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Sociodemographic and socioeconomic inequalities in physical activity among Slovenian youth

Sociodemografske in socioekonomske neenakosti glede telesne dejavnosti med slovensko mladino

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ABSTRACT

Introduction: Frequent physical activity has previously been found associated with numerous health benefits, yet it is unequally distributed across social strata, including in Slovenia. The aim of the present study was to examine the frequency of and inequalities in physical activity among Slovenian youth.

Methods: A representative cross-sectional study of 907 men and women aged 16–27 years ($\bar{x}_{\text{age}} = 21.90$, $s = 3.25$, 48.3 % women) living in Slovenia was carried out examining the determinants of physical activity (measured with a single item on the frequency of physical activity in previous 7 days).

Results: More than four out of ten young people (41.3 %) reported being vigorously physically active for at least 20 minutes daily only on two days or less in the previous week. Regression analysis indicated that eight predictor variables explained 4.2 % of the variance (*Adjusted R*² = 3.4 %) in physical activity. Male gender was the only significant predictor of more frequent physical activity ($\beta = 0.20$, $p < 0.001$). In addition, interaction effect was detected with gender moderating the association between age and physical activity ($\beta = -0.10$, $p < 0.05$).

Discussion and conclusion: Socioeconomic gradient in physical activity was not detected. Future studies should examine additional indicators of socioeconomic status and deprivation. The study results could provide a basis for programmes and interventions on physical activity that should target especially young women.

IZVLEČEK

Uvod: Raziskave kažejo, da ima redna gibalna aktivnost za zdravje številne pozitivne učinke, vendar je glede svoje pogostosti in stopnje neenakomerno porazdeljena med družbenimi sloji, kar velja tudi za Slovenijo. Namen pričujoče raziskave je bil preučiti pogostost in dejavnike gibalne aktivnosti med slovensko mladino.

Metode: Izvedena je bila presečna anketna raziskava na reprezentativnem vzorcu 907 v Sloveniji stanujočih mladih, starih 16–27 let ($\bar{x}_{\text{starost}} = 21,90$, $s = 3,25$, 48,3 % žensk). Analizirani so bili dejavniki gibalne aktivnosti (pogoste gibalne aktivnosti v zadnjih sedmih dneh).

Rezultati: Več kot štirje izmed desetih mladih (41,3 %) so poročali, da so bili v preteklem tednu le v dveh dnevih ali še redkeje intenzivno gibalno aktivni vsaj 20 minut dnevno. Regresijska analiza je pokazala, da je osem prediktorjev skupaj pojasnilo 4,2 % variance gibalne aktivnosti (*prilagojena R*² = 3,4 %). Moški spol je bil edini statistično značilni napovedovalec pogostejše gibalne aktivnosti ($\beta = 0,20$, $p < 0,001$). Prav tako je bil zaznan interakcijski učinek spola, ki je moderiral odnos med starostjo in pogostostjo gibalne aktivnosti ($\beta = 0,10$, $p < 0,05$).

Diskusija in zaključek: Vpliv socioekonomskega statusa na pogostost gibalne aktivnosti ni bil zaznan. V prihodnjih raziskavah bi bilo potrebno preučiti tudi druge kazalnike socioekonomskega položaja in deprivacije. Rezultati pričujoče raziskave bi lahko predstavljali podlago za programe in ukrepe na področju gibalne aktivnosti, ki bi morali biti usmerjeni predvsem na mlade ženske.

Introduction

Socioeconomic inequalities in health and mortality are well-documented (Phelan, et al., 2010; Mackenbach, 2012) and an important area in sociology of health (Nettleton, 2006). Evidence also suggests that differences in health behaviours are one of the factors contributing to health inequalities (Marmot & Wilkinson, 2005; Cohen, et al., 2006; Godley & McLaren, 2010) and among health and lifestyle behaviours, regular physical activity and physical fitness are among the most important factors associated with health, well-being and quality of life with physical inactivity increasing the risk of mortality and morbidity (e. g., the risk of obesity, some types of cancer, cardiac, vascular and pulmonary morbidities and mental/psychosocial health problems; see, among others) (Cavill, et al., 2006; Bouchard, et al., 2007; Iannotti, et al., 2009; Bouchard & Katzmarzyk, 2010; World Health Organization, 2010; Finne, et al., 2013; Rauner, et al., 2013). In a review of selected studies of physical activity, Janssen and LeBlanc (2010) found that 1) physical activity was associated with numerous health benefits; 2) the dose-response relations was detected in observational studies indicating that the more physical activity, the greater the health benefits; 3) results from experimental studies have shown that even modest amounts of physical activity can be health beneficial in high-risk youngsters. A publication of European Union on health statistics reports that there are several different aspects of physical activity beneficial for health: 1) the total amount of physical activity helps to regulate weight; 2) short, intense activity promotes fitness and influences well-being; 3) moderate exercise may help to reduce morbidity by 30–50 %; and 4) weight-bearing activity decreases bone loss and the chance of fracture (EU Commission, 2002, p. 54). In their review of the effects of physical activity on mental health, Raglin and colleagues (2007) conclude that 'there is growing evidence that the benefits of exercise can approach or equal those of psychopharmacological medication and therapy' (Raglin, et al., 2007, p. 255). Past research indicates that increasing the levels of physical activity and reducing sedentary behaviours during childhood and adolescence can play a significant role in prevention of adult morbidity e. g. adult overweight or obesity (Biddle, et al., 2010).

