HEALTH-RELATED QUALITY OF LIFE: A POPULATION BASED STUDY FROM SLOVENIA

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SUMMARY

Objectives: Health status is represented by people's subjective assessment of their sense of well-being and ability to perform social roles and has been well accepted as a health indicator of different populations. The aim of this study was to determine health-related quality of life in Slovenian population.

Methods: We performed a cross-sectional postal survey in a random stratified sample of 1,000 adult Slovenian inhabitants. The questionnaire consisted of the respondents' demographic data (sex, age, education level, employment status, living environment), self-reported chronic conditions, self-reported use of health services and EQ-5D instrument for measuring quality of life.

Results: The response rate was 41% (53.1% men, mean age 51.5 years). Respondents reported most problems in the pain dimension of EQ-5D (59.3%), following by mobility (30.4%), anxiety/depression (30.3%), daily activities (29.8%) and self-care (9.0%). At least one moderate problem was reported by 272 (66.3%) respondents. Independent factors, associated with problems in any EQ-5D dimension were primary and vocational education, older age, high blood pressure, rheumatic diseases, back problems, anxiety/depression, a visit to the emergency department in the past year, and a house visit from a family doctor in the past year.

Conclusions: The present study showed that the health-related quality of life of the Slovenian inhabitants is lower than the one found in some other European countries. This finding is surprising and also worrying. Because we cannot find any perceptible reason for this observation, larger and prospective studies are needed to confirm those results and to determine the reasons for that.

Key words: cross-sectional survey, health care utilization, chronic diseases, primary care, quality of life

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INTRODUCTION

Health status or health-related quality of life (HRQoL) is defined as an individual's perception of health-related problems with his/her own health in a defined period of time requiring the measurement of general, physiologic, mental, physical, and social health and patient satisfaction (1). HRQoL, representing people's subjective assessment of their sense of well-being and ability to perform social roles, has been well accepted as a health indicator in medical interventions or health surveys reporting on health utilisation related to HRQoL in specific populations such as primary care patients (2, 3), elderly (4–6) and patients with chronic conditions (2, 7–11).

Patients in family practice are suffering from a wide array of health care problems that impair their mobility, competence for self-care and usual activities. Studies on HRQoL from primary care populations, which used a standardised instrument for measuring health outcomes called EQ-5D (15), report on moderately high numbers of patients (73%) facing a moderate problem in at least one dimension out of five (mobility, self care, pain/discomfort, usual activity, anxiety/depression): any extreme problem reported 12.2% of respondents, whereas only 14.7% of respondents reported no problems on any of EQ-5D dimension at all (3). Wang and co-workers found a bit lower values on EQ-5D dimensions in German general practice population, i.e. reporting extreme problems regarding mobility, self care, pain/discomfort, usual activity, anxiety/depression as compared to Kersnik and co-workers' report concerning Slovenia (2, 3). Wang and co-workers also proved that the proportions of general practice patients reporting any problems were significantly higher than those of the general population in all dimensions except for the self-care (2).

White with co-workers developed a model of health care utilisation by general population (12). Green with co-workers revisited this model to develop a broader but still useful framework when considering the organization of health care services (13). Patients who seek medical care at different levels of health care services are population groups, which differ from the general population by the presence of chronic conditions, perceived health status or HRQoL and health care utilisation (2).

As expected, elderly people report worse HRQoL and more frequent use of health services (4–6). Chronic conditions have been shown to have an adverse impact on HRQoL scores (2, 7, 9, 10). Poorer scores on each HRQoL variable were also associated with increased odds of analgesic or antiinflammatory drugs use, whereas number of days of activity-limiting pain was a stronger predictor of physician visits among arthritis patients than other health-related variables (8). Presence of multimorbidity, especially psychiatric co-morbidity worsened HRQoL score (2, 10).

In a national sample of general United Kingdom population, Kind and co-workers found 6.2% respondent reporting any ex-

treme problem (14). König and co-workers found only 2.3% of respondents from German general population reporting any extreme problem (11). In population surveys more health problems are expected with increasing age, female sex, lower social class, lower education level and in chronic patients (11, 14).

As there has not been any general population data on HRQoL and health care utilisation, this study performed a postal survey of Slovenian adult population. The study was designed to determine the HRQoL of the Slovenian population and the effects of demographic data, chronic conditions, and health care utilisation on HRQoL.

