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Intrapersonal factors, social context and health-related behavior in adolescence

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**Intrapersonal factors, social context and
health-related behavior in adolescence**

Zuzana Veselská

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

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social context and
health-related behavior
in adolescence**

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Introduction

This study deals with health-related behaviors and tries to contribute to the understanding of possible determinants associated with these behaviors. Its main focus is on the intrapersonal dimension (perception of self) and on the additional contribution of factors from other dimensions (interpersonal and socio-cultural). This chapter covers the theoretical background of this study, describes the aim of the study and the theoretical model used and presents the research questions and the structure of this thesis.

1.1 Health-related behavior in adolescence

Health-related behaviors have traditionally been defined as behaviors undertaken by individuals that affect their health (Kasl & Cobb, 1966). These behaviors can be further distinguished between health-compromising behaviors (e.g. smoking, alcohol consumption, cannabis use, and unprotected sex), which have an undesired effect from a public health perspective on health, and health-enhancing behaviors (e.g. physical activity, healthy eating), which have a desired effect on health from a public health perspective. Patterns of health-compromising behaviors and their initiation and progression in adolescence are generally considered to be predictive of later involvement in such behaviors and exposure to their harmful consequences (Tucker, Ellickson, Orlando, Martino, & Klein, 2005). Healthy lifestyle patterns that include health-enhancing behaviors can be also traced back to childhood and adolescence (Hallal, Victora, Azevedo, Wells, 2006).

Previous research (Van Nieuwenhuijzen et al., 2009; Lam, Stewart, & Ho, 2001; Jessor, 1991) shows that the mentioned behaviors cluster together and therefore might have similar patterns of determinants. Empirical evidence supports the existence of organized patterns in adolescent health-related behaviors with several domains of influence (Petraitis, Flay, Miller, 1995; Jessor, 1991), which are described in more details in Table 1.1. Based on these models it is possible to distinguish the following domains of influence: genetics (e.g. a family history of addiction), intrapersonal factors (e.g. low self-esteem), interpersonal factors (e.g. family and/or peer support) and sociocultural (e.g. socioeconomic status) factors. Understanding factors related to health-related behaviors is essential for

developing effective and successful strategies that contribute to health promotion not only in adolescence (present health) but also in adulthood (future health).

Table 1.1 A matrix of types and influences on health behavior (Petraitis, Flay, Miller, 1995 – modified)

Level of influence	Type of influence		
	Cultural/attitudinal	Social/interpersonal	Intrapersonal
Ultimate	Constructs: local crime and employment rates; inadequate schools; poor career and academic options; negative evaluations from teachers; availability of substances weak public policies	Constructs: infrequent opportunities for rewards from family members; lack of parental warmth, support or supervision; negative evaluations from parents; home strain; parental divorce or separation	Constructs: impaired cognitive functions; genetic susceptibility; temperamental personalities; impulsivity; aggressiveness; emotional instability; extraversion; sociability; risk-taking; thrill-seeking; external locus of control
Distal	Constructs: weak commitment to conventional values, school, and religion; social alienation and criticism; weak desire for success and achievement, rebelliousness; desire for independence from parents; deviance	Constructs: weak attachment to and weak desire to please family members; strong attachment to and strong desire to please peers; greater influence from peers than parents; risky behavior; specific attitudes and behaviors of role models	Constructs: low self-esteem, temporary anxiety, stress, or depressed mood; poor coping skills; weak academic skills
Proximal	Constructs: expected costs and benefits of risky behavior, evaluation of costs and benefits of risky behavior, attitudes towards risky behavior by others, attitudes towards risky behavior by self	Constructs: prevalence estimates; motivation to comply with others; beliefs that important others encourage risky behavior	Constructs: refusal skills, use self-efficacy; refusal self-efficacy

1.2 Intrapersonal and interpersonal factors and health-related behaviors

As already mentioned, health-related behaviors are associated with factors from several domains of influence. In the next section, the focus will be on the role of factors from the intrapersonal and interpersonal domains.

1.2.1 Perception of self and health-related behavior

Adolescence, as the period of transition from childhood to adulthood, is a critical time for the development of lifelong perceptions, beliefs, values and practices. This period is related to making that transition and to coping with several challenges. Adolescents struggle with the developmental tasks of establishing an identity, accepting changes in physical characteristics, learning skills for a healthy lifestyle and separating from family (Susman, Dorn & Schiefelbein, 2003; Burt, 2002). Adolescents' family, peers, neighborhood environment, school and other associations can help them complete these tasks or can pose significant barriers that many youths will not be able to overcome on their own. During adolescence, youths continue with developing their perception of the self and face the task of establishing a satisfying self-identity (Burt, 2002; Anderson & Olnhausen, 1999).

Self-esteem is an evaluative and affective aspect of the self. It is also considered as equivalent to self-regard, self-estimation and self-worth (Harter, 1999). It refers to a person's global appraisal of his/her positive or negative value (Markus & Nurius, 1986). Self-esteem has well-known consequences not only for current physical and mental health and health-related behaviors, but also for future health and health-related behaviors during adulthood (Mann et al, 2004). Positive self-esteem is a basic element of mental health, but it also contributes to better health through its role as a buffer against negative influences. Conversely, negative self-esteem can play a critical role in the development of several internalizing (depression, anxiety) and externalizing (violence, substance use) problems (Mann et al., 2004). Self-esteem is closely connected with self-efficacy and plays an important role in what are currently the most frequently used cognitive models of health-related behavior, such as the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Attitude-Social influence-self-Efficacy (ASE) model (De Vries & Mudde, 1998), the Theory of Triadic Influence (TTI) (Flay & Petraitis, 1994) and the Precede-Proceed model (Green & Kreuter, 1999). Based on the review by Mann et al. (2004), self-efficacy in behavioral domains, according to the TPB, influences self-esteem or the evaluation of self-worth. At the same time, according to other models such as the ASE or TTI, self-esteem could be considered as a distal factor influencing self-efficacy in specific behavioral domains.

Self-esteem has been repeatedly associated with health-compromising and health-enhancing behaviors in past research. Recent studies have confirmed the connection between higher self-esteem and regular physical activity (White, Kendrick & Yardley, 2009; Penedo & Dahn, 2005; Parfitt & Eston, 2005). Evidence about the association between smoking or cannabis use and self-esteem is more contradictory but still suggests a connection between higher self-esteem and lower engagement in smoking and cannabis use (Kokkevi, Richardson, Florescu, Kuzman, & Stergar, 2007; Wild, Flisher, Bhana, & Lombard, 2004; Carvajal, Wiatrek, Evans, Knee, & Nash, 2000).

Self-efficacy, defined as beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations (Bandura, 1995), has a central role in socio-cognitive theories, e.g. Ajzen's (1988) theory of planned behavior or Bandura's (1986) social cognitive/learning theory. People's beliefs in their own efficacy influence the choices they make, their aspirations, how much effort they mobilize in given behaviors and how long they persevere in the face of difficulties (Bandura, 1991). Behavior-specific self-efficacy is therefore generally considered as an important determinant of the practice of health-related behaviors.

Specific beliefs about self-efficacy are considered to have the most immediate and direct association with health-related behaviors like regular smoking, cannabis use and physical activity. Low perceived self-efficacy has been repeatedly connected with a higher prevalence of smoking behavior (Engels, Hale, Noom, & De Vries, 2005; Kim, 2004; Engels, Knibbe, de Vries & Drop, 1998) and a lower prevalence of physical activity (White, Kendrick & Yardley, 2009; Annesi, 2006).

Self-competence and self-liking were defined by Tafarodi & Swann (1995) as constructs emerging from global self-esteem. Self-competence is defined as the evaluative experience of oneself as an intentional being with efficacy and power. Self-liking, on the other hand, is defined as the evaluative experience of oneself as a good or bad person according to internalized criteria for worth. These two dimensions could also be extracted from the Rosenberg Self-esteem Scale, as has been confirmed in other studies (Schmitt & Allik, 2005; Tafarodi & Milne, 2002). There is a lack of studies exploring self-liking and self-competence in association with health-related behaviors. However, both mentioned aspects of self are closely related to the concept of self-esteem and it can be assumed that they are associated with health-related behaviors in a similar way (Tafarodi & Swann, 1995).

1.2.2 Health-related behaviors and other intrapersonal and interpersonal factors

Based on the comprehensive social-psychological framework for explaining health-related behaviors proposed by Petriatis, Flay, & Miller (1995) and Jessor (1991), other intra- and interpersonal factors can be expected to contribute to the association between the perception of self and health-related behaviors. Their headings are also presented in Table 1.1 and Figure 1.1. From the intrapersonal domain, factors like personality, affectivity, mental health and resilience have been associated with health-related behaviors in previous research (Markey et al., 2006; Curry & Youngblade, 2006; Windle & Windle, 2001; Gordon Rouse, Ingersoll, & Orr, 1998). From the interpersonal domain, family and peers factors are the most studied determinants of health-related behaviors (Tomcikova et al., 2009; Mistry et al., 2009; Peters et al., 2009). To be able to fully explore health-related behaviors and their determinants, it is important to look for the expected contribution of factors from different domains.

1.3 Socioeconomic background of adolescent health-related behaviors

Socioeconomic background is probably an important cause of adolescents' health-related behaviors, but evidence on its role is not yet conclusive. There are some differences regarding type of health-related behaviors and some country differences as well. Different types of health-related behaviors do not associate similarly with socioeconomic status, and differences in the association between socioeconomic status and health-related behaviors were also found across countries (Richter et al., 2009; Currie et al., 2008). Regarding smoking, some studies found that socioeconomic differences in adolescent smoking are not present or not as pronounced as in adult smoking (Richter et al., 2009; Tuinstra et al., 1998), while other studies revealed consistent socioeconomic differences regarding this type of health-related behavior (Piko & Keresztes, 2008; Salonna et al., 2008; Goodman & Huang, 2002; Madarasova Geckova et al., 2005). Consistent socioeconomic differences can be found in health-enhancing behaviors like physical activity or consumption of fruits and vegetables. Higher socioeconomic status was associated with more frequent physical activity and a higher frequency of fruits and vegetables consumption (Richter et al., 2009; Vereecken, Maes & De Bacquer, 2004).

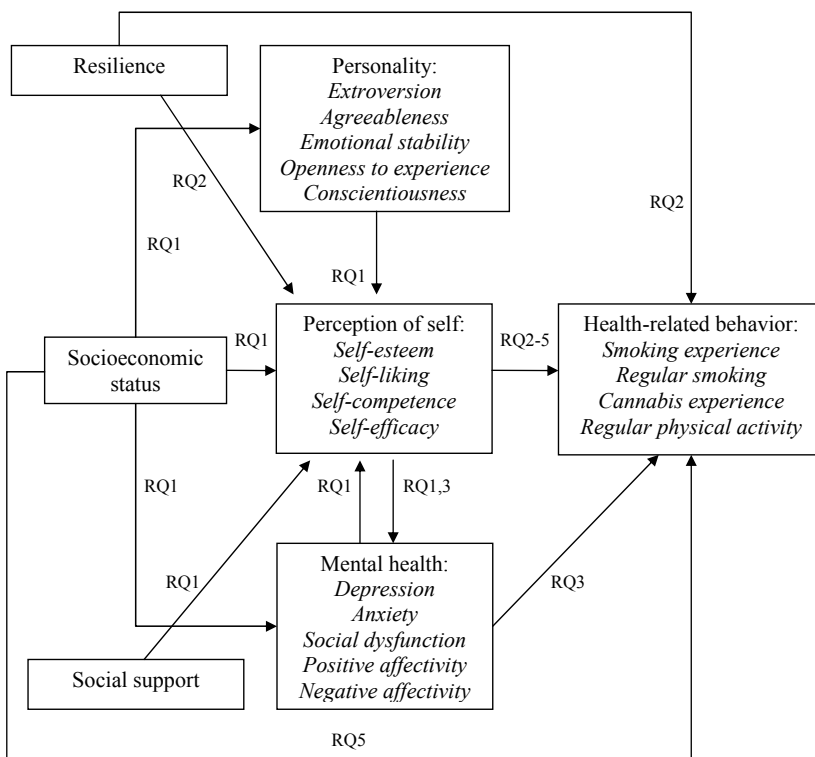
Geckova (2002) provided several explanations for these contradictory findings: (a) differences in the socio-cultural context; (b) differences in the measurements of socio-economic status; (c) differences in the measurements of health-related behaviors and (d) differences in the

samples. Differences in the socio-cultural context are very likely to occur and influence the findings. Therefore, they need to be taken into account in the process of explaining the results. In addition, differences in measurements of health-related behaviors might be more pronounced than differences in measurements of socioeconomic status since there is more variety in the questionnaires used for measuring various types of health-related behavior. A fifth explanation for these discrepancies could be the period of life in which these behaviors are established. For instance health-enhancing behaviors like physical activity are usually established in childhood when parental influence is much stronger than in adolescence (Richter et al., 2009). Therefore, socioeconomic status defined by the educational level of parents might be associated more strongly with such health-enhancing behaviors. In contrast, health-endangering behaviors like smoking are established more intensively in adolescence when the influence of parents is less pronounced and the influence from peers is growing. This might explain the less consistent findings about the connection between the socioeconomic status of parents and health-endangering behaviors like smoking in this period of life. These inconsistent findings also support the assumption made by Petraitis, Flay, & Miller (1995) that health-related behaviors in adolescence need to be explored with regard to factors from different domains of influence (intrapersonal, interpersonal and socio-cultural) which might contribute to the connection between socioeconomic status and health-related behaviors and which were not fully explored in the above mentioned studies.

1.4 Aims of the study and research questions

The general aim of this thesis was to examine the association between the perception of self (e.g. self-esteem, self-liking, self-competence and self-efficacy) and health-related behavior (e.g. smoking behavior, drunkenness, cannabis use and physical activity) among adolescents. A further aim of this thesis was to explore the contribution of other intrapersonal factors (e.g. personality, mental health and resilience) to the above mentioned association. Additionally, we were interested in the role of socioeconomic status as a background variable. The model of the relationships examined within this thesis is presented in Figure 1.1.

Figure 1.1 Model of the relationships between key constructs examined in the thesis



Five main research questions were formulated based on previous studies.

Research question 1:

Do personality, mental health and social support contribute to the relationship between socioeconomic status and self-esteem (Chapter 3)?

Research question 2:

Does self-esteem, along with resiliency factors, influence selected types of health risk behavior (smoking experience, regular smoking, and cannabis experience) among adolescent boys and girls (Chapter 4)?

Research question 3:

Does affectivity contribute to the association between self-efficacy and selected types of health risk behavior (smoking experience, regular smoking) in young adolescence (Chapter 5)?

Research question 4:

Do aspects of self-perception (self-esteem, self-liking, self-competence, and self-efficacy) associate with different levels of physical activity among adolescent boys and girls (Chapter 6)?

Research question 5:

Does self-esteem contribute to the relationship between socioeconomic status and physical activity (Chapter 7)?

1.5 Structure of the thesis

This thesis is divided into eight chapters.

Chapter 1 provides a general introduction to the associations between the key theoretical constructs of this thesis: perception of self (self-esteem, self-liking, self-competence, and self-efficacy), other intrapersonal factors (e.g. personality, mental health and resilience), socioeconomic status and health-related behavior (e.g. smoking behavior, cannabis use and physical activity). The primary aim and research questions of the thesis, along with the model of studied variables, are presented.

Chapter 2 provides information about the design of the study. It describes the data collection and the study samples used in this thesis. Furthermore, it provides a short description of the measures and analysis used.

Chapter 3 explores the association between socioeconomic status and self-esteem in adolescence with possible contributions of personality, mental health and social support.

Chapter 4 focuses on the influence of self-esteem and resilience on health-related behavior (smoking experience, regular smoking, and cannabis experience) among adolescent boys and girls.

Chapter 5 explores the association between self-efficacy and health-related behavior (smoking experience, regular smoking) in adolescence with the possible contribution of affectivity.

Chapter 6 focuses on the associations between the perception of self (self-esteem, self-liking, self-competence, and self-efficacy) and different levels of physical activity among adolescent boys and girls.

Chapter 7 explores the association between socioeconomic status and physical activity in adolescence with the possible contribution of self-esteem.

Chapter 8 presents and discusses the main findings of this thesis as well as its strengths, limitations and also its implications for practice and further research.

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Data sources

This chapter provides a general overview of the origin of the data (2.1), measures (2.2) and statistical analysis (2.3) used in this study.

2.1 Origin of the data

This study used two study samples. A brief description of these samples and information about their use in the separate chapters are given in the following text.

The first study sample consisted of 3,725 adolescents in the 8th and 9th grades at elementary schools in the major cities of Bratislava (600,000 inhabitants, Western Slovakia), Zilina (156,000 inhabitants, Northern Slovakia) and Kosice (240,000 inhabitants, Eastern Slovakia) as well as other smaller cities (10,000 – 40,000 inhabitants) in the eastern region of Slovakia. The sample was made up of 49% boys, with a mean age of 14.3 years (SD 0.65; range 11-17 years). Students younger than 13 and older than 16 years old were excluded to make the sample more homogeneous and to avoid age extremes which could influence the findings. After this exclusion, the study sample consisted of 3,694 students (mean age 14.3 years, SD 0.62), with 24.6% coming from Bratislava, 21.3% from Zilina, 32.1% from Kosice and 22% from other eastern region cities. Trained researchers and research assistants collected data between October and December 2006. A set of questionnaires was administered during two regular 45-minute lessons in a complete 90-minute time period on a voluntary and anonymous basis in the absence of the teachers. The overall response rate was 93.5%. Non-response was due to illness or another type of school absence. This sample was used in Chapter 3, 4 and 7.

A second study sample was collected in addition to the previous one to obtain data on the intrapersonal factors associated with health-related behavior. It consisted of 501 pupils from the last two grades of elementary schools in the eastern part of Slovakia (the cities of Kosice and Presov - 240,000 and 167,000 inhabitants respectively) and the eastern part of Czech Republic (Brno – 370,000 inhabitants). These three cities are comparable in that they are all the second or third biggest towns in their respective countries and are located in economically less-developed districts of the eastern parts of their respective countries. Of the study sample (n = 501, response 91.5%), 48.5% were boys and ranged from 11.5 to 16.3 years old

(mean age 14.7 years SD 0.90). The data were collected in a way similar to the previous sample. Trained researchers and research assistants collected data in June and September 2007. A set of questionnaires was administered during two regular 45-minute lessons in a complete 90-minute period of time on a voluntary and anonymous basis in the absence of teachers. Response was 91.5%, with non-response due mostly to school absence because of illness or other reasons. All questionnaires used in this study underwent the process of back-translation to ensure that the language versions used measure the same constructs as the original language versions. This sample was used in Chapter 5 and 6.

2.2 Measures

In this section an overview of variables and measures used in this study is given.

