). The determinants of sexual intercourse before age 16. *Journal of Adolescent Health*, 27(2), 136-147.

Preston, D. B., D'Augelli, A. R., Kassab, C. D., Cain, R. E., Schulze, F. W., & Starks, M. T. (2004). The influence of stigma on the sexual risk behavior of rural men who have sex with men. *Aids Education and Prevention*, 16(4), 291-303.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton, New Jersey: Princeton University Press.

Santelli, J. S., Lowry, R., Brener, N. D., & Robin, L. (2000). The association of sexual behaviors with socioeconomic status, family structure, and race/ethnicity among US adolescents. *American Journal of Public Health*, 90(10), 1582-1588.

Sarkova, M., Nagyova, I., Katreniakova, Z., Geckova, A. M., Orosova, O., Middel, B., et al. (2006a). Psychometric evaluation of the general health questionnaire-12 and rosenberg self-esteem scale in hungarian and slovak early adolescents. *Studia Psychologica*, 48(1), 69-79.

Sarkova, M., Nagyova, I., Katreniakova, Z., Sleskova, M., Orosova, O., Middel, B., et al. (2006b). General health questionnaire-12: The appropriateness of use with early adolescents. *European Journal of Public Health*, 16, 128-128.

Spencer, J. M., Zimet, G. D., Aalsma, M. C., & Orr, D. P. (2002). Self-esteem as a predictor of initiation of coitus in early adolescents. *Pediatrics*, 109(4), 581-584.

Vazsonyi, A. T., Trejos-Castillo, E., & Huang, L. (2006). Risky sexual behaviors, alcohol use, and drug use: A comparison of eastern and western european adolescents. *The Journal of Adolescent Health : Official Publication of the Society for Adolescent Medicine*, 39(5), 11.

Vukovic, D. S., & Bjegovic, V. M. (2007). Brief report: Risky sexual behavior of adolescents in belgrade: Association with socioeconomic status and family structure. *Journal of Adolescence*, 30(5), 869-877.

Wild, L. G., Flisher, A. J., Bhana, A., & Lombard, C. (2004). Associations among adolescent risk behaviours and self-esteem in six domains. *Journal of Child Psychology and Psychiatry*, 45(8), 1454-1467.

General discussion, implications and conclusion

This study was carried out to explore several factors associated with sexual risk behaviour among adolescents and young adults. The main aim of study was to explore how behavioural factors (alcohol use, tobacco use, sexual behaviour), psychological factors (extroversion, neuroticism, self-esteem, well-being, educational aspiration, values, religiousness) and social factors (family structure, parental education, parental support, parental monitoring, social support from friends and others) contribute to patterns of sexual risk behaviour. By assessing these variables we may add to the understanding of how such different factors might act as risk or protective components regarding this specific risk behaviour.

This final chapter summarizes and discusses the main findings of this study in the context of its theoretical background and current knowledge from the research in this field. In addition, the strengths and limitation of the study are discussed and its implications for future research and public health practice are addressed.

8.1 Main Findings

Research question 1:

Does the later sexual initiation, longer-lasting relationships and the use of a condom during first sexual intercourse promote more healthy sexual behaviour later on among young adults?

In general it is shown that risk behaviour during sexual initiation predicts sexual risk behaviour (SRB) later in life. Especially students who reported having had sex for the first time at the age of 17 or later were significantly less likely to report participating in the two types of SRB being explored (sex under alcohol or drug influence and having had multiple sexual partners). Similarly, those who reported a longer-lasting relationship prior to their first sexual intercourse were significantly less likely to report sex under alcohol or drug influence and multiple sexual partners. Moreover students who used a condom during their first sexual intercourse were significantly less likely to report inconsistent condom use as well.

Research question 2:

Do psychological factors (well-being, self-esteem, extroversion, neuroticism and religiousness) and behavioural factors (alcohol use, tobacco use and early sexual initiation) contribute to sexual risk behaviour of young adults?

Our results suggest that behavioural factors are more closely related to SRB than the psychological ones. Behavioural factors like being drunk and having early sex were strongly associated with SRB (multiple sexual partners and sex in risky conditions) of young adult males and females. Moreover, females' tobacco use (one cigarette per week) was associated with multiple sexual partners and sex in risky conditions as well. From the five explored psychological factors only two were associated with SRB. Especially high levels of extroversion and the unimportance of religiousness were associated with multiple sexual partners and with sex in risky conditions among females. Similarly, males' high extroversion was associated with multiple sexual partners. None from the explored behavioural and psychological factors was associated with inconsistent condom use.

Research question 3:

Do different types of value orientation associate with different types of sexual behaviour young adults?

Participants with more socially oriented values show less sexual risky behaviour compared with those with less socially oriented values. The most robust associations were found in the Social Orientation factor (Clean, Capable, Obedient, Polite, Responsible, Honest) and the Sense of Fellowship factor (Broadminded, Helpful, Forgiving). In all significant associations, the higher the importance of particular factors was, the less frequent SRB we found. We found that SRB was inversely related to the factors Social orientation and Sense of fellowship which reflect values focused on the well-being of others. Participants taking a higher risk (number of partners, sex with an unknown person and all cumulative indicators) consistently gave a lower priority to such values, both those reflecting social orientation on a personal level, e.g. Responsible, Loving and Honest, and social orientation on a societal level, e.g. Equality, Justice and a World of peace.

Research question 4:

Does the parental monitoring and support play a different role in sexual risk behaviour among adolescents?

Parental monitoring was more strongly associated with SRB than parental social support. In particular, lower monitoring by the father was significantly associated with early first sexual intercourse among girls and with inconsistent condom use among boys. Lower monitoring by the mother was associated only with inconsistent condom use among boys.

Research question 5:

Do psychosocial factors defined as self-esteem, well-being, educational aspiration, family structure, parental education and social support contribute to sexual risk behaviour of adolescents?

Psychosocial variables such as anxiety, social support from others and friends, social dysfunction and positive self-esteem do discriminate between adolescents who have had sex (either risky or safe) and adolescents who had not, but they do not discriminate between adolescents who have had risky sex and those who have had safe sex. Regarding psychological factors we found that the higher chance of remaining a virgin was associated with a low level of positive self-esteem, a low level of anxiety/depression and a high educational aspiration level. With regards to social factors we found that adolescents who reported a complete family arrangement, high social support from friends and low social support from parents were more likely not to have had sexual intercourse.

8.2 Discussion of the main findings

Behavioural factors and possible pathways of their influence

Type of sexual debut

One of the key findings of this thesis concerns the strong associations between early sexual intercourse (16 years and less) reported by young adult male and female students and their sexual risky behaviour (having sex in risky condition and multiple sexual partners) (Chapter 3). These findings are in line with those of several previous studies which showed early sexual initiation to be one of the most significant predictors of future sexual behaviour among adolescents and young adults (Greenberg et al., 1992; Santelli et al., 1998; Miller et al., 1999; Schubotz, 2004; Ryan et al., 2008; Cavazos-Rehg et al., 2010). Our finding that early sexual debut is correlated to SRB later on may be explained in a few ways.

First, adolescents who engage in early sexual onset may be risk-prone defined as the propensity to be attracted to potentially risk behaviour (Zuckerman, 1991). As we mentioned before, early sexual intercourse was associated with an increase in SRB, but this in fact may represent an indicator of those individuals who have an increased attraction to risk. Therefore, such risk-prone individuals should be identified in early adolescence already and provided with accurate contraceptive information (Magnusson et al., 2012).

