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Predictors of health-endangering behaviour among Roma and non-Roma adolescents in Slovakia by gender

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Abstract

Background: Roma are commonly described as having an unhealthy lifestyle, i.e. an unhealthy diet, intensive smoking, frequent alcohol consumption and a lack of physical activity. Data about such health-endangering behaviours among Roma adolescents are scarce and of poor quality, however. The aim of our study is to assess the occurrence of health-endangering behaviours among Slovak Roma adolescents in comparison to non-Roma adolescents and to assess the impact of parental education and social desirability on the differences found.

Methods: A cross-sectional study among Roma from separated and segregated settlements in the eastern part of Slovakia (N=330; mean age=14.50; interview) and non-Roma adolescents (N=722; mean age=14.86; questionnaire) was conducted. The effect of ethnicity and parental education on smoking, drunkenness, drug use and physical activity was analysed separately for boys and girls using logistic regression and adjusted for social desirability.

Results: Among girls, Roma adolescents had lower rates of smoking, drunkenness and drug use than non-Roma (odds ratios (ORs) from 0.14 to 0.60 compared to non-Roma), but higher rates of physical inactivity. Among boys, drug use was less frequent among Roma adolescents (OR/95% confidence interval 0.12/0.03-0.46); differences for the other health-endangering behaviours were small and statistically insignificant. The effects of parental education and social desirability were small.

Conclusions: In contrast to the scarce evidence, Roma had lower rates of substance abuse, especially among girls. Only physical inactivity rates were higher among Roma girls. A challenge in health promotion among Roma is to maintain their relatively low substance use and to promote physical activity.

Keywords: Roma, ethnicity, health-endangering behaviour, substance use, physical inactivity, adolescents, Slovakia.

Introduction

Roma (Romanies, Gypsies) are a rather large minority group having a very deprived position in Central Europe (Kósa et al., 2007). Census data show problems in estimating accurate numbers for the Roma population. In Slovakia, for example, 89,920 citizens declared themselves as ethnic Roma in the 2001 census (1.7 % of the total population of the Slovak Republic), but unofficial estimates range up to 750,000 Roma in Slovakia, the most likely estimate being 380,000 (7.2% of the total population) (Filadelfiová et al., 2007; Koupilova et al., 2001). Roma are known for their low educational status, high unemployment rates and poverty and for living in very poor conditions, especially those living in settlements. Most of the available studies indicate that Roma, in comparison with the majority population, have a worse health status and an unhealthier lifestyle (Hajioff & McKee, 2000; Kolarcik et al., 2009; Ringold et al., 2005; Van Cleemput et al., 2007; Zeman et al., 2003). Roma are characterised as smoking heavily, drinking too much alcohol and living in bad environmental conditions (Gourgoulianis et al., 2000; Petek et al., 2006). Moreover, the health literacy of the Roma population seems to be low, though evidence is scarce (Petek et al., 2006). They seem to perceive health as being influenced by fate and by performing rituals and following purification rules. In addition, they believe in the relative purity of the top vs the bottom half of the body, in traditional curative remedies, and in a spiritual basis of certain kinds of illness (Lehti & Mattson, 2001; Zeman et al., 2003). These perceptions and belief are likely to affect health-related behaviours among Roma, as they may lead to low expectations regarding health, stoicism, fatalism, and fear (Van Cleemput et al., 2007).

WHO places responsibility for major part of health inequities to external conditions, such as structural determinants (policies, economic, politics) and conditions of daily life (Commission on Social Determinants of Health, 2008). This is supported by data on socioeconomic differences in health behaviours as summarised by Mackenbach and Bakker in their monograph *Reducing inequality in health* (2002) which indicate that health behaviours (e.g. smoking) are not quite freely chosen by individual but are determined in certain degree by social conditions.