The central dependent variables were indicators of health-related behavior. Questions were used to assess health-compromising and health-enhancing behavior. Health-compromising behavior indicators concerned questions about smoking behavior and cannabis use. Health-enhancing behavior indicators concerned questions about physical activity.

The independent variables used in this study concerned indicators of socioeconomic status (Family affluence scale FAS, Parents' education level), indicators of perception of self (Rosenberg self-esteem scale RSE, Self-liking/Self-competence scale SLCS, Self-efficacy scale SES), and other intrapersonal (Ten-Item Personality Inventory TIPI, Positive and Negative Affect Schedule PANAS, 12-item General Health Questionnaire GHQ-12) and interpersonal factors (Perceived Social Support Scale PSSS, Resilience scale RSA).

Brief information about the origin of the measures and a short description are given in Table 2.1.

Table 2.1 Brief summary of variables and measurements used in this study

Measure	Source	Type of variables (Chapters)	Short description
Smoking behavior	Derived from Currie et al., 2004	Dependent (Chapters 4, 5)	Indicator of health-compromising behavior
Cannabis use	Derived from Currie et al., 2004	Dependent (Chapter 4)	Indicator of health-compromising behavior
Physical activity	Currie et al., 2004	Dependent (Chapters 6,7)	Indicator of health-enhancing behavior
Parents' education	Currie et al., 2004	Independent (Chapter 7)	Indicator of socioeconomic status
FAS	Currie et al., 2004	Independent (Chapter 3)	Indicator of socioeconomic status
RSE	Rosenberg, 1965	Independent (Chapters 4, 6, 7)	Measure of person's evaluation of his/her worthiness
SLCS	Tafarodi & Swann, 1995	Independent (Chapter 6)	Measure of self-liking and self-competence
SES	Sherer et al., 1982	Independent (Chapters 5, 6)	Measure of general and social self-efficacy
TIPI	Gosling, Rentfrow, Swann, 2003	Independent (Chapter 3)	Brief measure of Big-Five personality domains
PANAS	Watson, Clark, & Tellegen, 1988	Independent (Chapter 5)	Measure of positive and negative affect
GHQ-12	Goldberg, 1972	Independent (Chapter 3)	Measure of psychological well-being
PSSS	Blumenthal, 1987	Independent (Chapter 3)	Measure of perceived social support
RSA	Hjemdal et al., 2001	Independent (Chapter 4)	Measure of resilience

2.3 Statistical analysis

Several statistical methods were used across this study to analyze data. All analyses were performed using the statistical software package SPSS, versions 12.0, 14.0 and 16.0. Detailed information about the statistical analyses performed can be found in the "statistical analysis" section of each chapter.

Standard descriptive analyses regarding the studied variables were performed in Chapters 3-7. Chi-square tests and t-tests were used in Chapters 4 and 7 to explore gender or socioeconomic differences in the studied variables. Correlations between the studied variables were explored in Chapters 3 and 4. A one-way analysis of variance (ANOVA) and Scheffe post hoc tests were used in Chapter 6 to explore the differences in perception of the self regarding health-related behavior. Logistic regression was used for dichotomized health-related behavior in Chapters 4, 5 and 7, and linear regression was used for continuous measure of self-esteem in Chapter 3.

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Socioeconomic differences in self-esteem of adolescents influenced by personality, mental health and social support

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Abstract

Previous studies indicate that self-esteem is lower among adolescents of low socioeconomic status and is associated with a number of intrapersonal, interpersonal and sociocultural factors. Evidence on the mechanisms by which these factors contribute to the connection between socioeconomic status and developing self-esteem is incomplete, however. The purpose of this cross-sectional study is to assess whether personality, mental health and social support contribute to the relationship between socioeconomic status and self-esteem. A sample of 3,694 elementary-school students from Slovakia (mean age 14.3 years, 49% boys) filled out the Rosenberg Self-esteem scale, the Family affluence scale, the Ten-Item Personality Inventory, the 12-item General Health Questionnaire and the Perceived Social Support Scale. Hierarchical linear regression showed family affluence, personality dimensions of extroversion, emotional stability and openness to experience, as well as mental health subscales and social support from family and significant others to be associated with self-esteem. Results indicate that personality dimensions and mental health subscales contribute to the association between family affluence and self-esteem. The contribution of personality and mental problems in the relation between socioeconomic status and self-esteem may have important implications for the design of promotional programs aimed at enhancing self-esteem.

Introduction

Socioeconomic position has a clear impact on developing self-esteem, especially during the important stage of adolescence. At this period of life, the self-esteem of young people undergoes important changes, influenced not only by the already-mentioned socioeconomic status, but also by variety of other intrapersonal, interpersonal and sociocultural determinants (Finkenauer, Engels, Meeus & Oosterwegel, 2002). Adolescence, the period of transition from childhood to adulthood, is a critical time for the development of lifelong perceptions, beliefs, values and practices. An adolescent struggles with the developmental tasks of establishing an identity, accepting changes in physical characteristics, learning skills for a healthy lifestyle and separating from family (Susman, Dron & Schiefelbein, 2003). Therefore, before entering adulthood, it is important for the adolescent to develop high self-esteem and the ability to care for the self (Anderson & Olnhausen, 1999).

Self-esteem has well-known consequences not only on current physical and mental health and health-related behavior, but also on future health and health-related behavior during adulthood (Mann, Hosman, Schaalma & de Vries, 2004). Self-esteem also plays an important role in what are currently the most frequently used cognitive models of health behavior, such as the Theory of Planned Behavior (TPB) (Ajzen, 1991), the Attitude-Social influence-self-Efficacy (ASE) model (De Vries & Mudde, 1998), the Theory of Triadic Influence (TTI) (Flay & Petraitis, 1994) and the Precede-Proceed model (Green & Kreuter, 1999). Based on the review by Mann et al. (2004), self-efficacy in behavioral domains, according to the TPB, influences self-esteem or the evaluation of self-worth. At the same time, according to other models such as the ASE or TTI, self-esteem could be considered as a distal factor influencing self-efficacy in specific behavioral domains. In addition, to be able to change the consequences of self-esteem on future health and health-related behavior, it is important to be aware of possible correlates and associations of low or high self-esteem which are crucial during the developmental stage of adolescence. According to Harter (1999), the development and maintenance of self-esteem in childhood and adolescence is influenced by two important factors: perceived competence in areas of importance and the experience of social support. Considering other factors, correlates of self-esteem can be divided into several essential domains: (a) gender, (b) socioeconomic factors, (c) personality factors and mental health, and (d) factors from family, friends and significant others. It is also necessary to mention that in the past, researchers only investigated levels of explicit self-esteem. However, in recent decades other aspects of self-esteem have been discovered and explored, such as implicit self-esteem, contingent self-

esteem and self-esteem stability (Crocker, Luhtanen, Cooper & Bouvrette, 2003; Kernis et al., 1993).

Gender has been reported to have an influence on developing self-esteem during adolescence. Boys are more likely to have high self-esteem at this stage of life than girls (McMullin & Cairney, 2004; Robins et al., 2002; Kling, Hyde, Showers & Buswell, 1999). Gender differences have also been reported in age-related changes. Self-esteem among boys tends to increase, while self-esteem among girls tends to decrease a little during early adolescence (Birndorf, Ryan, Aunger & Aten, 2005; Robins et al., 2002).

Previous studies also show socioeconomic status to be significantly related to self-esteem. In general, those with higher socioeconomic status report higher self-esteem than those with lower socioeconomic status (Rhodes, Roffman, Reddy & Fredriksen, 2004; Francis & Jones, 1996). Among socioeconomic factors, family income seems to be most related to self-esteem among adolescents (Birndorf et al., 2005).

Mental health has been reported to be associated with self-esteem in the past. Several studies (Miyamoto et al., 2001; Bolognini, Plancherel, Bettchart, & Halfon, 1996; Rosenberg, Schooler, Schoenbach & Rosenberg, 1995; Brown & Mankowski, 1993) have been conducted in this field, and associations have been found between self-esteem and depression and between self-esteem and anxiety. Self-esteem has been also reported to be related to eating disorders (Stice, Presnell & Spangler, 2002) and aggression (Donnellan et al., 2005; Baumeister, Smart & Boden, 1996). However, the relationship between self-esteem and aggression is currently being debated by researchers. Some authors argue that low self-esteem is related to aggression (Donnellan et al., 2005), whereas others indicate that high self-esteem is linked to aggression (Baumeister, Smart & Boden, 1996). Surprisingly, less attention has been paid to the connection between personality dimensions and self-esteem itself, though it could be hypothesized that consistent personality traits might influence the way people perceive and evaluate themselves (Robins et al., 2001).

Family, peers and significant others play a major role in the development of an adolescent's self-esteem. The family in particular, as the primary environment at this period of life, provides an important background for developing and creating the initial sense of oneself. Previous studies have found a positive relationship between supporting family relationships and self-esteem (Birndorf et al., 2005; Sweeting & West, 1995; Barrera & Garrison-Jones, 1992). On the other hand, a lack of support or a dysfunctional family environment has been described as a contributor to maladjustment, behavioral problems and drug abuse (Wentzel, 1994; McKay, Murphy, Rivinus & Maisto, 1991). In addition, support from peer groups and significant others, like teachers, could positively or negatively influence the development of one's self-esteem.

The question remains regarding how social support from family, friends and significant others contribute along with other self-esteem factors (e.g. personality, mental health) to the association between socioeconomic status and self-esteem.

Factors such as gender, socioeconomic status, personality and mental health and support from family and other relationships are all suggested as important influences in the field of the developing self-esteem during the adolescence, ultimately affecting outcomes in the area of mental health and health behavior. Understanding the associations between self-esteem and its correlates could bring new ideas to the role of self-esteem in the framework of health promotion among young people. Socioeconomic status is less strongly associated with self-esteem in comparison to personality dimensions and mental health constructs, which are very similar and strongly associated. Social support from family, friends and significant others could be seen again as conceptually more distinct in relation to self-esteem.

Therefore, based on the theoretical and empirical findings, the main aim of this study is to assess whether personality, mental health and social support contribute to the relationship between socioeconomic status and self-esteem. We will explore these variables and their associations with self-esteem. We assume that (a) socioeconomic status, personality, mental health and social support will be significantly associated with self-esteem; (b) socioeconomic status will be less strongly related to self-esteem in the model, and the explanatory power will decrease after adding personality dimensions, mental health and social support subscales; and (c) personality dimensions and mental health subscales, as similar constructs, will be strongly related to self-esteem and have a greater explanatory power.

Methods

Sample and Procedure

The study sample consisted of 3725 adolescents in the 8th and 9th grades of elementary schools in the major cities of Bratislava (cca 425,000 inhabitants, Western Slovakia), Zilina (cca 157,000 inhabitants, Northern Slovakia), Kosice (cca 240,000 inhabitants, Eastern Slovakia) and other smaller cities (cca 20,000 – 40,000 inhabitants) in the eastern region of Slovakia, representing different parts of the country. The study sample was fairly evenly divided by gender (49% boys, 51% girls) and ranged in age from 11 to 17 years (mean age 14.3 years SD 0.65). We decided to exclude students under 13 and over 16 years of age to make the sample more homogeneous and to avoid the influence of age extremes. After this step, the study sample consisted of 3694 students (mean age 14.3 years SD 0.62). Of the sample 24.6% came from Bratislava, 21.3% from Zilina, 32.1% from Kosice and 22% from other eastern region cities.

Trained researchers and research assistants collected the data between October and December 2006. The set of questionnaires was administered during two regular 45-minute lessons in a complete 90-minute period of time on a voluntary and anonymous basis in the absence of teachers. An overall response rate of 93.5% was achieved. Non-response was due to illness or other types of school absence. The local Ethics Committee approved the study.

Measures

Self-esteem was assessed with the Rosenberg Self-esteem scale RSES (Rosenberg, 1965). The 10 items of the RSES assess a person's overall evaluation of his/her worthiness as a human being (Rosenberg, 1979). Responses range on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). Global self-esteem factor can then be calculated, with the sum score ranging from 10 to 40. A higher score indicates higher self-esteem. Cronbach's alpha for global self-esteem was 0.76.

Socioeconomic status was measured by the Family affluence scale, which was developed for the HBSC surveys (Currie et al., 2004) as a measure of family wealth. It comprises four items about family car ownership, bedroom occupancy, computer ownership and family holidays. The composite FAS score (ranging from 0 to 7) was calculated, with a higher score indicating higher family affluence. Cronbach's alpha was 0.60.

Personality was measured using the Ten-Item Personality Inventory (TIPI), which is a very brief measure of the Big-Five personality domains, with only 10 items being assessed. Each item consists of two descriptors, separated by a comma, using the common stem "I see myself as:" (e.g. "I see myself as: extroverted, enthusiastic"). Five dimensions were calculated within this scale, with the higher score indicating a higher level of each dimension: extroversion (2 items), agreeableness (2 items), emotional stability (2 items), conscientiousness (2 items), and openness to experience (2 items). Responses range on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree), with the sum score ranging from 2 to 14 for each subscale (Gosling, Rentfrow & Swann Jr., 2003). Correlations between subscales were significant and are presented in Table 2. The strongest correlations are between extroversion and openness to experience (0.31) and between emotional stability and agreeableness (0.27).

Psychological well-being was measured using the 12-item General Health Questionnaire (GHQ-12), with a higher score indicating worse psychological well-being (Goldberg, 1972). With this scale, 2 factors could be computed: depression/anxiety (6 items) and social dysfunction (6 items). Responses range on a 4-point scale from 1 to 4, with the sum score ranging from 6 to 24 for each factor (Sarkova et al., 2006). Cronbach's alpha was 0.82 for the depression/anxiety subscale and 0.65 for social dysfunction. Correlation between the subscales is 0.53 (Table 2).

Support from family, friends and significant others was measured using the Perceived Social Support Scale (PSSS), with a higher score indicating higher social support. With this scale, consisting of 12 items, 3 possible subscales could be calculated: perceived support from family (4 items), perceived support from friends (4 items), and perceived support from significant others (4 items), with the sum score ranging from 4 to 28 for each subscale. Responses range on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree) (Dahlem, Zimet & Walker, 1991; Zimet, Dahlem, Zimet & Farley, 1988; Blumenthal et al., 1987). Cronbach's alphas for the perceived support from family, friends, and significant others subscales were 0.91, 0.91, and 0.85, respectively. Correlations between the subscales are rather strong (0.59, 0.67, 0.78) and are presented in Table 2.

Statistical procedure and analysis

Standard descriptive analyses (mean, standard deviation, and range of sum score) were performed in the first step. All the scales used in this study were also checked for their distributional properties, and normal distributions were found. Next, we explored the correlations between all the variables. Finally, linear regression was used to analyze the data and to explore associations between self-esteem and other variables, with self-esteem as the dependent variable, adjusted for gender. We did this in both a bivariate and multivariate way. In the multiple regression the variables were entered hierarchically in the following order: Model 0 gender; Model 1 family affluence; in Model 2 the TIPI subscales were added; in Model 3 the GHQ-12 subscales were added; in Model 4 the PSSS subscales were added. The present study focused on the association between socioeconomic status and self-esteem and on the other factors (e.g. personality, mental health, social support) contributing to this association. Therefore family affluence as an indicator of socioeconomic status was added in Model 1. Variables were then added in an order from the proximal to the distal factors in three additional steps (Model 2 to 4): that is, starting with personality as the most proximal factor, via mental health, to social support as the most distal factor. We also explored in an additional analysis whether the associations of personality, mental health with global self-esteem were moderated by socioeconomic status, as measured by family affluence. All analyses were performed using SPSS version 12.

Results

Table 3.1 and 3.2 show the descriptive statistics (mean, standard deviation, and range of sum score) and correlation matrix for the variables.

Table 3.1 Descriptive statistic of the study variables

	Mean (SD)	Range
Self-esteem		
global self-esteem	28.07 (4.45)	10-40
positive self-esteem	15.06 (2.40)	5-20
negative self-esteem	12.01 (2.80)	5-20
Family affluence	3.91 (1.66)	0-7
TIP1		
extroversion	9.34 (2.85)	2-14
agreeableness	9.21 (2.42)	2-14
conscientiousness	9.49 (2.51)	2-14
emotional stability	8.77 (2.68)	2-14
openness to experience	9.83 (2.62)	2-14
GHQ-12		
depression/anxiety	11.80 (4.30)	6-24
social dysfunction	11.72 (2.61)	6-24
PSSS		
support from family	21.70 (5.48)	4-28
support from friends	21.65 (5.44)	4-28
support from others	22.07 (5.29)	4-28

In the next step the regression analyses of the associations of the study variables with global self-esteem and the crude effect of all the variables was performed. All of the variables are associated significantly with global self-esteem, but separately they explain just a small part of the total variance. Higher family affluence, a higher level of extroversion, agreeableness, conscientiousness, emotional stability and openness to experience as well as a higher amount of perceived support from family, friends, and significant others are all associated with higher global self-esteem. On the contrary, higher levels of depression/anxiety and social dysfunction are associated with lower global self-esteem. Among the study variables, both GHQ-12 subscales have the highest standardized β coefficients and the highest explained variance. Other variables, with the small exceptions of emotional stability and perceived support from family subscales, stay at the approximately same level of explained variance.

Table 3.2 Correlation matrix of the study variables

	1	2	3	4	5	6	7	8	9	10	11	12
1 global self-esteem	1											
2 family affluence	.16**	1										
3 TIPI extroversion	.18**	.11**	1									
4 TIPI agreeableness	.11**	-.00	-.03*	1								
5 TIPI conscientiousness	.07**	-.01	.06**	.13**	1							
6 TIPI emotional stability	.28**	.08**	.12**	.27**	.04*	1						
7 TIPI openness to experience	.18**	.11**	.31**	.15**	.17**	.12**	1					
8 GHQ depression anxiety	-.55**	-.07**	-.06**	-.08**	-.00	-.29**	-.02	1				
9 GHQ social dysfunction	-.39**	-.09**	-.08**	-.09**	-.04**	-.19**	-.09**	.53**	1			
10 PSSS support from family	.26**	.05**	.13**	.11**	.10**	.13**	.12**	-.19**	-.18**	1		
11 PSSS support from friends	.13**	.04*	.22**	.11**	.07**	.09**	.20**	-.04*	-.10**	.59**	1	
12 PSSS support from others	.15**	.05**	.21**	.12**	.09**	.07**	.22**	-.02	-.09**	.67**	.78**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 3.3 Associations of SES, personality dimensions, mental health and perceived social support with global self-esteem: standardized beta coefficients from hierarchical linear regression.

