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ORIGINAL ARTICLE

Self-rated health in different social classes of Slovenian adult population: nationwide cross-sectional study

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Abstract
Objectives Self-rated health can be influenced by several characteristics of the social environment. The aim of this study was to evaluate the relationship between self-rated health and self-assessed social class in Slovenian adult population.
Methods The study was based on the Countrywide Integrated Non-communicable Diseases Intervention Health Monitor database. During 2004, 8,741/15,297 (57.1%) participants aged 25–64 years returned posted self-administered questionnaire. Logistic regression was used to determine unadjusted and adjusted estimates of association between poor self-rated health and self-assessed social class.
Results Poor self-rated health was reported by 9.6% of participants with a decrease from lower to upper-middle/upper self-assessed social class (35.9 vs. 3.7%). Logistic regression showed significant association between self-rated health and all self-assessed social classes. In an adjusted model, poor self-rated health remained associated with self-assessed social class (odds ratio for lower vs. upper-middle/upper self-assessed social class 4.23, 95% confidence interval 2.46–7.25; $P < 0.001$).
Conclusions Our study confirmed differences in the prevalence of poor self-rated health across self-assessed social classes. Participants from lower self-assessed social class reported poor self-rated health most often and should comprise the focus of multisectoral interventions.

Keywords Cross-sectional study · Self-rated health · Social class · Social environment · Slovenia

Zusammenfassung
Fragestellung Der selbst-beschriebene Gesundheitszustand kann durch verschiedenartige soziale Faktoren beeinflusst werden. Das Ziel dieser Studie war es, den Zusammenhang zwischen selbst-beschriebenem Gesundheitszustand und selbst-definierter sozialer Klasse in einer Population slowenischer Erwachsener zu beschreiben.
Methoden Die Studie verwendete die Countrywide Integrated Non-communicable Diseases Intervention Health Monitor Datenbank. Im Jahr 2004 schickten 8741/15297 (57.1%) Teilnehmern im Alter von 25–64 Jahren einen per Post versendeten Fragebogen zurück. Es wurden nichtadjustierte und adjustierte sowie logistische Regressionsmodelle für die Analyse des Zusammenhangs von schlechtem selbst-beschriebenem Gesundheitszustand und selbst-definierter sozialer Klasse verwendet.
Ergebnisse Ein schlechter selbst-beschriebener Gesundheitszustand wurde von 9.6% der Teilnehmer berichtet, wobei sich ein Abfall von 35.9% bei niedrigerer bis 3.7% bei mittlerer/höherer selbst-definierter sozialer Klasse zeigte. In logistischen Regressionsmodellen waren selbst-beschriebene Gesundheit und alle selbst-definierten sozialen Klassen miteinander assoziiert. Ein adjustiertes Model zeigte, dass schlechterer selbst-bechriebener Gesundheitszustand mit der selbst-definierten sozialen Klasse assoziiert war (OR für

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niedrigere vs. mittlere/höhere selbst-definierten soziale Klasse 4.23, 95% CI 2.46–7.25; $P < 0.001$).
Schlussfolgerungen Unsere Studie bestätigt das Vorhandensein von deutlichen Unterschieden hinsichtlich der Prävalenz von schlechtem selbst-beschriebenem Gesundheitszustand innerhalb verschiedener selbst-definierter sozialer Klassen. Teilnehmer aus der niedrigeren selbst-definierten sozialen Klasse hatten die größte Prävalenz des schlechteren selbst-beschriebenen Gesundheitszustandes und sollten in den Mittelpunkt multisektorischer Interventionsprogramme gerückt werden.

Introduction

Self-rated health is an established measure of health status and has been widely used in large, population-based social and epidemiologic health studies. It has consistently been shown to have good test–retest reliability (Lundberg and Manderbacka 1996; Cox et al. 2009) and concurrent validity (Rowan 1994). In social epidemiology, self-rated health is particularly valuable as it predicts disability, functional decline, morbidity, and mortality (Idler and Benyamini 1997). Even when adjusted for objective assessment of health status, poor self-rated health remained predictive for increased mortality (Idler and Benyamini 1997). Although some skepticism regarding this single-item subjective measure was raised (Lang and Delpierre 2009), individual health perception seems to integrate biological, socioeconomic, and psychosocial dimensions which give this crude and simple measure a value beyond objective assessment methods (Jylhä 2009). When compared to medical view of health, which refers mainly to symptoms and signs due to underlying pathology, the self-evaluation encompasses physical and emotional components as well as satisfaction with life. Furthermore, state of feeling sick often reflects psychological and social consequences of having a problem rather than physical pain or discomfort (Blank and Diderichsen 1996).