MATERIALS AND METHODS

A cross-sectional postal survey in adult Slovenian population was performed. Study group included a sample of 1,000 adults (18 years or older) from Slovenia. A sample was randomly selected with a computer program based on Slovenian Telekom company phone book and stratified to represent all Slovenian regions.

A questionnaire similar to one used in other studies was developed. It was posted together with a franked and labelled envelope to all people in the sample, at the end of April 2009. After three weeks, a reminder was sent per post to all people in the sample. The questionnaire consisted of patient demographic data (sex, age, education level, employment status, living environment), self-reported chronic conditions, self-reported use of health services and EQ-5D instrument for measuring quality of life of the respondents (15). The respondents chose chronic conditions and use of health services from a list. We used only the 5-dimension part of the EQ-5D; we did not use the EQ-VAS part. Each EQ-5D dimension can be answered by one of the three answers: no problems – 1, moderate problems – 2, severe problems – 3. We dichotomised the scores of each EQ-5D dimension into the new variable (no problems/problems). The "no problem" part consisted of the answer 1 (no problems), and the "problems" part consisted of the answer 2 (moderate problems) and 3 (severe problems).

For statistical analysis we used SPSS 13.0 (SPSS Inc., Chicago, IL, USA). We calculated the descriptive statistics. In the univariate analysis we used independent samples t-test and χ^2 test. In the multivariate analysis we used the logistic regression. We entered the variables that showed statistical difference in univariate analysis at $p<0.05$. For other statistical tests the statistical significance was also set at $p<0.05$. In the statistical analysis we included the questionnaires that had been returned until May 31th 2009.

We have got an approval for the study of the National Ethics Committee.

Table 1. *Characteristics of the respondents*

Characteristic	N (%)
Sex (N=407)	
Men	216 (53.1)
Women	191 (46.9)
Education (N=404)	
Primary	50 (12.4)
Vocational	66 (16.3)
Secondary	146 (36.1)
University	123 (30.4)
Postgraduate	19 (4.7)
Status (N=407)	
Employed	196 (41.5)
Retired	171 (42.0)
Unemployed	24 (5.9)
Student	43 (10.6)
Environment (N=408)	
Rural	147 (36.0)
Suburbs	119 (29.2)
Urban	142 (34.8)
Health services utilization in the past year	
A visit to family doctor	287 (70.0)
A visit to clinical specialist	182 (44.4)
A visit to emergency department	71 (17.3)
Hospital stay	44 (10.7)
Home visit by family doctor	12 (2.9)
Chronic condition	
Low back pain	215 (52.4)
High blood pressure	117 (28.5)
High cholesterol	92 (22.4)
Rheumatic diseases	80 (19.5)
Allergies	75 (18.3)
Skin diseases	37 (9.0)
Anxiety/depression	35 (8.5)
Asthma	23 (5.6)
Kidney diseases	23 (5.6)
Cancer	17 (4.1)
Liver diseases	7 (1.7)

RESULTS

Responses were received from 410 participants (41% response rate), out of which 216 (53.1%) were men (Table 1). Mean age±standard deviation (SD) of the respondents was 51.5±18.4 years, range 18 to 89. The respondents reported most problems in the pain dimension of EQ-5D (241, 58.8%), followed by mobility (123, 30.0%), anxiety/depression (123, 30.0%), daily activities (120, 29.3%) and self-care (36, 8.8%) (Table 2). At least one moderate problem was reported by 272 (66.3%) respondents.

Univariate analysis

No differences regarding HRQoL were found among men and women. Older participants compared to the younger ones reported more problems in the following four EQ-5D dimensions (average age±SD of participants with problems vs. average age±SD of participants without any problems): mobility (65.8±13.6 vs. 44.9±16.4, $p<0.001$), self-care (64.2±14.9 vs. 50.0±18.1, $p<0.001$), pain (57.9±16.3 vs. 41.2±17.0, $p<0.001$), and daily activities (60.6±16.6 vs. 47.4±17.8, $p<0.001$). Participants with

Table 2. *Problems in five EQ dimensions according to the demographic characteristics of the respondents*