	Model 1	Model 2	Model 3	Model 4
gender ^a	-0.19***	-0.22***	-0.10***	-.12***
family affluence	0.14***	0.09***	0.07***	0.07***
TIPI extroversion		0.15***	0.11***	0.10***
TIPI agreeableness		0.05**	0.03	0.02
TIPI conscientiousness		0.05**	0.05**	0.04**
TIPI emotional stability		0.22***	0.09***	0.09***
TIPI openness to experience		0.10***	0.10***	0.08***
GHQ-12 depression/anxiety			-0.44***	-0.43***
GHQ-12 social dysfunction			-0.09***	-0.07***
PSSS support from family				0.08***
PSSS support from friends				0.01
PSSS support from others				0.07*
R - square	0.06***	0.18***	0.38***	0.40***

^a 1 = female

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

Model 1 = gender, family affluence

Model 2 = gender, family affluence, TIPI subscales

Model 3 = gender, family affluence, TIPI subscales, GHQ-12 subscales

Model 4 = gender, family affluence, TIPI subscales, GHQ-12 subscales, PSSS subscales

Table 3.3 shows the results of hierarchical regression analysis for global self-esteem, adjusted for gender, with 4 models. Altogether, the study variables accounted for 40% of the total variance, and from Model 1 to Model 4 the explained variance increased from 6% to 40%. Model 1 contains family affluence, representing socioeconomic status with a rather low explained variance of 6%. The standardized β coefficient for family income decreased in subsequent models, which may, along with the variables added, be mediators in a causal chain. Similarly, the explained variance increased both after adding personality dimensions and after the additional inclusion of depression/anxiety and social dysfunction. Adding social support (Model 4) hardly affected other betas and explained the variance.

We also explored in an additional analysis whether the associations of personality and mental health with global self-esteem were moderated by socioeconomic status, as measured by family affluence. No moderating effect of socioeconomic status was found on the association between personality and self-esteem or mental health and self-esteem.

Discussion

Self-esteem is an influential factor in both physical and mental health (Mann et al., 2004). Our findings reveal that an association exists between low socioeconomic status and lower self-esteem. This association changed after adjustment for personality and mental health, but not after additional adjustment for social support.

Family affluence as an indicator for socioeconomic status remained significantly associated with self-esteem from the first to the final model, but its explanatory power decreased after adding personality dimensions and mental health variables (depression/anxiety and social dysfunction). At the same time, family affluence itself explained only 6% of the variance in self-esteem. This indicates the existence of other influential factors contributing to the association between socioeconomic status and self-esteem and could be explained by the mediating role of the personality dimension of emotional stability and even more so by the mental health subscale of depression and anxiety. Also, previous studies on the mediating processes between socioeconomic status, personality and self-esteem and socioeconomic status, family processes and self-esteem indicate such a possibility (Riuz, Roosa & Gonzales, 2002; Bergman & Scott, 2001; Robins et al., 2001; Pullman & Allik, 2000). Our findings imply that lower socioeconomic status is an indicator of lower feelings of self-worth among adolescents, but at the same time such a connection is mediated by young people's personality and mental health.

Depression and anxiety as mental health factors explained the greatest part of the total variance, and in the model this variable took its

explanatory power from family affluence, as has been already mentioned. After adding in this factor, the explanatory power of the personality dimension emotional stability decreased rapidly as well. This may be due to the fact that both of them, emotional stability as well as depression and anxiety, are of a rather similar construct. Their connection has been revealed by previous studies. Neuroticism has been shown to be associated with depression or anxiety (Steunenberg, Beekman, Deeg & Kerkhof, 2006). Moreover, depression and anxiety are frequently associated with self-esteem (Rosenberg et al., 1995). With social support, we moved from the internal to the external determinants of self-esteem. During adolescence, young people have to struggle with developing their self-identity. Family members are those who could primarily influence the perception of self-worth, providing positive feedback and appraisal of an adolescent's behavior, and consequently influence also relationships outside the family environment, which again shape the feelings of self-worth (Kerr, Stattin, Biesecker & Ferrer-Wreder, 2003). As can be seen, social support did not remarkably change the relationship between socioeconomic status and adolescent self-esteem.

Strengths and limitations

This study has several important strengths, the most important being its large nationally representative sample and its high response rates. It also has limitations. First, only subjective self-reports were used for measuring individual aspects. However, previous studies support the validity of such self-reports (Reijneveld, Crone, Verhulst & Verloove-Vanhorick, 2003). A second limitation is the cross-sectional design of our study, which makes conclusive statements about causality in our findings impossible. They thus need to be confirmed in a longitudinal design. However, as is discussed in Mann et al. (2004) and Flay, Allred and Ordway (2001), there is a lack of clarity regarding the direction of the causal relations between self-esteem and mental problems and disorders (e.g. depression, anxiety or social dysfunction measured in the present study). Finally, it needs to be mentioned that other aspects of self-esteem (e.g. implicit self-esteem, contingent self-esteem) were not measured.

Implications and Conclusion

The contribution of personality and mental problems on the relation between socioeconomic status and self-esteem may have important implications for the design of health-promotion programs aimed at the reduction of socioeconomic differences in adverse health behavior. Family affluence is clearly associated with adolescent self-esteem and has an impact on the way young people evaluate themselves. Adolescents of low socioeconomic status seem to be a more vulnerable group in the comparison to their peers of higher socioeconomic status and were

identified as a target group for health-promotion programs. The review of Haney and Durlak (1998) about self-esteem interventions provides evidence for the effectiveness of these interventions. However, the authors indicate that such interventions, even though potentially effective, need a better theoretical foundation and should take into account possible differences between participants (e.g. age, ethnicity or type of their problems). Longitudinal studies are needed, however, to support the causal chain we have inferred from our cross-sectional study.

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Self-esteem and resilience: the connection with risky behavior among adolescents

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Abstract

The aim was to explore the association of self-esteem and resilience with smoking and cannabis use among adolescents, separately for gender. A sample of 3 694 adolescents (mean age 14.3 years) from elementary schools in Slovakia filled out the Rosenberg Self-esteem scale, the Resiliency scale and answered questions about cigarette and cannabis use. Logistic regression models showed associations between negative self-esteem and risky behavior, but only among boys. Regarding resilience, structured style and family cohesion were associated with a lower probability of smoking and cannabis use among both boys and girls. In contrast, social competence increased the probability of smoking and cannabis use among both groups. Negative self-esteem seems to play an important role regarding smoking and cannabis use among boys. Resilience seems to have mixed effects, some aspects being protective while other aspects increase the likelihood of smoking and use of cannabis. These results imply that the prevention of substance use should target not only specific individual characteristics, but also the possible risk or protective influences of the social environment, i.e. the family and social network.

Introduction

Smoking is the most common form of substance use, and its harmful impact on health is well known. Tobacco use among young people leads to short-term health problems, including reduced lung function, increased asthmatic problems, coughing, wheezing and shortness of breath, and reduced physical fitness. It also leads to greater susceptibility to and severity of respiratory illness (Currie et al., 2004). Similarly, cannabis is also widely used and is most frequently used by adolescents as their first illicit drug (Kingery, 1999). Recently, young people have reported using more drugs and starting to do so at an earlier age (Currie et al., 2004). Patterns of substance use, initiation and progression in adolescence are generally considered to be predictive of later involvement with substance use and exposure to its harmful consequences (Tucker, Ellickson, Orlando, Martino, & Klein, 2005). Understanding the factors associated with substance use in adolescents is therefore essential in the field of prevention and health promotion.

Many studies from the past decade have focused on the role of self-esteem in relation to health-related behavior, whether it is a health-enhancing or health-endangering behavior. Additionally, self-esteem has been shown to be associated with initiation and continuation of the use of tobacco and cannabis (Kokkevi, Richardson, Florescu, Kuzman, & Stergar, 2007; Wild, Flisher, Bhana, & Lombard, 2004; Carvajal, Wiatrek, Evans, Knee, & Nash, 2000; Glendinning & Inglis, 1999; Hofler et al., 1999). 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 behavior. 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 behaviors and substance use (Mann, Hosman, Schaalma, & de Vries, 2004). Outcomes of low or negative self-esteem differ considerably by gender. Negative self-esteem among boys leads more often to externalizing problems, while among girls mostly to internalizing problems (Gjerde, Block, & Block, 1988).

An explanation for the role of self-esteem in substance use may be provided by framing it within resilience. Several authors consider self-esteem to be part of resilience on the individual level (Kumpfer, 1999; Masten & Coatsworth, 1998). Resilience itself could be seen as the process of, capacity for, or outcome of successful adaptation in the face of challenging or threatening circumstances. Resilient children and adolescents have within themselves, their family, their peer-group and

their environment, protective factors that help to buffer them from the negative forces or stresses to which they are exposed in their everyday life (Boyce Rodgers & Rose, 2002; Kumpfer, 1999). Other studies (Buckner, Mezzacappa, & Beardslee, 2003; Gordon Rouse, Ingersoll, & Orr, 1998) have also observed that resilient adolescents had higher self-esteem and were less likely to be involved in risky behavior in comparison to their less resilient peers.

To summarize, self-esteem, which could be seen as part of the individual domain within the resilience framework (Currie et al., 2004), together with other aspects including family, peer-group and environment, is considered as an influential factor in physical/mental health and health-related behavior. It consequently deserves special attention in health promotion. The main aim of the present study was therefore to investigate the association between self-esteem along with resiliency factors and the various forms of risky behavior among adolescents, separately among boys and girls. We explored a model in which positive and negative factors of self-esteem were connected with the aspects of young people's resilience, and we explored their association with tobacco and cannabis use. We assumed negative self-esteem as a risk factor and positive self-esteem as a protective factor for cigarette and cannabis use. We also assumed resiliency aspects to be protective factors in relation to the mentioned forms of risky behavior.

Methods

Sample and Procedure

The study sample consisted of 3 725 adolescents in the 8th and 9th grades at elementary schools in the major cities of Bratislava (600 000 inhabitants, Western Slovakia), Zilina (156 000 inhabitants, Northern Slovakia), Kosice (240 000 inhabitants, Eastern Slovakia) and other smaller cities (10 000 – 40 000 inhabitants) in the eastern region of Slovakia, representing different parts of the country. The study sample was fairly evenly divided by gender (49% boys, 51% girls) and ranged in age from 11 to 17 years (mean age 14.3 years, SD 0.65). We decided to exclude the students aged under 13 and over 16 to make the sample more homogeneous and to avoid the influence of age extremes. After this step, the study sample consisted of 3 694 students (mean age 14.3 years, SD 0.62), with 24.6% coming from Bratislava, 21.3% from Zilina, 32.1% from Kosice and 22% from other eastern region cities.

Trained researchers and research assistants collected the data between October and December 2006. The set of questionnaires was administered during two regular 45-minute lessons in a complete

90-minute time period on a voluntary and anonymous basis in the absence of the teachers. The overall response rate was 93.5%. Non-response was due to illness or another type of school absence.

Measures

Self-esteem

Self-esteem was assessed using the Rosenberg Self-esteem scale RSES (Rosenberg, 1965). The 10 items of the RSES assess a person's overall evaluation of his/her worthiness as a human being (Rosenberg, 1979). Responses range on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). The RSES can be divided into an equal number of positively and negatively worded items measuring positive and negative self-esteem (Sarkova et al., 2006). Items were standardized and summed for the two factors (positive and negative self-esteem), with the sum score ranging from 5 to 20 for each factor. A higher score indicates higher self-esteem. Cronbach's alpha for the positive self-esteem subscale was 0.73 and for the negative self-esteem subscale 0.64.

Resilience

A Resilience Scale consisting of 33 items was used for measuring the respondents' resilience. This instrument used a five-point semantic scale format in which each item had a positive and negative attribute at either end of the scale continuum. The positive attributes were keyed to the right for half of the items to reduce acquiescence biases (Hjemdal, Friborg, Martinussen, & Rosenvinge, 2001). The scale consisted of the six aspects of resilience: personal strength/perception of self (6 items, sum score from 6 to 30), personal strength/perception of future (4 items, sum score from 4 to 20), structured style (4 items, sum score from 4 to 20), social competence (6 items, sum score from 6 to 30), family cohesion (6 items, sum score from 6 to 30), and social resources (7 items, sum score from 7 to 35) (Friborg, Barlaug, Martinussen, Rosenvinge, & Hjemdal, 2005). Cronbach's alpha was 0.63, 0.77, 0.60, 0.69, 0.74, and 0.83, respectively. A higher score indicates higher resilience.

Risky behavior

Within the scope of adolescents' risky behavior, the focus was on smoking and cannabis use. Smoking was measured with one question asking about this type of risky behavior; "Have you ever smoked a cigarette?" with the responses (1) no, never, (2) yes, I have tried, (3) yes, I used to smoke but I have quit, (4) yes, I smoke occasionally, (5) yes, now I smoke every day. We dichotomized the responses to this question for logistic regression in two ways. Firstly, we dichotomized the responses regarding experience with smoking: without experience - (1) no, never / with experience - the remaining four answers. In the second dichotomization we considered

regular smoking: not regular smoker - (2) yes, I have tried, (3) yes, I used to smoke but I have quit, (4) yes, I smoke occasionally / regular smoker - (5) yes, now I smoke every day. We chose this dichotomization because of the young age of the study sample, which ranged in age from 13 to 16 years. At this young age there could be found a substantial group of experimental smokers with only early experiences regarding smoking (experienced vs. inexperienced) and a smaller group of regular smokers who went from experimental smoking to regular smoking. This also describes current vs. non-current smoking, but comprises fewer respondents in the current group, thus limiting the power of our study. Therefore, we at the same time used the first dichotomization regarding experience with smoking. Cannabis use was measured with one question: "Have you ever smoked cannabis?" with the responses (1) no, never, (2) yes, I have tried, (3) yes, I smoke occasionally, (4) yes, now I smoke every day. We dichotomized the responses to this question for logistic regression as with or without experience with cannabis use.

Statistical analysis

Standard descriptive analyses were performed in the first step. Next, we explored gender differences in the patterns of smoking behavior and cannabis using chi-square tests. Finally, logistic regression models were performed to determine the associations of self-esteem and resilience with smoking behavior (previous experience with smoking and regular smoking) and cannabis use (previous experience with cannabis) as dependent variables. We did this multivariately with mutually-adjusted effects of both self-esteem and resilience. These analyses were performed separately for boys and girls. All analyses were performed using SPSS version 14.

Results

Table 4.1 shows the descriptive statistics for self-esteem and resilience subscales separately for boys and girls. Within all subscales there were significant gender differences. Boys had higher positive and lower negative self-esteem than girls. Within the resilience subscales boys had higher perception of self, perception of future and structured style, whereas girls reported higher social competence, family cohesion and social resources. Regarding risky behavior among the Slovak adolescents in the sample, significantly more boys than girls reported previous smoking and previous cannabis use.

Table 4.1 Descriptive statistics for self-esteem, resilience and risky behavior by gender

	Boys (n = 1 810)		Girls (n = 1 884)		<i>p</i>		
Smoking (n, %)							
any previous use of cigarettes	1165	68.0	1121	62.1	<i>p</i> < .001		
regular use of cigarettes	162	9.5	161	8.9	<i>p</i> > .05		
Cannabis (n, %)							
any previous use of cannabis	342	20.2	201	11.2	<i>p</i> < .001		
Self-esteem ^a (range, Mean, SD)							
positive self-esteem	5-20	15.53	2.31	5-20	14.59	2.40	<i>p</i> < .001
negative self-esteem	5-20	11.56	2.69	5-20	12.45	2.83	<i>p</i> < .001
Resilience ^b (range, Mean, SD)							
perception of self	6-30	22.21	3.87	6-30	21.67	3.89	<i>p</i> < .001
perception of future	4-20	15.10	3.42	4-20	14.67	3.63	<i>p</i> < .001
structured style	4-20	12.66	2.83	4-20	12.43	3.03	<i>p</i> < .05
social competence	6-30	22.39	4.10	6-30	23.55	4.02	<i>p</i> < .001
family cohesion	6-30	21.50	4.42	6-30	21.61	4.74	<i>p</i> < .001
social resources	7-35	27.32	5.20	7-35	29.42	4.81	<i>p</i> < .001

^a Higher scores indicate higher self-esteem.

^b Higher scores indicate higher resilience.

In Table 4.2 the correlations between the self-esteem and resilience subscales are shown. Both positive and negative self-esteem correlate significantly with all the resilience subscales.

Table 4.2 Correlations matrix for self-esteem and resilience variables

	1	2	3	4	5	6	7	8
1 positive self-esteem	1							
2 negative self-esteem	-.47***	1						
3 perception of self	.43***	-.40***	1					
4 perception of future	.32***	-.30***	.50***	1				
5 structured style	.14***	-.14***	.25***	.28***	1			
6 social competence	.24***	-.21***	.44***	.40***	.18***	1		
7 family cohesion	.22***	-.27***	.37***	.37***	.30***	.33***	1	
8 social resources	.20***	-.23***	.45***	.38***	.18***	.60***	.49***	1

****p* < .001

Table 4.3 shows the association of self-esteem and resilience with regular smoking, with estimated odds ratios (95% confidence intervals) of all the self-esteem and resilience covariates. In the univariate analyses, negative self-esteem was significantly associated with regular smoking among both boys and girls. In both groups higher negative self-esteem increased the probability of regular smoking. From the resilience subscales, higher perception of future and family cohesion decreased the probability of regular smoking among both boys and girls. Finally, structured style associates significantly with this behavior, decreasing the probability of regular smoking only among girls.

In the multivariate analyses, higher positive self-esteem decreased the probability of regular smoking and higher scores of negative self-esteem increased the probability of regular smoking, but only among boys. No significant association between self-esteem and regular smoking was found among girls. Within the resilience subscales, family cohesion was strongly associated with the probability of regular smoking in both genders, while a higher score in family cohesion decreased the probability of regular smoking. A higher score in social competence increased the probability of regular smoking among both boys and girls, while perception of future and structured style decreased the probability of regular smoking only among girls.

Similar results were obtained regarding any previous use of cigarettes. Negative self-esteem was associated with previous use of cigarettes only among boys, and from the resilience subscales, structured style, social competence and family cohesion were associated with previous cigarette use among both groups.

Table 4.3 Logistic regression (univariate and multivariate) for self-esteem and resilience associated with regular use of cigarettes, by gender.