The fundamentals of adult health behaviours are established during adolescence, but information about health behaviours among Roma adolescents is scarce. Adolescence is generally considered as a critical period regarding health-endangering behaviours and their future consequences (Adger, 1991; Boyle & Maisonneuve, 1995; Calvert & Bucholz, 2008; Cargiulo, 2007; Currie et al., 2008; Devlin & Henry, 2008; Hall & Solowij, 1998; Meltzer, 1994; Newcomb & Carbone, 1992; Simões et al., 2008). Adolescents who engage in substance use (i.e. alcohol, illicit drugs and smoking) increase their risk of ill-health, having family and school problems, antisocial behaviour and unprotected sexual intercourse (Rodham et al., 2005). Early onset and early initiation into substance use have been highlighted as specifically important and (potentially preventable) precursors of later problems (Currie et al., 2008).

Research on health-endangering behaviours among adolescent Roma is scarce and mostly of poor quality. Regarding smoking, a retrospective study by Kosa et al. (2007) among Hungarian Roma adults (men and women), 18 years and older, indicates that Roma start smoking much younger than the general population (Škarić-Jurić et al., 2007). Regarding the use of alcohol among young adolescents, another study of Puporka and Zádori showed that 95% of Hungarian Roma elementary school

pupils had tried alcohol and 40% of them had been drunk at least once (Puporka & Zádori, 1999). Studies on alcohol drinking among Hungarian Roma adults indicate frequent alcohol use, which might be linked to the high level of alcohol experience in Roma youth (Csépe et al., 2007; Kósa et al., 2007; Ringold et al., 2005). None of these studies provided separate comparisons for men and women. Regarding substance abuse, Puporka and Zádori (1999) stated that sniffing is typical for Roma children aged 9-12. Moreover, they summarised a small, methodologically very weak, survey indicating that 25% of the Roma elementary school pupils interviewed had already tried drugs (ecstasy, speed, marihuana, hashish). Studies on physical activity among Roma adolescents are lacking, but the lack of such activity is often mentioned as leading to other health problems, such as higher obesity and cardiovascular diseases (Krajcovicova-Kudlackova et al., 2004; Zsidegh et al., 2007). Severe problems among Roma adolescents are indicated, but they are not studied systematically or sufficiently from a methodological point of view.

Evidence on the occurrence of health-endangering behaviours among Roma is greatly needed to target health promotion. The aim of our study is to assess the occurrence of health-endangering behaviours among Roma adolescents compared to non-Roma adolescents in the eastern part of Slovakia. Furthermore, we examined whether socioeconomic status and sensitivity to social desirability could explain the differences in the prevalence rates between Roma and non-Roma adolescents.

Methods

Procedure

The Roma sample was recruited via elementary schools in small towns and villages in the eastern part of Slovakia which met the following criteria: the number of children aged 13 years or older living in Roma settlements (segregated and separated type) was at least 30; the school was able to provide 3 or 4 separate rooms where interviews could be conducted without disruption; and the school provided an internal list of children suitable for our study who could be randomly chosen and asked to participate in the interview. We contacted 22 elementary schools in municipalities in the study area that contained separated or segregated communities of Roma whose children potentially could attend schools. Out of these, 15 fulfilled our criteria. One of them was not willing to participate, while the other 14 were willing to participate in the study. From the lists of pupils living in Roma settlements prepared by the schools, we chose respondents randomly after stratification by gender. Respondents were individually interviewed during regular class time by community workers having ample experience in working with Roma and who were trained for our study. One hour was scheduled for each interview, and they actually lasted between 30 and 65 minutes.

Because non-Roma pupils in schools with higher proportions of pupils from Roma settlements might not be representative of all non-Roma adolescents, we decided to recruit a non-Roma sample from elementary schools in the same geographical area with no evident Roma community in the neighbourhood. We identified 25 such schools in the Košice and Prešov regions of eastern Slovakia and contacted a random sample of 15 of them. Eleven of the schools were willing to

participate, but two of them were excluded because they did not have at least one class of 8th and 9th grade that had not previously been included in a research project from our department. The questionnaires were administered during regular class time (45 minutes) by our research assistants, who had have training and experience. The questionnaire asked the same questions as the structured interview in the Roma sample.

Data were collected in May-June 2007. Parents were informed of the study via the school administration and could opt out if they disagreed. Participation in the study was fully voluntary and anonymous with no explicit incentives provided for participation.