Evidence that self-rated health varies according to socioeconomic status was firmly established. Lack of education, material hardship, inferior social position, job insecurity, and unemployment has been shown to be important determinants in the perception of poor self-rated health (Bobak et al. 2000; Leinsalu 2002; Gilmore et al. 2002; Knesebeck et al. 2003; Borrell et al. 2004; Nicholson et al. 2005; Molarius et al. 2007; Bauer et al. 2009). In general, people from lower social classes rate their health poorer when compared to those from higher social classes (Power et al. 1996; Martikainen et al. 2004). Most of the studies used individual objective measures such as education, income, occupational position, or composite surrogates for the assessment of social class (Bobak et al. 2000; Leinsalu 2002; Knesebeck et al. 2003; Borrell et al. 2004; Nicholson et al. 2005; Molarius et al. 2007; Bauer et al. 2009). Recently, subjective perception of social class has been proposed by some to have a stronger influence on health than objective measures of social status (Singh-Manoux et al. 2003, 2005; Demakakos et al. 2008). The influence of social class on health appears to be mediated in part by psychological and social factors, including one's perceived social standing in the community relative to others (Adler et al. 2000). Although relevant, the nationwide reports of self-assessed social class and self-rated health remain scarce (Hu et al. 2005).

There is compelling evidence for association between various surrogates of social class and self-rated health in long-standing (Knesebeck et al. 2003; Borrell et al. 2004; Molarius et al. 2007) and recently joined (Bobak et al. 2000; Leinsalu 2002; Pikhart et al. 2003) European Union member states. However, the member states remain culturally, politically, and economically distinct, therefore some of the surrogates might not be applicable to all of them. Alternatively, a subjective measure of an individual social class, as determined by social class self-classification, encompassing wide range of socioeconomic phenomena seems to be valuable (Adler et al. 2000; Singh-Manoux et al. 2003; Operario et al. 2004).

Slovenia is historically considered as a communist country; however, the communist government was less rigid when compared to Eastern European countries, and resembled countries with long-standing democracy in many ways. After the downfall of Yugoslavia, the 2 million inhabitants witnessed rapid economic transition to nowadays stable economy and an established position within European Union. A nationwide study in Slovenia, testing the association between self-rated health and self-assessed social class, would thus be relevant to the present knowledge on this topic.

This study was conducted to examine the relationship between self-rated health and self-assessed social class in Slovenian adult population and pre-defined sub-groups according to various characteristics of the social environment to provide scientific evidence for planning focused preventive actions in sub-populations identified to be at risk. We hypothesized that Slovenian adults in lower self-assessed social classes are more likely to report poor self-rated health.

In this paper, we first report Slovenian data on self-rated health in different self-assessed social classes and examine the relationship between various characteristics of the social environment and poor self-rated health.