The frequency and inequalities in physical activity

Bouchard and colleagues (2007, p. 2) note that '... Homo sapiens won the war against physical work of all kinds but has become afflicted by diseases brought about by a physically inactive lifestyle.' Indeed, Europeans are not sufficiently physically active (EU Commission, 2002), including Slovenians. For instance, results of Slovenian Public Opinion Survey data (Kurdiža, et al., 2006) indicated that between 25

% and 30 % of Slovenian adults reported being never or extremely rarely physically active. In a study of Slovenian adults CINDI (Countrywide Integrated Noncommunicable Disease Intervention) study aged 25 and older only about a fifth of respondents reached the recommended amount of recreational physical activity in 2004 and 2008, while combined physical activity recommendations were reached by almost six out of ten respondents (Djomba, 2012). Furthermore, recreational activity increased significantly from 2004 to 2008, but not combined activity (which included work-place activity).

An international study of 11-, 13-, and 15-year old adolescents HBSC (Health Behaviour in School-aged Children) from 2010 indicated that among 11-year-olds, Irish boys (43 %) and girls (31 %) reported highest physical activity rates, while Italian boys (10 %) and girls (7 %) reported the lowest. Slovenian 11-year old boys (31 %) and girls (20 %) were just above averages in HBSC study. The results of Slovenian HBSC study indicate a small decrease in the frequency of physical activity of adolescents between 2002 and 2010. In 2010 only 20.3 % of adolescents were physically active for 60 minutes a day all days of the week (Drev, 2011; 2012).

Numerous studies have also shown that individuals from higher socioeconomic groups have higher rates of physical activity, both research among adults and youth (Ball, et al., 2006; Bergman, et al., 2008; Cotter & Lachman, 2010; Munter, et al., 2012; White & McTeer, 2012; Federico, et al., 2013; Gearon, et al., 2013; Lehto, et al., 2013; Pudrovška & Anishkin, 2013; Roberts, et al., 2013) have provided similar results. The abovementioned cross-national HBSC study of adolescents (Currie, et al., 2010), for example, found that low family affluence was significantly associated with lower prevalence of physical activity in fewer than half of analyzed countries and regions, with the 'difference between those in low- and high-affluence households on averaged being less than 10 %'. Analyzing Slovenian HBSC data researchers similarly found that those adolescents whose families have higher socioeconomic status (SES) were more frequently physically active (Drev, 2011; 2012), though in the total sample of all three age categories there were significant family SES differences in physical activity levels only among boys, and not among girls (Currie, et al., 2010, p. 129). Similar results were reported in one of the latest national studies of Slovenian youth (Kirbiš, 2011a).

Besides socioeconomic inequalities in physical activity levels, two other sociodemographic variables were previously found to be associated with physical activity: age and gender. Specifically, more physically active were previously found to be younger youth (Currie, et al., 2010; Drev, 2011; 2012) and among boys and men (Katzmarzyk, 2007; Bergman, et al., 2008; Kirbiš, 2011a). Consistent with above-mentioned

studies, analyzing Slovenian CINDI survey data Djomba (2012) found that among adults over 25 years of age, men, the youngest age group of adults (25–39 year-olds) and those with higher educational levels reported most frequent recreational physical activity.