Characteristic	Problems in mobility (N, %)	Problems in self-care (N, %)	Pain (N, %)	Problems in daily activities (N, %)	Problems with nerves (N, %)
Sex					
Men	65 (30.7)	15 (7.1)	127 (29.6)	63 (29.4)	59 (27.7)
Women	58 (31.0)	21 (11.2)	114 (62.0)	57 (30.5)	64 (34.2)
Education					
Primary	27 (56.3)	12 (25.0)	38 (80.9)	26 (54.2)	26 (54.2)
Vocational	29 (45.3)	8 (12.5)	47 (74.6)	28 (44.4)	20 (31.7)
Secondary	36 (25.2)	9 (6.3)	65 (55.2)	35 (24.0)	42 (28.8)
University	29 (23.8)	7 (5.7)	66 (54.5)	28 (23.0)	30 (24.8)
Postgraduate	3 (15.8)	1 (5.3)	9 (47.4)	4 (21.1)	3 (15.8)
Status					
Employed	20 (11.9)	6 (3.6)	81 (48.8)	33 (19.8)	43 (25.9)
Retired	95 (57.6)	27 (16.5)	137 (83.5)	75 (44.9)	59 (35.3)
Unemployed	9 (37.5)	4 (16.7)	14 (58.3)	10 (41.7)	9 (37.5)
Student	1 (2.4)	0	11 (25.6)	4 (9.3)	12 (27.9)
Environment					
Rural	49 (33.6)	18 (12.4)	92 (63.0)	49 (33.6)	47 (32.4)
Suburbs	34 (29.3)	10 (8.6)	66 (57.4)	37 (31.9)	45 (38.8)
Urban	42 (30.4)	9 (6.5)	85 (62.0)	36 (25.7)	32 (22.9)

high school and university education in a comparison to others had lesser problems in the following dimensions: mobility (23.9% vs. 50.0%, p<0.001), self-care (6.0% vs. 17.9%, p=0.001), pain (54.4% vs. 77.3%, p<0.001), daily activities (23.3% vs. 48.6%, p<0.001), and problems with nerves (26.2% vs. 41.4%, p=0.004). Employed participants and students in comparison to others had lesser problems in the following EQ-5D dimensions: mobility (10.0% vs. 55.0%, p<0.001), self-care (2.8% vs. 16.5%, p<0.001), pain (44.0% vs. 80.3%, p<0.001), and daily activities (17.6 vs. 44.5, p<0.001). Participants, living in urban areas had lesser problems with nerves in comparison to others (22.9% vs. 35.2, p=0.012).

Participants with problems in the EQ-5D dimensions reported more frequent utilization of health services in the past year (Table 3). Also, participants with self-reported chronic conditions reported more problems in EQ-5D dimensions (Table 3).

Multivariate analysis

Independent factors, associated with problems in any EQ-5D dimension were primary and vocational education, older age, high blood pressure, rheumatic diseases, back problems, anxiety/depression, a visit to the emergency department in the past year, and a house visit from a family doctor in the past year (Table 4).

DISCUSSION

The health-related quality of life of general Slovenian population is lower than in other European populations (11). Older people and those with lower education have lower health-related quality of life. People who use health services more often and have some chronic conditions have lower health-related quality of life.

Since there is not any data on HRQoL of general population in Slovenia, our findings can be compared only to the Slovenian family practice attendees (3), in whom HRQoL is lower than found in our study. In a study from United Kingdom, 43.1% of respondents reported at least moderate problem in any dimension (14). Also, in the study from six European countries (16), 35.1% of respondents reported at least moderate problem in any of EQ-5D dimensions. In both cases it was much less than found in our study. The rank of most common dimensions, in which general population reported having any problems, are consistent with the findings of other studies (11, 16, 17), but the percentages of respondents, reporting any problem in the individual EQ-5D dimensions, are again very different from other studies (14, 16). The percentages of the respondents reporting at least moderate problems in individual EQ-5D dimensions can be compared to the percentages found in a German study among general practice patients (2). On the other hand, the latter study reported much lower percentages of participants having at least moderate problems in individual EQ-5D dimensions, when compared to the Slovenian study among general practice patients (3). The reasons for lower HRQoL of Slovenian population, when compared to the other European populations, could be multifaceted. On one hand, these results could reflect higher average age and lower education level of our sample in comparison to the national data (18–20). On the other hand, Slovenia has gone through many changes in the past years, which included also a change in the health care system (21). The transition processes and world wide economic crisis could have also affected the perception of HRQoL of our population, or performance just simply did not reach expectations (22).