	Regular use of cigarettes (univariate)		Regular use of cigarettes (multivariate)	
	Boys OR (95% CI)	Girls OR (95% CI)	Boys OR (95% CI)	Girls OR (95% CI)
Self-esteem scale				
positive self-esteem	0.93 (0.87 - 0.99)*	1.04 (0.97 - 1.12)	0.89 (0.81 - 0.98)*	1.04 (0.94 - 1.14)
negative self-esteem	1.11 (1.04 - 1.18)***	1.10 (1.04 - 1.17)***	1.17 (1.08 - 1.27)***	1.05 (0.97 - 1.14)
Resilience scale				
perception of self	0.96 (0.92 - 1.01)	0.97 (0.93 - 1.01)	0.98 (0.91 - 1.05)	1.02 (0.96 - 1.08)
perception of future	0.96 (0.91 - 1.01)	0.93 (0.89 - 0.97)***	0.99 (0.93 - 1.07)	0.94 (0.89 - 1.00)*
structured style	0.93 (0.88 - 0.99)*	0.87 (0.82 - 0.92)***	0.95 (0.88 - 1.03)	0.92 (0.86 - 0.99)*
social competence	1.01 (0.97 - 1.06)	1.02 (0.98 - 1.07)	1.12 (1.05 - 1.19)***	1.07 (1.01 - 1.14)*
family cohesion	0.89 (0.85 - 0.93)***	0.89 (0.86 - 0.92)***	0.89 (0.84 - 0.94)***	0.90 (0.87 - 0.94)***
social resources	0.97 (0.94 - 1.01)	0.98 (0.95 - 1.01)	0.99 (0.94 - 1.04)	1.02 (0.97 - 1.07)

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

Table 4.4 shows the association of self-esteem and resilience with previous use of cannabis. In the univariate analyses, negative self-esteem was significantly associated with cannabis use among both boys and girls. In both groups higher negative self-esteem increased the probability of this behavior. Also from the resilience subscales in the group of boys, structured style, family cohesion and social resources associated significantly with any previous cannabis use and decreased the probability of use, while social competence increased the probability of this behavior. Among girls, perception of future, structured style, social competence and family cohesion associates significantly with previous cannabis use. Higher perception of future, structured style and family cohesion decreased the probability of previous cannabis use, while social competence increased the probability of this behavior.

In the multivariate analyses, negative self-esteem was associated with previous experience with cannabis. Higher scores in this subscale increased the probability of cannabis experience, but only among boys. No significant association was found with both positive or negative self-esteem and cannabis experience among girls. The resilience subscales for structured style, social competence and family cohesion were also associated with cannabis experience among both boys and girls. Higher scores on structured style and family cohesion decreased the probability of cannabis experience. In contrast, a higher score in social competence increased the probability of cannabis experience.

From a theoretical perspective, SES could be relevant. We adjusted the analyses for SES using the Family affluence scale as an indicator for socioeconomic status, but it led to very similar results. We also explored the possible connection between self-esteem and the resilience subscales. We computed sum scores for the resilience scale and created subgroups of resilient and non-resilient adolescents by dichotomizing the sum scores. We then performed logistic regression analyses for both subgroups, and the results were very similar.

Table 4.4 Logistic regression (univariate and multivariate) for self-esteem and resilience associated with cannabis use, by gender.

	Any previous use of cannabis (univariate)		Any previous use of cannabis (multivariate)	
	Boys OR (95% CI)	Girls OR (95% CI)	Boys OR (95% CI)	Girls OR (95% CI)
Self-esteem scale				
positive self-esteem	1.04 (0.98 - 1.09)	0.96 (0.90 - 1.01)	0.96 (0.90 - 1.03)	0.98 (0.90 - 1.07)
negative self-esteem	1.06 (1.01 - 1.11)**	1.08 (1.02 - 1.14)***	1.07 (1.00 - 1.13)*	1.05 (0.98 - 1.13)
Resilience scale				
perception of self	0.98 (0.95 - 1.01)	0.98 (0.95 - 1.02)	0.99 (0.94 - 1.04)	1.02 (0.97 - 1.08)
perception of future	0.98 (0.94 - 1.02)	0.95 (0.92 - 0.99)*	1.00 (0.95 - 1.05)	0.96 (0.91 - 1.02)
structured style	0.93 (0.89 - 0.98)***	0.84 (0.79 - 0.88)***	0.95 (0.90 - 1.00)*	0.89 (0.83 - 0.94)***
social competence	1.04 (1.01 - 1.08)**	1.05 (1.01 - 1.09)*	1.15 (1.10 - 1.21)***	1.08 (1.02 - 1.14)**
family cohesion	0.93 (0.90 - 0.96)***	0.88 (0.86 - 0.91)***	0.92 (0.88 - 0.96)***	0.89 (0.85 - 0.92)***
social resources	0.97 (0.95 - 0.99)*	1.00 (0.96 - 1.02)	0.97 (0.93 - 1.00)	1.02 (0.98 - 1.07)

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

Discussion

Review of major findings

Since early initiation to smoking and cannabis use is very predictive of later use (Chassin, Presson, Rose, & Sherman, 1996), it is essential to focus on the possible antecedents of such behavior. The main focus in the present study was on the role of self-esteem and resilience factors in terms of tobacco and cannabis use. We assumed negative self-esteem as a risk factor for cigarettes and cannabis use, and we also assumed resiliency aspects to be protective factors in relation to these forms of risky behavior.

We assumed negative self-esteem as a risk factor for cigarettes and cannabis use and we also assumed resiliency aspects to be protective factors in relation to these forms of risky behavior. From the two self-esteem factors, only negative self-esteem seems to play an important role in risky behavior among adolescent boys and girls. No significant association was found among girls after adding resilience subscales. Gender differences could be explained by recent studies (Mann et al., 2004; Benjet & Hernandez-Guzman, 2001; Gjerde et al., 1988) regarding externalizing and internalizing behaviors in the context of negative self-esteem. Girls with lower or negative self-esteem are possibly more likely to have internalizing problems (depression, eating disorders, anxiety) than boys. In contrast, boys with the low or negative self-esteem are more likely to have externalizing problems (aggression, violence, health-related risky behavior) than girls (Leadbeater, Kuperminc, Blatt, & Hertzog, 1999). Thus, low feelings of self-worth seem to have different consequences, depending on gender. Among girls it leads more often to depression, anxiety and other internalizing symptoms whereas among boys it leads mostly to the problem behavior and other externalizing symptoms. In our results the association between negative self-esteem and risky behavior remains statistically significant only among boys, a fact consistent with the assumption that negative self-esteem is connected with problem behavior more often among boys (Mann et al., 2004).

It seems that boys and girls do not differ in regard to resilience factors. Among both groups the same factors (structured style, social competence and family cohesion) contributed to risky behavior. The results indicate that resilient adolescents, in comparison with their less resilient peers, are less likely to involve themselves in health-endangering behavior. Protective factors were found within the individual (perception of future and structured style) but also in the young people's environment. The family in particular, with its supporting power, seems to play an important part in the prevention of risky behavior. Our results are in the agreement with those of other studies (Miller & Plant, 2002; von Sydow K., Lieb, Pfister, Hofler, & Wittchen, 2002).

However, the role of social competence as a resilience factor seems to be different in terms of risky behavior, since higher social competence was associated with more frequent risky behavior among both groups. Consistent with the findings of other studies (Lillehoj, Trudeau, Spoth, & Wickrama, 2004; Simons-Morton & Haynie, 2003; Dolcini & Adler, 1994), social competence might actually increase adolescents' exposure to social opportunities to smoke, whether tobacco or cannabis. More socially competent adolescents might be more likely to find themselves in situations and places where exposure to cigarettes is high. This social environment provides an interpersonal context for the initiation and continuation of substance use as normative, acceptable behavior, and at the same time increases the opportunity and exposure to experiential learning from older individuals, including substance use behaviors (Scheier, Botvin, Diaz, & Griffin, 1999).

Strengths and limitations

This study has some limitations. One is the reliance on only subjective self-reports for measuring individual aspects, and especially for substance use. Another limitation is the cross-sectional study design itself, which could limit our suggestions about the direction of causation in the findings. A longitudinal design would have strengthened the study and provide more reliability in the results and conclusions. On the other hand the research sample, covering all the different regions of the country and focusing on the age group of young adolescents, provides valuable information about substance use and its possible antecedents.

Implications and Conclusion

Our study shows cigarette smoking in particular to be a major concern in the field of health promotion. The great prevalence of this behavior among young adolescents reveals the necessity for efficient prevention from an early age. Intervention programs should focus not only on the specific individual, but also on the social and environmental influences. The best place to deliver these programs is the school, which is the most important place in adolescence after family and at the same time is easily reachable. In this environment it is essential to eliminate negative self-esteem by providing variety of activities establishing the feeling of self-worth and at the same time keeping young people from risky behavior. This could for instance be reached by trainings on how to cope with things like a friend that offers a cigarette or by giving positive feedback on abstaining from use of alcohol at a young age. This may yield appropriate social competences to face emerging pressure of peers and social environment regarding smoking, cannabis use and other forms of risky behavior. In addition, the role of social competence, which might lead young people into substance use involving situations and places, is an interesting finding

which implies the need for more thorough and detailed research. Less exposure to the risky behavior connected with peer programs focusing on all the protective factors within the individual and in his/her environment could be a way of enhancing the health of adolescents.

In conclusion, the results show the association between negative self-esteem and risky behavior only among boys. In addition, among the resiliency aspects, structured style, social competence and family cohesion play an important role in both boys and girls. However, considering the resilience framework, it might also be helpful to keep in mind the possibility that its aspects could not only decrease, but also increase, the likelihood of health-related risky behavior among adolescents.

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Self-efficacy, affectivity and smoking behavior in adolescence

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Submitted

Abstract

Data on health-compromising behavior demonstrate the continuation of widespread use of cigarettes by young people. Research on the determinants of the aforementioned behavior confirms the contribution of self-efficacy and affective factors to the initiation and continuation of smoking behavior. The aim was to assess the degree to which affectivity contributes to the association between self-efficacy and smoking behavior in adolescence. A sample of 501 elementary-school students (mean age 14.7 ± 0.9 years, 48.5% males) from the Slovak and Czech Republics filled out the Self-efficacy Scale, the Positive and Negative Affect Schedule and answered questions about their smoking behavior. Logistic regression showed that social self-efficacy increased the likelihood of smoking behavior but only after adding positive and negative affectivity to the model. Adjustment for age and gender as possible covariates did not change these findings. Results show the need to prepare programs aimed at enhancing appropriate social self-efficacy and especially improving skills to resist the pressures emerging from peers. Adolescents should also learn to handle their negative emotions somewhat differently, instead of through smoking behavior.

Introduction

Evidence on health-compromising behavior demonstrates the continued high prevalence of cigarette smoking by young people (Baska, 2009; Currie et al., 2008; 2004; 2000). Initiation and progression in this stage of life are also generally considered to be predictive of later involvement and exposure to smoking's harmful consequences (Tucker, Ellickson, Orlando, Martino, & Klein, 2005). Moreover, smoking behavior has been shown to cluster with other types of health-compromising behavior as part of a problem behavior syndrome (Lam, Stewart, & Ho, 2001).

Research on the determinants implies a connection between perceived self-efficacy and health-compromising behavior. This, for instance, holds true for regular smoking, drunkenness and substance use (Engels, Hale, Noom, & De Vries, 2005; Petraitis, Flay, Miller, Torpy, & Greiner, 1998). Self-efficacy, defined as beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations (Bandura, 1995), has a central role in socio-cognitive theories, e.g. Ajzen's (1988) theory of planned behavior or Bandura's (1986) social cognitive/learning theory. Specific beliefs about self-efficacy are considered in these theories as the most immediate and direct association with regular smoking, drunkenness and substance use. Low perceived self-efficacy has been repeatedly connected with a higher prevalence of smoking behavior (Engels, Hale, Noom, & De Vries, 2005; Kim, 2004; Engels, Knibbe, de Vries & Drop, 1998).

However, those studies mostly focused on behavior-specific self-efficacy. Our study explores self-efficacy as a general construct and also covers specific efficacy in the area of social interactions. It could be expected that these two aspects of self-efficacy play different roles in connection with smoking behavior. General self-efficacy is assumed to be a protective factor. On the other hand, self-efficacy as a construct similar to social competence might play a role as a risk factor. Evidence regarding social self-efficacy and social competence suggests this assumption (Veselska et al., 2009; Simons-Morton & Haynie, 2003; Carvajal, Wiatrek, Evans, Knee, & Nash, 2000). Additionally, Simons et al. (1988), in their multistage social learning model, went one step further toward the explored role of self-efficacy and included emotional distress (negative affectivity) as a determinant of health-compromising behavior. Lately, more attention has been given to the way self-efficacy interacts with affectivity and how these variables contribute to the association between self-efficacy and health-compromising behavior (Curry & Youngblade, 2006; Engels, Hale, Noom, & De Vries, 2005).

Research on the associations between affectivity (especially negative affectivity) and health-compromising behavior has confirmed the

influence of negative affect as a risk factor (Curry & Youngblade, 2006; Colder & Stice, 1998). Evidence suggests that high levels of negative affect (e.g. depression, anxiety, anger) and underdeveloped affect regulation might lead to the smoking behavior (Chang & Chiang, 2009; Windle & Windle, 2001). Also, based on previous research, we assume that negative affect influences other variables, e.g. the association of self-efficacy with smoking behavior.

The aim of this study was to assess the association between self-efficacy (general and social), affectivity (positive and negative) and smoking behavior (previous experience with smoking, regular smoking) and the degree to which affectivity contributes to the association between self-efficacy and smoking behavior in young adolescents. We assumed that (a) self-efficacy and affectivity variables would significantly associate with engagement in smoking behavior among adolescents, and (b) affectivity would significantly contribute to the association between self-efficacy and smoking among adolescents.

Methods

Sample and procedure

The study sample consisted of pupils from the last two grades of elementary schools in the eastern part of Slovakia (the cities of Kosice and Presov) and the eastern part of Czech Republic (Brno). These three cities are comparable due to fact they are the second and third largest cities in their respective countries, and all are in the less well-developed districts in the eastern parts of their respective countries. Of the study sample ($n = 501$, response 91.5%) 48.5% were boys and ranged from 11.5 to 16.3 years (mean 14.7 years SD 0.90). Trained researchers and research assistants collected data in June and September 2007. The questionnaires were administrated during two regular 45-minute lessons in a complete 90-minute period of time on a voluntary and anonymous basis in the absence of the teachers. The response rate was 91.5%, with non-response due to illness or another type of school absence. All questionnaires used in this study underwent the process of back-translation to ensure that language versions used in this study measured the same constructs as the original language versions. The local Ethics Committee approved the study.

Measures

The Self-efficacy scale was used for measuring general (17 items) and social (6 items) self-efficacy. Responses range on the 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). A higher score indicates higher self-efficacy (Sherer et al., 1982). Cronbach's alpha was 0.82 for general self-efficacy and 0.61 for social self-efficacy. Social self-efficacy consists of

only six items and thus has a lower Cronbach's alpha in comparison with general self-efficacy. Considering the combination of the length of the scale and the Cronbach's alpha, the mean inter-item correlation (MIIC), is decisive. Here the MIIC was 0.21. According to Clark & Watson (1995), the MIIC should not be less than 0.15.

The Positive and Negative Affect Schedule (PANAS) was used for measuring positive (10 items) and negative (10 items) affect. Responses range on the 5-point Likert scale from 1 (very slightly or not at all) to 5 (very much). A higher score indicates higher positive and negative affect (Watson, Clark, & Tellegen, 1988). Cronbach's alpha was 0.81 for positive affect and 0.85 for negative affect.

Smoking behavior was measured with one question asking about this type of risky health behavior; "Have you ever smoked a cigarette?" with the responses (1) no, never, (2) yes, I have tried, (3) yes, I used to smoke but I have quit, (4) yes, I smoke occasionally, (5) yes, now I smoke every day. We dichotomized the responses to this question for logistic regression in two ways. Firstly, we dichotomized the responses regarding experience with smoking: without experience - (1) no, never / with experience - the remaining four answers. In the second dichotomization we considered regular smoking: not regular smoker - (2) yes, I have tried, (3) yes, I used to smoke but I have quit, (4) yes, I smoke occasionally / regular smoker - (5) yes, now I smoke every day. We chose this dichotomization because of the young age of the study sample, which ranged in age from 11 to 16 years. At this young age a substantial group of experimental smokers with only early experiences regarding smoking (experienced vs. inexperienced) could be found and a smaller group of regular smokers who went from experimental smoking to regular smoking. This also describes current vs. non-current smoking but comprises fewer respondents in the current group, thus limiting the power of our study. Therefore, we at the same time used the first dichotomization regarding experience with smoking.

Statistical procedure and analysis

Standard descriptive analyses were performed in the first step. Next, logistic regression was used to explore the associations between self-efficacy and negative affectivity as assumed independent variables and smoking behavior (previous experience with smoking and regular smoking) as the dependent variable. In the logistic regression the variables were entered hierarchically in the following order: Model 1 Self-efficacy scales (general and social) and in Model 2 the PANAS subscales (positive and negative affectivity) were added. Finally, we repeated logistic regression adjusted for age and gender to control for those variables. All analyses were performed using SPSS version 16.

Results

Table 5.1 shows the descriptive statistics (mean, standard deviation, range of sum score, and frequencies) for the study variables in the study sample.

Table 5.1 Descriptive statistics of the study variables in the research sample

	Range	Mean (SD)
Self-efficacy scale (range, mean, SD) ^a		
General self-efficacy	33-85	57.52 (8.98)
Social self-efficacy	8-30	20.20 (3.72)
PANAS (range, mean, SD) ^b		
Positive affectivity	13-50	33.02 (6.02)
Negativity affectivity	10-50	24.44 (6.75)
	N	%
Smoking behavior (N, %)		
any previous use of cigarettes	265	61.8
regular use of cigarettes	39	7.9

^a Higher score indicates higher general and social self-efficacy

^b Higher score indicates higher positive and negative affectivity

PANAS = The Positive and Negative Affect Schedule

Table 5.2 show odds ratios for the associations of self-efficacy (general and social) and affectivity (positive and negative) with smoking behavior (previous smoking experience and regular smoking) crude and adjusted for age and gender. In Model 1 no significant associations were found between self-efficacy (general or social) and smoking behavior (previous smoking experience and regular smoking). In Model 2, after positive and negative affectivity were added, the OR's of social self-efficacy increased and were significantly associated with smoking behavior. As can be seen, higher social self-efficacy increased the probability of engagement in smoking behavior. At the same time, negative affectivity significantly increased the probability of previous experience with smoking and regular smoking, and positive affectivity significantly decreased the probability of regular smoking.

Table 5.2 Associations of self-efficacy (general and social) and affectivity (positive and negative) with smoking behavior: Odds ratios (OR) and 95% confidence intervals (95% CI) from hierarchical logistic regression, crude and adjusted for age and gender.

	Smoking experience	Smoking experience adjusted for age and gender	Regular smoking	Regular smoking adjusted for age and gender
	OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Model 1				
Self-efficacy				
General self-efficacy	0.98(0.99-1.00)	0.97(0.95-1.00)	0.99(0.94-1.04)	0.98(0.93-1.03)
Social self-efficacy	1.04(0.98-1.11)	1.04(0.97-1.11)	1.13(0.99-1.27)	1.14(0.99-1.30)
Model 2				
Self-efficacy				
General self-efficacy	0.99(0.97-1.02)	0.98(0.96-1.02)	1.03(0.98-1.09)	1.02(0.96-1.09)
Social self-efficacy	1.07(1.00-1.14)*	1.06(1.00-1.14)*	1.20(1.05-1.38)***	1.20(1.04-1.40)**
PANAS				
Positive affectivity	0.97(0.93-1.02)	0.97(0.93-1.02)	0.90(0.83-0.98)**	0.88(0.80-0.97)**
Negative affectivity	1.05(1.01-1.09)**	1.05(1.01-1.09)***	1.10(1.02-1.19)**	1.08(1.00-1.17)**

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

Model 1 = Self-efficacy

Model 2 = Self-efficacy, PANAS

PANAS = The Positive and Negative Affect Schedule

In the next step, in order to control the influence of age and gender in the analysis, we repeated the logistic regression models adjusted for age and gender. As can be seen in Table 5.2, this adjustment did not change the previous results.