On the other hand, several research gaps in the literature can be identified. Firstly, studies on youth physical activity usually do not examine which SES variables have the strongest relative impact on physical activity. Such comparative analysis was, for example, carried out in a study of Finnish adults by Laaksonen and colleagues (2003) who found that when adjusting for educational and occupational status, income differences in many health behaviours, including physical activity, were largely removed. Nonetheless, to our knowledge there are no studies of youth comparing the relative impact of education of each parent, subjective economic status of the family and young individual's own educational level and income, and studies in general examining the impact of different SES measures are rare. An exception, for example, is the above mentioned HBSC study of adolescents (Currie, et al., 2010; Jeriček Klanšček, et al., 2011), which did examine the impact of adolescent's family SES on health and health-related behaviours with three available SES indicators: 1) by summing four items of family material possessions into a SES scale (Family Affluence Scale); 2) by a single-item of subjective financial status of adolescent's family; 3) and by parental employment status. First two SES indicators proved significant determinants of physical activity levels (Jeriček Klanšček, et al., 2011).

Secondly, the impact of SES on physical activity might differ across sociodemographic groups, especially among genders. For example, examining social influences of leisure-time physical activity in young Danish adults, Osler and colleagues (2001) found that among women those with higher educational levels were more frequently physically active (higher percentage of those reporting lower levels of leisure time physical activity among lower-educated group), while among men there were no differences across two educational groups. In addition, among women, higher parental education decreased the likelihood of frequent physical activity, while among men parental education increased the likelihood of frequent physical activity. The same pattern was found in a study of young adults by Oygard & Anderssen (1998), who reported an interaction between gender and education, with highly educated females reporting significantly higher leisure-time physical activity levels than less educated females, though the same pattern was not detected among males. Similar gender interaction has been found in a study of adolescents by Mar Bibiloni and colleagues (2012) who found that girls with lower parental educational levels reported higher frequency of sedentary behaviour (though the differences were statistically insignificant), while the same parental

educational impact was not detected among boys.

Finally, previous studies have found that physical activity levels are negatively associated with more frequent sedentary behaviour and media use (Koezuka, et al., 2006; Motl, et al., 2006; Raudsepp, et al., 2008; Gebremariam, et al., 2013). In a meta-analysis of the relationships between one type of sedentary behaviour, media use, body fatness and physical activity in children and youth, Marshall and colleagues (2004) found a small but negative relationship between TV viewing and physical activity. Since both sedentary behaviour and media use are also more frequent among young people from lower SES backgrounds (Brodersen, et al., 2007; Currie, et al., 2010; Lundahl, et al., 2013; Coombs, et al., 2013), results also detected among Slovenian youth (Drev, 2011; Kirbiš & Zagorc, 2014), it is important to examine whether any potential SES differences in physical activity levels are removed when adjusting for sedentary behaviour, which was in our study measured by television and Internet use. We examined both types of sedentary behaviour since a representative study of Slovenian youth in 2013 found that the frequency of Internet use surpassed television use (Kirbiš & Zagorc, 2014).

Study aim and hypotheses

The aim of the present research was to examine the frequency of and inequalities in physical activity among Slovenian youth. Based on the reviewed literature, the following hypotheses were tested in our study: higher SES (H1), male gender (H2) and lower age (H3) have a positive impact on physical activity. Additionally, three research questions were addressed: does gender moderate the impact of other predictors on physical activity? (RQ1); which SES indicator has the strongest impact on physical activity? (RQ2); does sedentary behaviour impact physical activity? (RQ3).

Before turning to the empirical part of the study let us note two additional points. First, we use the term *inequalities* in health and health behaviours as differences between groups, most often between 'groups occupying unequal positions in the dominant social hierarchies' (Graham, 2007, p. 3) that are also regarded 'both unfair and avoidable, as they are caused by unhealthy public policies and lifestyles influenced by structural factors' (Whitehead & Dahlgren, 2006; cited in World Health Organization, 2006, p. 1).

Secondly, there are different public health guidelines on recommended amount of daily physical activity (Pate, 2007, pp. 29-30; Rowland, 2007, p. 267). One of the recommendations is that adults should accumulate 30 to 60 minutes of moderately intense physical activity (e. g., brisk walking) on most or all days of the week to help prevent these diseases (Pate, et al., 1995; cited in Janssen, 2007, p. 170). In our study we followed the guideline used in the U.S. Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey

(Grunbaum, et al., 2004), also employed in a study of Page and colleagues (2009). Their item measured the number of days respondents participated in the past week in vigorous physical activity (that made them sweat and breathe hard for at least 20 minutes) (Bergman, et al., 2008).