Table 3. *Health services utilization, self-reported chronic conditions and quality of life*

Variable	Mobility		Self-care		Pain		Daily activities		Problems with nerves	
	Problems vs. no problems (%)	p*	Problems vs. no problems (%)	p*	Problems vs. no problems (%)	p*	Problems vs. no problems (%)	p*	Problems vs. no problems (%)	p*
Health services utilization in the past year										
A visit to family doctor	82.3 vs. 72.3	0.049	88.2 vs. 74.0	0.093	83.8 vs. 62.2	<0.001	87.2 vs. 70.4	<0.001	81.6 vs. 73.0	0.089
A visit to emergency department	23.1 vs. 17.1	0.188	26.7 vs. 18.5	0.330	21.6 vs. 15.8	0.173	27.1 vs. 16.1	0.020	34.6 vs. 13.0	<0.001
Hospital stay	23.0 vs. 6.7	<0.001	16.1 vs. 11.3	0.386	17.4 vs. 3.5	<0.001	22.7 vs. 7.3	<0.001	19.1 vs. 8.9	0.008
A visit to clinical specialist	59.1 vs. 42.9	0.005	60.6 vs. 46.4	0.145	57.0 vs. 33.1	<0.001	64.3 vs. 40.5	<0.001	60.3 vs. 41.9	0.001
A house visit by family doctor	9.2 vs. 0.8	<0.001	25.8 vs. 1.2	<0.001	5.0 vs. 0.7	0.033	9.2 vs. 0.8	<0.001	6.5 vs. 2.0	0.048
Chronic conditions										
Diabetes	44.1 vs. 55.9	0.077	25.0 vs. 7.2	0.003	12.1 vs. 4.6	0.016	13.4 vs. 7.5	0.082	10.9 vs. 8.6	0.558
High blood pressure	55.8 vs. 44.2	<0.001	47.1 vs. 27.6	0.028	42.3 vs. 10.5	<0.001	50.9 vs. 20.3	<0.001	41.2 vs. 24.7	0.002
High cholesterol	30.4 vs. 69.6	0.001	37.5 vs. 22.8	0.082	33.5 vs. 10.5	<0.001	34.5 vs. 19.9	0.004	27.7 vs. 22.6	0.294
Rheumatic diseases	45.7 vs. 9.5	<0.001	55.9 vs. 17.2	<0.001	31.6 vs. 4.7	<0.001	44.7 vs. 10.6	<0.001	29.8 vs. 17.1	0.008
Low back pain	79.5 vs. 44.4	<0.001	85.3 vs. 51.9	<0.001	74.3 vs. 25.2	<0.001	80.9 vs. 43.9	<0.001	69.3 vs. 48.7	<0.001
Asthma	9.6 vs. 4.2	0.055	18.2 vs. 4.7	0.008	7.1 vs. 4.0	0.264	8.8 vs. 4.5	0.147	8.0 vs. 4.9	0.239
Skin diseases	12.1 vs. 8.3	0.258	12.1 vs. 9.2	0.537	11.5 vs. 6.0	0.102	8.0 vs. 10.5	0.571	14.2 vs. 7.9	0.087
Liver diseases	2.6 vs. 1.5	0.437	3.1 vs. 1.7	0.466	1.8 vs. 2.0	1.000	3.6 vs. 1.1	0.203	2.7 vs. 1.5	0.427
Kidney diseases	8.8 vs. 4.6	0.149	15.6 vs. 4.9	0.030	8.1 vs. 3.3	0.079	11.6 vs. 3.8	0.008	12.6 vs. 3.4	0.002
Anxiety/depression	14.9 vs. 6.4	0.011	21.9 vs. 7.8	0.016	11.6 vs. 4.7	0.025	15.9 vs. 6.0	0.003	27.2 vs. 1.1	<0.001
Cancer	7.0 vs. 3.4	0.174	12.5 vs. 3.8	0.047	6.3 vs. 2.0	0.074	6.3 vs. 3.8	0.289	3.6 vs. 4.9	0.787

* χ^2 test

The influence of some demographic factors on lower HRQoL was expected and also consistent with other studies (7, 11, 23–25). Also, the impact of chronic conditions on HRQoL is known, especially of those accompanied with chronic pain or those of mental origin (7, 10). People with lower HRQoL reported greater health-care services utilisation also in previous studies in some special populations (8, 9).

