Factors Associated with Health-Related Quality of Life among University Students

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SUMMARY

Introduction University students are subjected to different kinds of stressors, i.e.academic pressures, social issues and financial problems. This can affect their academic achievements and quality of life.

Objective The aim of this study was to determine the health-related quality of life of university students, and how it is affected by the presence of chronic diseases, mental disorders comorbidity, and patterns of medical services' use.

Methods This web-based study included a sample of 1,410 Slovenian university students. We used a self-administered questionnaire, containing a sheet with demographic data, Zung's self-assessment inventories about anxiety and depression, and EQ-5D questionnaire. The main outcome measures were scores on EQ-5D part and VAS part of the EQ-5D questionnaire.

Results Independent factors associated with the health-related quality of life of university students, were the presence of chronic pain, the presence of depression and anxiety, need for urgent medical help and at least one visit to a clinical specialist in the past year. The independent factors associated with the health status of university students were the presence of chronic diseases, chronic pain, depression and anxiety, a visit to a clinical specialist, a need for urgent medical help and a visit to an emergency unit in the past year.

Conclusion Health-related quality of life of university students can be seriously affected by the presence of mental disorders and chronic pain. Appropriate health-related measures should be adopted to achieve early recognition of worse health-related quality of life, the presence of mental disorders and other chronic conditions, and to enable their effective treatment.

Keywords: quality of life; students; chronic disease; pain; depression; anxiety

INTRODUCTION

University students are a special population group regarding health issues. Their concerns, burdens and worries differ from other population groups [1]. They are subjected to different kinds of stressors, such as academic pressures, social issues and financial problems [2, 3, 4]. As such, they are prone to the development of mental problems, which can affect their academic achievements and quality of life [3, 5, 6].

Studies have shown that young adults differ from older people regarding their perception of health-related quality of life. Namely, young people use psychological and behavioural factors to assess their health, whereas older people regard their physical health to be more important [3, 7]. Mental problems, especially depressive symptoms, were found to be highly prevalent among university students [3, 8, 9, 10]. In addition, depressive symptoms have been shown to be three times as often among adolescents and young adult population than among children and older adults [11, 12]. Moreover, three out of four mental health problems among adults were found to have their onset before age of 24 years [13].

Despite the importance of students' health and the fact that health-related habits formed during younger age are difficult to change later in life, the information about students' health and their health-related lifestyles is scarce [6]. Previous studies have shown that the overall quality of life of university students was good [3, 14, 15]. But, when compared to the overall population of similar age or to their working peers, their health status is relatively poor [6, 16]. Worse health-related quality of life was found among female university students, medical students, final-year students, those with psychosomatic complaints, those who reported more than two visits to a doctor in the last six months, regular smokers, and those living with their parents [3, 15, 17, 18]. The county of birth, physical activity, well-being, self-efficacy, perceived stress, and sense of coherence were also important [3, 15].

OBJECTIVE

The health-related quality of life of students' population in Slovenia has not yet been studied. Therefore, we wanted to determine the overall quality of life of university students. We also focused on the presence of chronic diseases, mental disorders comorbidity, and patterns of medical services' use. We hypothesised that the health-related quality of life would be good, but lower in female students, students with chronic diseases and chronic pain, and in students with mental disorders.

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METHODS

Settings and participants

The study was undertaken at the University of Maribor. At the time of the research approximately 24,200 students were enrolled at 15 different faculties [19]. Out of that, approximately 37% were men [20].

The National Ethics Committee approved the study.

Study design

This was a web-based cross-sectional study. The questionnaire was available at the web address from July 3rd and August 11th 2008. The students were assured about anonymity and confidentiality of their responses.

Demographic data

We collected the following demographic data: sex, age, marital status (single, married, in a relationship, divorced), faculty, year of study, students' status (full-time students, part-time students with full-time job, gappers), and part-time job.

Health status and health-related behaviour

We collected the following data: the presence of chronic diseases (defined as diseases, that last for more than one year), the presence of chronic pain (defined as a pain that lasts for more than one year), the severity of chronic pain in the last two weeks (Visual Analogue Pain Scale – VAS), the use of health services in the past year (house visit from the chosen family doctor, house visit from other family doctors, a need for urgent medical help, a visit to a clinical specialist, hospitalisation, a visit to an emergency medicine department, a use of self-medication, and a visit to a healer, homeopath or chiropractic).

Visual Analogue Pain Scale

Patients marked the level of chronic pain on a 10-point Visual Analog Pain Scale (VAS) [21] ranging from 0 (no pain) to 10 (the worst pain imaginable).