Methods

Description of the instrument

Self-reported physical activity

The single item measuring physical activity in our study was very similar to one of the items in the short form of International physical activity questionnaire (IPAQ) (Ekelund, et al., 2006; Macfarlane, et al., 2007; Poole, et al., 2011; Tran, et al., 2013). IPAQ is a measure of health-related physical activity and has been cross-culturally validated for use on young and middle aged adults aged 15 to 69 years (Craig, et al., 2003). Our item of physical activity was the following: 'Think about the last 7 day. During these last 7 days, on how many days did you do vigorous physical activities, like heavy lifting, bicycling, brisk walking or running, etc., hard for at least 20 minutes? Think only about those physical activities that you did for at least 10 minutes at a time' (1 = 0 days, 8 = 7 days). Single-item indicators of physical activity have previously been found to have sufficient levels of reliability and validity (Milton, et al., 2011; Gill, et al., 2012; Hamilton, et al., 2012; Wanner, et al., 2013).

Socioeconomic status

Socioeconomic status is a composite measure that consists of different indicators of economic status (e. g., income), social status (e. g., education) and work status (e. g., occupation) (Dutton & Levine, 1989, p. 30; cited in Adler, et al., 1994, p. 15). In other words, education, income and occupation are regarded as key indicators of SES (Graham, 2009, p. 6). In our study we measured SES with two out of the three commonly used indicators of SES: educational level (father's and mother's education) and respondent's income. Included in the measure of SES was also an indicator of perceived family economic status.

Education

We measured father's and mother's education with three identical items on a 5-point scale: 'What is the highest achieved level of your father's (your mother) education?' (1 = uncompleted primary school, 5 = completed master or doctorate degree). Both items were recoded to a 3-point scale (1 = primary level or less, 2 = secondary level, 3 = tertiary level).

Income

Respondent's average monthly income was assessed with the following question: 'Rate, please, what is your average monthly income? Sum all forms of income (in addition to wages, for example, this included any compensation, grant, allowance, interests, rental income, disability benefits, etc.)'. We recoded income values into eleven categories (1 = 50 € or less, 11 = more than 1000 €).

Self-perceived family material status

Respondents also assessed their family's relative material (economic) status in comparison to perceived Slovenian average with the following question: 'How do you rate the material situation of your family according to the Slovenian average?' Answers originally coded on a 10-point scale (1 = highly below average, 10 = highly above average) were subsequently recoded to a 3-point scale of family's relative material status (1 = (highly) below average, 2 = average, 3 (highly) above average).

Sedentary behaviour

Sedentary behaviour was measured with two media use items. Internet use was measured with the following 'What is the average amount of time you spend daily using the Internet? (Including Internet use via smart phone and/or tablet)?'; and television use was measured with the following item: 'What is the average amount of time you spend daily watching the television?'. Respondents have provided answers in 'hours' and the original values were for the purpose of regression analyses recoded in the following way: Internet use (1 = up to an hour, 7 = more than six hours daily) and television use (1 = up to an hour, 4 = more than three hours).

Sociodemographic predictors

Two sociodemographic variables included in our analysis were age (measured as the year of birth and subsequently recoded into age in years and then into three age groups: 16–19 years, 20–23 years and 24–27 years) and gender (female = 1, male = 2).

Sample description

CEPYUS (Center for the Study of post-Yugoslav Societies) and FES (Friedrich Ebert Stiftung, Zagreb) conducted a FES Slovenian Youth 2013 Study, which consisted of a stratified quota sample. The target population were youth residing in the Republic of Slovenia who were on May 28th 2013 aged between 16 and 27 years. According to the Statistical Office of the republic of Slovenia there were $N = 282,194$

Slovenian citizens in 16-27 age group in 2012, $n = 900$ respondents has been chosen by study authors as sufficiently reliable in order to draw inferences to the whole population. The standard sampling error, assuming a 95 percent level of reliability, accounts for +/- 3.3 percentage points (Flere & Divjak, 2014). The sample consisted of 907 respondents ($\bar{x}_{\text{age}} = 21.90$, $s = 3.25$, 48.3 % women).

Description of research process and data collection

The survey was conducted between May 29th and July 20th 2013 in the form of a face-to-face interview, as a rule within households. Before the fieldwork was carried out all the interviewers took part in one of the three introductory seminars, where they were given detailed instructions on interviewing and the on the selection of proper respondents. Interviewers were also instructed on quota requirements and to interview only one person per household. In case the potential respondent had refused to participate in our survey, the interviewer had to write down the reasons for his/her non-response (Flere & Divjak, 2014).

Survey questionnaires consisted of two parts: oral and written part. The oral part of the questionnaire was conducted within face-to-face interviews with interviewers reading the questions aloud to interviewees and with filling out survey responses, which they received from the respondents. Upon completion of the oral part of the questionnaire the interviewer handed the respondent the written questionnaire and asked him/her to fill out the written questionnaire himself/herself. Written part of the questionnaire consisted of questions that were more personal and intimate in nature (Flere & Divjak, 2014).