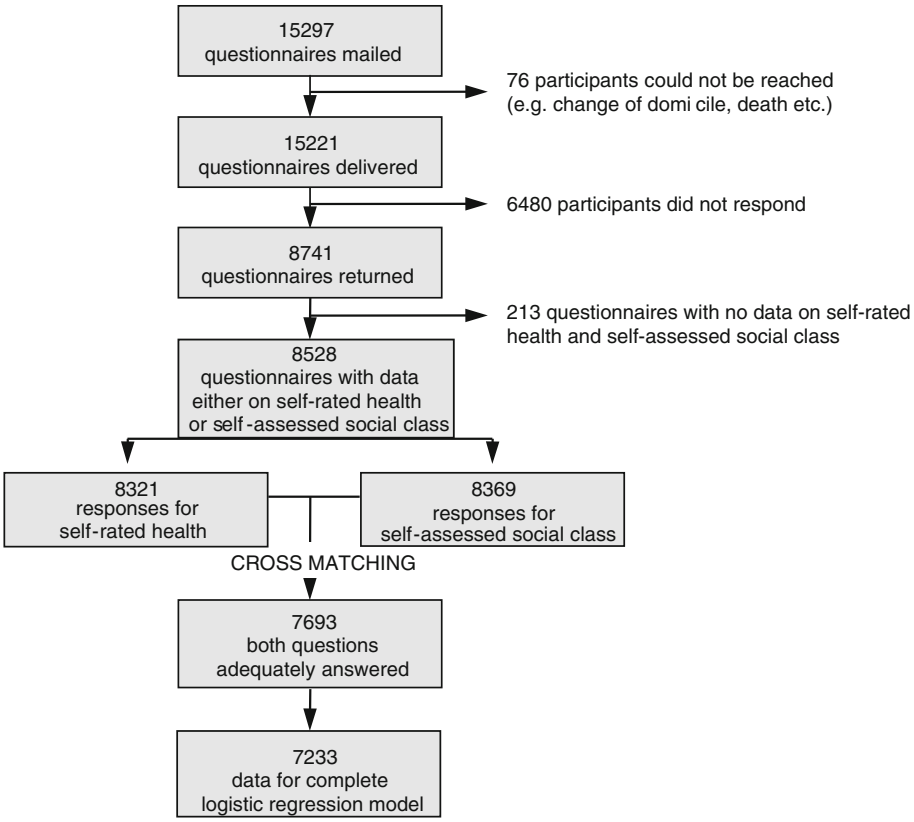

Fig. 1 Flowchart of the study

Methods

The study was based on Slovenian Countrywide Integrated Non-communicable Diseases Intervention program (CINDI) Health Monitor database (World Health Organization 1996). Since 2001, data are collected on approximately 4-year intervals by cross-sectional survey using a self-administered questionnaire. This study used data collected in 2004. The stratified simple random sampling from the Republic of Slovenia Central Population Registry was performed by Statistical Office of the Republic of Slovenia (Zaletel-Kragelj 2004). Sample included 15,297 participants, aged 25–64 years, from nine health regions (75,000–600,000 inhabitants, simple random sampling in each region) to assure for same participant structure in study sample and population. No weighing or clustering was applied. The research protocol for the survey was approved by the Ethical Committee of the Republic of Slovenia in 2004.

A self-administered postal questionnaire, based on the CINDI Health Monitor Core Questionnaire, was mailed to the participants (Prättälä et al. 2001). To increase the response rate, extensive media campaign, lottery with healthy behavior associated prizes and reminder letters for non-respondents were used. After 14 days, all non-respondents were reminded by a repeated invitation and a new issue of a questionnaire. Second reminder to non-respondents was sent after additional 7 days and was by invitation only.

Flowchart of the study is presented in Fig. 1. In brief, 15,297 questionnaires were mailed and 15,221 (99.5%) of them were actually delivered. The response rate was 57.1%. The respondents did not differ statistically from non-respondents in age distribution or distribution of size of settlements of permanent residence, but the response to the survey was slightly lower among men (44.7%) than among women (55.3%) at a ratio 1:1.2 (according to population data in 2004, the ratio was 1:1).

Subjective assessment of individual's health was measured through a single question: "How would you assess your present state of health?". We used a five-stage rating scale: 1—very good; 2—good; 3—fair; 4—poor; 5—very poor. For the needs of this study, a pre-defined subgroup of poor self-rated health was formed by pooling those participants who rated their health as poor or very poor.

Socioeconomic status of the study participants was assessed by self-classification into one of the five pre-defined social class categories. The questionnaire included the following question: "In your opinion, which social class do you belong to?" For classification, a five-stage rating scale was used: 1—lower; 2—labor; 3—middle; 4—upper-middle; 5—upper. In case of uncertainty, participants could choose the answer "I don't know."

As covariates, we assessed gender, age, marital status, educational level, kind of work, residence community, and geographical region.

Participants were asked to enter year of birth. During statistical analysis, age was recoded into five categories: 25–29, 30–39, 40–49, 50–59, and 60–64 years.

