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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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