Discussion

Social efficacy was found to be significantly associated with smoking behavior (previous experience with smoking and also regular smoking) but only in the connection with affectivity. Social self-efficacy increased the likelihood of previous experience with smoking and regular smoking among adolescents. Additionally, negative affectivity was found to be associated with the both types of smoking behavior and positive affectivity with regular smoking. Positive affectivity decreased and negative affectivity increased the likelihood of smoking behavior. General self-efficacy was not found to be significantly associated with smoking behavior in the present study.

Social self-efficacy or perceived effectiveness in social situations and peer relations could increase the probability of engagement in smoking behavior (Engels, Hale, Noom, & De Vries, 2005; Kim, 2004; Engels, Knibbe, de Vries & Drop, 1998). Peer groups and the social environment provide the interpersonal context for the initiation and continuation of substance use as normative, acceptable behavior, and at the same time increase the opportunity and exposure to experiential learning, including of substance use behaviors, from older individuals (Scheier, Botvin, Diaz, & Griffin, 1999). The fact that social self-efficacy increased the probability of smoking behavior is consistent with the findings in our previous study and is also in line with evidence from other European countries and the USA (Veselska et al., 2009; Simons-Morton & Haynie, 2003; Carvajal, Wiatrek, Evans, Knee, & Nash, 2000).

Smoking behavior was also significantly associated with negative affect. This may be because smoking serves as a means of reducing negative emotions and enhancing positive ones, while decreasing anxiety, depression or anger. Poor psychological well-being with the prevalence of negative emotions contributes to increased smoking behavior (Chang & Chiang, 2009; Taylor, 2006; Windle & Windle, 2001). The mentioned studies were conducted mostly on the adult population, however. Our findings from an adolescent sample suggest that the same mechanism is applicable to young people.

Finally, affectivity was assumed to contribute to the association between self-efficacy and smoking behavior. This assumption was confirmed. Adding positive and negative affectivity to self-efficacy increased the odds ratios of social self-efficacy. This is in line with adolescent substance use models (Petraitis et al., 1995) that consider emotional aspects as the relevant factor in the association between self-

efficacy and risky health behavior. At the same time it seems to be an important finding for smoking prevention programs. Social self-efficacy itself was not significantly associated with smoking among adolescents. The additional influence of affectivity and especially negative emotions changed this situation. This shows a need to prepare programs in which adolescents can learn to handle their negative emotions, e.g. anxiety, depression and anger, somewhat differently, instead of through the smoking behavior in their peer groups.

Strengths and Limitations

This study has several important strengths, the most important of which is its high response rates and international sample. It also has limitations. First, only subjective self-reports were used for measuring individual aspects, and especially for measuring smoking behavior. However, previous studies support the validity of self-reports (Reijneveld, Crone, Verhulst, & Verloove-Vanhorick, 2003). A second limitation is the cross-sectional design of our study, by which it is impossible to make conclusive statements about causality in our findings. They thus need to be confirmed in a longitudinal design.

Implications

Our results indicate that prevention and intervention programs focusing on the reduction of smoking behavior should focus on several issues. Firstly, the essential aspect of intervention strategies is the social influence of peers and the social environment. Young adolescents with higher levels of social self-efficacy might be more exposed to substance use among their peers, and in social settings like bars, pubs and other places. Solutions could be found in enhancing appropriate social self-efficacy and especially skills for resisting the pressures emerging from peers and the wider social environment regarding smoking. At the same time, we identified negative affectivity as a potential risk factor if it occurs with higher levels of social efficacy. This shows a need to prepare programs in which adolescents could learn to handle their negative emotions, e.g. anxiety and depression, somewhat differently, instead of through the smoking behavior. Regarding future research, the causal relationships between what we hypothesize should be confirmed in longitudinal designs.

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Aspects of self differ among physically active and passive youths

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Abstract

The aim of this paper was to explore connection between aspects of self and different levels of physical activity among adolescent boys and girls. An international sample of 501 elementary-school students (mean age 14.7 ± 0.9 years, 48.5% males) from the Slovak and Czech Republics completed the Self-competence/Self-liking scale, the Rosenberg's Self-esteem scale, the Self-efficacy Scale and a question on their physical activity during the week. Respondents were divided into three categories: (1) no physical activity; (2) infrequent physical activity; (3) everyday physical activity. Data were explored with one-way analysis of variance (ANOVA) separately for each gender. Boys with no physical activity had lower self-liking and social self-efficacy in comparison with boys with everyday physical activity. Girls with no physical activity had lower positive self-esteem, self-liking, self-competence, general and social self-efficacy and higher negative self-esteem in comparison with girls with infrequent and everyday physical activity. To conclude, regular physical activity is connected with psychological aspects of self among adolescents, especially among girls. Incorporating physical activity into the life of young people on a regular basis might lead to the enhancement of their feelings of self-worth and self-efficacy.

Introduction

Previous studies have shown that regular physical activity among adolescents can contribute to both their physical health and their psychological and social well-being (Schmalz, Deane, Birch, Krahnstoever Davison, 2007; Tessier et al., 2007; Parfitt and Eston, 2005). In addition, physical activity during early adolescence has been shown to persist from adolescence into adulthood (Hallal, Victora, Azevedo, Wells, 2006). However, recent international studies (Currie et al., 2008; 2004; 2000) show a lack of sufficient physical activity during adolescence, particularly among girls. These findings indicate that the lack of regular physical activity among adolescents is a long-term public health problem (Hallal et al., 2006). In the present study we focus on the connection between the frequency of physical activity and aspects of self in early adolescence and on potential gender-related differences.

In a review of key correlates of physical activity, Sallis, Prochaska, Taylor (2000) proposed the following categorization of the relevant factors: demographic, psychological, social factors and physical environment. The present study will focus on psychological factors, with special attention paid to aspects of self.

These factors (specifically self-efficacy, self-esteem, and self-competence) have already been explored in relation to physical activity. Self-esteem representing person's overall feeling of self-worth (Rosenberg, 1965) was associated with physical activity in several studies (White, Kendrick, Yardley, 2009; Krahnstoever Davisona et al., 2007; Schmalz et al., 2007; Levy and Ebbeck, 2005; Parfitt and Eston, 2005). Mentioned studies confirmed connection between physical activity and higher self-esteem. Self-liking (sense of social worth) and self-competence (sense of personal efficacy) used in this study was defined by Tafarodi and Swann (1995) as constructs similar to self-esteem. These two dimensions could be extracted also from the Rosenberg Self-esteem Scale as it was confirmed in other studies (Schmitt and Allik, 2005; Tafarodi and Milne, 2002). Therefore, it could be expected that self-liking and self-competence will be associated with the physical activity similarly like self-esteem. Self-efficacy as a part of Theory of Planned Behavior (TPB) (Ajzen, 1988) was repeatedly associated with physical activity (White, Kendrick, Yardley, 2009; Annesi, 2006). Typically, research finds strong association between perception of self-efficacy and engagement in physical activity. Though, it should be mentioned that those studies mostly focused on behavior specific self-efficacy. Our study focus on the self-efficacy as general construct and also cover specific efficacy in the area of social interactions. Most of the studies have examined physical activity as a continuous or dichotomous variable, whereas our study included three categories based on the

frequency to distinguish between no physical activity, infrequent though present physical activity and everyday physical activity. Also, most of the studies explore only one of the self-perception aspects. For this reason we explored the relation between the frequency of physical activity and the aspects of self perception (e.g. higher self-esteem, self-competence or self-efficacy). Last to be mentioned, studies exploring self-perception and physical activity usually do not look into gender differences.

Regarding gender differences, adolescent girls were found to be less engaged in physical activities than boys (Currie et al., 2008; 2004; 2000). Still, whether their engagement in physical activity can be explained and possibly be enhanced by their different perceptions of self in comparison with boys is a question that needs to be explored.

The aim of this paper was to explore whether aspects of self (self-esteem, self-liking, self-competence, and self-efficacy) are associated with different levels of physical activity among adolescent boys and girls. We will explore whether at least some physical activity, even though infrequent, is similarly associated with aspects of the self as frequent, i.e. everyday physical activity. We will also explore gender-related differences regarding this as well.

Methods

Sample and procedure

The study sample consisted of 501 pupils from the last two grades of elementary schools in the eastern part of Slovakia (cities of Kosice and Presov) and the eastern part of Czech Republic (Brno). These three cities are comparable in that they are the second and third biggest towns in economically less-developed districts of the eastern parts of their respective countries. Of the study sample ($n = 501$, response 91.5%), 48.5% were boys and ranged from 11.5 to 16.3 years (mean age 14.7 years SD 0.90). Trained researchers and research assistants collected data in June and September 2007. The set of questionnaires was administrated during two regular 45-minute lessons in a complete 90-minute period of time on a voluntary and anonymous basis in the absence of teachers. Response was 91.5%, with non-response due mostly to school absence because of illness or other reasons. All questionnaires used in this study underwent the process of back-translation to ensure that language versions used in this study measure same constructs as the original language versions.

Measures

Self-esteem was assessed using the Rosenberg Self-esteem scale RSES (Rosenberg, 1965). The RSES can be divided into an equal number of positively and negatively worded items measuring positive and negative

self-esteem (Halama, 2008; Sarkova et al., 2006). Responses range on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). Higher scores indicate higher positive and negative self-esteem, respectively. Cronbach's alpha was 0.78 for the positive self-esteem subscale and 0.66 for the negative self-esteem subscale.

Self-liking/Self-competence scale was used for measuring self-liking (10 items) and self-competence (10 items). Responses range on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Higher scores indicate higher self-liking and self-competence (Tafarodi and Swann, 1995). Cronbach's alpha was 0.81 for self-liking and 0.82 for self-competence.

Self-efficacy scale was used for measuring general (17 items) and social (6 items) self-efficacy. Responses range on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating higher self-efficacy (Sherer et al., 1982). Cronbach's alpha was 0.82 for general self-efficacy and 0.61 for social self-efficacy.

Physical activity was assessed using a single question transformed from a single question repeatedly used and validated in HBSC surveys (Currie et al., 2008; 2004; 2000): "How often per week do you have physical activity for more than 20 minutes?", with answers of (1) never; (2) once a week; (3) 2 to 3 times a week; (4) every day. For the purpose of the present study, respondents were divided into three categories based on their answers: (1) no physical activity (never); (2) infrequent physical activity (1-3 times a week); and (3) everyday physical activity (every day). Similar categorization of single self-reported item on the frequency of physical activity was used in the study of Mäkinen et al. (2009).

Statistical analysis

Before the analysis was made, the subsamples from Slovakia and Czech Republic were compared in the frequency of physical activity and also in self variables. Very similar results were obtained for both subsamples, with the p-values for differences in outcomes all being 0.05 or higher and effect sizes for differences all being trivial. Therefore, we decided to merge these two subsamples and work with this main research sample. Standard descriptive analyses were performed in the first step to describe the background characteristics of the three groups of adolescents based on frequency of their physical activity per week. Second, a one-way analysis of variance (ANOVA) and Scheffe post hoc tests were used to explore the differences in aspects of self between the three groups (no physical activity, infrequent physical activity and everyday physical activity). Finally, these analyses were repeated separately for boys and girls. All analyses were performed using SPSS version 16.

Results

The background descriptive characteristics of the whole study sample and of the three groups regarding the frequency of physical activity per week are presented in Table 6.1.

Table 6.1 Descriptive statistics of the sample by frequency of physical activity

	No activity	Infrequent activity	Everyday activity	Total study sample
Total number	87	295	98	480
Age				
Mean (SD)	14.68 (0.91)	14.16 (1.06)	14.74 (0.88)	14.70 (0.90)
Range	12.1-16.2	11.5-16.3	12.2-16.3	11.5-16.3
Boys (proportion)	39.1 %	47.1 %	62.2 %	48.5 %

Analysis of variance and Scheffe Post Hoc tests (Table 6.2) revealed significant differences between adolescents with no physical activity and adolescents with infrequent or everyday physical activity regarding aspects of self. Positive self-esteem, self-liking, self-competence, as well as general and social self-efficacy were higher, and negative self-esteem was lower among adolescents with a higher frequency of physical activity.

Table 6.2 Differences between research groups in aspects of self with one-way analysis of variance (ANOVA) and Scheffe post-hoc tests

	Group 1 mean (n= 87)	Group 2 mean (n= 295)	Group 3 mean (n= 98)	F value	p value	Scheffe test Differences between groups
Self-esteem						
positive	13.3	14.6	15.0	12.17	0.001	1-2, 1-3
negative	13.4	12.3	12.1	7.00	0.001	1-2, 1-3
Self-liking	30.1	33.2	34.8	11.36	0.001	1-2, 1-3
Self-competence	31.8	34.8	35.7	10.56	0.001	1-2, 1-3
Self-efficacy						
general	53.6	58.2	59.3	11.10	0.001	1-2, 1-3
social	18.9	20.3	20.9	6.87	0.01	1-2, 1-3

Group1: no physical activity

Group2: infrequent physical activity

Group3: everyday physical activity

Table 6.3 presents results from analyses of variance and Scheffe Post Hoc tests separately for boys and girls. Boys with everyday physical activity had higher self-liking and social self-efficacy than boys with no physical activity. Girls with infrequent and everyday physical activity had higher positive self-esteem, self-liking, self-competence, general and social self-efficacy and lower negative self-esteem than girls with no physical activity.

Table 6.3 Difference between research groups in self-system variables with one-way analysis of variance (ANOVA) and Scheffe post-hoc tests separately for boys and girls.

	Boys					Girls						
	Group 1 mean (n= 34)	Group 2 mean (n= 139)	Group 3 mean (n= 61)	F value	p value	Scheffe test differences between groups	Group 1 mean (n= 53)	Group 2 mean (n= 156)	Group 3 mean (n= 37)	F value	p value	Scheffe test differences between groups
Self-esteem positive	14.3	15.0	15.1	1.43	0.24	-	12.7	14.3	14.6	9.32	0.001	1-2, 1-3
Self-esteem negative	12.4	12.2	11.8	0.87	0.42	-	14.1	12.4	12.7	7.20	0.001	1-2, 1-3
Self-liking	32.1	33.8	35.6	3.38	0.05	1-3	28.6	32.6	33.6	7.18	0.001	1-2, 1-3
Self-competence	33.4	35.4	36.0	1.81	0.17	-	30.9	34.2	35.5	7.91	0.001	1-2, 1-3
Self-efficacy general	56.4	57.7	59.1	1.04	0.36	-	51.9	58.5	59.8	12.37	0.001	1-2, 1-3
Self-efficacy social	18.7	19.8	20.7	3.63	0.05	1-3	19.1	20.7	21.4	4.71	0.01	1-2, 1-3

Group 1: no physical activity

Group 2: infrequent physical activity

Group 3: everyday physical activity

Discussion

Our study shows that positive self-esteem, self-liking, self-competence, general self-efficacy, and social self-efficacy were higher and negative self-esteem was lower among adolescents with a higher frequency of physical activity. The differences were much more pronounced for girls than for boys. Self-liking and social self-efficacy were higher among adolescent boys with higher frequency of physical activity. At the same time, positive self-esteem, self-liking, self-competence and general and social self-efficacy were higher, and negative self-esteem was lower among adolescent girls with a higher frequency of physical activity. Results hold for young adolescents from Slovakia and Czech Republic in a similar way.

We found that physical activity during the week is connected with higher levels of positive aspects of self (positive self-esteem, self-liking, self-competence, and self-efficacy) and with lower levels of negative aspects (negative self-esteem). These findings are in line with previous studies on adolescent girls and boys (White, Kendrick, Yardley, 2009; Annesi, 2006; Parfitt and Eston, 2005). Additionally to existing research evidence, present study included three categories based on the frequency with aim to distinguish between no physical activity, infrequent though present physical activity and everyday physical activity. Our findings suggest, that at least infrequent physical activity was connected with feelings of self-worth (self-esteem, self-liking) and personal efficacy (general or social). They may imply that active engagement in regular physical activity during school or leisure time could improve the way youths perceive themselves. Causal links, however, are not so simple, and influences may go in both directions as well, i.e. a reinforcement of the self might also lead to more physical activity. Therefore it is necessary to explore this connection further in a future longitudinal study.

Research in this field was done mostly in adolescent girls and adult women (Krahnstoever Davisona et al., 2007; Schmalz et al., 2007; Levy and Ebbeck, 2005). Additionally, our findings cover not only girls but also boys and provide gender comparison. Our separate analyses for boys and girls showed many more associations between physical activity and the self among girls than among boys. Among girls, all aspects of self were higher in case of more frequent physical activity. Among boys, only self-liking and social self-efficacy were higher in the group with everyday physical activity. In general girls tend to report lower levels of self aspects compared with boys (Birndorf, Ryan, Auinger, Aten, 2005; Robins, Trzesniewski, Tracy, Gosling, Potter, 2002). At the same time, they are less engaged in physical activity (Currie et al., 2008). In addition, girls at this age are much more concerned with their physical appearance, are less willing to participate in physical activities and experience less enjoyment from

them (Krahnstoever Davisona et al., 2007). Such negative feelings may contribute to a lower intrinsic motivation for physical activity, implying that girls have to motivate themselves actively to participate in physical activity. This self-motivation may be assumed to require a strong self. Recent studies have indeed confirmed self-consciousness and concerns about appearance as barriers to physical activity among adolescent girls (Robins, Pender, Kazanis, 2003; Leslie et al., 1999). At the same time Gillison et al. (2008) reported in their study that those adolescent girls who are engaged in physical activity perceive it as a sort of duty, and their motivation is related to physical attractiveness and health benefits.

Among boys, aspects of self did not play such an important role as in girls. An explanation could be that their motivation for this activity differs from girls. Boys are more engaged in group sporting activities with the aim of being part of peer relationships; they have some intrinsic motivation for physical activity. Gillison et al. (2008) reported that adolescent boys perceived physical activity as something which forms a large part of their social life and is the way of spending time with their friends. Thus, additional motivation is required less often for them. It is clear, then, that in future research it will be important to take a closer look at the motivation for physical activity and possible barriers to it among adolescent boys and girls.

Strengths and limitations

This study has several important strengths, the most important one being its high response rate and international sample. On the other side, it also has several limitations. First, only subjective self-reports were used for measuring aspects of self, and especially for measuring physical activity. However, previous studies support the validity of self-reports (Reijneveld, Crone, Verhulst, Verloove-Vanhorick, 2003). A main limitation is its cross-sectional design, which makes it impossible to formulate conclusive statements about causality in our findings. They therefore need to be confirmed in studies with a longitudinal design.

