

The role of family background on cigarette smoking among adolescent school children in Slovakia: findings from the 2007 Slovakia Global Youth Tobacco Survey

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Abstract

Objectives To analyse Global Youth Tobacco Survey (GYTS) data to determine the role of family background on cigarette smoking among adolescents in Slovakia.

Methods The GYTS is a school-based survey of students aged 13–15 years developed by the World Health Organization and the Centers for Disease Control and Prevention. The GYTS was conducted in Slovakia in 2007.

Results Students from families where one or more parents were smokers were significantly more likely to report lifetime smoking, current cigarette smoking and signs of nicotine dependence (only girls). Socio-economic status of parents as measured by parent educational level and employment status was not statistically associated with students' smoking status. Girls from families with lower socioeconomic status showed more frequently positive attitudes regarding smoking of their peers.

Conclusions Considering family background, parental smoking plays the most important role in smoking of their children regardless of employment status and educational level. The findings suggest that the tobacco control program effort in Slovakia needs to focus on implementation and enforcement for those policies already in place as well as expansion into additional measures.

Keywords Smoking · Adolescents · Socioeconomic factors · Family background

Introduction

Tobacco use is a major preventable cause of death in the world. The World Health Organization (WHO) attributes over 4 million deaths a year to tobacco, a figure that is expected to increase to 10 million deaths a year by 2020 (Ezzati and Lopez 2003). Slovakia ranks among countries with relatively high prevalence of adolescent tobacco use (Warren et al. 2008; Baška et al. 2006). About one quarter of 13- to 15-year-old adolescents are current cigarette smokers (smoking one or more days during the last month) showing only slight gender differences and not significantly changing over recent time (GYTS Country Report Slovakia 2008). Prevalence of smoking initiation in age 13 and less in Slovakia is about twice as high as the average in other European countries (Sociálne determinanty zdravia školákov 2009).

Family background plays an important role in the development of behavioural models of youngsters, including tobacco use. Numerous studies suggest that parental smoking is a significant family-related factor contributing in smoking of siblings (Forrester et al. 2007; Fidler et al. 2008; Madarasova Geckova et al. 2005; Komro

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et al. 2003; Hedman et al. 2007; Gilman et al. 2009). However, results in this field are considered inconsistent and authors express a need for further research (Avenevoli and Merikangas 2003).

Tobacco smoking significantly contributes to health inequality in Europe (Mackenbach 2006). People from lower socioeconomic groups smoke more frequently and consequences of tobacco use are more severe among them (Lewis et al. 2001). High prevalence of smoking in lower socioeconomic groups significantly contributes in health inequality in Slovakia, as demonstrated by higher cardiovascular (both males and females) and cancer (males) mortality rates in regions with low level of education (Ginter and Hulanská 2007). A high prevalence of parental smoking is likely lead to higher smoking rates in youngsters among lower socioeconomic groups (Madarasova Geckova et al. 2005). Lower education level as well as parents unemployment was associated with an increased probability of tobacco use in their children, as well (Gritz et al. 2003; Unger et al. 2004; Droomers et al. 2005; Arvanitidou et al. 2008). Moreover, permissiveness of offspring's smoking and lower parental monitoring in such families can also play a role in young people smoking behaviour (Forrester et al. 2007; Fidler et al. 2008; Madarasova Geckova et al. 2005; Komro et al. 2003).

The Global Youth Tobacco Survey (GYTS), developed by WHO, the US Centers for Disease Control and Prevention and the Canadian Public Health Association, provides reliable and representative data on tobacco use and related factors in schoolchildren 13–15 years of age (Warren et al. 2006, 2008). GYTS data can be used to analyse tobacco use as well as attitudes towards smoking in children in association with selected family-related factors and indicators of socioeconomic status. Socioeconomic conditions, particularly educational level and employment status, have been found to be important determinants of numerous life-style-related risk factors, thus significantly contributing to health inequalities. People in lower socioeconomic groups more frequently suffer from chronic diseases resulting in higher mortality rates and reduced life expectancy (Mackenbach 2006).

In this article, GYTS data from Slovakia, collected in 2007, are analysed to address three questions:

1. Is there an association between adolescents' smoking status and the smoking and socioeconomic status of their parents?
2. Is there an association between adolescents' attitudes towards smoking (expressed as attractiveness of smoking of peers) and the smoking and socioeconomic status of their parents?
3. Are there gender differences in these associations?