Marital status was inquired for and participants had following options: married, living in consensual union, single, divorced, or widowed.

Education was measured as the highest level of education achieved, with the participants choosing one of the six categories: incomplete primary education, primary education, vocational education, secondary education, college education, and university education.

The kind of work was assessed by asking participants to classify themselves into one of the five categories according to their work characteristics: heavy work (strenuous physical work, e.g., agriculture, farming, forestry, industry, construction, mining); administrative work (people who work in office, e.g., civil servants and lower management); intellectual work/student (people who perform intellectual and creative tasks, e.g., middle and higher management, research and development, physicians); housekeeper/pensioner (people who perform housekeeping or are retired); unemployed (people who were unemployed at the time of the study).

The type of residence community was defined as: urban (urban environment as city or town); suburban (environment adjacent to city or town, i.e., within city/town municipality); rural (village or remote communities unrelated to previous categories).

In our study, we have adopted previously used geographical distribution on western, central, and eastern region of Slovenia. Those regions share the same west-to-east pattern of increasing socioeconomic inequality, prevalence of cardiovascular risk factors and chronic disease, and mortality rate (Zaletel-Kragelj et al. 2004).

Social class or self-rated health was reported by 8,528 respondents. The question about social class was answered by 8,369/8,528 participants (98.1%). Of those, 496 participants could not classify themselves to one of the pre-defined social classes and were excluded from the analysis. The self-rated health was reported by 8,321/8,528 participants (97.6%). After cross-matching, both questions were adequately answered by 7,693/8,528 participants (90.2%). Data for complete logistic regression model were available for 7,233/8,528 participants (84.8%).

Table 1 Study population characteristics

Characteristic	*n*	(%)
Gender		
Men	8,528	44.7
Women		55.3
Age (years)		
25–29	8,528	12.8
30–39		24.4
40–49		25.8
50–59		25.7
60–64		11.4
Marital status		
Married	8,483	63.9
Consensual union		13.4
Single		15.2
Divorced		4.4
Widowed		3.1
Educational level		
Incomplete primary	8,290	5.1
Primary		13.9
Vocational		28.5
Secondary		29.2
College		8.5
University		14.7
Kind of work		
Heavy work	8,216	14.1
Administrative work		38.9
Intellectual work/student		19.3
Housekeeper/pensioner		21.0
Unemployed (job seeker)		6.7
Social class (self-assessed)		
Lower	8,369	2.4
Labor		31.9
Middle		47.1
Upper-middle		11.7
Upper		1.0
Undetermined		5.9
Residence community		
Urban	8,456	34.4
Suburban		21.8
Rural		43.8
Geographical region		
Western	8,528	21.6
Central		30.2
Eastern		48.3

Data are presented as number of participants (%). Due to rounding the cumulative % can be different than 100%

Statistical analysis

In the analysis, poor self-rated health was treated as an outcome (dependent variable), and the self-assessed social class was treated as an independent variable. Those who could not classify themselves in one of the pre-defined social classes were excluded from the analysis. Due to the low number of participants in the upper self-assessed social

Table 2 Estimates of prevalence of poor self-rated health in self-assessed social classes in 7,693 participants of the nationwide study