Study sample

The sample of Roma adolescents consisted of 330 Roma elementary school pupils, all of whom live in Roma settlements (the segregated and separated types) in the eastern part of Slovakia, in or near small towns and villages. The sample comprised 160 boys (48.5%) and 170 girls (51.5%) with ages ranging from 12 to 17 years (mean age =14.50; SD=1.03). The response rate was 99.7%.

The sample of non-Roma adolescents consisted of 722 elementary school pupils attending the 8th and 9th grades; 354 of them were boys (53.2%) and 312 girls. Ages ranged from 14 years to 17 years old. The mean age was 14.86 (SD=0.63) and the response rate was 95.9%. We did not perform an ex ante power analysis because of a lack of evidence on prevalence rates in Roma adolescents, but aimed at acquiring a sufficient number of respondents to detect relevant ethnic differences by gender, in which we apparently succeeded.

Measures

Our questionnaire covered demographic and socioeconomic characteristics (gender, age, father's and mother's highest educational degree earned), social desirability, and questions on frequency or experience with several health-endangering related behaviour: substance use (smoking, drunkenness, and experience with drug use) and physical inactivity.

Smoking status was measured by the question: Have you ever smoked a cigarette? Respondents reported their experience with smoking as follows: (1) no never; (2) yes, I have tried it; (3) yes, I used to smoke but I have quit; (4) yes, I smoke occasionally but not daily; (5) yes, I smoke every day (Tuinstra et al., 1998). Smoking status was dichotomised into categories: never/former smoking and current smoking (cut-off point 3/4) similarly as Salonna et al. (2008).

Drunkenness was measured by the question: During the last 4 weeks, have you been drunk? Respondents reported frequency of being drunk with answers: (1) no, (2) 1-2 times, (3) 3 times and more. The answers were dichotomised in two categories (cut-off point 1/2): have not been drunk, have been drunk at least once (Kalina et al., 2009).

Experience with drug use was measured by the question: Have you ever tried any other drugs? There were only two possible answers: yes or no.

Physical inactivity was measured by the question: How often do you have physical activity per week? Physical activity was defined as a sport activity longer than 20 minutes; physical education in school was not included. Respondents were asked to quantify their frequency of physical activity as (1) never, (2) once a week, (3) at least 2-3 times a week, (4) every day. The answers were dichotomised into two categories (cut-off point 2/3): lack of physical activity and frequent physical activity, similarly as Salonna et al. (2008).

Social desirability is the tendency of respondents to reply in a manner that will be viewed favourably by others. Higher social desirability thus can affect the validity of results. It was measured using the Social Desirability Response Set (SDRS-5) (Hays et al., 1989). The scale inquires about common situations that people are prone to respond to favourably (e.g.: “No matter who I’m talking to, I’m always a good listener”). The five items are then rated with a five-point Likert scale (definitely true, mostly true, don’t know, mostly false, definitely false). The total score is counted only from the extreme answers of each item (scored 1 point), meaning the total score ranges from 0 to 5 points, with a higher total score indicating higher levels of socially desirable responses. Cronbach’s α for the current sample was 0.53, but the mean inter item correlation (MIIC) was 0.19. According to Clark and Watson (1995) and Parker et al. (2003), consistency is acceptable if the MIIC is above 0.15.

Statistical analysis

As first step, we computed baseline statistics (prevalence rates and means) for background characteristics and health-endangering behaviours regarding Roma and non-Roma adolescents. We tested the statistical significance of differences between them by computing chi-square tests for categorical variables and t-tests for continuous variables. Next, logistic regression analyses were used to assess whether ethnic differences in health-endangering behaviour could be explained by gender, parental education and social desirability. Finally, we assessed whether the effects of ethnicity differed by gender and by SES, again by using multivariable logistic regression (MLR). The latter analyses yielded a statistically significant interaction of gender with ethnicity and SES. As a result, we report all logistic regression analyses separately for boys and girls. We used three models to explain ethnic differences in health-endangering behaviour. Model 1 tested the crude effect of ethnicity on outcome variables; Model 2 tested the effect of ethnicity and socioeconomic status; and Model 3 contained variables of ethnicity, socioeconomic status and social desirability.

All analyses were performed using the statistical software SPSS 14.0 for Windows.

Results

Table 4.1 shows that Roma adolescents more frequently have low-educated parents than their non-Roma counterparts. This reflects their situation in the general Slovak population.