Second, it is likely that early sexual debut particularly for girls is non-voluntary and forced by an often older partner. Even those young adult boys and girls which reported voluntary early sexual debut are more likely to report external reasons for engaging in intercourse (e.g. peer pressure, desire to please partner) regret concerning the timing of first sexual intercourse, and wished to have waited longer (Dickson et al., 1998; Magnusson et al., 2012).

Therefore, with no surprise, such relationships are short-term characterized by physical attraction and high emotional intensity (e.g. infatuation, falling in love, loss of control) whereas relationships in later adolescence are characterized by more commitment, caring, support, maturity, negotiation and interdependence (Adams et al., 2001; Shulman & Kipnis, 2001; Foulkes et al., 2009). Moreover, in this study (Chapter 3) we found that a longer lasting relationship with a partner before first sexual intercourse was associated with less sexual partners and with a lower probability to engage in sex under the influence of alcohol or drugs.

However we did not find an association between early sexual onset and inconsistent condom use among young adults later on. Several studies have explored such associations (Manlove et al., 2000; Capaldi et al., 2002; Kaestle et al., 2005; Manlove et al., 2006; Cavazos-Rehg et al., 2010) and confirmed that the level of contraception use (oral contraceptives or condoms) at sexual debut may be predictive for use of contraception later on. However, other studies have had argued that the level of condom use among partners is rather a function of type and length of the relationship than of the previous behaviour (Civic, 1999; Macaluso et al., 2000; Fortenberry et al., 2002; Bauman & Berman, 2005; Foulkes et al., 2009). It was proposed that the frequency of condom use is higher with new and casual partners and lower as partners recognized their own relationship as steady. This explanation refers to a couple's higher trust that they developed in their relationship over time (Foulkes et al., 2009). Thus, at the beginning of a new relationship, or in a relationship where partners did not expect to last this very long, they tend to use condoms. As soon as the relation shifts to a more committed, trusting level where the couple starts to perceive their partner as the person they want to live with, they stopped condom use (Bauman & Berman, 2005). This idea is also supported by Capaldi et al. (2002) who measured rates of condom use regarding 4 young adult samples divided by the age of sexual onset from young adolescent to young adult. Interestingly, the highest level of condom was found among those who have had sex in early adolescence; accordingly the highest levels of condom use were reported at the period of sexual onset in every other group and with a decreasing tendency later on (Capaldi et al., 2002).

Alcohol use and sexual risky behaviour

We found that almost half of the males and one third of the females reported being drunk at least once during the last month (Chapter 4). These males who had been drunk were more likely to have multiple sexual partners and sex under risky occasions; the young females who had been drunk concerned reported only sex under risky occasions. We did not find differences in the consistency of reported condom use to be related to alcohol use.

There is ample evidence in the literature that alcohol use has a strong link to sexual risky behaviour among adolescents and young adults (Stueve & O'Donnell, 2005; Brookmeyer & Henrich, 2009). Several theories explain such a link. From a traditional point of view, alcohol acts as a general dnhibitor, causing people to "let go of" the inhibitors that would normally constrain their behaviour (MacDonald et al., 2000). An alternative theory, the

alcohol myopia theory, suggests that alcohol causes a restriction in cognitive capacity, and therefore people have limited skills to process all information in their environment. Instead they are more likely to focus on the most salient issues (Steele et al., 1985). If powerful cues promoting unsafe behaviour are salient, according to this theory alcohol use could lead to more risky behaviour (MacDonald et al., 2000).

From another theoretical perspective these associations can be explained by a concept that sees sexual risk, substance use, and delinquency as comprising a problem behaviour syndrome (Jessor, 1987), with common causes and influences underlying all three behaviours (Donovan & Jessor, 1985). It was found that all three problem behaviours were positively correlated with one another, negatively correlated with conformity, and positively correlated with an unconventional personality (Donovan & Jessor, 1985). Other studies support the finding that adolescent delinquency and substance use are associated with the timing of the first sexual intercourse (Stueve & O'Donnell, 2005), and when high levels of alcohol use, marijuana use, or sexual risk are reported, youth is at higher risk for high levels of the other risk behaviours as well (Duncan et al., 1999; van Nieuwenhuijzen et al., 2009).

From the explored variables in our study (sex under risky occasions, multiple sexual partners and inconsistent condom use) the last one has to be considered as the most risky in terms of acquiring STIs or unintended pregnancies. Such a view may also be shared among university students, and may be kept in mind even if having used much alcohol. That may offer an explanation for the lack of an association between use of alcohol and (inconsistent) condom use.

Psychological factors

Researchers previously found that adolescents' problem behaviour tends to cluster (van Nieuwenhuijzen et al., 2009) and may have the same underlying cause, such as mental or self-perception problems (Hallfors et al., 2005). Regarding the set of psychological factors related to SRB the role of value orientation, personality traits, self-esteem and well-being attracted most research attention. In this study we explored the role of these on sexual behaviour of young adults (Chapters 4 and 5) and of adolescents (Chapter 7).

We found that adolescents with low well-being (more depressive symptoms) were more likely to be sexually experienced and more likely report sexual risky behaviour also after adjustment for other psychological and social factors, in line with other studies (Harris et al., 2002; Longmore et al., 2004; Zimmerman et al., 2008; Schwartz et al., 2011). Previous research on depressive symptoms and sexual activity (Whitbeck et al., 1992) reported a higher significance of such associations for girls than for boys. However, the study by Harris et al. (2002) revealed that depressive symptoms are related to the sexual onset of young boys as well. It has been also reported that depressive symptoms play a greater role for younger adolescents (Longmore et al., 2004). This also counts for our study (Chapter 4) where no significant associations between a high amount of

depressive symptoms neither low self-esteem and sexual behaviour of young adults was found. However, some studies indicate that the effect of depressive symptoms on sexual behaviour may have vice versa patterns (Goodman & Capitman, 2000; Brook et al., 2002; Hallfors et al., 2005). Hallfors et al. (2005) proposes that risky patterns of sexual behaviour and drug use during adolescence pose an increased risk on depression particularly for girls, while boys are more vulnerable for binge drinking and marihuana use.

In contrast to the protective role of high well-being that we found (Chapter 7), adolescents with higher positive self-esteem were more likely to have risky sex than their peers with low positive self-esteem (Chapter 7). This is in contrast with several studies which found positive self-esteem to be a protective factor regarding SRB (Lejuez et al., 2004; Longmore et al., 2004; Preston et al., 2004). Moreover we found no significant association between negative self-esteem and SRB. The adverse role of high self-esteem on problem behaviour was explained by Baumeister et al. (1996) who proposed that the higher the self-esteem, the greater the vulnerability to ego threats which consequently leads to problem behaviour. Therefore our results concerning positive self-esteem and SRB among adolescents contribute to the inconsistent findings between self-esteem and SRB (Goodson et al., 2006). Nevertheless, the methodological approach to explore the association of SRB with positive and with negative self-esteem can provide more detailed information concerning the nature of this concept. We may conclude in line with Longmore et al. (2004) that among adolescents negative well-being (depressive symptoms) is a stronger predictor of SRB than self-esteem, but we could not determine whether this association is causal.