After finishing with the fieldwork the interviewer returned the filled-in questionnaires and the validity of his/her questionnaires was checked with control phone calls to the respondents in order to prevent fraud. Respondents were asked by interviewers to provide their personal and contact information only for the purpose of checking the quality of the fieldwork. In order to ensure anonymity and confidentiality of collected information, all necessary precautions were taken to prevent the potential abuse of personal data. Data was treated separately from respondents' answers to survey questions to prevent the possibility of linking the given answers with particular respondents. During the fieldwork, 1,163 potential respondents were invited to participate in the survey and among them, 907 valid interviews were completed and incorporated into the data. The overall response rate was therefore 78.0 percent (Flere & Divjak, 2014).

Data were analysed using Statistical Package for the Social Sciences Version 19.0 (SPSS). First, descriptive analyses for the outcome variable were completed by total sample, by gender and by age groups. Next, standard multiple regression analysis was performed

(Tabachnick & Fidell, 2012) and the model used to examine the effect of predictor variables on the frequency of physical activity included: two sociodemographic and five socioeconomic variables and also two sedentary behaviour items (television and Internet use).

Results

Table 1 presents descriptive statistics for the frequency of physical activity of Slovenian youth by total sample, by gender and by age groups. Almost 12 % of respondents reported not doing 20 minutes or more of vigorous activity on any day in previous seven days; a similar percentage has exercised one day in the previous week and 18 % have exercised on two days in the past seven days. As already mentioned, recommendations for (aerobic) physical activity differ. Some call for adults to engage in at least 30 minutes of moderate-intensity activity, 5 days per week, or 20 minutes of vigorous-intensity activity, 3 days per week (US Department of Health and Human Services; cited in, Anon., 2008; Bergman, et al., 2008; Child Trends, 2012, p. 3). If we use the recommendation of 3 days or more of at least 20 minutes of physically activity, then the analysis indicates that 58.7 % of Slovenian youth exercise in according to such health guideline. On the other hand, if we employ the recommendations that youth should be physical active all days of the week, only 12.3 % of Slovenian youth are sufficiently physically active. Lastly, using a 3 or more days a week of regular physical activity as a cut-off point, we see 58.7 % of respondents are active within that recommendation, while more than four out of ten young people in Slovenia (41.3 %) are physically active only two days per week or less.

Looking at the gender differences, columns 2 and 3 in Table 1 indicate that there are a higher proportion of men being physical active all and most days of the week, while the relative majority of women reported being physical active only two days in previous week, indicating substantial gender differences. An independent-samples t-test was conducted to compare the frequency of physical activity for males and females. There were significant differences for males ($\bar{x} = 4.66$, $s = 2.24$) and females ($\bar{x} = 3.78$, $s = 1.97$, $t(901.96) = 6.32$, $p < 0.001$, two-tailed). The magnitude of the differences in the means (mean difference = 0.88) was moderate (eta squared = 0.04). Similarly, columns 4, 5 and 6 by age groups indicate that younger age group reported being the most frequently physically active while the oldest age group reported being the least active, although the analysis of mean comparisons (ANOVA; not shown) indicated no significant age group mean differences ($p > 0.05$). In sum, these descriptive statistics by total sample, gender and age groups indicate relatively low physical activity levels of Slovenian youth, especially women and older youth,

Table 1: *Descriptive statistics for the frequency of physical activity among Slovenian youth in 2013; total sample, by gender and by age groups (Source: CEPYUS-FES Slovenian 2013 Youth Study (2013))*

Tabela 1: *Opisna statistika pogostosti gibalne aktivnosti med slovensko mladino v letu 2013; celotni vzorec, po spolu in po starostnih skupinah (Vir: CEPYUS-FES Slovenian 2013 Youth Study (2013))*

Frequency of physical activity (per week)/ Pogostost gibalne aktivnosti (na teden)	Total sample n = 907	Men n = 469	Women n = 438	16–19 years n = 258	20–23 years n = 295	24–27 years n = 354
0 days	11.9 %	9.9 %	13.9 %	11.9 %	8.0 %	15.0 %
1 day	11.6 %	9.5 %	13.9 %	10.0 %	11.1 %	13.2 %
2 days	17.8 %	13.8 %	22.0 %	16.7 %	21.4 %	15.6 %
3 days	16.9 %	16.2 %	17.7 %	17.0 %	19.5 %	14.7 %
4 days	12.7 %	12.8 %	12.6 %	9.8 %	12.5 %	15.1 %
5 days	12.2 %	14.5 %	9.7 %	13.3 %	11.9 %	11.6 %
6 days	4.6 %	5.7 %	3.4 %	4.5 %	4.8 %	4.5 %
7 days	12.3 %	17.5 %	6.8 %	16.7 %	10.9 %	10.3 %