Table 4.1 Sociodemographic characteristics and sensitivity for social desirability of the Roma and non-Roma samples (numbers and percentages)

	Roma N=330	%	non Roma N=722	%	p value
Gender					
boys	160	48.5	354	53.2	not significant ^a
girls	170	51.5	312	46.8	
Father's education					
elementary	169	54.2	18	2.6	p<0.001 ^a
apprenticeship	116	37.2	144	21.2	
secondary	20	6.4	328	48.2	
university	7	2.2	190	27.9	
Mother's education					
elementary	231	74.3	32	4.6	p<0.001 ^a
apprenticeship	62	19.9	114	16.5	
secondary	16	5.1	340	49.1	
university	2	0.6	206	29.8	
Parents' highest education					
elementary	154	47.8	9	1.3	p<0.001 ^a
apprenticeship	132	41.0	82	11.6	
secondary	28	8.7	338	47.9	
university	8	2.5	277	39.2	
Social desirability					
answered	327	99.1	671		p<0.001 ^b
mean (SD)	2.17 (1.29)		1.00 (1.08)		

^a Chi-square tests

^b T-test

Note: Percentages do not always add up to 100, due to rounding. In the table only valid percentages are presented. Missing cases for each variables are as follows: gender 0% Roma, 7.8% non-Roma; father's education 5.5% Roma, 5.8% non-Roma, mother's education 5.8% Roma, 4.2% non-Roma, Parents' highest education 2.5% Roma, 2.2% non-Roma, father's employment status 10.9% Roma, 10.0 % non-Roma, mother's employment status 12.7% Roma, 5.5% non-Roma, social desirability 0.9% Roma, 7.1% non-Roma.

Prevalence rates of health-endangering behaviours by ethnicity

The prevalence rates of health-endangering behaviour in the samples are presented in Table 4.2. Among Roma girls, the prevalence of current smoking, drunkenness and experimental drug use is lower, and the prevalence of physical inactivity is higher than among non-Roma girls. Among boys, differences between Roma and non-Roma were statistically significant only for experience with drug use. Prevalence rates for current smoking, drunkenness and physical inactivity did not differ with any statistical significance between Roma and non-Roma boys.

Table 4.2 Health-endangering behaviours of Roma and non-Roma adolescents by gender

	Boys			Girls		
	Roma N (%)	non-Roma N (%)	<i>p</i> value	Roma N (%)	non-Roma N (%)	<i>p</i> value
Smoking status						
current smoking	28 (17.5)	87 (24.9)	n.s. ^a	16 (9.4)	65 (21.0)	<i>p</i> <0.001 ^a
Drunkness during last 4 weeks						
have been drunk	25 (15.6)	69 (19.9)	n.s. ^a	16 (9.4)	59 (19.2)	<i>p</i> <0.01 ^a
Experience with drug use						
yes	4 (2.5)	55 (15.9)	<i>p</i> <0.001 ^a	2 (1.2)	28 (9.1)	<i>p</i> <0.001 ^a
Physical inactivity						
lack of physical activity	32 (20.0)	66 (19.1)	n.s. ^a	101 (59.4)	128 (41.6)	<i>p</i> <0.001 ^a

^a Chi-square tests

Note: In the table only valid percentages are presented. Missing cases for each variables are as follows: smoking status 0% Roma, 1.2% non-Roma; drunkness during last 4 weeks 0% Roma, 1.9% non-Roma, experience with drug use 1.2% Roma, 2.1% non-Roma, physical inactivity 0% Roma, 2.5% non-Roma.

Explaining the effects of variables on health-endangering behaviour outcomes

Table 4.3 shows that introduction of the parents' highest education to the models did not affect most ethnic differences in an important way, except for smoking and drunkness among girls. The decrease of the OR's was relatively large regarding smoking experience among girls. On the other hand, it caused a relevant increase of the OR's for binge drinking among both genders.

Including social desirability as a control variable into the analyses did not change the OR's to a substantial degree.