Methods

The GYTS uses a two-stage cluster survey design that produces representative samples of students in grades associated with the ages 13–15 years. In Slovakia, the 2007 sample frame included grades 7–9 in elementary schools and 3–5 in 8-year study grammar schools. At the first stage, 60 schools were selected with probability proportional to enrolment size (a complete list of all schools with enrolment data was obtained from the Office of School Information and Prognosis, Ministry of Education of the Slovak Republic). At the second sampling stage, classes within the selected schools were randomly selected. All students attending the school the day the survey was administered in selected classes were eligible to participate. Student participation was voluntary and anonymous using self-administered data collection procedures. The GYTS sample design produces representative, independent, cross-sectional estimates for each site.

The fieldwork was performed in April–June 2007. The school response rate was 100% and the student response rate was 86.1%. A total of 4,696 students participated, thus yielding highly representative sample.

The GYTS questionnaire contained 90 multi-choice questions, 54 of them core questions uniformly used in each country. The questions covered seven categories: tobacco use, knowledge and attitudes regarding tobacco, environmental tobacco smoke exposure, media and advertising, desire for cessation, access and availability to obtain tobacco and teaching in schools on tobacco (Warren et al. 2008). Accuracy of the Slovak country questionnaire was checked through back translation.

In this analysis, the following variables were used and defined:

- Ever smoked cigarettes (lifetime cigarette smoking)—students who responded “yes” to the question “Have you ever smoked cigarettes in your life, even one or two puffs?”
- Current cigarette smoker—students who smoked cigarettes on at least 1 day during the month preceding the survey.
- Frequent cigarette smoker—students who smoked cigarettes 20 and more days in the past month.
- Susceptibility to initiate smoking—never smokers who responded “definitely yes” or “maybe yes” or “no” to two questions: “If your best friend offered you a cigarette, would you smoke it?” and “Do you think you will try smoking a cigarette in the next year?”
- Nicotine dependency among current smokers—students who answered “yes” to the question, “Do you always have or feel like having a cigarette first thing in the morning?”

- Unemployment in the family—students who answered “father (step father or mother’s partner) only” or “mother (step mother or father’s partner) only” or “neither” to the question, “Are your parents currently employed?”
- Lower educational status of parents—students who reported neither mother nor father having completed secondary school with final examination or university education.
- Parental smoking—students who reported at least one parent smoking.
- Students thinking that smoking boys/girls are more attractive—students who answered “more attractive” to the question, “Do you think smoking cigarettes makes boys/girls more or less attractive?”

A weighting factor was applied to each student record to adjust for non-responses and variation in the probability of selection at the school, class, and student levels. SUDAAN, a software package for statistical analysis of correlated data (Shah et al. 1997), as well as EPI INFO was used to calculate weighted prevalence estimated (expressed in percentage) and 95% confidence intervals of the estimates. Details of the methodology are included in previous publications on GYTS (Warren et al. 2008; Baška et al. 2006; GYTS Country Report Slovakia 2008; Warren et al. 2006).

Frequencies of the variables are presented as weighted percentages with respective confidence interval 95%. Differences between prevalence estimates were considered statistically significant if the 95% confidence intervals did not overlap. Associations between predictor and outcome variables were tested using logistic regressions and were expressed as odds ratio with respective confidence intervals. Independent variables (predictors) were those concerning family background, i.e. parental smoking, unemployment in the family and parents lower education status. Outcome variables were those related to adolescent smoking and attitudes towards smoking, i.e. ever smoking, current cigarette smoking, frequent cigarette smoking, susceptibility to smoking, nicotine dependency among current smokers and attitudes regarding social attractiveness of smoking (how respondents consider smoking of boys and girls).

Results

Almost two-thirds of the students reported lifetime smoking and the frequency was higher for boys than for girls (69.3 vs. 60.2%). About one quarter of the total sample (26.4%) was current cigarette smokers. Less than one-tenth of students (8.0%) were frequent smokers. Less than one-fifth (16.8%) of current smokers reported signs of nicotine

dependency. Almost one-third of those who have ever smoked initiated smoking before the age of ten (34.8% for boys and 22.3% for girls). About one quarter of those who never smoked reported they were susceptible to initiate smoking in the next year (29.6% for boys and 17.7% for girls).