Legend/Legenda: n - number/število; % - percentage/odstotek

Table 2: *Multiple regression model estimating effects of sociodemographic, socioeconomic and sedentary behaviour variables on the frequency of physical activity among Slovenian youth (Source: CEPYUS-FES Slovenian 2013 Youth Study (2013))*

Tabela 2: *Multipli regresijski model učinka sociodemografskih in socioekonomskih spremenljivk in sedečega vedenja na pogostost gibalne aktivnosti med slovensko mladino (Vir: CEPYUS-FES Slovenian 2013 Youth Study (2013))*

Total	B	SE B	β
Constant	4.08	0.70	
Gender	0.76	0.14	0.19**
Age group	-0.13	0.10	-0.05
Father's education	0.13	0.14	0.04
Mother's education	0.10	0.13	0.03
Perceived family material status	-0.17	0.10	-0.06
Respondent's monthly income	-0.02	0.03	-0.02
Sedentary behaviour (Internet use)	-0.00	0.03	0.00
Sedentary behaviour (Television use)	-0.03	0.07	-0.02
Gender * Age group	-0.50	0.20	-0.10*

R^2 / Adj. R^2 = .042 / .034***

Legend/Legenda: * - statistical significance at 0.05 level; statistična značilnost na ravni 0,05; ** - statistical significance at 0.01 level; statistična značilnost na ravni 0,01; *** - statistical significance at 0.001 level; statistična značilnost na ravni 0,001; B = unstandardized coefficient/nestandardizirani koeficient; SE B - standard error/standardna napaka; β - standardized (beta) coefficient/standardizirani (beta) koeficient; R^2 - variance explained/pojasnjena varianca; Adj. R^2 - adjusted variance explained/prilagojena pojasnjena varianca; * - interaction effect/interakcijski učinek

Note: The inclusion of interaction effect (gender x age group) increased explained variance to 5.8 % (Adjusted R^2 = 4.0 %).

For the purpose of regression analysis the measure of physical activity was recoded from original eight categories into seven by combining answers '6 days' and '7 days' into a single value (physically active 6 to 7 days in past 7 days).

Opomba: Vključitev interakcijskega učinka (spol x starost) je povečala pojasnjeno varianco na 5,8 % (prilagojena R^2 = 4,0 %).

Za namene regresijske analize smo indikator gibalne aktivnosti rekodirali iz originalnega osemstopenjskega kazalnika v sedemstopenjskega, v skupno kategorijo smo združili kategoriji '6 dni' in '7 dni' (v preteklih 7 dnevih gibalno aktiven 6 do 7 dni).

which presents a pressing public health issue that needs to be addressed.

Table 2 presents the results of standard multiple regression analysis by total sample indicating the associations between each predictor variable and physical activity after controlling for other predictor variables entered into the model. All predictors explained combined 4.2 % of the variance (Adjusted R^2 = 3.4 %) in frequency of physical activity ($F(7, 786) = 4.96, p < 0.001$). The only significant beta value

was for male gender ($\beta = 0.20, p < 0.001$), indicating that men are significantly more often physically active than women (giving confirmation to H2), while none of the SES predictor variables proved to be significant (rejecting H1). It seems then that among post-adolescent Slovenian youth neither personal nor family socioeconomic status impacts the frequency of physical activity. In addition, age groups were also not a significant predictor of physical activity, indicating a rejection of H3.

Addressing our three research questions, we found that sedentary behaviour was not associated with physical activity (RQ3), while insignificance of all examined SES indicators indicated that neither of them impacted physical activity (RQ2). Finally, since gender was found to be the only significant predictor of physical activity, we also tested for the possibility of interaction effect with gender moderating the impact of remaining variables on physical activity (seven interactions were entered into regression analysis). The results have shown one significant interaction effect, with gender moderating the impact of age on physical activity indicating that among young men physical activity decreases with age while among women it remains relatively similar across three age groups, which provided us with an answer to our RQ1. The inclusion of interaction effect increased combined explained variance to 5.8 % of the (*Adjusted R*² = 4.0 %). None of the remaining interactions of gender reached significance (not shown in Table 2).