Discussion

Our study shows that Roma ethnicity is associated with lower rates of substance abuse, especially among girls. Only physical inactivity rates were higher among Roma girls. Differences in parental educational level hardly affect the generally large ethnic differences, and sensitivity to social desirability also has hardly any effect. Our results contradict previous findings and statements regarding Roma adolescents (Csépe et al., 2007; Gourgoulanis et al., 2000; Kósa et al., 2007; Petek et al., 2006; Puporka & Zádori, 1999; Ringold et al., 2005; Škarić-Jurić et al., 2007). Social desirability did not have a substantial effect on ethnic differences in health-endangering behaviours.

Studies about ethnic disparities in substance use do not show a consistent pattern, since ethnic minorities differ regarding their (dis)advantage in health behaviour compared to the majority population (Oyefeso & Ghodse, 1998). The pattern becomes even more inconsistent when particular substances such as tobacco smoking, alcohol consumption or illicit drug use are compared (Rodham et al., 2005).

Table 4.3 Differences between Roma and non-Roma adolescents by gender regarding four health endangering behaviours, crude and after adjustment for highest parental educational level (model 2) and additional adjustment for sensitivity to social desirability (model 3)

	Smoking status N=474 OR (95% CI) ^{smc}	Drunkenness N=471 OR (95% CI) ^{smc}	Experience with drug use N=468 OR (95% CI) ^{smc}	Physical inactivity N=472 OR (95% CI) ^{smc}
BOYS				
Model 1				
Ethnicity (Roma vs non-Roma)	0.67 (0.42 - 1.09)	0.80 (0.48 - 1.33)	0.14 (0.05 - 0.39) *** **	1.02 (0.63 - 1.64)
Model 2				
Ethnicity (Roma vs non-Roma)	0.61 (0.30 - 1.24)	0.83 (0.39 - 1.79)	0.11 (0.03 - 0.42) *** **	0.68 (0.33 - 1.40)
Parental education				
elementary education	1	1	1	1
apprenticeship	1.66 (0.74 - 3.73)	1.15 (0.49 - 2.68)	0.86 (0.16 - 3.95)	1.06 (0.50 - 2.26)
secondary	1.00 (0.39 - 2.58)	1.26 (0.47 - 3.37)	0.68 (0.14 - 3.21)	0.79 (0.32 - 1.95)
university	1.26 (0.47 - 3.35)	1.00 (0.35 - 2.84)	0.73 (0.15 - 3.52)	0.43 (0.16 - 1.15)
Model 3				
Ethnicity (Roma vs non-Roma)	0.67 (0.32 - 1.41)	1.03 (0.46 - 2.32)	0.12 (0.03 - 0.46) ** **	0.62 (0.29 - 1.31)
Parental education				
elementary education	1	1	1	1
apprenticeship	1.63 (0.72 - 3.66)	1.10 (0.47 - 2.58)	0.83 (0.18 - 3.87)	1.08 (0.51 - 2.32)
secondary	0.98 (0.38 - 2.56)	1.24 (0.46 - 3.35)	0.66 (0.14 - 3.17)	0.78 (0.51 - 3.11)
university	1.25 (0.47 - 3.34)	0.99 (0.34 - 2.84)	0.71 (0.15 - 3.46)	0.43 (0.16 - 1.16)
Social desirability	0.92 (0.75 - 1.12)	0.82 (0.66 - 1.03)	0.94 (0.712 - 1.25)	1.10 (0.90 - 1.34)
GIRLS				
Model 1				
Ethnicity (Roma vs non-Roma)	0.43 (0.24 - 0.78) **	0.42 (0.22 - 0.77) **	0.13 (0.03 - 0.54) ***	2.20 (1.49 - 3.26) ***
Model 2				
Ethnicity (Roma vs non-Roma)	0.29 (0.12 - 0.74) **	0.51 (0.20 - 1.35) *	0.10 (0.01 - 0.93) * **	2.17 (1.15 - 4.09) ** **
Parental education				
elementary education	1	1	1	1
apprenticeship	0.82 (0.31 - 2.19)	1.17 (0.40 - 3.41)	0.29 (0.03 - 3.30)	1.02 (0.55 - 1.92)
secondary	0.56 (0.18 - 1.77)	1.15 (0.34 - 3.97)	0.47 (0.05 - 4.93)	0.96 (0.44 - 2.10)
university	0.57 (0.18 - 1.85)	1.64 (0.47 - 5.74)	0.62 (0.06 - 6.42)	1.01 (0.45 - 2.28)
Model 3				
Ethnicity (Roma vs non-Roma)	0.29 (0.11 - 0.78) *	0.62 (0.23 - 1.70) *	0.12 (0.01 - 1.19) **	2.31 (1.17 - 4.54) ** **
Parental education				
elementary education	1	1	1	1
apprenticeship	0.82 (0.31 - 2.19)	1.18 (0.40 - 3.45)	0.28 (0.02 - 3.29)	1.03 (0.55 - 1.92)
secondary	0.56 (0.18 - 1.78)	1.15 (0.33 - 3.94)	0.47 (0.05 - 4.89)	0.96 (0.44 - 2.10)
university	0.57 (0.18 - 1.85)	1.67 (0.48 - 5.84)	0.62 (0.06 - 6.50)	1.02 (0.45 - 2.30)
Social desirability	1.00 (0.31 - 2.19)	0.86 (0.68 - 1.10)	0.85 (0.58 - 1.24)	0.95 (0.81 - 1.12)

