

Predictors of health-related quality of life and disability in patients with chronic non-specific low back pain

Napovedni dejavniki z zdravjem povezane kakovosti življenja pri bolnikih s kronično nespecifično bolečino v križu

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Izvleček

Izhodišča: Bolniki s kronično bolečino v križu imajo glede na splošno populacijo slabšo kakovost življenja. Kronična bolečina v križu namreč resno prizadene funkcionalno in delovno sposobnost bolnikov vseh starosti. Z raziskavo smo želeli določiti raven oviranosti in z zdravjem povezano kakovost življenja pri bolnikih s kronično nespecifično bolečino v križu.

Metode: Izvedli smo presečno raziskavo na 187 bolnikih (45,5 % moških, povprečna starost 50,1 leta) s kronično nespecifično bolečino v križu, ki so se udeležili fizioterapevtskega programa. Uporabili smo vizualno analogno lestvico za ocenjevanje jakosti bolečine (VAS), vprašalnik Euroqol (EQq) in vprašalnik Oswestry Disability Index (ODI).

Rezultati: Povprečna vrednost indeksa po lestvici ODI je bila $14,6 \pm 9,0$ točk, po vprašalniku EQ-5D $3,6 \pm 1,6$ točk in $55,4 \pm 18,3$ točk po vprašalniku EQ-VAS. Povprečna vrednost ocene s pomočjo VAS je bila $6,0 \pm 2,1$ točke. Neodvisni dejavnik, ki vpliva na nižjo kakovost življenja po oceni EQ-VAS, je višja jakost kronične bolečine. Neodvisni dejavniki, povezani z nižjo kakovostjo življenja po vprašalniku EQ-5D, so bili znaki depresije oz. anksioznosti, višja jakost bolečine in prisotnost kroničnih bolezni. Neodvisni dejavniki, povezani z višjo oviranostjo po vprašalniku ODI, so bili znaki depresije oz. anksioznosti, višja jakost kronične bolečine in prisotnost drugih kroničnih bolezni.

Zaključki: Kronična bolečina v križu je pogosto vzrok večje oviranosti in nižje kakovosti življenja, še posebej pri bolnikih s sočasnimi somatskimi in z duševnimi boleznimi, pri ženskah in pri bolnikih z višjo jakostjo kronične bolečine. Potrebno je, da se zdravniki osredotočijo na aktivno iskanje simptomov in znakov depresije oz. anksioznosti pri svojih bolnikih in več pozornosti namenijo učinkovitejšemu zdravljenju kronične bolečine, še posebej pri bolnikih, ki imajo tudi druge bolezni.

Abstract

Background: The quality of life in patients with chronic low-back pain is lower in comparison with that in general population. This seriously affects the functional ability and working status of young and adult population. The aim of this study was to determine the level of disability and the health-related quality of life in patients with chronic non-specific low back pain.

Methods: We performed a cross-sectional study in 187 patients (45,5 % of men, mean age 50.1 years) with chronic non-specific low back pain attending physical therapy program. We used Visual Analog Pain Scale (VAS), Euroqol questionnaire (EQq), and Oswestry Disability Index (ODI).

Results: Mean ODI score \pm SD was 14.6 ± 9.0 . Mean score of EQ-5D was 3.6 ± 1.6 points and of EQ-VAS 55.4 ± 18.3 points. Mean score on VAS was 6.0 ± 2.1 points. An independent factor associated with lower quality of life on EQ-VAS was higher level of chronic pain. Independent factors associated with a lower quality of life on EQ-5D were the presence of anxiety and depression, higher level of chronic pain, and the presence of chronic disease. Independent factors associated with greater disability measured on ODI were the presence of signs of anxiety and depression, higher level of chronic pain, and the presence of any chronic disease.

Conclusions: Chronic low back pain can be the cause of greater disability and lower quality of life, especially in patients with somatic and mental co-morbidities, in female patients and in patients with higher levels of chronic pain. Doctors should focus on active search for signs of depression and anxiety and better pain management in patients with chronic low back pain, especially if somatic co-morbidities exist.

Table 1: Demographic and clinical characteristics of patients.