A minority of students considered smoking for boys and girls as attractive. Their attitudes clearly differ according to smoking status. About twice as many current smokers reported a positive attitude compared to respondents who never smoked. Among those who never smoked, more boys than girls (14.4 vs. 6.8%) thought that boys who smoke are more attractive (Table 1).

About one half of students (50.9%) reported that their parents smoked. Less than one-third of students (29.0%) came from families with lower educated parents and less than one quarter of students (23.5%) reported unemployment of at least one parent. No significant gender differences were found in the frequency of those variables (Table 1).

Parental smoking showed positive association with lifetime smoking, current cigarette smoking and frequent smoking both in boys and girls. In the case of girls, it was strongly associated with signs of nicotine dependency (Table 2).

Lower education of parents was not associated with any indicators, of tobacco use (lifetime smoking, current cigarette smoking, being a frequent smoker, signs of nicotine dependence, smoking initiation before age 10, and susceptibility to become a smoker). Among girls, susceptibility to start smoking was less frequent in those whose parents had lower education (OR 0.62). Lower education of parents was also positively associated with the attitude that smoking boys are more attractive, among current smoking girls. Lower education of parents was also associated with the attitude that smoking girls are more attractive, among never smokers of both sexes and current smoking girls (Table 2).

Parents’ unemployment (for either one or the two of them) was significantly associated with smoking initiation before age 10 in both genders. This association was negative for boys (OR 0.75) and positive for girls (OR 1.41). Similarly, girls from families with unemployment were less susceptible to smoke (OR 0.58). Unemployment of parents was also positively associated with the attitude that smoking boys are more attractive among girls (both current and never smokers) and with the attitude that smoking girls are more attractive among current smoking girls (Table 2).

Discussion

Cigarette smoking is somewhat frequent among students in Slovakia. Although lifetime smoking and its early initiation

Table 1 Frequency of indicators related to tobacco use, attitudes towards smoking and selected family related factors in students, 2007 Slovakia Global Youth Tobacco Survey

	Frequency of the variable		
	Total	Boys	Girls
Tobacco use			
Ever smoked	64.9 (62.1–67.7)	69.3 (66.1–72.3)	60.2 (56.5–63.8)
Current cigarette smokers	26.4 (24.0–28.7)	28.0 (24.9–31.3)	24.1 (21.4–27.0)
Frequent smokers (smoke 20 and more days in the past month)	8.7 (6.8–10.6)	10.4 (7.8–13.0)	6.6 (5.1–8.2)
Current cigarette smokers always have or feeling like having a cigarette first thing in the morning	16.8 (14.1–19.9)	18.6 (14.9–23.0)	14.5 (10.5–19.5)
Ever smokers initiating before age 10	29.1 (27.1–31.2)	34.8 (31.6–38.2)	22.3 (20.0–24.8)
Never smokers susceptible to smoke	24.6 (21.8–27.5)	17.7 (15.4–20.4)	29.6 (25.1–34.5)
Attitudes towards smoking (attractiveness of smoking of peers)			
Think smoking boys are more attractive: never smokers	10.1 (8.1–12.0)	14.4 (10.9–18.0)	6.8 (4.7–8.8)
Think smoking boys are more attractive: current cigarette smokers	23.5 (19.9–27.0)	21.2 (17.6–24.8)	25.8 (19.1–32.6)
Think smoking girls are more attractive: never smokers	7.1 (5.5–8.7)	7.4 (4.5–10.2)	6.5 (4.7–8.4)
Think smoking girls are more attractive: current cigarette smokers	14.2 (12.0–16.3)	15.4 (12.4–18.4)	12.3 (9.0–15.7)
Family-related factors			
Parental smoking	50.9 (48.5–53.2)	47.7 (45.3–50.1)	53.4 (50.3–56.4)
Lower education of parents	29.0 (24.7–33.2)	27.5 (23.7–31.3)	29.4 (24.5–34.3)
Unemployment of parents	23.5 (20.0–27.1)	22.7 (19.5–25.9)	23.2 (19.3–27.2)

Values are percent (95% CI)

before age 10 still predominates in boys, reflecting traditional gender differences in tobacco use, other indicators of current tobacco use (current cigarette smoking, being a frequent smoker, as well as signs of nicotine dependence) show no significant difference between boys and girls. These findings, together with a higher susceptibility to start smoking found among girls, indicate a potential increase of tobacco use among women in the coming years.