Among the other explored psychological variables in this study extroversion played the most important role (Chapter 4). We found that a higher level of extroversion among young adults girls was related to having had multiple sexual partners, and sex under risky occasions and among boys to having had multiple sexual partners. Our results are very similar to those of other studies which showed that a high level of extraversion was associated with more promiscuous sexual desires and behaviour and unsafe sexual practices (Costa et al., 1992; McCown, 1993; Pinkerton & Abramson, 1995; Schmitt & Buss, 2000). Reasons why more extroversion leads to more risky sexual behaviour may be that extrovert people have a higher libido than introverts, or extraverts may need to raise their habitually low levels of cortical arousal to a more comfortable level by engaging in risky sex (Eysenck et al., 1976). Extraverts seek excitement and social activity in an effort to heighten their arousal level, whereas introverts tend to avoid social situations in an effort to keep such arousal to a minimum. Anyhow, the links between extraversion and promiscuous sexuality appear to be robust, at least in Western cultures (Schmitt, 2004).

Our study also deals with personal values and found that young adults with more social-oriented values show less sexual risky behaviour compared with those with less socially oriented values (Chapter 5). Despite that there is evidence about values as strong cognitive, emotionally significant guiding and organizing principles which substantially shape the current and future

health behaviours (Young & West, 2010) little attention has been paid to this concept in recent literature. Some studies have shown that specific value orientations are associated with sexual risky behaviours (Chernoff & Davison, 1999; Goodwin et al., 2002). Goodwin et al. (2002) who were guided by Schwartz' values approach (Schwartz, 1994) indicated that values had a moderate but consistent relationship with sexual behaviour, with riskier sexual activity reported by those high on openness to change, hedonism and self-enhancement. Chernoff and Davison (1999) found, following the Rokeach value approach (Rokeach, 1973) that a higher occurrence of sexual risk behaviour may be positively associated with risk-taking, impulsivity, and sensation seeking, and negatively associated with other-oriented values (i.e., concern for others). Similar to Chernoff and Davison(1999), we found that social-oriented values play a protective role in all explored indicators of SRB except condom use. However, self-oriented values in our study were not associated with any type of the explored SRBs contrasting to Williams et al. (2000) who showed that young adults with intrinsic life goals (e.g., self-acceptance, internal development, friendship and social relationship) tend to report lower frequencies of health risk behaviours. Moreover, recent findings on adolescents from Young and West (2010) do not support the idea that certain “pro-social” values substantively protect against substance use. However, we may argue that the values system among adolescents is not stable and may markedly differ to the values system in young adulthood.

Social factors

Family and peers

One of the most important and straightforward results of this thesis concerns the associations between family structure, family processes and adolescents' SRB (Chapters 7 and 6). According to many studies the family environment in terms of family structure and family processes may provide one of the most significant conditions regarding sexual risk behaviour of adolescents (Borawski et al., 2003; Fisher et al., 2009). Several studies have confirmed that a complete family, higher SES of the family, more support and monitoring from family may serve as protective factors regarding sexual risk (Roosa et al., 1997; Lenciauskiene & Zaborskis, 2008; De Graaf et al., 2011). In line with the mentioned studies, family completeness, higher parental education, high parental support and higher monitoring were found in this study as strong protective factors regarding SRB.

The protective function of the complete family as we found can be explained by several factors such as higher socioeconomic status, higher social support, better relationship and communication with parents and by parental monitoring (Tomcikova et al., 2011). Complete families may have higher SES in terms of two instead of one stable income, what in contrast to divorced families was found as a major protective factor. However, in our study we explored only parental education as the indicator of SES. Nevertheless, adolescents from higher educated parents were less likely to

report SRB. Also social support from family was associated with less sexual risk behaviour. However, social support from friends played a different role. While those who reported high family support are less likely to engage in early sexual onset, adolescents with higher support from their friends are more likely to have had sex. This can be explained by the power of social norms and perceived expectations. Several studies have indicated that the perception of norms from a person's environment mainly provided by friends may strongly influence his behaviour. The role of social support was also studied by Mazzaferro et al. (2006) who showed that low levels of social support were associated with high levels of SRB. However, in this study social support was scored as one factor, thus it is not specified from whom the social support is provided. From our results we may conclude that adolescents at this age are very sensitive to the specific sources of social support. Therefore, their behaviour differs depending on these sources.

In our study (Chapter 6) we showed that different sources of parenting practices (from mother and father) may differently be associated with the behaviour of adolescents. It is parental monitoring rather than parental support that might influence adolescent's sexual behaviour. We found that paternal monitoring might influence different aspects of sexual behaviour among boys (condom use) and girls (early sexual onset). However, it was proposed that the quality of monitoring may often rely on the quality of communication (Clark et al., 2008), which is highly associated with parental support in terms of warmth, responsiveness and child-centeredness. This pathway may explain the differences in the crude and adjusted models, where monitoring is the key variable to be associated with sexual risk behaviour among adolescents.

8.3 Strengths and limitations of the study

Our study has several strengths and some limitations. One of the most important strengths is the large, nationally representative samples used in Chapters 6 and 7 which cover the different regions of Slovakia and focus on the adolescents. Moreover our third sample is a part of HBSC study (Currie et al., 2012) what allowed us to put our findings in an international perspective. An additional strength of all three samples is the design of those studies including the pupil's anonymity and absence of the teachers during completion of the questionnaire. This may have increased the validity of self-reports approaches and decreased the probability of under or over reporting health behaviour (Del Boca & Noll, 2000; Brener et al., 2003). Moreover due to a rather high response rate in all samples, selection bias was unlikely occur.

However our study also has some limitations. A main one is its cross-sectional design, which can limit our understanding of the relevant pathways. A longitudinal study design, especially on SRB, may provide deeper insight into this issue. Also we did not obtain information from family members, friends or school environment. These lacking sources could increase the understanding of some inconsistencies in the field of sexual risk behaviour

research. Finally our results are strongly dependent on the assumption that what participants say is what they did. Therefore self-reported sexual behaviour data may be vulnerable to various types of information biases, like memory effects and social desirability bias (McCallum & Peterson, 2012). However, some studies showed no type of data collection mode-dependent differences (Bates & Cox, 2008; Hines et al., 2010). Therefore, existing research suggests that the mode of data collection may have some degree of impact on participants' responding, but results are not specific enough to isolate which mode is best suited for which situation (McCallum & Peterson, 2012).

8.4 Implications

Implications for further research

This study showed the significant role of several behavioural, psychological and social factors on sexual risk behaviour of adolescents and young adults. However some of our findings are in contrast to previous studies what highlights the inconsistency concerning some predictors of SRB. Such inconsistencies can be partially explained by the study design. Our research which used a cross-sectional design, should thus be repeated by studies with a longitudinal approach to specify causal relationship between behavioural, psychological and social determinants and SRB. From a longitudinal perspective more attention should be paid to comprehensive models that take into account factors from multiple systems of influence. Examples of such models may include pathways in which individual, family and environmental factors influence sexual behaviour.

More research attention should be paid to social predictors of SRB such as family and peer environment. We found a strong protective influence of parental monitoring and support on SRB when explored separately. However in the adjusted model only parental monitoring especially from fathers plays a dominant role, but the mechanism of this association is not fully explained yet. Future studies should explore the possible mediating or moderating effect of these variables.