Discussion

The aim of the present study was to examine the frequency and determinants of physical activity among Slovenian youth. Previous studies identified four major determinants of physical activity levels of youth and adult population in industrialized countries, with male gender (Katzmarzyk, 2007; Bergman, et al., 2008; Kirbiš, 2011a), lower age (Currie, et al., 2010; Drev, 2011; 2012; Kirbiš, 2011a), higher family and personal SES (Ball, et al., 2006; Kirbiš, 2011a; White & McTeer, 2012) and lower frequency of sedentary behaviours and media use (Marshall, et al., 2004; Koezuka, et al., 2006; Motl, et al., 2006; Raudsepp, et al., 2008; Gebremariam, et al., 2013) being associated with higher physical activity.

Our results corroborate only some of the findings in previous research. Age, for example, did not prove to be a significant predictor of physical activity at the total sample level of Slovenian youth, but it did among males. One reason could be that age was examined as an ordinal variable (three age groups) and not at the interval level, which may have ameliorated out some of the age differences among women and consequently in total sample. Nonetheless, our results indicate that men's physical activity decreases with age, which could be related to several factors, for example with entering the labour market, family building, partnerships, etc. Future studies should examine to what extent employment status and other factors contribute to low physical activity levels among older young males.

Results thus indicated that gender acts as a moderator of the relationship between age and physical activity. With gender moderating this relationship, analysis indicated that older young men (although less physically active than younger men) are more physically active than either age category of

women indicating that women are less often physically active than men, as predicted and as already detected in previous studies of Slovenian youth. Lower physical activity among women could be one of the factors contributing to their lower levels of subjective health status since physical inactivity is one of the few risk behaviours that is more frequent among women.

Another surprising finding is that none of the five SES variables were significant predictors of physical activity. This is in contrast with studies of adolescents and youth not only in other countries (Currie, et al., 2010; White & McTeer, 2012), but also in Slovenia (Kirbiš, 2011a; Drev, 2011; 2012), including with studies of Slovenian adult population (Buzeti, et al., 2011, p. 37; Djomba, 2012). Several explanations can be proposed. Firstly, our results could have ensued due to the indicator of physical activity we used in our study. Although similar single item indicators of physical activity have previously been rigorously tested for reliability and validity (Milton, et al., 2011; Gill, et al., 2012; Hamilton, et al., 2012; Wanner, et al., 2013), it may be that our respondents answered the question on physical activity with specific context of physical activity in mind; for example, leisure time physical activity. In fact, in their systematic review of the literature, Beenackers and colleagues (2012) analyzed different types of physical activity (e. g., total, leisure-time including sport, occupational, active transport) and found that in majority of analyzed studies leisure time physical activity was more frequent among those from high SES, occupational physical activity was more frequent among those from lower SES, while total physical activity and active transport physical activity did not show a consistent SES pattern (40 % and 38 % positive associations respectively). We tested the possibility that our physical activity item was understood mainly as leisure time physical activity by examining the correlation of our item with an item on frequency of sport activity (1 = never, 2 = sometimes, 3 = often) and found a strong association, yet both items still only had less than a third of the shared variance indicating that the item on physical activity measures activities other than leisure time sports activities. This gives additional confirmation to the validity of our physical activity item on the one hand, and on the other also indicates that our item most likely measured total (or 'daily') physical activity (Beenackers, et al., 2012).

Despite the surprising finding of absence of socioeconomic inequalities in physical activity, a similar pattern was observed in the most recent studies of Slovenian youth, which also found that the same five SES variables that were examined in our study had a relatively small predictive power in explaining differences in subjective health of young people (Kirbiš, 2014; Tavčar Krajnc & Kirbiš, 2014). Following West's (1997) explanation, Kirbiš & Tement (2014) argue that 'equalisation' process might take place in the period of post-adolescence and young

adulthood in Slovenia, when the impact of family characteristics on young person's life in general, and health in particular, decreases, while the role of school environment, peers and youth cultures increases. Such process of equalisation might decrease SES group differences in health in the period of youth and it might be that such process also takes place with regard to health-related behaviours, such as physical activity. For example, in a study of Canadian children and adolescents, White & McTeer (2012) found that more frequent sport participation was associated with higher family SES among 6–9 year-olds, but 'not among' for 10–15 year-olds, which according to the authors, 'might be indicative that opportunities for involvement become more equitable as we move from childhood to youth' (White & McTeer, 2012, p. 204). Future studies should test this hypothesis and 1) examine whether socioeconomic inequalities in physical activity among Slovenian public are smaller in the period of post-adolescence and young adulthood than in childhood and adulthood; 2) what age period specifically equalisation, if at all, takes place and what are its underlying mechanisms.