Regarding attitudes towards smoking, particularly its attractiveness among peers, two findings are noteworthy:

1. Attitudes strongly depend on respondents' smoking status, i.e. current smokers more frequently reported positive attitudes.
2. Positive answers were somewhat infrequent, not more than one quarter of respondents even among current smokers reported such positive attitudes.

Although attitudes towards tobacco use among adolescents are closely related to their smoking status, positive perceptions of smoking of peers do not prevail even among current smokers. These findings indicate that positive attitudes towards tobacco use do not represent essential reason for smoking initiation. Another study focused on this issue (Chalela et al. 2007) and supports such interpretation, where only a minority of smokers reported attractiveness of smoking as a main reason for tobacco use and where the most frequent reported reason for smoking was the belief that smoking can help relax.

Several authors pointed out that parental smoking is one of the most important factors determining initiation and development of regular tobacco use in children (Forrester et al. 2007; Fidler et al. 2008; Madarasova Geckova et al. 2005; Komro et al. 2003; Hedman et al. 2007; Gilman et al. 2009). Similarly, some studies identified parent unemployment and lower education level of parents as factors increasing the probability of smoking in youngsters (Gritz et al. 2003; Unger et al. 2004; Droomers et al. 2005). Our results only partially support such findings. The association between family-related factors and youth tobacco use indicators is remarkably divided: while parental smoking is clearly associated with adolescents' tobacco use, it was associated neither with age of smoking initiation, nor with susceptibility to start smoking, and to attitudes. However, analysed socioeconomic factors such as parent education and unemployment were associated only with indicators other than tobacco use (smoking initiation before age 10, susceptibility and attitudes). Our GYTS results did not indicate a direct influence of parent's socioeconomic status on the tobacco use in adolescents.

This could be explained the fact that children of smoking parents, regardless of their socioeconomic status, more frequently experiment with cigarettes and take up regular smoking at a younger age so that during adolescence they are already current smokers. On the other hand, the absence of a statistical association between parental smoking and current susceptibility to start smoking may

Table 2 Association of indicators related to tobacco use and attitudes towards smoking in students with selected family related factors, 2007 Slovakia Global Youth Tobacco Survey

Indicators related to tobacco use and attitudes towards smoking in students: outcome variables	Influence of selected family-related factors: independent variables		
	Parental smoking	Lower education level of parents	Unemployment of parents
Ever smoked			
Boys	1.92 (1.62–2.28)	1.03 (0.82–1.30)	0.98 (0.74–1.31)
Girls	2.12 (1.79–2.50)	0.83 (0.59–1.17)	1.05 (0.77–1.41)
Current cigarette smokers			
Boys	2.25 (1.75–2.90)	1.27 (0.93–1.73)	1.30 (0.95–1.76)
Girls	2.49 (2.09–2.96)	1.12 (0.83–1.51)	1.22 (0.94–1.59)
Frequent smokers (smoke 20 and more days in the past month)			
Boys	3.06 (2.28–4.11)	1.10 (0.77–1.56)	0.97 (0.65–1.44)
Girls	4.20 (2.66–6.63)	1.25 (0.79–1.99)	1.50 (0.99–2.28)
Current cigarette smokers always have or feeling like having a cigarette first thing in the morning			
Boys	1.44 (1.00–2.09)	0.79 (0.50–1.26)	1.25 (0.67–2.35)
Girls	5.16 (2.06–12.94)	0.81 (0.39–1.66)	1.29 (0.66–2.53)
Ever smokers initiating before age 10			
Boys	1.02 (0.87–1.19)	0.81 (0.65–1.01)	0.75 (0.61–0.94)
Girls	1.23 (0.93–1.62)	1.12 (0.89–1.41)	1.41 (1.07–1.87)
Never smokers susceptible to smoke			
Boys	1.05 (0.73–1.49)	0.95 (0.59–1.54)	1.21 (0.75–1.94)
Girls	0.93 (0.71–1.20)	0.62 (0.43–0.90)	0.58 (0.41–0.80)
Think smoking boys are more attractive: never smokers			
Boys	0.83 (0.41–1.71)	1.48 (0.85–2.55)	1.50 (0.94–2.40)
Girls	1.35 (0.78–2.35)	1.69 (0.92–3.11)	1.77 (1.01–3.07)
Think smoking boys are more attractive: current smokers			
Boys	1.39 (0.85–2.28)	1.07 (0.63–1.80)	0.68 (0.36–1.29)
Girls	1.55 (1.00–2.41)	1.69 (1.11–2.58)	1.70 (1.07–2.70)
Think smoking girls are more attractive: never smokers			
Boys	0.69 (0.35–1.35)	2.31 (1.15–4.67)	1.66 (0.94–2.92)
Girls	1.11 (0.66–1.87)	2.21 (1.19–4.09)	1.52 (0.80–2.89)
Think smoking girls are more attractive: current smokers			
Boys	0.99 (0.54–1.79)	1.23 (0.74–2.02)	1.02 (0.59–1.76)
Girls	1.69 (0.95–2.98)	2.64 (1.64–4.25)	2.03 (1.30–3.16)