Implications for public health practice

The findings of this study may have several implications for public health practice. One of our key findings indicates that the age of sexual onset is a significant predictor of further patterns of sexual behaviour. This early sexual onset among adolescents was significantly associated with incomplete families, low parental monitoring and with low parental social support. Therefore, adolescents from incomplete families with low monitoring and support should be in particular the target group for health promotion and prevention programs. It is important to strengthen a positive family environment as it may be protective against early sexual behaviour.

In addition to controlling the child's whereabouts, parents should try to optimize conditions for the child to disclose information about own experiences (Stattin & Kerr, 2000). To know how adolescents feel and think can result in a dialogue that may encourage children to share their lives with parents.

Our study also may provide implications for public health practice among young adults. In contrast to adolescents this period is characterized by lower direct parental supervision; therefore parental processes in this age are less important. Our data present the clear message that interventions should not only focus on vaginal intercourse, but also on anal and oral intercourse and their consequences. The coincidence of sexual risky behaviour with substance use increases the importance of intervention focused not only on one type of risky behaviour, but on the whole complex of health-related behaviours.

Moreover, health promotion programmes should not only focus on smoking, alcohol and drugs, for example, but sexual risk behaviour should also be integrated into such prevention programmes. Due to the accumulation of risk behaviour among young people, focusing on prevention in a related set of unhealthy behaviours instead of a single type of unhealthy behaviour will be very important, particularly in early adolescence. Moreover, results show a high need for health promotion programmes in early adolescence that target SRB in conjunction with other health-related risk behaviours such as alcohol abuse.

8.5 Conclusion

Despite that adolescents and young adults are most vulnerable in sexual and reproductive health the scientific attention in Slovakia on this topic has been underestimated. Therefore behavioural, psychological and social factors have been explored in this study and each of them was related to SRB in a specific way.

Behavioural factors like being drunk and alcohol use were strongly associated with SRB (multiple sexual partners and sex in risky conditions) of young adult males and females. Therefore alcohol use prior to and during sexual intercourse has to be considered as a consistently and potential trigger of unintended pregnancies and higher level of STIs risk among young adults. Moreover sexual behavioural factors, like early sexual onset and inconsistent condom use during first sexual intercourse were strongly associated with SRB (multiple sexual partners, sex in risky conditions and inconsistent condom use) of young adult males and females. Similarly, those who reported a longer-lasting relationship prior to their first sexual intercourse were significantly less likely to report sex under the influence of alcohol or drugs and multiple sexual partners.

Our findings regarding psychological factors were not in line with earlier findings on self-esteem as a protective factor. Several studies found contradictory results regarding self-esteem and sexual behaviour. In the context of developing prevention and intervention programs this has to be

taken into account. On the other hand, social value orientation was found as a strong protective factor regarding SRB of young adults. Instead of self-oriented values social orientation may provide better protective function and background for risk reduction strategies.

Our study also underlined the importance of family especially among adolescents. The structure of a family, the close relationship between child and parents, and balanced parental monitoring and support may provide a crucial background for a healthy development of adolescent's sexuality.

References

- Adams, R. E., Laursen, B., & Wilder, D. (2001). Characteristics of closeness in adolescent romantic relationships. *Journal of Adolescence*, 24(3), 353-363.
- Bates, S. C., & Cox, J. M. (2008). The impact of computer versus paper-pencil survey, and individual versus group administration, on self-reports of sensitive behaviors. *Computers in Human Behavior*, 24(3), 903-916.
- Bauman, L. J., & Berman, R. (2005). Adolescent relationships and condom use: Trust, love and commitment. *Aids and Behavior*, 9(2), 211-222.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review*, 103(1), 5-33.
- Borawski, E., Ievers-Landis, C., Lovegreen, L., & Trapl, E. (2003). Parental monitoring, negotiated unsupervised time, and parental trust: The role of perceived parenting practices in adolescent health risk behaviors. *Journal of Adolescent Health*, 33(2), 60-70.
- Brener, N. D., Billy, J. O. G., & Grady, W. R. (2003). Assessment of factors affecting the validity of self-reported health-risk behavior among adolescents: Evidence from the scientific literature. *Journal of Adolescent Health*, 33(6), 436-457.
- Brook, D. W., Brook, J. S., Zhang, C. S., Cohen, P., & Whiteman, M. (2002). Drug use and the risk of major depressive disorder, alcohol dependence, and substance use disorders. *Archives of General Psychiatry*, 59(11), 1039-1044.
- Brookmeyer, K. A., & Henrich, C. C. (2009). Disentangling adolescent pathways of sexual risk taking. *Journal of Primary Prevention*, 30(6), 677-696.
- Capaldi, D. M., Stoolmiller, M., Clark, S., & Owen, L. D. (2002). Heterosexual risk behaviors in at-risk young men from early adolescence to young adulthood: Prevalence, prediction, and association with STD contraction. *Developmental Psychology*, 38(3), 394-406.
- Cavazos-Rehg, P. A., Krauss, M. J., Spitznagel, E. L., Schootman, M., Cottler, L. B., & Bierut, L. J. (2010). Associations between multiple pregnancies and health risk behaviors among U.S. adolescents. *Journal of Adolescent Health*, 47(6), 600-603.

- Chernoff, R. A., & Davison, G. C. (1999). Values and their relationship to HIV/AIDS risk behavior among late-adolescent and young adult college students. *Cognitive Therapy and Research*, 23(5), 453-468.
- Civic, D. (1999). The association between characteristics of dating relationships and condom use among heterosexual young adults. *Aids Education and Prevention*, 11(4), 343-352.
- Clark, D. B., Kirisci, L., Mezzich, A., & Chung, T. (2008). Parental supervision and alcohol use in adolescence: Developmentally specific interactions. *Journal of Developmental and Behavioral Pediatrics*, 29(4), 285-292.
- Costa, P. T. J., Fagan, P. J., Piedmont, R. L., Ponticas, Y., & Wise, T. N. (1992). The five-factor model of personality and sexual functioning in outpatient men and women. *Psychiatric Medicine*, 10(2), 199-215.
- Currie, C., Zanotti, C., Morgan, A., Currie, D., de Looze, M., Roberts, C., et al. (2012). 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. Copenhagen: WHO Regional Office for Europe.
- De Graaf, H., Vanwesenbeeck, I., Woertman, L., & Meeus, W. (2011). Parenting and adolescents' sexual development in western societies A literature review. *European Psychologist*, 16(1), 21-31.
- Del Boca, F. K., & Noll, J. A. (2000). Truth or consequences: The validity of self-report data in health services research on addictions. *Addiction*, 95, S347-S360.
- Dickson, N., Paul, C., Herbison, P., & Silva, P. (1998). First sexual intercourse: Age, coercion, and later regrets reported by a birth cohort. *British Medical Journal*, 316(7124), 29-33.
- Donovan, J. E., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. *Journal of Consulting and Clinical Psychology*, 53(6), 890-904.
- Duncan, S. C., Strycker, L. A., & Duncan, T. E. (1999). Exploring associations in developmental trends of adolescent substance use and risky sexual behavior in a high-risk population. *Journal of Behavioral Medicine*, 22(1), 21-34.
- Eysenck, S. B. G., White, O., & Eysenck, H. J. (1976). Personality and mental-illness. *Psychological Reports*, 39(3), 1011-1022.
- Fisher, D. A., Hill, D. L., Grube, J. W., Bersamin, M. M., Walker, S., & Gruber, E. L. (2009). Televised sexual content and parental mediation: Influences on adolescent sexuality. *Media Psychology*, 12(2), 121-147.
- Fortenberry, J. D., Tu, W. Z., Harezlak, J., Katz, B. P., & Orr, D. P. (2002). Condom use as a function of time in new and established adolescent sexual relationships. *American Journal of Public Health*, 92(2), 211-213.