Characteristic	Social class (self-assessed)			
	Lower	Labor	Middle	Upper-middle/upper
Total sample	70 (35.9)	363 (13.9)	229 (6.0)	38 (3.7)
Gender				
Men	33 (39.3)	192 (15.1)	100 (6.0)	15 (3.3)
Women	37 (33.3)	171 (12.8)	129 (6.0)	23 (3.9)
Age (years)				
25–29	1 (9.1)	10 (4.4)	12 (2.0)	3 (1.9)
30–39	9 (27.3)	45 (8.1)	34 (3.3)	4 (1.4)
40–49	25 (43.1)	113 (14.7)	50 (5.4)	7 (2.6)
50–59	30 (44.1)	139 (18.7)	92 (10.3)	20 (9.0)
60–64	5 (20.0)	56 (17.6)	41 (10.4)	4 (4.3)
Marital status				
Married	41 (39.8)	260 (14.3)	156 (6.6)	25 (3.8)
Consensual union	4 (25.0)	31 (10.9)	24 (3.9)	3 (1.9)
Single	16 (37.2)	45 (14.3)	22 (3.6)	4 (2.3)
Divorced	4 (23.5)	15 (16.0)	19 (10.6)	2 (5.7)
Widowed	4 (26.7)	11 (12.0)	7 (8.2)	4 (30.8)
Educational level				
Incomplete primary	24 (47.1)	60 (24.8)	12 (25.0)	0 (0)
Primary	13 (32.5)	115 (16.3)	21 (10.4)	5 (55.6)
Vocational	17 (28.8)	134 (12.0)	64 (6.7)	2 (3.8)
Secondary	7 (36.8)	43 (10.2)	95 (6.0)	4 (1.7)
College	1 (33.3)	2 (5.7)	15 (3.5)	13 (6.3)
University	1 (25.0)	1 (4.0)	14 (2.5)	13 (2.5)
Kind of work				
Heavy work	16 (33.3)	103 (14.8)	23 (8.6)	4 (16.0)
Administrative work	4 (18.2)	90 (9.1)	71 (4.0)	3 (1.3)
Intellectual work/student	0 (0)	5 (12.8)	24 (3.0)	15 (2.3)
Housekeeper/pensioner	24 (36.4)	101 (16.7)	73 (10.6)	12 (11.8)
Unemployed (job seeker)	20 (45.5)	44 (26.2)	28 (12.7)	4 (22.2)
Residence community				
Urban	22 (40.7)	97 (14.3)	79 (5.6)	14 (2.8)
Suburban	6 (21.4)	81 (15.9)	59 (6.6)	10 (3.7)
Rural	42 (37.2)	184 (13.1)	88 (5.8)	14 (5.4)
Geographical region				
Western	9 (26.5)	67 (11.6)	43 (5.0)	8 (4.0)
Central	15 (30.6)	93 (13.6)	63 (5.1)	10 (2.4)
Eastern	46 (41.1)	203 (15.0)	123 (7.0)	20 (4.6)

Data are presented as number of participants (%)

class who rated their health as poor or as very poor, we additionally pooled the participants from upper-middle and upper self-assessed social classes.

Differences in prevalence of poor self-rated health between different self-assessed social classes were analyzed using binary multiple logistic regression (Hosmer and Lemeshow 1989; Altman 1993). Three models were performed: unadjusted (Model 1), age adjusted (Model 2), and adjusted for the effects of gender, age, marital status, educational level, kind of work, residence community, and geographical region (Model 3). The dummy variables were created for all independent variables considered in the model. The simple method was applied. The group with the lowest frequency of observed outcome was assigned as

Table 3 Logistic regression models with odds ratios and their 95% confidence intervals of poor self-rated health according to characteristics of the social environment

Characteristic	Model 1	*P*	Model 2	*P*	Model 3	*P*
Social class (self-assessed)						
Upper-middle/upper	1.00		1.00		1.00	
Middle	1.67 (1.18–2.37)	0.004	1.64 (1.16–2.34)	0.006	1.05 (0.70–1.56)	ns
Labor	4.27 (3.03–6.01)	<0.001	3.78 (2.68–5.33)	<0.001	1.88 (1.22–2.88)	0.004
Lower	14.78 (9.55–22.87)	<0.001	12.57 (8.10–19.56)	<0.001	4.23 (2.46–7.25)	<0.001
Age (years)						
25–29			1.00		1.00	
30–39			1.74 (1.11–2.71)	0.015	1.68 (1.05–2.67)	0.030
40–49			3.32 (2.18–5.05)	<0.001	3.04 (1.94–4.77)	<0.001
50–59			5.24 (3.47–7.93)	<0.001	4.29 (2.71–6.81)	<0.001
60–64			4.53 (2.91–7.07)	<0.001	3.58 (2.12–6.04)	<0.001
Gender						
Women					1.00	
Men					1.06 (0.88–1.27)	ns
Marital status						
Widowed					1.00	
Divorced					1.56 (0.86–2.84)	ns
Single					1.51 (0.87–2.62)	ns
Consensual union					1.24 (0.71–2.16)	ns
Married					1.31 (0.81–2.11)	ns
Educational level						
University					1.00	
College					1.27 (0.74–2.18)	ns
Secondary					1.67 (1.02–2.72)	0.041
Vocational					1.58 (0.95–2.65)	ns
Primary					2.05 (1.20–3.52)	0.009
Incomplete primary					3.05 (1.72–5.40)	<0.001
Kind of work						
Intellectual work/student					1.00	
Administrative work					1.08 (0.71–1.66)	ns
Housekeeper/pensioner					1.70 (1.08–2.67)	0.023
Heavy work					1.87 (1.18–2.97)	0.008
Unemployed (job seeker)					3.61 (2.25–5.78)	<0.001
Residence community						
Rural					1.00	
Urban					1.09 (0.88–1.34)	ns
Suburban					1.26 (1.00–1.57)	0.046
Geographical region						
Western					1.00	
Central					1.02 (0.78–1.32)	ns
Eastern					1.29 (1.03–1.62)	0.027