Values are odds ratio (95% CI)

indicate that this association weakens when children get older. Thus, it can be hypothesized that 13- to 15-year-old adolescents are getting to be influenced predominantly by factors outside from the family, especially peer smoking (Madarasova Geckova et al. 2005; Chalela et al. 2007; Christophi et al. 2009).

The interaction we found between gender, parent unemployment and smoking initiation before age 10 is interesting. This could be explained by gender differences in ways by which adolescents get cigarettes. Several studies carried out in various settings found that boys were more likely than girls to buy cigarettes, while girls were more likely to be offered cigarettes from somebody else (Jones et al. 2002; Leatherdale and Strath 2007; Castrucci

et al. 2002). Therefore, we can expect that girls are less sensitive to lack of money and other family-related factors such as negative example of parents or permissiveness towards smoking of their children play more important role. However, it seems that such assumptions may apply only for younger age groups, i.e. before age 10, since girls from lower socio-economic families were more likely to report positive attitudes toward smoking. The association between socio economic status and susceptibility to start smoking is negative, inverse (girls from families of higher socioeconomic groups are more susceptible to start smoking). So, attitudes gained through family background do not have necessarily lead to tobacco use and smoking initiation and development are influenced by numerous

factors outside the family. This means that the whole social environment, i.e. peer pressure, social tolerance of smoking, advertisement, etc., plays an important role in smoking initiation. Therefore, preventive efforts should focus also on factors outside the family such as community and mass-media campaigns, school programs as well as effective tobacco control legislation and its enforcement.

Previous studies have shown that demand reduction measures, primarily those that increase the price of tobacco, are effective to reduce initiation of tobacco use and consumption among young people (Jha and Chaloupka 2000). In addition, comprehensive tobacco control programs often include non-price interventions such as: restrictions on smoking in public places and work places; a complete ban on advertising and promotion by tobacco companies; promotion of quitting among adults and youth; mobilizing community efforts to restrict minors' access to tobacco products; development and implementation of school-based educational programs in combination with community-based activities; and dissemination of information on the health consequences of smoking, such as having prominent warning labels on cigarette packets (Jha and Chaloupka 2000).

Despite significant findings, we are aware of several limitations of this analysis:

- GYTS design uses relatively narrow age range (from 13 to 15 years) not allowing reasonable analysis of differences between younger and older age groups. Further studies covering adolescents older than 15 years could provide a more complete picture on the influence of family background on adolescent lifestyle.
 - Questionnaires only provide data on respondents' parents employment status and provide no information on actual job seeking process and social deprivation from unemployment.
 - Considering the age of the respondents, reliability of the answers regarding parents' education level could be questionable.
- GYTS findings from Slovakia regarding role of family background in the initiation and development of tobacco use in youngsters can be summarized into several points:
- Among family-related factors, smoking of parents is the most important variable associated with adolescents smoking and it is particularly so for experimenting with smoking before the age of 10. Parents' employment status and education level showed only moderate associations with attitudes and only for girls.
 - During adolescence, attitudes towards smoking are not associated with cigarette smoking status.
 - Other factors beyond family background seem to play a role in initiation and development of tobacco use.

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Conflict of interest statement The authors declare that they have no competing interests.

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