Measures of depression and anxiety

For the assessment of depressive and anxious symptoms we used the Zung's self-rating depression scale [22] and the Zung's self-rating anxiety scale [23]. Each scale consists of 20 depression-related (or anxiety-related) questions. All questions should be answered according to 4 statements (most of the time/always – scored 4, often – scored 3, sometimes – scored 2 and never/rarely – scored 1). The composite score can range from minimal 20 points to maximal 80 points. The depression (or anxiety) is present if the composite score is 50 or more. Both questionnaires were translated from English to Slovene.

EQ-5D questionnaire

The first part of EQ-5D (EQ-5D part) [24] consists of five dimensions (mobility, self-care, usual activity, pain/discomfort, anxiety/depression). For each dimension there are three answers categories (no problem – scored 0/some problems – scored 1/severe problems – scored 2]. The composite score ranges from 0 to 10 points. The second part of EQ-5D (EQ-5D VAS part) [24] is a visual analogue scale, providing the respondents with the option to describe their current overall health status on a thermometer-type scale ranging from 0 (the worst health imaginable) to 100 (the best health imaginable). In this study, we had modified the scale to be more suitable for the web application, so it ranged from 0 (the worst health imaginable) to 10 (the best health imaginable).

Statistical analysis

We used the SPSS 13.0 package (SPSS Inc, Chicago, IL, USA). Descriptive statistics were computed. To identify statistically significant differences between different variables independent samples t-test, one-way ANOVA, and χ^2 test were performed. To identify the presence of significant correlations between continuous variables, linear correlation was performed. Multivariate analysis using linear regression was performed to identify independent factors for health-related quality of life. Variables with statistically significant differences in a univariate analysis were entered. P value<0.05 was considered statistically significant.

RESULTS

Demographic data

1,410 of the students answered the questionnaire, but 816 of the students fully completed it and entered the final analysis. 538 (65.9%) of the respondents were women. The mean±SD of age of the respondents was 22.4±2.5). The majority of them were in a relationship (479; 58.7%), others were single (322; 39.5%), married (13; 1.6%) or divorced (2; 0.2%). 177 of the students (21.7%) were in the first year of study, 204 (25.0%) in the second, 194 (23.8%) in the third, 138 (16.9%) in the fourth, 67 (8.2%) in the fifth, and 36 (4.4%) in the sixth. The majority were full-time students (751; 92.0%), others were part-time students with full-time job (34; 4.2%) or gappers (31; 3.8%). 540 (66.2%) reported having a part-time job.

Health-related quality of life and demographic data

The composite score of EQ-5D part, as answered by the participants, ranged from 0 to 6 points. Mean±SD of scores was 0.9±1.2. The mean±SD scores of EQ-5D VAS part were 7.9±1.5, ranging from 0 to 10.

Sex, year of study, students' status, and part-time job were significantly related to the health-related quality of life (Table 1). Students' age was not significantly correlated either to EQ-5D part (r=0.013; p=0.373) or to EQ-5D VAS part of the EQ-5D questionnaire (r=0.012; p=0.740).

Health-related quality of life and mental diseases

The composite scores of the Zung's depression scale ranged from 20 to 65 points. The mean±SD of scores was 37.8±9.0. Seventy-nine of the students (9.7%) scored positive for the presence of depression. The composite scores of the Zung's anxiety scale ranged from 19 to 65 points. The mean±SD of scores was 33.3±7.3. Twenty-six of the students (3.2%) scored positive for the presence of anxiety. The composite scores of EQ-5D part were significantly correlated with the composite scores of the Zung's depression scale (r=-0.563; p<0.001) and the Zung's anxiety scale (r=-0.590; p<0.001). Similarly, the scores on EQ-5D VAS part were significantly correlated with the composite scores of the Zung's depression scale (r=-0.531; p<0.001) and the Zung's anxiety scale (r=-0.564; p<0.001). The students with depression reported a significantly lower quality of life on both parts of EQ-5D in comparison to those without depression (EQ-5D part: 2.4 (1.7) vs. 0.8 (1.0), p<0.001; EQ-5D VAS part: 6.1 (1.8) vs. 8.1 (1.3), p<0.001). Similarly, the students with anxiety also reported a significantly lower quality of life on both parts of EQ-5D in comparison to those without anxiety (EQ-5D part: 3.0 (1.4) vs. 0.9 (1.1), p<0.001; EQ-5D VAS part: 5.2 (2.7) vs. 8.0 (1.3), p<0.001).