Model 1: unadjusted, Model 2: age adjusted, Model 3: adjusted for gender, age, marital status, educational level, kind of work, residence community, and geographical region

ns Non-significant

the reference group (Darlington 1990). We report odds ratio (OR) and 95% confidence interval (CI) with corresponding *P*-value for analyzed variables. In all statistical tests a *P*-value of 0.05 or less was considered significant. SPSS statistical package for Windows Version 13.0 (SPSS Inc., Chicago, IL, USA) was used for analysis.

Results

Respondents in final sample of 8,528 participants were equally distributed across age groups whilst there was a slight female predominance (55.3 vs. 44.7%). Most of the respondents were married (63.9%), completed less than or equal to secondary education (76.7%) and were performing administrative work (38.9%). Majority of respondents classified themselves to labor (31.9%) or middle (47.1%) social class whilst only 2.4 and 1.0% reported to be in lower and upper self-assessed social class, respectively. Further details are presented in Table 1.

In participants that answered question on self-rated health, 796 (9.6%) of them reported poor self-rated health. In participants that answered both question on self-rated health and self-assessed social class, 700 (9.1%) of them reported poor self-rated health. Table 2 presents the estimates of prevalence of poor self-rated health in social classes according to the various characteristics of the social environment. A clear decrease of poor self-rated health from 35.9% in lower to 3.7% in upper-middle/upper social class was observed. The same trend was observed throughout most of the characteristics of the social environment. In very few cases (e.g., primary educational level, unemployed) minor deviations have been observed which are likely due to the small number of participants rather than having a true association importance. In participants aged 40–59 years, those with incomplete primary education, unemployed, from urban residence community or from eastern Slovenia and self-classified to lower social class, particularly high proportion of poor self-rated health was found (over 40% for all).

In an unadjusted model (Model 1), the association between poor self-rated heath and self-assessed social class was significant across all social classes. When the model was adjusted for age (Model 2), no major changes were observed (Table 3). However, after adjustment for the effects of other potential confounders (Model 3), the odds for poor self-rated health over the self-assessed social class decreased significantly. Association remained significant for lower (OR 4.23, 95% CI 2.46–7.25; $P < 0.001$) and labor self-assessed social class (OR 1.88, 95% CI 1.22–2.88; $P = 0.004$) whilst middle self-assessed social class was not associated with poor self-rated health anymore (OR 1.05, 95% CI 0.70–1.56; $P = 0.813$). Other results on logistic regression analysis are presented in Table 3.

Discussion

Our study confirms previous reports on large differences in prevalence of poor self-rated health in different social classes. In contrast to most of the previous surveys, however, the social class was self-assessed by participants, and representative nationwide sample was used. Both self-rated health and social class were evaluated by a single question, which increases the applicability in everyday clinical practice, research community, as well as for health and social policy planning.