Unlike some previous studies (Oygar & Anderssen, 1998; Osler, et al., 2001) we did not detect different impact of SES on physical activity levels in either gender, since among both men and women no socioeconomic inequalities in physical activity were found. Another surprising finding in our study was that more frequent sedentary behaviour (as measured by Internet use and television use) was not associated with the frequency of physical activity, although previous studies have confirmed such link (Marshall, et al., 2004; Gebremariam, et al., 2013). It seems then that despite the increasing frequency of Internet use among young people in Slovenia in the last four years (Kirbiš & Zagorc, 2014), neither of the two forms of sedentary behaviour is a factor contributing to lower physical activity. In other words, since physical activity levels among Slovenian post-adolescent youth and young adults were previously found to be increasing (Kirbiš, 2011a), while among adolescents they were found to be decreasing (Drev, 2012), and since sedentary behaviour in the form of media use was found to be increasing among both adolescents and young adults (Kirbiš, 2011b; Drev, 2012; Kirbiš & Zagorc, 2014), this presents researchers with a paradox that needs to be addressed in future studies. In this regard Marshall & Welk (2008, p. 12) argue that physical activity and sedentary behaviour are 'not two sides of the same coin' and that 'high levels of physical activity and sedentary behaviour are able to coexist with a lifestyle of a young person'.

Our representative study of Slovenian youth also has several additional shortcomings that need to be addressed. First, we investigated self-reported physical activity levels with a single item, while future studies of Slovenian youth should employ more nuanced

indicators of physical activity. Secondly, although the strength of our study is that we examined the impact of five different SES indicators, we did not analyze the impact of other potentially relevant SES indicators (e. g., housing conditions, employment status, objective and subjective material deprivation, personal/family material possessions, etc.). Thirdly, previous studies have found that many other social factors impact physical activity levels. For example, numerous other relevant concepts were previously also found to be associated with physical activity (Burton, et al., 2003), including the number of friends' young people have (Drev, 2011; 2012). Fourthly, our analysis focused on the physical activity at the individual level, while studies have shown that macro- and mezo-characteristics (e. g., at country and neighbourhood level) also play an important role in physical activity (Adams, et al., 2013). Fifthly, post-adolescent youth are not a homogenous group and differ, among others, with regard to their predominant activity (high-school students, tertiary students, employed and unemployed youth, etc.).

Despite caveats our study has several important practical implications: firstly, programmes and interventions on physical activity should be designed targeting especially young women. Slovenia has relatively low income inequality (Eurostat, 2013), low health inequalities among post-adolescent youth (Kirbiš, 2014; Tavčar Krajnc & Kirbiš, 2014) and, as our study indicates, low socioeconomic inequalities in physical activity among post-adolescent youth. Slovenia's relatively low inequalities in post-adolescent youth health, together with its policies, might present a model for other countries that are witnessing high inequalities in health among youth. At the same time, Slovenia policy makers should put effort to reduce inequalities in health among remaining age groups (children, adults and the elderly) and scholars should further examine different socioeconomic measures and their impact on physical activity including among youth. Finally, multilevel interventions based on social-ecological models are becoming more prominent lately; by not only targeting individuals, but also social environments, physical environments, and policies and such interventions are also needed in Slovenia.

Conclusion

Our study aimed at examining the frequency of and identifying determinants of physical activity and therefore to help to pinpoint those segments of Slovenian youth that are at a particular risk of low levels of physical activity. We found that more than four out of ten young people in Slovenia (41.3 %) are insufficiently physically active – only two days per week or less. Examined measures of SES, on the other hand, did not indicate the existence of significant socioeconomic inequalities in physical activity. Future studies need to

examine whether the SES variables examined in our study have a different impact on the physical activity levels among youth groups with different predominant activity (high-school students, tertiary students, employed and unemployed youth, etc.) and to examine other indicators of material and relative deprivation. We also found that young women across all three age groups are at higher risk of infrequent physical activity than young men. Interventions should therefore particularly focus on young women, especially by eliminating socio-structural constraints that negatively impact women's physical activity levels. Despite higher levels of physical activity among young men compared to young women, older age group of young men also needs to be addressed in the programmes and future studies, since a large decrease in physical activity occurs among men at the turn from adolescence to young adulthood. In sum, in Slovenia and Europe interventions based on analyses relating to health and health behaviours are desired in order to further examine the impact of SES and other determinants on health and health behaviours, including physical activity, with a goal of improving health of youth and adults. It is important to set up mechanisms at different levels of society to further monitor and improve health and well-being of Slovenian population, but also aiming to reduce inequalities across social structure, including between genders.

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