-
- Foulkes, H. B. S., Pettigrew, M. M., Livingston, K. A., & Niccolai, L. M. (2009). Comparison of sexual partnership characteristics and associations with inconsistent condom use among a sample of adolescents and adult women diagnosed with chlamydia trachomatis. *Journal of Womens Health, 18*(3), 393-399.
- Goodman, E., & Capitman, J. (2000). Depressive symptoms and cigarette smoking among teens. *Pediatrics, 106*(4), 748-755.
- Goodson, P., Buhi, E. R., & Dunsmore, S. C. (2006). Self-esteem and adolescent sexual behaviors, attitudes, and intentions: A systematic review. *Journal of Adolescent Health, 38*(3), 310-319.
- Goodwin, R., Realo, A., Kozlova, A., Luu, L. A. N., & Nizharadze, G. (2002). Values and sexual behaviour in central and eastern europe. *Journal of Health Psychology, 7*(1), 45-56.
- Greenberg, J., Magder, L., & Aral, S. (1992). Age at 1st coitus - a marker for risky sexual-behavior in women. *Sexually Transmitted Diseases, 19*(6), 331-334.
- Hallfors, D. D., Waller, M. W., Bauer, D., Ford, C. A., & Halpern, C. T. (2005). Which comes first in adolescence - sex and drugs or depression? *American Journal of Preventive Medicine, 29*(3), 163-170.
- Harris, K. M., Duncan, G. J., & Boisjoly, J. (2002). Evaluating the role of "nothing to lose" attitudes on risky behavior in adolescence. *Social Forces, 80*(3), 1005-1039.
- Hines, D. A., Douglas, E. M., & Mahmood, S. (2010). The effects of survey administration on disclosure rates to sensitive items among men: A comparison of an internet panel sample with a RDD telephone sample. *Computers in Human Behavior, 26*(6), 1327-1335.
- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction, 82*(4), 331-342.
- Kaestle, C. E., Halpern, C. T., Miller, W. C., & Ford, C. A. (2005). Young age at first sexual intercourse and sexually transmitted infections in adolescents and young adults. *American Journal of Epidemiology, 161*(8), 774-780.
- Lejuez, C. W., Simmons, B. L., Aklin, W. M., Daughters, S. B., & Dvir, S. (2004). Risk-taking propensity and risky sexual behavior of individuals in residential substance use treatment. *Addictive Behaviors, 29*(8), 1643-1647.
- Lenciauskiene, I., & Zaborskis, A. (2008). The effects of family structure, parent-child relationship and parental monitoring on early sexual behaviour among adolescents in nine european countries. *Scandinavian Journal of Public Health, 36*(6), 607-618.
- Longmore, M. A., Manning, W. D., Giordano, P. C., & Rudolph, J. L. (2004). Self-esteem, depressive symptoms, and adolescents' sexual onset. *Social Psychology Quarterly, 67*(3), 279-295.
- Macaluso, M., Demand, M. J., Artz, L. M., & Hook, E. W. (2000). Partner type and condom use. *Aids, 14*(5), 537-546.

- MacDonald, T. K., MacDonald, G., Zanna, M. P., & Fong, G. T. (2000). Alcohol, sexual arousal, and intentions to use condoms in young men: Applying alcohol myopia theory to risky sexual behavior. *Health Psychology, 19*(3), 290-298.
- Magnusson, B. M., Masho, S. W., & Lapane, K. L. (2012). Early age at first intercourse and subsequent gaps in contraceptive use. *Journal of Womens Health, 21*(1), 73-79.
- Manlove, J., Mariner, C., & Papillo, A. R. (2000). Subsequent fertility among teen mothers: Longitudinal analyses of recent national data. *Journal of Marriage and the Family, 62*(2), 430-448.
- Manlove, J., Terry-Humen, E., & Ikramullah, E. (2006). Young teenagers and older sexual partners: Correlates and consequences for males and females. *Perspectives on Sexual and Reproductive Health, 38*(4), 197-207.
- Mazzaferro, K. E., Murray, P. J., Ness, R. B., Bass, D. C., Tyus, N., & Cook, R. L. (2006). Depression, stress, and social support as predictors of high-risk sexual behaviors and STIs in young women. *Journal of Adolescent Health, 39*(4), 601-603.
- McCallum, E. B., & Peterson, Z. D. (2012). Investigating the impact of inquiry mode on self-reported sexual behavior: Theoretical considerations and review of the literature. *Journal of Sex Research, 49*(2-3), 212-226.
- McCown, W. (1993). Personality-factors predicting failure to practice safer sex by hiv positive males. *Personality and Individual Differences, 14*(4), 613-615.
- Miller, K., Forehand, R., & Kotchick, B. (1999). Adolescent sexual behavior in two ethnic minority samples: The role of family variables. *Journal of Marriage and the Family, 61*(1), 85-98.
- Pinkerton, S. D., & Abramson, P. R. (1995). Decon-making and personality-factors in sexual risk-taking for hiv aids - a theoretical integration. *Personality and Individual Differences, 19*(5), 713-723.
- Preston, D. B., D'Augelli, A. R., Kassab, C. D., Cain, R. E., Schulze, F. W., & Starks, M. T. (2004). The influence of stigma on the sexual risk behavior of rural men who have sex with men. *Aids Education and Prevention, 16*(4), 291-303.
- Roosa, M. W., Tein, J. Y., Reinholtz, C., & Angelini, P. J. (1997). The relationship of childhood sexual abuse to teenage pregnancy. *Journal of Marriage and the Family, 59*(1), 119-130.
- Ryan, S., Franzetta, K., Manlove, J. S., & Schelar, E. (2008). Older sexual partners during adolescence: Links to reproductive health outcomes in young adulthood. *Perspectives on Sexual and Reproductive Health, 40*(1), 17-26.
- Santelli, J. S., Brener, N. D., Lowry, R., Bhatt, A., & Zabin, L. S. (1998). Multiple sexual partners among US adolescents and young adults. *Family Planning Perspectives, 30*(6), 271-275.