Implications

Physical activity is an excellent way of enhancing physical health during adolescent years, and development of healthy patterns in adolescence can be tracked into adulthood. In addition, there is increasing evidence that regular physical activity could be a means of enhancing mental health, especially among adolescent girls. The fact that a relatively minimal amount of physical activity is related to a more positive perception of self may support adolescent health promotion, both if causality goes from physical activity to the self or the other way round. In addition, our findings support using a different approach towards adolescent boys and girls in the promotion of physical activity. Finally, future research should

be longitudinal in design in order to assess the causal relationships between physical activity and the self. Our results show that much can be gained in health by further exploring this relationship.

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Socioeconomic status and physical activity among adolescents: the mediating role of self-esteem

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Submitted

Abstract

Physical activity is an essential part of a healthy lifestyle in adolescence. Previous studies have shown physical activity to be associated with socioeconomic status and self-esteem; the latter association may mediate the former, but evidence on this is lacking. The aim of our study was to explore the associations of socioeconomic status and the self-esteem of adolescents with physical activity, and their joint effects. A sample of 3,694 elementary-school students from Slovakia (mean age 14.3 years, 49% boys) completed the Rosenberg Self-esteem Scale and answered questions about their parents' educational level and about the frequency of their physical activity. Results revealed that adolescents with higher socioeconomic status were significantly more likely to report physical activity at least five days per week and to report higher self-esteem. In logistic regression the association of socioeconomic status with physical activity decreased after adding in self-esteem, suggesting that at least a part of this association is mediated by self-esteem. To conclude, youths from lower socioeconomic groups have already been identified as a target group. Our findings suggest that it is important in promotion programs to focus not only on the enhancement of their physical activity but also on their self-esteem as a possible mediator.

Introduction

Regular physical activity is a part of a lifestyle which leads to physical health benefits such as reduced risks of coronary heart disease, diabetes and obesity but also to mental health benefits like reduced risks of depression, anxiety and mood disorders (Penedo & Dahn, 2005). Healthy lifestyle patterns that include regular physical activity can be traced back to childhood and adolescence. Those stages of development are crucial for adopting healthy lifestyles that have consequences for current and future physical and mental health (Hallal, Victora, Azevedo & Wells, 2006). Despite the well-known health benefits of regular exercise, recent international studies (Currie et al., 2008; 2004; 2000) show a lack of sufficient physical activity among adolescents, indicating a potentially serious public health problem (Hallal, Victora, Azevedo & Wells, 2006). It is therefore important to identify possible determinants for the specific target groups.

Social inequalities have been found in the physical activity of adolescents, adolescents with low-educated or low-income parents being less physically active (Currie et al., 2008; Mota, Ribeiro & Santos, 2009; Richter et al., 2009; Piko & Keresztes, 2008). One explanation for this is that parents with a higher education level may help students develop more positive attitudes towards health and health-related behaviors, and a high family income may support the engagement in certain sports having high costs. Moreover, intrapersonal factors may contribute to social inequalities in physical activity and influence the connection between the socioeconomic status of youths and their engagement in physical activity. Several studies (Veselska et al., 2009; Birndorf, Ryan, Auinger & Aten, 2005; Rhodes, Roffman, Reddy & Fredricksen, 2005) have shown that adolescents from higher socioeconomic groups report higher self-esteem. In turn, self-esteem has been shown to be significantly associated with physical activity (Penedo & Dahn, 2005; Parfitt & Eston, 2005). Though associations between self-esteem and socioeconomic status or self-esteem and physical activity were explored in the above mentioned studies, there is a lack of evidence on the role of self-esteem in the relation between socioeconomic status and physical activity. We assumed that self-esteem as an intrapersonal factor may not only mediate but also moderate the relation between socioeconomic status of adolescents and their physical activity. Therefore, the aim of this study was to explore the associations of socioeconomic status and self-esteem with physical activity and the possible influence (mediation or moderation) of self-esteem on the association between socioeconomic status and physical activity by assessing their joint effects.

Methods

Sample and procedure

The study sample consisted of 3,725 adolescents in the 8th and 9th grades at elementary schools in the major cities of Bratislava (600,000 inhabitants, Western Slovakia), Zilina (156,000 inhabitants, Northern Slovakia) and Kosice (240,000 inhabitants, Eastern Slovakia) as well as other smaller cities (10,000 – 40,000 inhabitants) in the eastern region of Slovakia. The sample was made up of 49% boys, with a mean age of 14.3 years (SD 0.65; range 11-17 years). Students younger than 13 and older than 16 years old were excluded to make the sample more homogeneous and to avoid age extremes which could influence the findings. After this exclusion, the study sample consisted of 3,694 students (mean age 14.3 years, SD 0.62), with 24.6% coming from Bratislava, 21.3% from Zilina, 32.1% from Kosice and 22% from other eastern region cities.

Trained researchers and research assistants collected data between October and December 2006. The set of questionnaires was administered during two regular 45-minute lessons in a complete 90-minute time period on a voluntary and anonymous basis in the absence of the teachers. The overall response rate was 93.5%. Non-response was due to illness or another type of school absence. The local Ethics Committee approved the study.

Measures

Physical activity was assessed using a single question repeatedly used and validated in HBSC surveys (Currie et al., 2008; 2004; 2000): "Over a typical or usual week, on how many days were you physically active for a total of at least 60 minutes per day?" with answers (1) 0 days; (2) 1 day; (3) 2 days; (4) 3 days; (5) 4 days; (6) 5 days; (7) 6 days; (8) 7 days. We dichotomized the responses to this question for logistic regression into two categories, with the cut-off point at 5 days of physical activity per week, further denoted as sufficient vs. insufficient physical activity.

Socioeconomic status was assessed by parents' education level, defined as the highest level of education obtained from each parent of the respondents. Education level from both parents was combined into one indicator and was classified as: high (university), middle (secondary school) or low (apprenticeship or primary school only).

Self-esteem was assessed using the Rosenberg Self-esteem Scale (RSES) (Rosenberg, 1965). The 10 items of the RSES assess a person's overall evaluation of his/her worthiness as a human being (Rosenberg, 1979). Responses range on a 4-point scale from 1 (strongly disagree) to 4 (strongly agree). A global self-esteem factor can then be calculated, with the sum score ranging from 10 to 40. A higher score indicates higher self-esteem. Cronbach's alpha for global self-esteem was 0.76.

Statistical analysis

Standard descriptive analyses for the whole study sample and for different socioeconomic groups were performed in the first step. In the next step we performed hierarchical logistic regression in three models adjusted for gender. In Model 1 we explored the association between socioeconomic status and physical activity. In Model 2 we added self-esteem to explore the association between self-esteem and physical activity, and in the final Model 3 we added the interaction between socioeconomic status and self-esteem to assess whether self-esteem modifies the association between socioeconomic status and physical activity. All analyses were performed using SPSS version 16.

Results

Table 7.1 shows the descriptive statistics of all the study variables for the whole study sample and separately for three socioeconomic groups (low SES, middle SES, and high SES). Significant socioeconomic differences were found between the variables. Adolescents with higher socioeconomic status were significantly more likely to report physical activity on at least five days per usual week and also were significantly more likely to report higher self-esteem.

Table 7.1 Descriptive statistics of the study variables in the whole study sample and separately by socioeconomic status

	Whole sample (n = 3694)	1 Low SES (n = 345)	2 Middle SES (n = 1 626)	3 High SES (n = 1 441)	p	Post hoc analysis
Gender: n (%)						
Boys	1 765 (49.0)	131 (38.6)	753 (47.6)	765 (54.5)		
Physical activity: n (%)						
5 or more days per week	1 074 (30.5)	74 (22.6)	455 (29.3)	474 (34.3)	p < .001	1-2, 1-3, 2-3
RSE ^a : Mean (SD; range)	28.07 (4.45; 11-40)	26.58 (4.17; 13-39)	27.92 (4.49; 11-40)	28.69 (4.30; 11-40)	p < .001	1-2, 1-3, 2-3

^a Higher scores indicate higher self-esteem.

Table 7.2 presents odds ratios (OR) and 95% confidence intervals (CI) from the hierarchical logistic regression adjusted for gender. Model 1 shows the association between socioeconomic status and sufficient physical activity. High socioeconomic status significantly increased the probability of sufficient physical activity. In Model 2, after self-esteem was added to the analysis, the association between high socioeconomic status and sufficient physical activity weakened and higher self-esteem increased the probability of sufficient physical activity significantly. In the final Model 3, interactions between socioeconomic status and self-esteem were added. These interactions were not statistically significant. Gender was significantly associated with sufficient physical activity in all three models.

Table 7.2 Associations of socioeconomic status and self-esteem with sufficient physical activity (on 5 or more days per week): odds ratios (OR) and 95%-confidence intervals (CI) for sufficient physical activity from hierarchical logistic regression.

		Model 1	Model 2	Model 3
		OR (95% CI) adjusted for gender	OR (95% CI) adjusted for gender	OR (95% CI) adjusted for gender
Gender	girls	1.00 ***	1.00 ***	1.00 ***
	boys	2.40 (2.05-2.82)	2.24 (1.90-2.63)	2.24 (1.90-2.63)
SES	low	1.00 ***	1.00 *	1.00
	middle	1.30 (0.96-1.75)	1.22 (0.91-1.65)	6.31 (0.74-53.89)
	high	1.57 (1.16-2.11)	1.43 (1.06-1.93)	6.32 (0.72-55.65)
RSE			1.05 (1.03-1.07) ***	1.11 (1.03-1.19)***
SES low*RSE				1.00
SES middle*RSE				0.94 (0.87-1.02)
SES high*RSE				0.95 (0.88-1.02)

*** p-value for the overall contribution of this variable to the model < 0.001

* p-value for the overall contribution of this variable to the model < 0.05

Discussion

In this study we explored the associations between socioeconomic status, self-esteem and physical activity among adolescents and the potential influence of self-esteem on the association between socioeconomic status and the physical activity of adolescents. Our results show that youths with high socioeconomic status engage in regular physical activity more often than their peers with middle or low socioeconomic status and also report higher self-esteem. The association of socioeconomic status with physical activity decreased after adding in self-esteem, suggesting that at least a part of this association is mediated by self-esteem. The connection between socioeconomic status and physical activity may thus be mediated by the self-esteem of adolescents.

Socioeconomic inequalities in the physical activity of adolescents have been found in previous research (Currie et al., 2008; Mota, Ribeiro & Santos, 2009; Richter et al., 2009; Piko & Keresztes, 2008) and our findings confirm their existence. The higher education of parents may help students develop positive attitudes towards health and health-related behaviors. Family income, on the other hand, may support the engagement in certain sports having high costs. In general it can be assumed that youths from lower socioeconomic groups are more vulnerable regarding low physical activity and are thus an important target group in the promotion of physical activity.

Additionally, our study provides information about the mediating role of self-esteem on this relation between socioeconomic status and physical activity. A higher socioeconomic status was found to be associated with higher self-esteem (Veselska et al., 2009; Birndorf, Ryan, Auinger & Aten, 2005; Rhodes, Roffman, Reddy & Fredricksen, 2005). Previous research has also revealed a connection between self-esteem and physical activity (Krahnstoeber davisona et al., 2007; Parfitt & Eston, 2005). Based on this connection, feelings of self-worth seem to play an important role in the connection between socioeconomic status and physical activity in adolescence. The lower socioeconomic status of adolescents might be reflected in their negative perception of self. Consequently, low self-esteem creates a barrier to their engagement in physical activity. Interventions focused on the strengthening of self-esteem might lessen the negative association between low socioeconomic status and insufficient physical activity. Parental, school and community involvement enhances these actions and provides the necessary background (Derzon, Wilson & Cunningham, 1999). Finally, self-esteem interventions need take into account possible differences between participants (e.g. age, gender, ethnicity or type of problems) (Haney & Durlak, 1998).

Strengths and limitations

This study has several important strengths, the most important being its large nationally representative sample and its high response rate. It also has limitations. First, only subjective self-reports were used for measuring physical activity. The main limitation, however, is its cross-sectional design, which makes it impossible to formulate conclusive statements about causality in our findings. They therefore need to be confirmed in studies with a longitudinal design.

Implications

Physical activity is an excellent way of enhancing physical health during adolescent years, and development of healthy patterns in adolescence can be tracked into adulthood (Hallal, Victora, Azevedo & Wells, 2006). Youths from lower socioeconomic groups have already been identified as a target group regarding physical activity. Our findings suggest that it could be important in promotion programs to focus not only on the direct enhancement of their physical activity, but also on the enhancement of their self-esteem, which was identified as possible mediator. This may offer a route to reach substantial gains in public health.

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General discussion, implications for future research and practice and conclusions

This study was carried out to examine the association between perception of self (e.g. self-esteem, self-liking, self-competence and self-efficacy) and health-related behaviors (e.g. smoking behavior, drunkenness, cannabis use and physical activity) among adolescents. The contribution of other intrapersonal and interpersonal factors (e.g. mental health and resilience) to the above mentioned associations was also taken into account and explored. Additionally, I was interested in the role of socioeconomic status as a background socio-cultural variable.

In this final chapter the main findings of the study are discussed on the general level in the context of theoretical background, as outlined in Chapter 1. Next, the most important strengths and limitations of the present study are reviewed. The last part of this chapter deals with possible implications in the field of future research and public health practice.

8.1 Main findings

Research question 1

Chapter 3 of the thesis discussed the following research question: Do personality, mental health and social support contribute to the relationship between socioeconomic status and self-esteem?

Findings reveal that an association does exist between low socioeconomic status and lower self-esteem. This association changed after adjustment for personality and mental health, but not after additional adjustment for social support. Family affluence as an indicator for socioeconomic status remained significantly associated with self-esteem from the first to the final model, but its explanatory power decreased after adding personality dimensions and mental health variables (depression/anxiety and social dysfunction).

Research question 2

In Chapter 4 the focus moved to the association between the perception of self and health-compromising behavior, and the following research question was explored: Does self-esteem along with resiliency factors influence selected types of health-compromising behavior (smoking experience, regular smoking, cannabis experience) among adolescent boys and girls?

Of the two self-esteem factors, only negative self-esteem was significantly associated with health-compromising behavior among adolescent boys and girls in such a way that the probability of smoking or cannabis experience and engagement in regular smoking increased. No significant association was found among girls after the adding of resilience subscales. Boys and girls did not differ with regard to resilience factors. Among both groups the same factors (structured style, social competence and family cohesion) were significantly associated with health-compromising behavior. Structured style and family cohesion decreased and social competence increased the probability of smoking or cannabis experience and regular smoking.

Research question 3

Chapter 5 provided answers to the following research question: Does affectivity contribute to the association between self-efficacy and selected types of health-compromising behavior (smoking experience, regular smoking) in young adolescence?

Social efficacy was found to be significantly associated with smoking behavior (previous experience with smoking and also regular smoking) but only in connection with affectivity. Social self-efficacy increased the likelihood of previous experience with smoking and regular smoking among adolescents. Additionally, negative affectivity was found to be associated with both aspects of smoking behavior and positive affectivity with regular smoking. Positive affectivity decreased and negative affectivity increased the likelihood of smoking. General self-efficacy was not found to be significantly associated with smoking behavior in the present study.

Research question 4

In Chapter 6 the focus moved from health-compromising to health-enhancing behavior in connection with the perception of self. The following research question was explored: Do aspects of self perception (self-esteem, self-liking, self-competence, and self-efficacy) associate with different levels of physical activity among adolescent boys and girls? Findings show that positive self-esteem, self-liking, self-competence,

general self-efficacy and social self-efficacy were higher, and negative self-esteem was lower among adolescents with a higher frequency of physical activity. The differences were much more pronounced for girls than for boys. Self-liking and social self-efficacy were higher among adolescent boys with a higher frequency of physical activity. At the same time, positive self-esteem, self-liking, self-competence and general and social self-efficacy were higher, and negative self-esteem was lower among adolescent girls with a higher frequency of physical activity.

Research question 5

In Chapter 7 focus remained in the field of health-enhancing behavior and the following research question is explored: Does self-esteem contribute to the relationship between socioeconomic status and physical activity?

Youths with high socioeconomic status engage in regular physical activity more often than their peers with middle or low socioeconomic status and also report higher self-esteem. The association of socioeconomic status with physical activity decreased after adding in self-esteem, suggesting that at least a part of this association is mediated by self-esteem. The connection between socioeconomic status and physical activity may thus be mediated by the self-esteem of adolescents.

8.2 Discussion of the main findings

Smoking behavior, cannabis use and physical activity as explored in this study are all health-related behaviors. Previous research (Van Nieuwenhuijzen et al., 2009; Lam, Stewart, & Ho, 2001; Jessor, 1991) shows that the mentioned behaviors cluster and therefore might have similar patterns of determinants. Empirical evidence supports the existence of organized patterns in adolescent health-related behaviors with several domains of determinants (Petraitis, Flay, Miller, 1995; Jessor, 1991). Based on the theoretical framework of Jessor (1991) and Petraitis, Flay and Miller (1995), we proposed in Chapter 1 a model connecting expected variables from the socio-cultural, interpersonal and intrapersonal domains.

Perception of self and health-related behavior

Emerging from this theoretical framework, the main aim of this study was to explore the connections between the perception of self (self-esteem, self-liking, self-competence, and self-efficacy) and various types of health-related behavior which might be considered as health-compromising (smoking or cannabis use) or as health-enhancing (physical activity).

In line with the proposed model, we found that self-esteem and self-efficacy were connected with health-compromising behavior such as smoking and cannabis use (Chapters 4 and 5). To be more specific, negative

self-esteem, and high social efficacy serve as risk factors regarding smoking and cannabis use. Our findings are in line with previous studies in this field (Kokkevi et al. 2007; Engels, Hale, Noom, & De Vries, 2005; Wild, Flisher, Bhana & Lombard 2004; Simons-Morton & Haynie, 2003, Carvajal et al., 2000). Moreover, these aspects of self perception were connected with health-enhancing behavior such as regular physical activity (Chapters 6 and 7). Positive self-esteem, self-liking, self-competence and general and social self-efficacy serve as protective factors, while negative self-esteem serves as a risk factor regarding regular physical activity. Once again this is in line with previous research in this field (White, Kendrick & Yardley, 2009; Schmalz, Deane, Birch & Krahnstoever Davison, 2007; Parfitt, Eston, 2005).