The debate whether to use subjective or objective social class assessment continues (Adler et al. 2000; Lynch et al. 2001; Singh-Manoux et al. 2003; Operario et al. 2004; Macleod et al. 2005; Demakakos et al. 2008). Recently, Macleod et al. (2005) reported the findings from a cohort of 5,232 middle-aged Scottish men. They found little support for any advantage of subjective over objective social status and advocate that material inequality itself is a major determinant of health inequalities. Whilst this may hold true for long-standing and stable communities, it might not be applicable to the ones recently exposed to changes in the leading political party orientation—like neo-liberalism with strong market orientation. In former communist countries, e.g., Estonia, the concept of social class was heavily influenced by the official ideology. Thus, the correlations between education, occupation, and income have not been the same as in western communities, finally favoring the subjective assessment of social class (Leinsalu 2002). It is possible that this "Estonian effect" also takes place in Slovenia. In a direct comparison of subjective assessment and objective indices of social class, the former was found to be more consistently and strongly related to health-related factors as self-rated health (Adler et al. 2000). Reassuringly, the analysis of Whitehall II study, which included 10,308 middle-aged British civil servants, showed that subjective assessment of social class is an independent predictor of morbidity (Singh-Manoux et al. 2003). In view of Slovenia's political history and available evidence supporting the subjective social class assessment we argue our decision for subjective assessment as appropriate.

Previous studies which used the subjective estimates of social class, focused mainly on specific populations as civil servants aged 35–55 years (Singh-Manoux et al. 2003, 2005, 2006), older Russian men and women (Nicholson et al. 2005), low-income Mexican-origin sub-population in Texas (Franzini and Fernandez-Esquer 2006), and English population aged over 52 years living in private households (Demakakos et al. 2008). Relatively few data on self-rated health and social class from nationwide samples are available. The recent report of 991 Taiwanese persons is of particular importance and agrees with the data from our study. In this nationwide sample of elderly (mean age 68 ± 8 years), social class was assessed by a ten-rung ladder from MacArthur Scale of Subjective Social Status, and self-rated health by a five-stage Likert scale (Hu et al. 2005). In multivariate model, adjusted for education,

income, age, sex, ethnicity, socioeconomic index, working and marital status, smoking, alcohol use, and depression score, an OR of 1.19 for one quartile difference in social status and worse self-rated health was found. To the best of the authors' knowledge our study is the first to report on association between subjective social class assessment and self-rated health in a nationwide representative sample which gives an additional dimension to this approach.

Irrespective of the methodology used, the association between social class and self-rated health seems to be straightforward (Bobak et al. 2000; Singh-Manoux et al. 2003; Martikainen et al. 2004). As expected, an evident decrease of poor self-rated health prevalence over social class from 35.9% to only 3.7% was found. Whilst the trend was the same for most of the observed characteristics of the social environment, we consider figures for primary educational level or less, unemployed, and those performing heavy work as characteristics that need additional attention. Albeit distinctly different, all three might have similar explanation for higher prevalence of poor self-rated health. People with lower educational level are frequently performing heavy work in branches where workforce fluctuation is higher, which in turn is associated with limited job security (Sverke et al. 2002). Supportive data came from Lynch and Kaplan (2000) who reported that higher educational level itself is a predictor of future social success and better health, through higher status jobs, higher incomes, better housing and working conditions, and more accumulated wealth. Recently published prospective cohort study of representative sample of Danish workforce showed that job insecurity had stronger effect on health, when it was combined with poor chances on the labor market (Rugulies et al. 2008). For those performing heavy work, disequilibrium between large work effort and low rewards (salary, self-esteem, career opportunities, and job security) may significantly contribute to poorer ratings of health as well (Pikhart et al. 2001; Bauer et al. 2009).