-
- Schmitt, D. P. (2004). The big five related to risky sexual behaviour across 10 world regions: Differential personality associations of sexual promiscuity and relationship infidelity. *European Journal of Personality*, 18(4), 301-319.
- Schmitt, D. P., & Buss, D. M. (2000). Sexual dimensions of person description: Beyond or subsumed by the big five? *Journal of Research in Personality*, 34(2), 141-177.
- Schubotz, D. (2004). Sexual behaviour of young people in northern ireland: First sexual experience. *Critical Public Health*, 14(2), 177-190.
- Schwartz, S. J., Waterman, A. S., Vazsonyi, A. T., Zamboanga, B. L., Whitbourne, S. K., Weisskirch, R. S., et al. (2011). The association of well-being with health risk behaviors in college-attending young adults. *Applied Developmental Science*, 15(1), 20-36.
- Schwartz, S. H. (1994). Are there universal aspects in the structure and contents of human-values. *Journal of Social Issues*, 50(4), 19-45.
- Shulman, S., & Kipnis, O. (2001). Adolescent romantic relationships: A look from the future. *Journal of Adolescence*, 24(3), 337-351.
- Stattin, H., & Kerr, M. (2000). Parental monitoring: A reinterpretation. *Child Development*, 71(4), 1072-1085.
- Steele, C. M., Critchlow, B., & Liu, T. J. (1985). Alcohol and social-behavior II. The helpful drunkard. *Journal of Personality and Social Psychology*, 48(1), 35-46.
- Stueve, A., & O'Donnell, L. N. (2005). Early alcohol initiation and subsequent sexual and alcohol risk behaviors among urban youths. *American Journal of Public Health*, 95(5), 887-893.
- Tomcikova, Z., Geckova, A. M., Reijneveld, S. A., & van Dijk, J. P. (2011). Parental divorce, adolescents' feelings toward parents and drunkenness in adolescents. *European Addiction Research*, 17(3), 113-118.
- van Nieuwenhuijzen, M., Junger, M., Velderman, M. K., Wiefferink, K. H., Paulussen, T. W. G. M., Hox, J., et al. (2009). Clustering of health-comproming behavior and delinquency in adolescents and adults in the dutch population. *Preventive Medicine*, 48(6), 572-578.
- Whitbeck, L. B., Hoyt, D. R., Miller, M., & Kao, M. Y. (1992). Parental support, depressed affect, and sexual experience among adolescents. *Youth & Society*, 24(2), 166-177.
- Williams, G. C., Cox, E. M., Hedberg, V. A., & Deci, E. L. (2000). Extrinsic life goals and health-risk behaviors in adolescents. *Journal of Applied Social Psychology*, 30(8), 1756-1771.
- Young, R., & West, P. (2010). Do 'good values' lead to 'good' health-behaviours? longitudinal associations between young people's values and later substance-use. *BMC Public Health*, 10, 165.

Zimmerman, S. M., Phelps, E., & Lerner, R. M. (2008). Positive and negative developmental trajectories in US adolescents: Where the positive youth development perspective meets the deficit model. *Research in Human Development*, 5(3), 153-165.

Zuckerman, M. (1991). The balance between risk and reward. In L. P. Lipsitt, & L. L. Mitnick (Eds.), (pp. 143-152)

Summary

Patterns of sexual behaviour during adolescence and early adulthood may strongly influence health and sexual health behaviours later on. Therefore healthy sexual behaviour and development among young people is a major public health concern in most developed countries. Because sexual risk behaviour (SRB) is strongly associated with other types of health endangering behaviour the importance of focusing on this behaviour is even more striking.

The central aim of this thesis was to explore the relationship between SRB of adolescents and young adults and behavioural factors (alcohol use, tobacco use, sexual behaviour), psychological factors (extroversion, neuroticism, self-esteem, well-being, educational aspiration, values, religiousness) and social factors (family structure, parental education, parental support, parental monitoring, social support from friends). Based on the aim of the thesis, five research questions were consecutively explored regarding the mutual associations between some factors at first sexual intercourse and their associations with current SRB among young adults (Chapter 3); the associations of psychological and behavioural factors with SRB among young adults (Chapter 4); the associations of different types of value orientation with SRB among young adults (Chapter 5); the different role of parental processes on SRB of adolescents (Chapter 6); the psychosocial factors and their contribution to SRB of adolescents (Chapter 7).

Chapter 1 provides a general introduction to the issues of sexual health and SRB. The chapter continues with a brief overview of the associations of behavioural (e.g. alcohol use), psychological (e.g. self-esteem, well-being), and social factors (e.g. family processes, family structure) with SRB. At the end of the chapter the aim and model with the studied variables and the research questions of the thesis are presented.

Chapter 2 provides information about the design of the study. It also describes the three study samples used in this thesis. Furthermore it provides a short description of the measures which were used.

Chapter 3 describes the associations between some factors at first sexual intercourse (age and condom use during sexual debut, the length of relationship before sexual debut) with current SRB among young adults. The results show that risk behaviour during sexual initiation predicts SRB later in life. Especially students who reported having had sex for the first time at the age of 17 or later were significantly less likely to report participating in the two types of SRB being explored (sex under alcohol or drug influence and having had multiple sexual partners). Similarly positive associations were confirmed in condom use during first sexual intercourse and later on.

Chapter 4 focused on behavioural factors. These seem to be more closely related to SRB than (other) psychological factors. Behavioural factors like being drunk and having early sex were strongly associated with SRB (multiple sexual partners and sex in risky conditions) of young adult males and females. From the five explored psychological factors only two were associated with SRB. Especially high levels of extroversion and considering religion as being less important were associated with multiple sexual partners, and with sex in risky conditions among females. Similarly, males' high extroversion was associated with multiple sexual partners. None from the explored behavioural and psychological factors was associated with inconsistent condom use.

Chapter 5 describes the associations between different types of value orientation and SRB among young adults. We found that young adults with more socially oriented values show less SRB compared with those with less socially oriented values. SRB was inversely related to the factors Social orientation and Sense of fellowship which reflect values focused on the well-being of others. Participants taking a higher risk (number of partners, sex with an unknown person and all cumulative indicators) consistently gave a lower priority to such values, both those reflecting social orientation on a personal level, e.g. Responsible, Loving and Honest, and social orientation on a societal level, e.g. Equality, Justice and a World of peace.

Chapter 6 focused on the associations of parenting processes (monitoring and support) with adolescent's SRB. Parental monitoring was more strongly associated with SRB than parental social support. In particular, lower monitoring by the father was significantly associated with early first sexual intercourse among girls and with inconsistent condom use among boys. Lower monitoring by the mother was associated only with inconsistent condom use among boys.

Chapter 7 describes whether psychosocial factors (as self-esteem, well-being, educational aspiration, family structure, parental education and social support) are associated with adolescent's SRB. Psychosocial variables such as anxiety, social support from others and friends, social dysfunction and positive self-esteem do discriminate between adolescents who have had sex (either risky or safe) and adolescents who had not, but they do not discriminate between adolescents who have had risky sex and those who have had safe sex. Regarding psychological factors we found that a higher chance of still being a virgin was associated with a low level of positive self-esteem, a low level of anxiety/depression, and a high educational aspiration level. With regard to social factors we found that adolescents who reported a complete family arrangement, high social support from friends and low social support from parents were more likely to have not yet had sexual intercourse.

The final chapter of this thesis (*Chapter 8*) summarizes and discusses the main findings of this study in the context of its theoretical background and current knowledge from the research in this field. In addition, the strengths and limitation of the study are discussed and its implications for future research and public health practice are addressed.

Samenvatting

Patronen van seksueel gedrag tijdens adolescentie en jonge volwassenheid kunnen een sterke invloed hebben op de gezondheid en het seksueel gezondheidsgedrag later. Daarom is gezond seksueel gedrag onder jongeren in de meeste ontwikkelde landen een belangrijk volksgezondheidsprobleem. Omdat seksueel risicogedrag (SRG) sterk samenhangt met andere soorten gezondheidsschadend gedrag is het richten van de aandacht op dit gedrag nog meer van belang.