Health-related quality of life and chronic conditions

Chronic pain was present in 265 (32.5%) of the students. Mean score±SD on the VAS scale was 5.2±2.1), ranging from 0 to 10. The students with chronic pain reported a significantly lower quality of life on both parts of the EQ-5D than those without chronic pain (EQ-5D part: 1.6 (1.3) vs. 0.6 (0.9), p<0.001; EQ-5D VAS part: 7.4 (1.6) vs. 8.2 (1.3), p<0.001). The composite scores of both parts of EQ-5D were significantly correlated with scores on VAS pain scale (EQ-5D part: r=-0.270, p<0.001; EQ-5D VAS part: r=-0.122, p=0.048).

At least one chronic disease was present in 213 (26.1%) of the students. The students with chronic diseases reported a significantly lower quality of life on both parts of EQ-5D than those without chronic diseases (EQ-5D part: 1.4 (1.4) vs. 0.8 (1.0), p<0.001; EQ-5D VAS part: 7.4 (1.7) vs. 8.1 (1.3), p<0.001).

Health-related quality of life and the use of health services

Six of the students (0.7%) reported having a house visit from their chosen family doctor in the past year, 17 (2.1%) reported having a house visit from other family doctor, 153 (18.8%) required urgent medical help, 206 (25.2%) reported a visit to a clinical specialist, 81 of them (9.9%) were hospitalised, 290 (35.5%) reported a visit to an emergency department, 489 (59.9%) used self-medication, and 39 (4.8%) reported a visit to a healer, homeopath or chiropractic. The students who required a house visit, urgent medical help or hospitalisation, visited of the clinical specialist, emergency medicine department or an alternative treatment provider or used self-medication in the past year reported a significantly lower quality of life on the both parts of the EQ-5D questionnaire (Table 2).

Multivariate models

The independent factors associated with the score of EQ-5D part were the presence of chronic pain, depression and anxiety, need for urgent medical help and a visit to a clinical specialist in the past year (Table 3). The prediction model explained 30% of the variation. The independent factors associated with the score of EQ-5D VAS part were the presence of chronic diseases, chronic pain, depression and anxiety, a visit to a clinical specialist, a need for urgent medical help and a visit to an emergency unit in the past year (Table 4). The prediction model explained 28% of the variation.

Table 1. Health-related quality of life and demographic data (one-way ANOVA was performed)

Item		EQ-5D part			VAS part		
		Mean	SD	p	Mean	SD	p
Sex	Men	0.7	1.0	<0.001	8.2	1.2	<0.001
	Women	1.1	1.2		7.8	1.6	
Marital status	Married/in relationship	0.9	1.2	0.993	7.9	1.6	0.364
	Single/divorced	0.9	1.1		8.0	1.3	
Year of study	First	1.0	1.2	0.047	8.1	1.4	0.278
	Last	0.7	1.0		8.2	1.3	
Students' status	Full-time/part-time job	0.9	1.1	0.001	8.0	1.4	0.005
	Gappers	1.6	1.5		7.2	1.9	
Part-time job	Yes	1.4	1.4	<0.001	7.4	1.7	<0.001
	No	0.8	1.0		8.1	1.3	

Table 2. Health-related quality of life and the use of health services in the past year (independent t-test was performed)

Item		EQ-5D part			VAS part		
		Mean	SD	p	Mean	SD	p
House visit from the chosen family doctor	Yes	1.5	1.4	0.082	7.3	1.5	0.305
	No	0.9	1.1		7.9	1.5	
House visit from other family doctors	Yes	1.5	1.6	0.030	7.1	1.7	0.018
	No	0.9	1.1		8.0	1.5	
Need for urgent medical help	Yes	1.6	1.4	<0.001	7.2	1.7	<0.001
	No	0.8	1.0		8.1	1.3	
Visit to a clinical specialist	Yes	1.4	1.4	<0.001	7.3	1.7	<0.001
	No	0.8	1.0		8.2	1.3	
Hospitalisation	Yes	1.5	1.5	<0.001	7.4	1.8	0.001
	No	0.9	1.1		8.0	1.4	
Visit to emergency medicine department	Yes	1.1	1.2	0.001	7.5	1.6	<0.001
	No	0.8	1.1		8.2	1.3	
Use of self-medication	Yes	1.1	1.2	<0.001	7.8	1.5	0.002
	No	0.7	1.0		8.1	1.4	
Visit to a healer, homeopath or chiropractic	Yes	1.7	1.4	<0.001	7.3	1.8	0.005
	No	0.9	1.1		8.0	1.4	