A multivariate analysis revealed possible independent factors, which could be associated with having problems in each EQ-5D dimension. The effect of some of these factors (age, education level, rheumatic diseases, back pain, high blood pressure) has already been proven in other studies (2, 14, 16). But, it seems that besides demographic factors the use of health-care services and the presence of chronic conditions also play an explanatory role

Table 4. *Logistic regression analysis for the problems in individual EQ-5D dimensions, controlled for sex and age*

Dependent variable	Independent variable	OR	Lower 95% CI	Upper 95% CI	p
Problems in mobility*	Age (years)	1.062	1.027	1.099	0.001
	Primary/vocational education	0.453	0.227	0.905	0.025
	Back pain	2.343	1.113	4.930	0.025
	Constant	0.013	–	–	<0.001
Problems in self-care†	Back pain	3.771	1.052	13.521	0.042
	House visit in the past year	17.747	2.123	148.382	0.008
	Constant	0.043	–	–	0.027
Pain‡	High blood pressure	2.951	1.260	6.911	0.013
	Back pain	6.143	3.239	11.649	<0.001
	Constant	0.168	–	–	0.045
Problems in daily activities¶	Primary/vocational education	0.481	0.249	0.930	0.030
	Rheumatic diseases	2.941	1.373	6.296	0.005
	Back pain	2.891	1.437	5.817	0.003
	A visit to emergency department	2.483	1.035	5.958	0.042
	Constant	0.035	–	–	0.001
Problems with nerves††	Anxiety/depression	32.372	7.209	145.366	<0.001
	Constant	0.589	–	–	0.486

* χ^2=136.293, df=13, Nagelkerke R^2=0.513, p<0.001
† χ^2=52.460, df=13, Nagelkerke R^2=0.339, p<0.001
‡ χ^2=142.785, df=14, Nagelkerke R^2=0.507, p<0.001
¶ χ^2=102.782, df=15, Nagelkerke R^2=0.409, p<0.001
†† χ^2=79.715, df=12, Nagelkerke R^2=0.306, p<0.001

in the level of HRQoL of general population which is consistent with our expectations. This is an important finding because self-rated health is an indicator of population health and measurements of perceived health status are widely used in health surveys (23). Namely, self-rated health may be a powerful predictor of future morbidity and mortality (26) and independent medical, behavioural and psychosocial risk factors (27). Although we did not use the same questionnaire for self-rated health (which is of subjective nature) as some other studies did (18, 28), the HRQoL instrument also reflects subjective reports of persons' own perceptions about their health and is so actually dependent on self-rating, which enables comparison of our results obtained in these studies and gives us also some valuable information about future morbidity in Slovenian population.

The outcomes measurement bears in itself methodological and feasibility problems. Mortality and morbidity data demand long spans of time for useful conclusions to be drawn, so there are not any other easily measurable outcome measures readily available for evaluation of health status apart from HRQoL instruments. So, we must rely on subjective reports of persons' own perceptions regardless of possible bias of subjectivity of the reports and other social, cultural, economical and political influences, which might skew the results. Several generic instruments were developed to make those reports valid and reliable, many of them disease specific (1). One of such generic instruments is EQ-5D questionnaire, which was used in surveys in Western Europe (15, 29) and has been used also in our study. Another problem is sampling and response rate in general population surveys. As general population registers are difficult to obtain for such polls, many studies relay on public phone book registers, which are free for use and provide also direct phone access for computer assisted telephone interviewing (30). As our questionnaire was relatively long and respondents' recall demanding, we decided to do a postal survey thus allowing respondents to take time for considered answering. Response rates in postal surveys are often significantly lower, usually below 50%, like in our case and also in other similar studies (23). This could have produced a sampling bias. A possible source of bias is also self-reporting of chronic conditions and health services utilisation. We should also bear in mind that certain populations that are not registered in a phone book were excluded from the study, which might have affected the representativeness of the sample. According to the available demographic data about Slovenian population there is slightly lower percentage of men (49.5%) (18), the average age (40.3 years) is lower (19) and the education level (4.4% with unfinished primary school, 22.6% with finished primary school, 56.0% with secondary school, 15.7% with university education and 1.3% with postgraduate education) is slightly lower (20).

Our study showed that the HRQoL of the Slovenian inhabitants is lower than the one found in some other European countries. Respondents reported most problems in the pain dimension. The HRQoL is affected by older age, lower education, more frequent usage of health services and the presence of chronic condition. Low HRQoL of Slovenian population is surprising and also worrying. Because we cannot find any firm reasons for this finding, larger and prospective studies are needed to confirm those results and to determine the reasons for that. Nevertheless, the findings of our study point out to the need for the establishment of effective

programs on a national level that would improve HRQoL of the Slovenian population.

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