p < 0.05, ** p < 0.01, *** p < 0.001

^o smc - Significance of model change for the added variable; Improvement of fit of the model due to the addition of the variable concerned (X²-test in the case of logistic regression)

Model 1 – ethnicity; Model 2 - ethnicity + parents' highest education; Model 3 - ethnicity + parents' highest education + social desirability

One explanation may be that the prevalence rates for substance use among ethnically distinct groups depend on social norms, values and beliefs held by group members and by the degree of assimilation with the majority's values (Karlsen et al., 1998; Oyefeso & Ghodse, 1998). The Roma population is an ethnic minority with its own social norms and values that stay behind the trends in substance use of its members. Several studies show that ethnic minorities tend to use substances more than the majority population; others show the opposite (Baker et al., 2006). Reviewing the literature, the prevalence of substance use seems to be higher among white adolescents representing the majority population (Best et al., 2001; De Moor et al., 1989; Dotinga, 2005; Ellickson et al., 1996; Karlsen et al., 1998; Ramisetty-Mikler et al., 2004; Rodham et al., 2005; Rogers et al., 1997). Karlsen et al. (1998) suggested that social forces such as high peer pressure and low familial influence might be more salient for substance use initiation and maintenance in non-Roma adolescents. It might explain the higher substance use prevalence among non-Roma in our study.

Ethnic categories might overlap with socioeconomic categories, and part of the ethnic variability could therefore often be explained by socioeconomic status. According to Buka (2002), SES is not a merely a confounder of racial/ethnic disparities in health but a part of the causal pathway by which race affects health. Our results do not support this idea regarding health behaviour, a fact in contrast with our previous findings on the health status of Roma adolescents, which show a significant effect of SES on Roma adolescents' health (Kolarcik et al., 2009). Whereas some previous studies on lifestyles in adults have shown that socioeconomic position explains a part of the differences between ethnic minorities and the majority group, SES hardly contributed to the low substance use among Roma adolescents in our sample (Baker et al., 2006; Najman et al., 2006). Less endangering health behaviours among Roma adolescents may arise from Roma health beliefs about for instance purity of the body. However, the causal pathway should be investigated further because their health beliefs might also lead to for instance fatalism which could negatively affect health behaviours (Lehti & Mattson, 2001; Petek et al., 2006; Van Cleemput et al., 2007; Zeman et al., 2003).

Previous studies reporting high substance use among Roma population mostly referred to the adult population (Csépe et al., 2007; Gourgoulianis et al., 2000; Petek et al., 2006; Škarić-Jurić et al., 2007). These studies are not directly comparable with our study, but they contributed to the positioning of the Roma population as susceptible to substance use. This might be true for the adult population, but our results show that it does not hold true for young Roma. Studies on substance use among Roma pupils or children are very scarce and based on methodologically weak surveys on very small samples with limited generalizability. Additional evidence relates to personal experience or the opinions of professionals (Puporka & Zádori, 1999; Ringold et al., 2005).