In the lower social class, highest prevalence of poor self-rated health was expected. Previous studies showed that ageing is associated with growing burden of poor self-rated health (McCullough and Laurenceau 2004). Despite significant associations between age increase per decade and poor self-rated health, there is a slight decline in ORs across age groups which makes our results not as straightforward as reported previously. This may be due to rather low absolute number of participants in the oldest age group (60–64 years), but we are proponents of an alternative explanation. Over the past two decades, changes of the labor market have resulted in a considerable increase in job insecurity in most European countries, particularly those facing transition (Ahs and Westerling 2006; Rugulies et al. 2008). Former regime did not promote college and university education to such an extent as it is done nowadays, but offered good and stable jobs also to people with lower education. As a consequence there were no important differences in salaries between employees with different education. Thus, the middle-aged population might have experienced new situation on labor market after the transition, when demand for qualified workforce increased, as disadvantageous or even threatening (O'Relley 2006). This particular age group represents people too young to be retired but too old to remain interesting for the employers (State Portal of the Republic of Slovenia 2009). By the time of transition those people were in their late thirties which would mean that they have finished their education long before. New labor market circumstances add either to unemployment or job dissatisfaction, finally leading to psychosocial stress and poor mental and physical health. Complementary data for our notion, including the potential explanations, come from several post-communist countries (Pikhart et al. 2001; Leinsalu 2002; Gilmore et al. 2002). In a cross-sectional study, Leinsalu (2002) investigated social variations in self-rated health in a random sample of 4,711 Estonians aged 15–79 years. A multivariate model, adjusted for age, residence community, ethnicity, marital status, economic activity, occupation, and income identified the less or equal to lower secondary education as independent predictor of poor self-rated health for men (OR 2.32) and women (OR 3.88). Recently, McFadden et al. (2008) reported that in manual classes, men and women under 50 years of age had a prevalence of poor self-rated health similar to that seen in men and women in non-manual social classes over 70 years old. Even after adjustment for age, educational status, and lifestyle factors there was still strong evidence of a social gradient in self-rated health, with unskilled men (OR 2.44) and women (OR 1.97) approximately twice as likely to report poor self-rated health as professionals. Similar results came from Moscow Health Survey 2004, where low or general secondary education (OR 1.91), manual occupational class (OR 1.65), and economic hardship (OR 3.14) were associated with higher chance of having poor self-rated health (Vågerö et al. 2008). Most comprehensive data were reported in an analysis of 5,330 participants from seven post-communist countries. Material deprivation (OR 1.32) and primary education were independently predictive of poor self-rated health (Bobak et al. 2000).

Results of an adjusted multivariate model were generally consistent with previous findings, which identified specific sub-populations with highest attributable risk of poor self-rated health (Knesebeck et al. 2003; Borrell et al. 2004; Roos et al. 2005). Generally, marginal subgroups of individual characteristics of the social environment had highest risk for reporting poor self-rated health. This finding is shared with previous reports of subjective (Singh-Manoux et al. 2003; Nicholson et al. 2005; Franzini

and Fernandez-Esquer 2006) and objective (Knesebeck et al. 2003; Borrell et al. 2004; Roos et al. 2005) social class assessment from the developed countries or countries in transition. Elderly and poorly educated individuals, frequently without job, and belonging to lower social class should be the primary target for interventional programs. A special caution should be dedicated to the specific needs of individual community and possibilities given by the economy, political priorities, and socio-cultural model of the community. An established and valued intervention may be difficult for wide implementation.

Potential limitations of this study have to be addressed. Firstly, the cross-sectional design of our study limits conclusions on causality between self-rated health and self-assessed social class. To fully address this question, a longitudinal design should be used in future. Secondly, our study used the self-assessment questionnaire thus socially desirable answers cannot be excluded. Additionally, final sample could be confined to those who were more willing to participate. As the first argument would lead to under estimation of poor self-rated health, the second could level off for this bias. Thirdly, response rate and thus the nationwide applicability of the findings could be argued as borderline. Nonetheless, both issues are shared with many surveys and authors believe they did not affect the study findings to a greater extent (Bobak et al. 2000; Pikhart et al. 2003; Molarius et al. 2007). Fourthly, absolute numbers of participants in few subgroups of characteristics of the social environment have been low. Thus, a single or only few participants with poor self-rated health could shift the balance, changing a linear relationship between self-rated health and self-assessed social class into a J-shaped curve. Fifthly, we cannot exclude the potential impact of an acute transitional health condition at the time of the study (e.g., viral infection in an otherwise healthy person). Finally, we did not control for possible influence of psychiatric conditions or type of personality.

In conclusion, our study adds to the accumulating body of evidence supporting strong association between self-assessed social class and self-rated health. Several characteristics of the social environment, which are also widely accepted as negative indicators of social class, were associated with poor self-rated health. Interventional programs should focus on the elderly and poorly educated individuals, frequently without a job, and belonging to lower social class. Those programs have to be multisectoral and should reach beyond health care resources.

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