However, we did not explore behavior-specific self-efficacy or self-esteem regarding health-related behavior. Evidence suggests that these are associated with smoking, cannabis use and physical activity (Peters, 2009; Kahn et al., 2008; Victoir, 2007; Annesi, 2006), and it might be of further interest to explore their association jointly with the already explored aspects of self-perception. Behavior-specific determinants are usually associated more strongly with health-related behaviors than more general determinants (Flay, 2002). This also holds true for our study. In Chapter 5 social self-efficacy as a behavior-specific efficacy was associated with smoking, whereas general self-efficacy was not found to be significantly associated. In addition, it is interesting to examine their contribution to the already established association of socio-cultural background (e.g. socioeconomic status) with health-related behaviors as was outlined in the recent research of Droomers, Schrijvers & Mackenbach (2004). Finally, it is important to focus on different stages and levels of health-compromising behaviors like smoking and on health-enhancing behaviors like physical activity, and to explore similarities and dissimilarities in patterns of influence. We made a first attempt regarding this issue in Chapters 4, 5 and 6, but further research is needed for better understanding.

Contribution of other intrapersonal and interpersonal factors

In addition to the association between the perception of self and health-related behaviors, other intra- and interpersonal factors can be expected to contribute, as outlined in the model in Chapter 1. Comprehensive social-psychological frameworks for explaining health-related behavior such as those proposed by Petraitis, Flay and Miller (1995) and by Jessor (1991), as well as our model outlined in Chapter 1, include several major explanatory domains of determinants.

Therefore, the contribution of other intrapersonal and interpersonal factors (e.g. affectivity or resilience) to the above mentioned association was taken into account and explored. As expected, other intrapersonal and interpersonal factors were associated with health-compromising behavior

and significantly influenced the connection between the perception of self and health-related behavior. After adding resilience factors, negative self-esteem was no longer connected with smoking behavior and substance use among adolescent girls (Chapter 4). After adding affectivity social self-efficacy was associated with smoking behavior (Chapter 5). This is in line with models on adolescent substance use and other health-related behaviors (Flay, 2002; Petraitis, Flay, Miller, 1995; Jessor, 1991) that consider emotional aspects and resilience as relevant factors in the association between the perception of self and health-compromising behavior. In addition, the family is another important factor in the social environment which is strongly associated with health-endangering behavior. Parental support, monitoring and communication with parents may serve as buffer against risk factors connected with health-endangering behavior (Freisthler, Byrnes, & Gruenewald, 2009; Tomcikova et al., 2009; Griffin et al., 2000). These factors were not explored in the present study and offer new directions for future research.

Role of socioeconomic status as a socio-cultural variable

Regarding the health-related behavior of adolescents it is important to take into account the socio-cultural (or environmental) domain and especially the role of socioeconomic status. Previous research suggests a direct connection between socioeconomic status and health-related behavior (Richter et al., 2009; Currie et al., 2008; Piko & Keresztes, 2008; Madarasova Geckova et al., 2005).

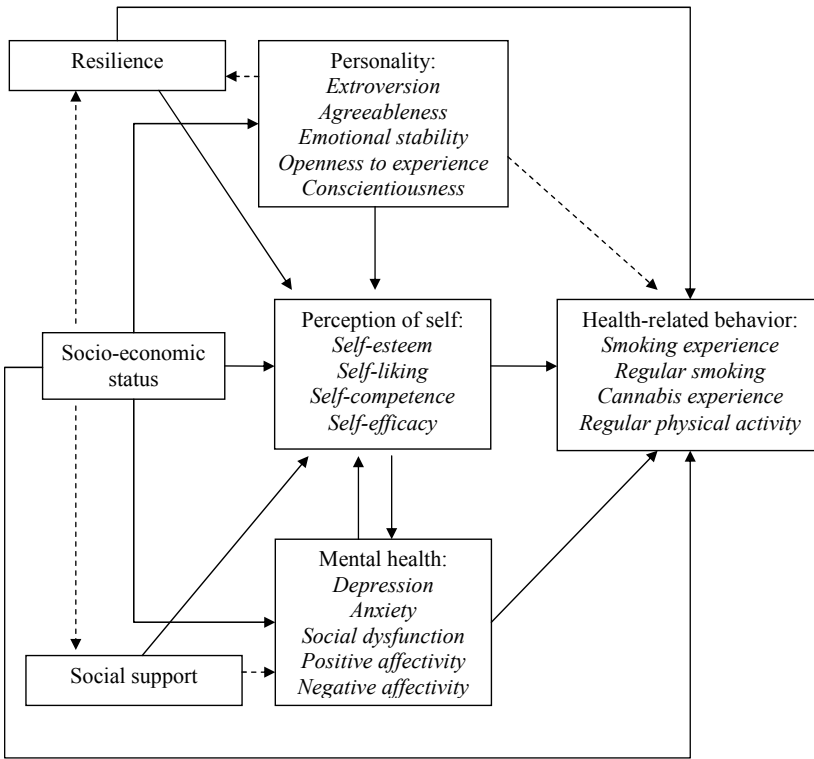
The findings of this study confirm the assumption that this connection is mediated by adolescent's perception of self. Firstly, the contribution of personality and mental health to the connection between socioeconomic status and self-esteem of adolescents was explored. Low socioeconomic status was found to be associated with low self-esteem, and personality and mental health were found to mediate this association (Chapter 3). Next, the contribution of self-esteem to the connection between socioeconomic status and health-related behavior was also explored. Confirming the model proposed in Chapter 1, socioeconomic status was associated with health-related behavior, and self-esteem mediated this association (Chapter 7).

Based on the mentioned results it is assumed that socioeconomic status indeed influences adolescents' health behavior through the way they perceive themselves. Previous studies have shown that higher socioeconomic status was associated with higher self-esteem (Birndorf, Ryan, Auinger, Aten, 2005; Rhodes, Roffman, Reddy, Fredriksen, 2004). Our findings are in line with these studies. Previous research has also revealed a connection between self-esteem and health behavior (White, Kendrick, Yardley, 2009; Schmalz, Deane, Birch, Krahnstoever Davison, 2007; Annesi, 2006), which is also in line with our work. Based on this

previous research and the results of present study it could be concluded that feelings of self-worth play an important role in the connection between socioeconomic status and health behavior in adolescence. The lower socioeconomic status of adolescents might be reflected in their negative perception of self. Consequently, low self-esteem creates a barrier to their engagement in health-enhancing behavior and at the same time leads to health-compromising behavior.

Our findings can be integrated into the model which was proposed in Chapter 1 and lead to an elaborated theoretical model. Figure 8.1 covers the confirmed associations but also includes possible connections between variables that were not explored but could be studied in future research. Confirming the assumptions of the proposed model, we assumed aspects of self-perception to influence health-related behavior. Other intrapersonal factors (resilience and affectivity) significantly contribute to this association. However, we did not fully explore the connection between other intrapersonal factors and health-related behaviors or the connection between intrapersonal factors themselves. Finally, based on recent literature (Flay, 2002; Petraitis, Flay, Miller, 1995; Jessor, 1991), a number of associations should be further explored in subsequent research, i.e. the contribution of other domains e.g. socio-cultural or interpersonal. We expect to find an influence of socioeconomic status and family or peers factors.

Figure 8.1 Model of the relationships between key constructs as a framework for future research



8.3 Strengths and limitations of the study

This study has several important strengths, the most important being its large, nationally representative sample covering the different regions of the country and focusing on the age group of young adolescents. This provides valuable information about health-related behavior and its possible antecedents. A second important strength is the availability of an additional international sample, which enabled the study of more detail information about the association between the perception of self and health-related behavior. Finally, a third strength is the high response rate in both study samples.

However, this study also has some limitations. One is the use of subjective self-reports for measuring health-related behavior, e.g. smoking behavior or physical activity. However, previous studies support the validity of self-reports (Reijneveld, Crone, Verhulst, & Verloove-Vanhorick, 2003; Rebagliato, 2002). Also, confidentiality, anonymity and

privacy provided by self-administration of questionnaires in the absence of teachers decreased the probability of under or over reporting of health-related behavior (Brenner, Billy, Grady, 2003). A review by Brenner, Billy and Grady (2003) reported high reliability of self-reports regarding tobacco and substance use and moderate to high reliability of self-reports regarding physical activity. A second limitation is the cross-sectional design of our study, by which it is impossible to make conclusive statements about causality in our findings. They thus need to be confirmed in a study with a longitudinal design.

8.4 Implications

8.4.1 Implications for future research

As has already been mentioned in the limitations of the study, our cross-sectional design did not provide sufficient information for conclusive statements about the causality of our findings. This leads to a main implication for future research, which should be longitudinal in design in order to assess such causal relationships between the explored variables from the socio-cultural, interpersonal and intrapersonal domains. Such longitudinal or cross-sectional data collections should also bring a more detailed overview of trends in health-related behavior among adolescents.

Additionally, our results show that much can be gained in the health of adolescents by further exploration of the studied variables in a more complex way with the possible influence of other determinants. Models of health behavior proposed by Petraitis, Flay and Miller (1995) and Jessor (1991) imply the importance of studying determinants of health-related behavior from different domains (socio-cultural, interpersonal and intrapersonal) and of testing for their potential connections and influences. Future research should provide insight into the pathway mechanisms and possible mediating and moderating effects. It would be also of interest to explore the contribution of family, peers and community factors. These aspects were not covered in this study but are expected to have an important role in health-related behavior.

Another important issue is the clustering (i.e. co-occurrence) of health-related behavior. It is important to examine in more depth which behaviors cluster together and may be influenced by similar factors. An evident example is age, but apparently other factors, like family factors (Tomcikova et al., 2009), may contribute too. This should be tested further in order to prepare more efficient prevention programs which enable us to focus on several behaviors at the same time instead of separate prevention programs for each of them.

8.4.2 Implications for public health practice

Based on the findings of this study several implications for public health practice arise. It is well-known that adolescents of low socioeconomic status are a more vulnerable group than their peers of higher socioeconomic status and are thus a target group for health promotion programs. Socioeconomic status is clearly associated with an adolescent's self-esteem and has an impact on the way young people evaluate themselves. Regarding this, our findings suggest that health promotion programs should focus on the enhancement of self-esteem, which was identified as a possible mediator between socioeconomic status and health-related behavior. This may offer a route for achieving substantial gains in public health.

Our results indicate that prevention and intervention programs aimed at the reduction of health-endangering behaviors should focus on several issues. One of the essential aspects of intervention strategies is the social influence of peers and the social environment. Young adolescents with higher levels of social self-efficacy or social competence might be more exposed to substance use among their peers and especially in social settings like bars, pubs and other places. It is important to provide adolescents with places to meet that at the same time do not offer them the opportunity for substance use. Solutions could also be found in enhancing appropriate social self-efficacy or competence, especially the skills needed to resist the pressures emerging from peers and the wider social environment regarding substance use (Crone et al., 2003). At the same time, we identified negative self-esteem and negative affectivity as potential risk factors for health-endangering behavior. This shows a need to prepare programs in which adolescents could learn to cope with or improve their negative self-esteem by providing a variety of activities establishing the feeling of self-worth and cope with their negative emotions, e.g. anxiety and depression, in other ways than through health-endangering behavior.

Intervention programs should focus not only on a specific individual, but also on his/her social and environmental setting. In addition, the family is another important factor in the social environment which is strongly associated with health-endangering behavior. Parental support, monitoring and communication with parents may serve as buffers against risk factors connected with health-endangering behavior (Freisthler, Byrnes, & Gruenewald, 2009; Tomcikova et al., 2009; Griffin et al., 2000). A good place to deliver programs may be school, which is the most important place in adolescence next to family and at the same time is easily reachable. This is the place where health promotion could be easily implemented in the concept of the healthy school. However, parental and community involvement enhances health promotion activities and provides the

necessary background (Derzon, Wilson, Cunningham, 1999). Parental and wider community involvement may be key elements for a more effective approach in health promotion programs. Finally, interventions need take into account possible differences between participants (e.g. age, gender, or ethnicity) (Haney, Durlak, 1998).

Conclusion

Smoking behavior, cannabis use and physical activity as explored in this study are all health-related behaviors. Patterns of health-compromising behavior, initiation and progression in adolescence are generally considered to be predictive of later involvement in this behavior and exposure to its harmful consequences (Tucker, Ellickson, Orlando, Martino, & Klein, 2005). In addition, healthy lifestyle patterns that include health-enhancing behavior can be traced back to childhood and adolescence (Hallal, Victora, Azevedo, Wells, 2006). Understanding the factors associated with health-related behavior and pathways of their influence in adolescents are therefore essential in the field of prevention and health promotion. Our results support the idea of connection between the perception of self and health-related behavior in adolescence. Our findings also shed some light on the contribution of other domains. It is important to have in mind other factors from the environmental, intrapersonal and interpersonal domains to explore the connection between the perception of self and health-related behavior in an appropriate way. Intrapersonal factors like perception of self are clearly connected with health-related behaviors in adolescence. At the same time they are connected with other domains of influence which need to be taken into account in creating health promotion programs.

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Summary

Patterns of health-compromising behaviors and their initiation and progression in adolescence are generally considered to be predictive of later involvement in such behaviors and exposure to their harmful consequences on health. Health-enhancing behaviors can be also traced back to childhood and adolescence. Empirical evidence supports the existence of several domains of determinants covering intrapersonal, interpersonal and socio-cultural areas of influence in adolescent health-related behaviors. This thesis deals with health-related behaviors and tries to contribute to the understanding of possible determinants associated with these behaviors. Its main focus is on the intrapersonal dimension (with the perception of self as a core element) and on the additional contribution of factors from other dimensions (the interpersonal and socio-cultural).

In this thesis several aims were explored. The general aim was to examine the association between the perception of self (e.g. self-esteem, self-liking, self-competence and self-efficacy) and health-related behaviors (e.g. smoking behavior, drunkenness, cannabis use and physical activity) among adolescents. A further aim of this thesis was to explore the contribution of other intrapersonal factors (e.g. personality, mental health and resilience) to the above mentioned association. Additionally, we were interested in the role of socioeconomic status as a background variable. Departing from the general aim of this thesis, five research questions were subsequently answered focusing on the association between socioeconomic status and self-esteem and the possible contribution of other factors (Chapter 3), the association of self-esteem and resilience with smoking and cannabis use (Chapter 4), the association of self-efficacy with smoking and the possible contribution of affectivity (Chapter 5), the associations of aspects of self and different levels of physical activity (Chapter 6) and finally, the association between socioeconomic status and physical activity and the possible contribution of self-esteem (Chapter 7). The answers are described in Chapters 3 to 7.

Chapter 1 provides a general introduction to the associations between the key theoretical constructs of this thesis: the perception of self (self-esteem, self-liking, self-competence, and self-efficacy), other intrapersonal factors (e.g. personality, mental health and resilience), socioeconomic status and health-related behavior (e.g. smoking behavior, cannabis use and physical activity). The primary aim and research questions of the thesis, mentioned above, along with a model of the studied variables are presented in the end of this chapter.

Information about the design of the study is given in Chapter 2. It presents the data collection and descriptions of the study samples used in this thesis. It further provides a short description of the measures and analysis used.

In Chapter 3 the association between socioeconomic status and self-esteem in adolescence and the possible contributions of personality, mental health and social support is explored. The findings reveal that adolescents with a low socioeconomic status have lower self-esteem. This association changed after adjustment for personality and mental health, but not after additional adjustment for social support. Family affluence as an indicator for socioeconomic status remained significantly associated with self-esteem from the first to the final model, but its explanatory power decreased after adding personality dimensions and mental health variables (depression/anxiety and social dysfunction).

Chapter 4 focuses on the influence of self-esteem and resilience on health-compromising behavior (previous smoking experience, regular smoking, and previous cannabis experience) among adolescent boys and girls. Based on the results, of the two self-esteem factors, only negative self-esteem was significantly associated with health-compromising behavior among adolescent boys and girls in such a way that the probability of smoking or cannabis experience and engagement in regular smoking increased. No significant association was found among girls after the adding of resilience subscales. Boys and girls did not differ with regard to resilience factors. Among both groups the same factors (structured style, social competence and family cohesion) were significantly associated with health-compromising behavior. Structured style and family cohesion decreased and social competence increased the probability of smoking or cannabis experience and regular smoking.

In Chapter 5 the association between self-efficacy and health-compromising behavior (previous smoking experience, regular smoking) in adolescence and the possible contribution of affectivity is explored. Social efficacy was found to be significantly associated with smoking behavior (previous experience with smoking and also regular smoking) but only in connection with affectivity. Social self-efficacy increased the likelihood of previous experience with smoking and regular smoking among adolescents. Additionally, negative affectivity was found to be associated with both aspects of smoking behavior and positive affectivity with regular smoking. Positive affectivity decreased and negative affectivity increased the likelihood of smoking. General self-efficacy was not found to be significantly associated with smoking behavior.

Chapter 6 focuses on the associations between the perception of self (self-esteem, self-liking, self-competence, and self-efficacy) and different levels of physical activity among adolescent boys and girls. The findings show that positive self-esteem, self-liking, self-competence, general self-

efficacy and social self-efficacy were higher, and negative self-esteem was lower among adolescents with a higher frequency of physical activity. The differences were much more pronounced for girls than for boys. Self-liking and social self-efficacy were higher among adolescent boys with a higher frequency of physical activity. At the same time, positive self-esteem, self-liking, self-competence and general and social self-efficacy were higher, and negative self-esteem was lower among adolescent girls with a higher frequency of physical activity.

Chapter 7 explores the association between socioeconomic status and physical activity in adolescence and the possible contribution of self-esteem. The results revealed that youths with high socioeconomic status engage in regular physical activity more often than their peers with middle or low socioeconomic status and also report higher self-esteem. The association of socioeconomic status with physical activity decreased after adding in self-esteem, suggesting that at least a part of this association is mediated by self-esteem. The connection between socioeconomic status and physical activity may thus be mediated by the self-esteem of adolescents.

Finally, in Chapter 8 the main findings of the study are discussed on the general level in the context of a theoretical background. Next, the most important strengths and limitations are reviewed. The last part of this chapter deals with possible implications in the field of future research as well as public health practice.

Understanding the factors associated with health-related behaviors in adolescence and the pathways for these associations is essential for prevention and health promotion. Findings as reported in this thesis support the idea of a connection between the perception of self and health-related behaviors in adolescence. They also shed some light on the contribution of factors from the socio-cultural, intrapersonal and interpersonal domains. It is important to keep this in mind when designing effective health promotion programs.

Samenvatting

Aangenomen wordt dat patronen van riskant gezondheidsgedrag, begin en ontwikkeling gedurende de adolescentie voorspellend zijn voor dergelijk gedrag op de volwassen leeftijd en voor de gezondheidsschadende consequenties ervan. Ook de basis van gezondheidsbevorderend gedrag lijkt te liggen in de kinderleeftijd en de adolescentie. Onderzoek bevestigt het bestaan van verschillende groepen van determinanten, waaronder intrapersoonlijke, interpersoonlijke en social-culturele, op het gezondheidsgedrag van de adolescent. Dit proefschrift heeft betrekking op gezondheidsgedrag en poogt bij te dragen aan het inzicht in de mogelijke determinanten daarvan. Het accent ligt op intrapersoonlijke factoren, met zelfperceptie als centraal thema, en op de aanvullende bijdrage van factoren uit andere groepen (interpersoonlijk en sociaal-cultureel).