The unhealthy diet and a low physical activity of Roma are also frequently mentioned in the literature as a potential cause of the higher prevalence of obesity among this group, resulting in a higher prevalence of cardiovascular complications in adulthood among them (Krajcovicova-Kudlackova et al., 2004; Zsidegh et al., 2007). The low physical activity among Roma girls that we found confirms previous findings. The lifestyle of Roma adolescents reflects health beliefs of the ethnic group, which might affect their attitude toward physical or activities, especially among girls.

Hosper et al. (2007) showed that culturally specific attitudes influence participation in physical activities among Turkish and Moroccan women, for instance.

Convergence with the majority culture can improve rates of physical activity among ethnic minorities (Hosper et al., 2007). Roma are a relatively high excluded ethnic minority from Central European societies and better inclusion might improve their participation in physical activities. What is questionable is whether such inclusion would not increase the prevalence of other health-endangering behaviours already more prevalent among non-Roma adolescents.

Strengths and limitations

Although Roma are considered to be a hard-to-reach population, we succeeded in collecting data from a considerable sample of Roma adolescents and in achieving high response rates among both Roma and non-Roma samples. Another strength was the use of standardised outcome measures that are used broadly in a wide range of research settings.

A limitation of our study may be that data from Roma were collected via an interview (to cope with illiteracy, for example), but that data from non-Roma came via self-reported questionnaires. The pros and cons of these two types of data collection should thus be considered when interpreting our results, though we excluded social desirability as a source of bias by adjusting for it (Bowling, 2005).

Second, our sample was representative for Roma adolescents who live in settlements and attend regular schools. This comprises the most substantial part of the Roma who live in eastern Slovakia (and as such, Central Europe). Because Roma communities vary in terms of regional settlement patterns, integration levels, and economic and social development, generalization of our results to other parts of Roma adolescents, such as integrated Roma living in cities, should be done with caution (Ringold et al., 2005). Differences in health indicators within Roma groups with distinct level of integration occur and similar differences may be present in health-endangering behaviour (Filadelfiová et al., 2007; Vaňo & Mészáros, 2004). Moreover, geographical variability in socioeconomic conditions of the Roma population, as well as in their culture and history, may be expected, as noted by Ringold et al. (2005). She indicated that within regions, the poverty level in a Roma settlement appears to be closely connected to that of the living area concerned and with the level of integration of the Roma in the local population. Roma who live in segregated settlements in deprived regions are significantly worse off than those who live in settlements in more developed and economically better-off regions and with a better integration (Ringold et al., 2005).

Third, even though our total sample comprised over 1000 respondents, its power to detect ethnic differences by gender may be low in some instances. Post-hoc power analyses showed that for girls, power ranged from 81 to 97%. For boys it ranged from 7 to 100%, being in particular low for physical activity (7%) and drunkenness (17%). The latter is due, however, to the small size of the ethnic differences in prevalence rates for these outcomes, sample sizes being sufficient to detect relevant ethnic differences with reasonable power.

Implications

Our study is one of the first which assesses health-endangering behaviour among Roma adolescents compared with their non-Roma counterparts. Its findings challenge those of previous studies, implying that they should be confirmed by similarly

well-designed replication studies (Kósa et al., 2007; Ringold et al., 2005, Škarić-Jurić et al., 2007; Csépe et al., 2007). Based on our findings, the main challenge in health promotion among Roma is to maintain the relatively low substance use among them and to promote their physical activity. Moreover, prevention of substance use should be targeted more on Roma boys, who seem to behave more riskily than Roma girls when compared with non-Roma adolescents.

Future research should focus on a deeper understanding of the differences in health-endangering behaviours between Roma and non-Roma adolescents regarding the cultural and wider socioeconomic characteristics that may contribute to them. In this research the subgroups of Roma adolescents that were missed by our study should also be included. Due to methodological difficulties, Roma are often neglected in general studies, and they should be included in wider research on adolescents as a subgroup.

Conclusion

In contrast to the scarce evidence, Roma ethnicity proved to be associated with lower rates of substance abuse, especially among girls in samples of Roma and non-Roma in Slovakia. Only physical inactivity rates were higher among Roma girls. A challenge in health promotion among Slovak Roma adolescents is to maintain their relatively low substance use while promoting physical activity.