Table 3. Multivariate model for the score of EQ-5D part of EQ-5D questionnaire (linear regression was performed)

Factor	B	95% CI		p
		Lower bound	Upper bound	
Female sex	0.097	-0.095	0.288	0.322
First year of study	-0.072	-0.261	0.117	0.454
Students' status (gappers)	-0.112	-0.568	0.344	0.630
Part-time job	-0.180	-0.368	0.008	0.060
Chronic disease	0.123	-0.113	0.359	0.306
Chronic pain	0.516	0.303	0.729	<0.001
Depression	0.980	0.620	1.341	<0.001
Anxiety	1.031	0.448	1.614	0.001
House visit from other family doctors	-0.046	-0.684	0.592	0.888
Need for urgent medical help	0.355	0.082	0.628	0.011
Visit to a clinical specialist	0.267	0.031	0.502	0.027
Hospitalisation	-0.064	-0.419	0.291	0.722
Visit to emergency medicine department	-0.013	-0.226	0.199	0.902
Use of self-medication	0.106	-0.084	0.295	0.273
Visit to a healer, homeopath or chiropractic	0.206	-0.246	0.657	0.372
Constant	0.564	0.065	1.063	0.027

F=13.044; df=15; p<0.001 (the model explained 30% of variation)

Table 4. Multivariate model for the score of EQ-5D VAS part of EQ-5D questionnaire (linear regression was performed)

Factor	B	95% CI		p
		Lower bound	Upper bound	
Female sex	0.114	-0.069	0.297	0.221
Students' status (gappers)	0.018	-0.437	0.472	0.939
Part-time job	0.067	-0.114	0.249	0.466
Chronic disease	-0.256	-0.468	-0.044	0.018
Chronic pain	-0.361	-0.559	-0.163	<0.001
Depression	-1.308	-1.636	-0.981	<0.001
Anxiety	-1.470	-2.011	-0.928	<0.001
Need for urgent medical help	-0.349	-0.605	-0.093	0.008
Visit to a clinical specialist	-0.453	-0.675	-0.230	<0.001
Hospitalisation	0.210	-0.117	0.537	0.208
Visit to emergency medicine department	-0.321	-0.514	-0.128	0.001
Use of self-medication	-0.059	-0.237	0.119	0.516
Visit to a healer, homeopath or chiropractic	0.191	-0.219	0.601	0.360
Constant	8.496	8.012	8.980	<0.001

F=25.847; df=13; p<0.001 (the model explained 28% of variation)

DISCUSSION

The health-related quality of life of university students in Slovenia is good. This finding is consistent with studies from other countries [3, 14, 16]. The prevalence of depression and anxiety found in our study is in line with the findings by some studies [25, 26], but contrasted to others [3, 17, 27]. Since different studies used different measures to assess the presence of mental disorders, the inter-comparison of the results is difficult to be made. The prevalence of chronic conditions among student population in our study is also in line with other studies [6].

Several factors that were previously found to be associated with worse quality of life were also confirmed in this study; female sex, mental disorders, and more frequent use of health-care services [3, 15]. In contrast to the find-

ings of Raj and co-workers [18], the final year students in our study reported better quality of life than the first year students. This can be explained by the fact that Raj and co-workers [18] focused only on the final year medical students, which were also found in other studies to be different from students of other profiles [17, 28, 29]. The students' status and the presence of a part-time job significantly affect the health-related quality of life. Since other studies have also demonstrated a negative effect of stress on the quality of life [3, 26, 29], this finding is not a surprise. Frequent use of health-care services was also previously demonstrated to be connected with a low quality of life [3], which is consistent with our findings.

Some new variables were found to be associated with health-related quality of life of students among which the most important are the presence of chronic disease and chronic pain. Another important factor is also more frequent use of self-medication and self-treatment among

students with worse health-related quality of life. It seems that, on one hand, the health system fails to provide effective health-care for students, which, on the other, results in the worse quality of life of students and drives them to use alternative health-care resources more often.

The use of EQ-5D questionnaire gives us the opportunity to compare two ways of quality of life assessment; more self-independent assessment (EQ-5D part) with the assessment based completely on self-rating of one's own health status (EQ-5D VAS part). Therefore, the highest value of this study is in revealing of independent factors associated with both ways of students' health-related quality of life assessment. The presence of chronic pain, depression and anxiety, need for urgent medical help, and visit to a clinical specialist in the past year are independently associated with worse quality of life in both ways of assessment.