Het centrale doel van dit proefschrift was om de relatie tussen SRG van adolescenten en jong volwassenen en gedragsmatige factoren (alcoholgebruik, tabakgebruik, seksueel gedrag), psychologische factoren (extraversie, neuroticisme, eigenwaarde, welbevinden, onderwijs-aspiraties, waarden, religiositeit) en sociale factoren (gezinsstructuur, opleiding van de ouders, ondersteuning door ouders, ouderlijk toezicht, sociale steun van vrienden) te onderzoeken. Op basis van deze doelstelling van het proefschrift werden achtereenvolgens vijf vragen onderzocht met betrekking tot de onderlinge samenhang tussen een aantal factoren ten tijde van de eerste geslachtsgemeenschap en hun samenhang met het huidige SRG bij jongvolwassenen (Hoofdstuk 3), psychologische en gedragsfactoren en hun samenhang met het SRG bij jongvolwassenen (Hoofdstuk 4), de samenhang tussen verschillende typen waardenoriëntaties en SRG bij jongvolwassenen (Hoofdstuk 5), de verschillende rollen van ouderlijke processen op SRG van adolescenten (Hoofdstuk 6), en psychosociale factoren en hun bijdrage aan het SRG van adolescenten (Hoofdstuk 7).

In *Hoofdstuk 1* wordt een algemene inleiding gegeven over seksuele gezondheid en SRG. Verder geeft het hoofdstuk een kort overzicht van de samenhang tussen gedragsproblemen (bijv. alcoholgebruik), psychologische factoren (bijv. het gevoel van eigenwaarde, welbevinden), en sociale factoren (bijvoorbeeld familie processen, gezinsstructuur) met SRG. Aan het eind van het hoofdstuk wordt het doel en het model met de bestudeerde variabelen gepresenteerd alsmede de onderzoeksvragen van het proefschrift.

In *Hoofdstuk 2* wordt informatie over de opzet van het onderzoek gegeven. Verder worden de drie in dit proefschrift gebruikte steekproeven beschreven. Tenslotte wordt een korte beschrijving gegeven van de instrumenten die zijn gebruikt.

In *Hoofdstuk 3* worden de verbanden beschreven tussen een aantal factoren ten tijde van de eerste geslachtsgemeenschap (leeftijd en het gebruik van condooms, de voorafgaande lengte van de relatie) met het huidige SRG bij jongvolwassenen. De resultaten laten zien dat risicogedrag tijdens de seksuele initiatie het SRG in het latere leven voorspelt. Vooral studenten die aangaven voor de eerste keer seks te hebben gehad op een leeftijd van 17 jaar of hoger hadden significant minder kans om deelname aan twee specifieke

soorten SRG te rapporteren (seks onder alcohol-of drugsgebruik invloed en het hebben van meerdere seksuele partners). Ook werden positieve verbanden gevonden met betrekking tot het wel gebruiken van condooms tijdens de eerste geslachtsgemeenschap en zulk gebruik later.

In *Hoofdstuk 4* wordt ingegaan op gedragsfactoren. Deze lijken sterker samen te hangen met SRG dan (andere) psychologische factoren. Gedragsfactoren, zoals dronkenschap en vroege seks, bleken sterk geassocieerd met het SRG (meerdere seksuele partners en seks in risicovolle omstandigheden) van de jongvolwassen mannen en vrouwen. Van de vijf onderzochte psychologische factoren bleken er slechts twee samen te hangen met SRG. Vooral een hoge mate van extraversie en het minder belangrijk vinden van religie hingen samen met het hebben van meerdere seksuele partners, en met seks in risicovolle omstandigheden bij vrouwen. Bij mannen hing daarnaast hoge mate van extraversie samen met meerdere seksuele partners. Geen van de onderzochte gedrags-en psychologische factoren hing samen met inconsistent condoomgebruik .

In *Hoofdstuk 5* wordt de samenhang beschreven tussen de verschillende typen waardenoriëntaties en SRG bij jongvolwassenen. We vonden dat jongvolwassenen met meer maatschappelijk georiënteerde waarden minder SRG vertoonden in vergelijking met mensen met minder maatschappelijk georiënteerde waarden. SRG was omgekeerd gerelateerd aan de factoren Sociale oriëntatie en Gevoel van gemeenschap, waarden die gericht zijn op het welzijn van anderen. Die deelnemers die een groter risico nemen (aantal partners, seks met een onbekende persoon en alle cumulatieve indicatoren) gaven consistent een lagere prioriteit aan deze waarden, zowel die de maatschappelijke oriëntatie weergeven op een persoonlijk niveau, bijvoorbeeld Verantwoordelijk, Liefdevol en Eerlijk en maatschappelijke oriëntatie op een maatschappelijk niveau, bijvoorbeeld Gelijkheid, Rechtvaardigheid en een Wereld van vrede.

In *Hoofdstuk 6* wordt ingegaan op de v samenhang van opvoedprocessen (toezicht en ondersteuning) met het SRG van adolescenten. Ouderlijk toezicht is sterker geassocieerd met SRG dan ouderlijke sociale steun. In het bijzonder werd een significant verband gevonden tussen een minder strikt toezicht door de vader en een vroege eerste geslachtsgemeenschap bij meisjes en met inconsistent condoomgebruik bij jongens. Minder strikt toezicht door de moeder hing alleen samen met inconsistent gebruik van condooms bij jongens.

In *Hoofdstuk 7* wordt ingegaan op de vraag of psychosociale factoren (zoals het gevoel van eigenwaarde, welbevinden, onderwijs-aspiraties, gezinsstructuur, opleiding van de ouders en sociale steun) samenhangen met het SRG van een adolescent. Psychosociale variabelen zoals angst, sociale steun van anderen en van vrienden, sociaal disfunctioneren en een positief gevoel van eigenwaarde onderscheiden jongeren die seks hebben gehad (zowel riskant of veilig) van jongeren die dat niet hadden, maar ze onderscheiden niet tussen jongeren die risicovolle seks hebben gehad en jongeren veilige seks hebben gehad. Wat betreft psychologische factoren vonden we dat een hogere kans om nog steeds een maagd te zijn samenhangt met een laag niveau van positieve zelfwaardering, een laag niveau van angst/

depressie, en een hoog opleidingsstreefniveau. Wat betreft sociale factoren vonden we dat jongeren die aangaven uit een compleet gezin te komen en meer sociale steun te krijgen van vrienden en minder sociale steun van ouders, meer kans hadden om nog geen geslachtsgemeenschap te hebben gehad.

In het laatste hoofdstuk van dit proefschrift (*Hoofdstuk 8*) worden de belangrijkste bevindingen van dit onderzoek samengevat en ingekaderd in de theoretische achtergrond en de huidige kennis van het onderzoek op dit gebied. Daarnaast worden de sterke punten en beperkingen van het onderzoek besproken en de implicaties ervan voor toekomstig onderzoek en de volksgezondheidspraktijk genoemd.

Podoby sexuálneho správania počas obdobia adolescencie a mladej dospelosti môžu výrazne ovplyvniť sexuálne zdravie a zdravie ako také aj do budúcnosti. Preto zdravé sexuálne správanie a zdravý sexuálny vývin je jedným z hlavných záujmov vo väčšine vyspelých krajín. Dôležitosť tohto záujmu je o to viac markantná, pretože sexuálne rizikové správanie (SRS) je asociované s mnohými ďalšími formami rizikových správanií.