In dit proefschrift worden verschillende vragen onderzocht. De algemene vraag is de relatie tussen zelfperceptie (bijvoorbeeld zelfwaardering, self-esteem; gevoel van eigenwaarde, self-liking; zelfcompetentie, self-competence; en eigen-effectiviteit, self-efficacy) en gezondheidsgedrag (bijvoorbeeld roken, dronkenschap, cannabisgebruik en lichamelijke inspanning) bij adolescenten. Daarnaast is de bijdrage van andere intrapersoonlijke factoren, zoals persoonlijkheid, psychische gezondheid en weerbaarheid aan deze relatie onderzocht. Tenslotte is de rol van sociaal-economische status als achtergrondvariabele onderzocht. Vanuit de algemene vraag van dit proefschrift zijn vijf onderzoeksvragen in dit proefschrift beantwoord, die gericht zijn op het verband tussen sociaal-economische status en zelfwaardering, en de mogelijke bijdrage van andere factoren (Hoofdstuk 3), het verband tussen zelfwaardering en weerbaarheid met roken en cannabisgebruik (Hoofdstuk 4), het verband tussen eigen-effectiviteit en roken en de mogelijke bijdrage van affectiviteit (Hoofdstuk 5), het verband tussen aspecten van het zelf en lichamelijke inspanning (Hoofdstuk 6) en het verband tussen sociaal-economische status en lichamelijke inspanning en de mogelijke bijdrage van zelfwaardering (Hoofdstuk 7). De antwoorden komen aan de orde in de hoofdstukken 3 tot en met 7.

Hoofdstuk 1 bevat een algemene inleiding over de verbanden tussen de belangrijkste constructen uit dit proefschrift: zelfperceptie (zelfwaardering, gevoel van eigenwaarde, zelf-competentie en eigen-effectiviteit), andere intrapersoonlijke factoren (zoals persoonlijkheid, psychische gezondheid en weerbaarheid) en gezondheidsgedrag (bijvoorbeeld roken, dronkenschap, cannabisgebruik en lichamelijke inspanning). De algemene vraag en de onderzoeksvragen van het

proefschrift worden ook in dit hoofdstuk gepresenteerd, met daarbij een model voor de onderzochte variabelen.

De opzet van het onderzoek wordt geschetst in Hoofdstuk 2, dat verder ingaat op de dataverzamelingen en de steekproeven die in dit proefschrift zijn gebruikt. Daarnaast wordt een korte beschrijving van de meetinstrumenten en de analysemethoden gegeven.

In Hoofdstuk 3 wordt het verband tussen sociaal-economische status en zelfwaardering gedurende de adolescentie onderzocht, en de mogelijke bijdrage daaraan van persoonlijkheid, psychische gezondheid en sociale steun. De resultaten laten zien dat adolescenten met een lagere sociaal-economische status een lager zelfwaardering hebben. Dit verband veranderde na toevoeging van persoonlijkheid en psychische gezondheid, maar niet na toevoeging van sociale steun. Family affluence als indicator van sociaal-economische status bleef een significant verband laten zien met zelfwaardering in alle modellen, maar de verklarende kracht ervan nam af na toevoeging van persoonlijkheidsdimensies en psychische gezondheid (depressie/angst en sociaal disfunctioneren).

In Hoofdstuk 4 komt de invloed van zelfwaardering en weerbaarheid op gezondheidsgedrag (ooit roken, regelmatig roken en cannabisgebruik) bij jongens en meisjes in de adolescentie aan de orde. De resultaten geven aan dat van de twee maten voor zelfwaardering, alleen negatieve zelfwaardering een significant verband heeft met gezondheidsschadend gedrag bij adolescente jongens en meisjes zodanig dat de kans op ooit roken of cannabisgebruik en de kans op regelmatig roken toeneemt. Het significante verband verdween bij meisjes na toevoeging van de weerbaarheid subschalen aan het model. Jongens en meisjes verschilden niet met betrekking tot de weerbaarheidsfactoren. In beide groepen was er een significant verband tussen dezelfde factoren (gestructureerde stijl, sociale competentie en cohesie van het gezin) en gezondheidsschadend gedrag. Gestructureerde stijl en cohesie van het gezin deden de kans op ooit roken en cannabisgebruik, en op regelmatig roken afnemen terwijl sociale competentie die kans verhoogde.

In Hoofdstuk 5 wordt ingegaan op het verband tussen eigen-effectiviteit en gezondheidsgedrag (ervaring met roken, regelmatig roken) gedurende de adolescentie en de mogelijke invloed van affectiviteit. Eigen-effectiviteit bleek een significant verband te hebben met rookgedrag (ooit gerookt hebben, en ook regelmatig roken), maar alleen in samenhang met affectiviteit. Sociale eigen-effectiviteit deed de kans op ooit gerookt hebben en op regelmatig roken toenemen bij adolescenten. Daarnaast bleek negatieve affectiviteit een verband te hebben met beide aspecten van rookgedrag en positieve affectiviteit met regelmatig roken. Positieve affectiviteit deed de kans op roken afnemen terwijl negatieve affectiviteit deze deed toenemen. Algemene eigen-effectiviteit bleek geen significant verband te hebben met rookgedrag.

In Hoofdstuk 6 wordt ingegaan op de verbanden tussen zelfperceptie (zelfwaardering, gevoel van eigenwaarde, zelf-competentie, en eigen-effectiviteit) en verschillende niveaus van lichamelijke inspanning bij jongens en meisjes in de adolescentie. Uit de resultaten blijkt dat positieve zelfwaardering, gevoel van eigenwaarde, zelf-competentie, algemene eigen-effectiviteit en sociale eigen-effectiviteit hoger zijn bij adolescenten die vaker lichamelijke inspanning hebben en negatieve zelfwaardering juist lager. De verschillen waren meer uitgesproken bij meisjes in vergelijking met jongens. Gevoel van eigenwaarde en sociale eigen-effectiviteit waren hoger bij jongens die vaker lichamelijke inspanning hadden. Tegelijkertijd waren positieve zelfwaardering, gevoel van eigenwaarde, zelf-competentie en algemene en sociale eigen-effectiviteit hoger, en negatieve zelfwaardering lager bij meisjes die vaker lichamelijke inspanning hadden.

In Hoofdstuk 7 wordt het verband tussen sociaal-economische status en lichamelijke inspanning bij adolescenten onderzocht en de mogelijke bijdrage van zelfwaardering. De resultaten laten zien dat jongeren met een hoge sociaal-economische status vaker aan regelmatige lichamelijke inspanning doen dan hun leeftijdgenoten met een gemiddelde of lage sociaal-economische status en dat ze ook een hogere zelfwaardering rapporteren. Het verband tussen sociaal-economische status en lichamelijke inspanning werd zwakker na het toevoegen van zelfwaardering, wat suggereert dat tenminste een deel van dit verband wordt gemedieerd door self-esteem. Het verband tussen sociaal-economische status en lichamelijke inspanning zou dus gemedieerd kunnen worden door de zelfwaardering van adolescenten.

Tenslotte worden in Hoofdstuk 8 de belangrijkste bevindingen van de studie besproken in de context van theoretische achtergrond. Vervolgens wordt ingegaan op de belangrijkste sterke punten en beperkingen van de studie. Het laatste onderdeel van dit hoofdstuk is gericht op de mogelijke consequenties voor toekomstig onderzoek en voor de praktijk van de publieke gezondheid.

Inzicht in de factoren die verband houden met gezondheidsgedrag van adolescenten en hun causale paden is essentieel voor preventie en gezondheidsvoorlichting. De bevindingen zoals gerapporteerd in dit proefschrift ondersteunen de gedachte dat er een verband is tussen zelfperceptie en gezondheidsgedrag van adolescenten. Ze werpen ook enig licht op de bijdrage van factoren uit de sociaal-culturele, intrapersoonlijke en interpersoonlijke domeinen. Het is belangrijk om hier aandacht aan te besteden, om te bereiken dat effectieve gezondheidbevorderingsprogramma's worden voorbereid.

Zhrnutie

Vzorce zdravie ohrozujúceho správania sa, ich začiatok a rozvoj v adolescencii, sú vo všeobecnosti vnímané ako prediktory neskoršieho zapojenia sa do tohto správania, ako aj vystavenia sa jeho škodlivým dôsledkom na zdravie v dospelosti. Taktiež zdravie podporujúce správanie sa v dospelosti môže byť vystopované späť až do detstva a adolescencie. Výskumné zistenia podporujú existenciu viacerých oblastí determinantov, ktoré zahŕňajú intrapersonálne, interpersonálne a socio-kultúrne vplyvy na so zdravím súvisiace správanie sa adolescentov. Táto práca sa práve preto zaoberá so zdravím súvisiacim správaním a pokúša sa prispieť k pochopeniu determinantov, ktoré sa s týmto správaním spájajú. Zameriava sa najmä na intrapersonálnu oblasť (vnímanie seba ako centrálnu časť) a na dodatočné pôsobenie faktorov z ostatných dimenzií (interpersonálnej a socio-kultúrnej dimenzie).

V tejto práci bolo skúmaných niekoľko cieľov. Hlavným cieľom bolo overiť spojenie medzi seba perceptions (napr. sebaúcta, sebaúčinnosť, sebakompetencia) a so zdravím súvisiacim správaním (napr. fajčenie, užívanie marihuany a fyzická aktivita) u adolescentov. Dodatočným cieľom tejto práce bolo preskúmať podiel ostatných intrapersonálnych faktorov (napr. osobnosť, duševné zdravie, reziliencia) na vyššie spomínaný vzťah. Okrem toho sme sa zaujímali aj o úlohu socio-ekonomického statusu ako premennej tvoriacej pozadie vzťahov medzi premennými. Vychádzajúc z cieľov tejto práce, bolo vypracovaných päť výskumných otázok zameriavajúcich sa na vzťah medzi socio-ekonomickým statusom a sebaúctou a možným podielom ďalších faktorov na tento vzťah (Kapitola 3), na vzťah medzi sebaúctou a rezilienciou na jednej strane a fajčením a užívaním marihuany na strane druhej (Kapitola 4), na vzťah medzi sebaúčinnosťou a fajčením s pravdepodobným vplyvom afektivity ako ďalšej premennej (Kapitola 5), na vzťah medzi aspektmi seba percepcie a odlišnými úrovňami fyzickej aktivity (Kapitola 6) a na vzťah medzi socio-ekonomickým statusom a fyzickou aktivitou s pravdepodobným vplyvom sebaúcty na tento vzťah (Kapitola 7). Odpovede na tieto výskumné otázky sú popísané v Kapitole 3 až 6.

Kapitola 1 ponúka všeobecný úvod do vzťahov medzi kľúčovými teoretickými konštruktmi tejto práce: seba percepčia (sebaúcta, sebaúčinnosť, sebakompetencia), ostatné intrapersonálne faktory (osobnosť, duševné zdravie, reziliencia), socio-ekonomický status a so zdravím súvisiace správanie (fajčenie, užívanie marihuany a fyzická aktivita). Primárny cieľ, tak ako aj výskumné otázky tejto práce spolu s teoretickým modelom skúmaných premenných je prezentovaný v závere tejto kapitoly.

Informácie o dizajne štúdie sa nachádzajú v Kapitole 2. Obsahuje údaje o zberoch dát, popis výskumných vzoriek použitých v tejto práci a prináša tiež krátky popis metodík a štatistických analýz, ktoré boli použité.

V Kapitole 3 je skúmaný vzťah medzi socio-ekonomickým statusom a sebaúctou v adolescencii s predpokladaným vplyvom premenných, ako je osobnosť, duševné zdravie a sociálna opora na tento vzťah. Zistenia odhalili, že adolescenti s nízkym socio-ekonomickým statusom majú nižšiu sebaúctu. Tento vzťah sa zmenil po pridaní premenných ako je osobnosť a duševné zdravie, avšak pridanie premennej sociálna opora už na vzťah medzi socio-ekonomickým statusom a sebaúctou žiaden vplyv nemalo. Rodinný blahobyť ako ukazovateľ socio-ekonomického statusu zostal štatisticky významný vo vzťahu k sebaúcte vo všetkých analyzovaných modeloch, avšak jeho vplyv ako premennej sa výrazne znížil po pridaní osobnostných dimenzií a premenných týkajúcich sa duševného zdravia (depresia/anxieta a sociálna dysfunkcia).

Kapitola 4 sa zameriava na vplyv sebaúcty a reziliencie na zdravie ohrozujúce správanie (predchádzajúca skúsenosť s fajčením, pravidelné fajčenie a predchádzajúca skúsenosť s marihuanou) u chlapcov a dievčat v období adolescencie. Vychádzajúc zo zistení, z dvoch faktorov sebaúcty, len negatívna sebaúcta mala štatisticky významný vzťah na zdravie ohrozujúce správanie u adolescentných chlapcov a dievčat. Pravdepodobnosť predchádzajúcej skúsenosti s fajčením a marihuanou, ako aj pravidelné fajčenie sa zvyšuje s negatívnou sebaúctou. Štatisticky významný vzťah sa však už nepotvrdil u dievčat po pridaní jednotlivých subškál reziliencie. V prípade samotného vplyvu reziliencie ako premennej neboli zistené žiadne rozdiely medzi chlapcami a dievčatami. V oboch skupinách boli rovnaké subškály (štruktúrovaný štýl, sociálna kompetencia a rodinná súdržnosť) v štatisticky významnom vzťahu s jednotlivými formami zdravie ohrozujúceho správania. Štruktúrovaný štýl a rodinná súdržnosť znižovali a sociálna kompetencia zvyšovala pravdepodobnosť predchádzajúcej skúsenosti s fajčením a marihuanou, ako aj pravidelné fajčenie.

V Kapitole 5 je skúmaný vzťah medzi sebaúčinnosťou a zdravie ohrozujúcim správaním (predchádzajúca skúsenosť s fajčením a pravidelné fajčenie) v adolescencii s predpokladaným vplyvom afektivity na tento vzťah. Sociálna sebaúčinnosť bola v štatisticky významnom vzťahu s fajčením (predchádzajúca skúsenosť s fajčením a tiež pravidelné fajčenie avšak len v spojení s afektivitou). Sociálna sebaúčinnosť teda zvyšovala pravdepodobnosť predchádzajúcej skúsenosti s fajčením, ako aj pravidelné fajčenie u adolescentov. Okrem toho, negatívna afektivita bola v štatisticky významnom vzťahu s oboma aspektmi fajčenia, zatiaľ čo pozitívna afektivita len s pravidelným fajčením. Pozitívna afektivita pritom znižovala a negatívna afektivita zvyšovala pravdepodobnosť

fajčenia. Nebol zistený štatisticky významný vzťah medzi všeobecnou sebaúctou a fajčením.

Kapitola 6 sa zameriava na vzťah medzi seba-percepciou (sebaúcta, sebaúčinnosť, sebaocenenie, sebakompetencia) a odlišnými úrovňami fyzickej aktivity u chlapcov a dievčat v období adolescencie. Zistenia ukázali, že pozitívna sebaúcta, sebaocenenie, sebakompetencia, všeobecná sebaúčinnosť a sociálna sebaúčinnosť boli vyššie a negatívna sebaúcta bola nižšia u adolescentov s vyššou frekvenciou fyzickej aktivity. Tento rozdiel bol omnoho výraznejší u dievčat ako u chlapcov. Sebaocenenie a sociálna sebaúčinnosť boli vyššie u adolescentných chlapcov s vyššou frekvenciou fyzickej aktivity. Zároveň, pozitívna sebaúcta, sebaocenenie, sebakompetencia, všeobecná a sociálna sebaúčinnosť boli vyššie a negatívna sebaúcta bola nižšia u adolescentných dievčat s vyššou frekvenciou fyzickej aktivity.

Kapitola 7 skúma vzťah medzi socioekonomickým statusom a fyzickou aktivitou v adolescencii s predpokladaným vplyvom sebaúcty na tento vzťah. Výsledky odhalili, že mladí ľudia s vyšším socioekonomickým statusom sa zapájajú do fyzickej aktivity omnoho častejšie ako ich rovesníci so stredným alebo nízkym socioekonomickým statusom a taktiež majú vyššiu sebaúctu. Vzťah medzi socioekonomickým statusom a fyzickou aktivitou sa oslabil po pridaní sebaúcty. To naznačuje, že prinajmenšom časť vzťahu medzi socioekonomickým statusom a sebaúctou je u adolescentov mediovaná ich sebaúctou.

Na záver, v Kapitole 8 sú diskutované hlavné zistenia na všeobecnej úrovni v rámci teoretického kontextu uvedeného v Kapitole 1. Ďalej sú zhodnotené najdôležitejšie silné stránky tejto štúdie, ako aj jej limitácie. Posledná časť tejto kapitoly sa zaoberá možnými dôsledkami a implikáciami na poli budúceho výskumu a praxe v oblasti verejného zdravia.

Porozumenie faktorov, ktoré sú spojené so zdravím súvisiacim správaním v adolescencii a ich možného vplyvu je nevyhnutné pre oblasť prevencie a podpory zdravia. Naše výsledky podporujú myšlienku spojenia percepcie seba so zdravím súvisiacim správaním. Taktiež prinášajú určité svetlo do možného prínosu ďalších faktorov z intrapersonálnej, interpersonálnej a socio-kultúrnej oblasti. Je dôležité nestratiť zo zreteľa všetky tieto oblasti možného vplyvu, ak chceme byť schopní pripraviť efektívne programy zamerané na podporu zdravia.

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About the author



Zuzana Veselska was born on the 9th of December 1981 in Kosice, Slovak Republic. After finishing her secondary school in Kosice, she studied psychology at the Department of Psychology, University of Presov. She graduated at psychology in May 2006 and her Master thesis “Social competence and its association with aggressive behavior among adolescents” dealt with the connection between social competence and different types of aggressive behavior among youths. During her university studies she worked as a volunteer and consultant on the Child Help Line. After completing her university studies she started working at PJ Safarik University in Kosice, Slovak Republic in October 2006 and at the same time started her PhD studies at University of Groningen, The Netherlands. During her work at the university as well as in her PhD studies, she focused on intrapersonal factors associated with health-related behaviors among adolescents. In addition, she participated in the education process in the Faculty of Arts and in the Medical Faculty where she delivered the subjects Developmental Psychology and Communication in Medicine. She also participated as a lecturer in Social-psychological trainings for university students and supervised students’ bachelor theses. During this time she finished one-year training in relaxation-imaginative psychotherapy. Since 2009 she is a member of the HBSC (Health Behaviors in School-aged Children) national team and member of HBSC Positive Health Focus group. At present she is working at the Department of Health Psychology, Institute of Public Health, Medical Faculty, PJ Safarik University in Kosice as a researcher with some teaching duties. Her professional interest focuses on intrapersonal determinants associated with health and health-related behaviors among youths.

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