In the multivariate analysis, we failed to demonstrate sex differences in both ways of assessing health-related quality of life. Some previous studies have demonstrated sex differences in relation to the self-rated health status [3, 6, 15, 30]. Although health perceptions are likely to be sex-specific (since sex is associated with many other health outcomes [31], most previous studies have demonstrated these differences only in univariate analysis. Mikolajczyk and co-workers [3] performed both univariate and multivariate analyses; sex differences were found only in the first one, but not in the second one. This is also consistent with the results of our study. These findings further support Mantzavinis and co-workers' [32] recommendations that analyses of self-reported health status should consider interactions among investigated variables.

The association of other important factors with health-related quality of life that can be demonstrated by multivariate analysis only in EQ-5D part is the presence of chronic diseases. It seems that students with chronic diseases do not regard this fact as important in affecting their self-perceived health status, or they regard it as normal living circumstances. Since the results of self-reporting of chronic diseases can be affected by the technique used (open questions or check-lists) [6], these results should be taken into consideration with caution and demand further investigations.

The use of the EQ-5D questionnaire gave us the opportunity to study the effect of those variables which students themselves perceive as important in terms of the health-related quality of life, and are not necessarily connected with the actual health-related quality of life. Namely, medical students, for example, have been shown to have a tendency to value health states higher than the general public [33].

The advantages of this study are a large sample of respondents and the use of reliable and valid measurements in assessing mental disorders and health-related quality of life. The main limitation is the unknown response rate, which can be a source of bias, especially the selection one. A lot of studies using a web-questionnaire have been done, thus showing that internet-based surveys are suitable for research in university students [34, 35]. Also, the sex and age distribution of our sample is similar to the whole population of students ([20], which gives us the possibility to assume that our results reflect the real health situation of Slovenian students.

CONCLUSION

Our study showed that although the health-related quality of life of university students is good, it can be seriously affected by the presence of mental disorders and chronic pain. Doctors, especially family doctors, must be aware of the fact that mental disorders and other chronic conditions also exist in this population. Even though elderly adults present a considerable burden to physicians and to the health system, student population should not be overlooked. Thus, appropriate health-related measures should be adopted to achieve early recognition of worse health-related quality of life, the presence of mental disorders and other chronic conditions, and to enable their effective treatment.

Further research should be focused on the comparison of students' health-related quality of life with the general population to identify the special needs of students regarding health and to develop better health measures to improve students' health.

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Фактори удружени с квалитетом живота студената у односу на њихово здравствено стање

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КРАТАК САДРЖАЈ

Увод Студенти су изложени различитим стресовима, као што су притисак студија, друштвена питања и финансијски проблеми. То све може да утиче на њихове резултате студирања и квалитет живота.

Циљ рада Циљ истраживања је био да се одреди квалитет живота студената у односу на њихово здравствено стање и како на њега утичу хронична обољења, ментални поремећаји, коморбидитети и начин коришћења здравствених услуга.

Методе рада Истраживање засновано на употреби интернета обухватило је узорак од 1.410 студената факултета у Словенији. Коришћен је упитник који је садржавао питања о демографским подацима испитаника, Зунгове (*Zung*) упитнике о самопроцени анксиозности и депресије и *EQ-5D* упитник (упитник емотивне интелигенције). Главни резултати обухватили су укупан збир бодова из *EQ-5D* дела и *VAS* (визуелна аналогна скала бола) дела упитника *EQ-5D*.

Резултати Независни фактори удружени с квалитетом живота студента у односу на њихово здравствено стање обу-хватили су: постојање хроничног бола, постојање депресије и анксиозности, потребу хитне медицинске помоћи и најма-ње један специјалистички преглед на клиници током прет-ходне године. Независни фактори удружени са здравстве-ним стањем студента били су: постојање хроничних обо-љења, хроничних болова, депресије и анксиозности, пре-глед код клиничког специјалисте, потребу хитне медицин-ске помоћи и преглед на одељењу за хитну помоћ током претходне године.

Закључак Квалитет живота студената у односу на њихово здравствено стање може да буде озбиљно угрожен услед менталних поремећаја и хроничних болова. Потребно је да се примене одговарајуће мере здравствене заштите које би омогућиле рано препознавање погоршаног квалитета живота, заступљеност менталних поремећаја и других хронич-них стања, како би се спровело ефикасно лечење студената.

Кључне речи: квалитет живота; студенти; хронично обољење; бол; депресија; анксиозност