Hlavným cieľom tejto práce je preskúmať vzťahy medzi SRS adolescentov a mladých dospelých a faktormi správania (pitie alkoholu, fajčenie, sexuálne správanie), psychologickými faktormi (extroverzia, neuroticizmus, sebaúcta, psychická pohoda, vzdelanostné aspirácie, osobné hodnoty) a sociálnymi faktormi (štruktúra rodiny, vzdelanie rodičov, sociálna podpora od priateľov, rodičovská podpora a kontrola). V zmysle cieľov tejto práce bolo sformulovaných 5 výskumných otázok týkajúcich sa: asociácií medzi faktormi správania pri prvom pohlavnom styku a aktuálnym sexuálnym správaním sa mladých dospelých (Kapitola 3); asociácií medzi psychologickými faktormi a faktormi správania a SRS mladých dospelých (Kapitola 4); asociácií medzi rôznymi hodnotovými orientáciami a SRS mladých dospelých (Kapitola 5); rozličných foriem rodičovského správania (podpora, kontrola) a SRS adolescentov (Kapitola 6); psychosociálnych faktorov a ich vplyvu na SRS adolescentov (Kapitola 7)

Kapitola 1 ponúka všeobecný úvod do problematiky sexuálneho zdravia a SRS. Kapitola pokračuje krátkym predstavením vzťahov medzi faktormi správania (napr. pitie alkoholu), psychologickými faktormi (napr. sebaúcta, psychická pohoda) a sociálnymi faktormi (štruktúra rodiny, rodičovské správanie) a SRS. Na konci kapitoly spolu s cieľom práce je prezentovaný model výskumu ktorý prezentuje skúmané premenné a výskumné otázky.

Kapitola 2 poskytuje základné informácie o dizajne celej štúdie. Venuje sa popisu jednotlivých výskumných vzoriek a popisu metodík , ktoré boli použité v tomto výskume.

Kapitola 3 popisuje asociácie medzi faktormi správania pri prvom pohlavnom styku (vek a použitie kondómu pri prvom pohlavnom styku, dĺžka vzťahu pre prvým pohlavným stykom) a SRS mladých dospelých. Výsledky ukazujú, že rizikové správanie pred a počas prvého pohlavného styku môže predikovať SRS aj v neskoršom období. Obzvlášť študenti, ktorí priznali prvý pohlavný styk vo veku 17 rokov a neskôr mali významne nižšiu pravdepodobnosť na SRS (sex pod vplyvom omamných látok a vysoký počet sexuálnych partnerov). Podobné pozitívne asociácie boli potvrdené aj pri používaní kondómu pri prvom pohlavnom styku.

Kapitola 4 je zameraná na faktory správania a psychologické faktory vo vzťahu k SRS. Na základe výsledkov práve faktory správania, ako pitie alkoholu a skorý vek pri prvom pohlavnom styku majú na rozdiel od

psychologických faktorov výrazný vplyv na pravdepodobnosť výskytu SRS (viac sexuálnych partnerov a sex pod vplyvom omamných látok) medzi mladými dospelými. Spomedzi piatich psychologických faktorov sa iba dva ukázali ako významné. Faktory, ako vysoká miera extroverzie a nízka miera dôležitosti religiozity boli u žien asociované s vyšším počtom sexuálnych partnerov a sexom pod vplyvom omamných látok. Podobne aj muži, ktorí skórujú vysoko v miere extroverzie majú vyššiu pravdepodobnosť mať viac sexuálnych partneriek. Žiaden so skúmaných psychologických faktorov alebo faktorov správania nebol asociovaný s mierou používania kondómov.

Kapitola 5 popisuje asociácie medzi rôznymi typmi hodnotových orientácií a SRS na vzorke mladých dospelých. Táto štúdia potvrdila, že mladí ľudia ktorí preferujú viac sociálne orientované hodnoty dosahujú nižšie skóre v ukazovateľoch SRS. V tejto štúdii sú formy SRS negatívne asociované s faktormi ako Sociálna orientácia a Zmysel pre spoločnosť. Respondenti ktorí sa správali rizikovo (počet sexuálnych partnerov, sex s neznámou osobou a kumulatívne indikátory) konzistentne dávali nízke skóre sociálne orientovaným hodnotám tak v rovine osobnej (zodpovednosť, česťnosť, oddanosť) ako aj v spoločenskej rovine (rovnosť, spravodlivosť, mierový svet).

Kapitola 6 sa zameriava na vzťahy medzi formami rodičovského správania (kontrola, podpora) a SRS adolescentov. Rodičovská kontrola sa oproti rodičovskej podpore ukázala ako silnejší prediktor SRS. Predovšetkým, nižšia miera monitoringu zo strany otca bola medzi dievčatami výraznejšie asociovaná s nízkym vekom pri prvom pohlavnom styku a s nekonzistentným používaním kondómu medzi chlapcami.

Kapitola 7 sa zaoberá vzťahmi medzi psychosociálnymi faktormi (sebaúcta, psychická pohoda, vzdelanostné aspirácie, štruktúra rodiny, vzdelanie rodičov a sociálna opora) a SRS adolescentov. Premenné ako anxieta, sociálna opora od známych a priateľov, sociálna dysfunkcia a kladná sebaúcta sú odlišné u adolescentov ktorí už mali sex (rizikový alebo bezpečný) a takými ktorí ešte pohlavný styk nemali. Na druhej strane, spomínané premenné nie sú odlišné pri porovnaní adolescentov, ktorí sa správajú rizikovo a nerizikovo. V kontexte psychologických faktorov sme zistili že pravdepodobnosť mať prvý pohlavný styk neskôr bola asociovaná s nízkou sebaúctou a anxiety/depresiou a vysokou mierou vzdelanostnej aspirácie. V kontexte sociálnych faktorov, adolescenti z kompletných rodín, s vysokou sociálnou oporou od priateľov a nízkou od rodičov mali väčšiu pravdepodobnosť mať prvý pohlavný styk neskôr.

Záverečná kapitola (*Kapitola 8*) sumarizuje a diskutuje jednotlivé zistenia tejto práce v kontexte teoretických a výskumných poznatkov z oblasti tohto druhu výskumu. Zároveň sú prezentované silné a slabé stránky s návrhmi pre budúci výskum a prax v oblasti sexuálneho zdravia.

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Eleanor Roosevelt

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About the author



Ondrej Kalina was born on March 5th, 1982 in Prešov, Slovakia. After finishing secondary school in Prešov, he studied at the University of Prešov where he graduated in Psychology with his Master thesis entitled “Efficiency of the neurofeedback training on volleyball players”.

After studying, his professional career started at P.J. Šafárik University as a researcher. At the same time he started his PhD project at the University of Groningen. He focused on sexual risk behaviour of adolescents and young adults in Slovakia. During that time he was also active as a lecturer in the subjects of cognitive psychology, social psychology; communications skills and psycho-social trainings. He was also responsible for supervising Bachelor and Master theses..

In the context of research he has taken part in two international research projects (SliCE – Students Life Cohort study in Europe; SNIPE – Social Norms Intervention for the prevention of Polydrug use). In terms of national project he has been active in several research projects as well (e.g. APVV - Individual, interpersonal, social and societal factors of risky behaviour in adolescence and early adulthood; APVV – Drug use among young adults: drug use prevention based on research data). Additionally, he has taken a long term psychotherapy course in the systemic psychotherapy approach which he uses in his psychotherapy practice. Apart from his professional interests he has worked as an ice-hockey referee for more than 10 years.

Currently he works as a lecturer at the Department of Education and Health Psychology, Faculty of Arts, P.J. Šafárik University.

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