Characteristic	Number (%) of patients
Gender	
Male	85 (45.5)
Female	102 (54.5)
Education	
Primary	38 (20.3)
Secondary	114 (61.0)
University	26 (13.9)
No answer	9 (4.8)
Employment status	
Employed	131 (70.1)
Unemployed	7 (3.7)
Retired	49 (26.2)
Sick leave	
Yes	71 (38.0)
No	114 (61.0)
Physical activity	
Not at all	55 (29.4)
From time to time	79 (42.2)
Often	37 (19.8)
Every day	14 (7.5)
No answer	2 (1.1)
Chronic disease	
Yes	85 (45.5)
No	101 (54.0)
No answer	1 (0.5)
Anxiety and depression	
Yes	87 (46.5)
No	81 (43.3)
No answer	19 (10.2)

Introduction

Chronic low back pain is a common medical and social problem, as its one-year prevalence in a general population is estimated at 44%.¹ The quality of life in patients with chronic low back pain is lower in comparison with general population^{2,3,4} and even in comparison with the quality of life in patients with other chronic diseases (e.g. hypertension, diabetes, asthma).^{5,6} This seriously affects the functional ability and working status of young and adult population.^{7,8}

While the main problem affecting quality of life and disability in patients with acute low back pain is the intensity of pain itself, in patients with chronic low back pain individual, psychosocial and work related factors are more important.^{9,10} Due to these factors chronic low back pain is correlated to a real disability, which can affect the quality

of life of patients.¹¹ Recent study has shown that disability and quality of life do not share a simple linear correlation.¹²

In general, disability of patients with chronic low back pain is predicted by pain duration, and the quality of life of such patients is predicted by disability.¹³ Functional status, as well as psychological factors, seems to determine the health-related quality of life.¹⁴ Previous studies have shown that the quality of life of patients with low back pain is affected by female sex,^{4,12,15} growing age,¹⁵ occupation, physical and emotional stress^{15,16} and level of pain.¹⁷

To date, there are no data on the quality of life and disability of patients with chronic low back pain in Slovenia. Quality of life was assessed only in a sample of family practice patients.¹⁸ Also, Slovenian family doctors take a very varied approach to the management of such patients.¹⁹ Obviously, there is a need for the establishment of evidence-based guidelines for the management of low back pain. Since often no correlation exists between self-reported and actual disability of patients with chronic low back pain,¹² but a success in management of such patients largely depends on the improvement of patients' perceptions rather than on the improvement of clinical signs,²⁰ it is crucial that disability and quality of life and factors associated with them are known. So, the aim of this study was to determine the level of disability and the health-related quality of life and important factors in Slovenian patients with chronic non-specific low back pain. Furthermore, we also wanted to determine a possible correlation between disability and quality of life.

Patients and methods

Type of study

We performed a cross-sectional study in a population of patients with low back pain that were attending physical therapy program at the physical therapy department of Topolsica health resort, which is one of the several providers of physical therapy in the northeast region of Slovenia. The study was approved by the National Ethics Committee.

Table 2: Multivariate analysis for lower quality of life according to EQ-VAS^a.

Dependent variable	Independent variable	B	S.E. (B)	p
EQ-VAS ^b score	Female gender	0.829	2.844	0.771
	Sick leave	4.847	2.815	0.087
	Higher VAS ^c score	3.394	0.735	<0.001
	Anxiety and depression	4.917	2.857	0.088

^a Model $F = 9.013$, $R^2 = 0.216$, $p < 0.001$

^b EuroQol visual analog scale

^c Visual analog pain scale

Study population

We included consecutive adult patients (18 years old or older) that were admitted to physical therapy in the period from 1 March 2008 to 28 February 2009. We excluded patients with low back pain that lasted for less than 12 weeks, patients with underlying pathology of chronic back pain (infection, tumor, osteoporosis, rheumatoid arthritis, fracture, inflammation, previous vertebral surgery, intervertebral disc herniation), and patients who refused participation in the study.

Data collection

The doctor at the department of physical therapy gave a questionnaire to all eligible patients before the beginning of the physical therapy program. The questionnaire consisted of visual analog pain scale (VAS),²¹ EuroQol questionnaire,²² Oswestry Disability Index 2.0 (ODI),²³ Duke anxiety-depression scale (Duke-AD),²⁴ and a sheet with the following demographic and clinical data: gender, age, education (primary, secondary, university), employment status (employed, unemployed, retired), physical activity (not at all, from time to time, often, every day), body mass index (BMI), the duration of low back pain (in months), whether a patient is on sick leave, and the presence of chronic disease (self-reported as a disease that lasted for 12 months or more).

VAS is a 10-point scale for marking the level of pain, ranging from 1 (no pain) to 10 (worst pain imaginable).²¹ EuroQol questionnaire is a wide accepted questionnaire for health-related quality of life and consists of two components. Its first component (EQ-

5D) consists of five dimensions (mobility, self-care, usual activity, pain/discomfort, and anxiety/depression). For each dimension there are three answer categories (no problem – scored 0; moderate problems – scored 1; extreme problems – scored 2). The composite score ranges from 0 to 10 points. Its second component is a visual analogue scale (EQ-VAS), 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).²² ODI consists of 10 items: pain intensity, personal care, lifting, walking, sitting, standing, sleeping, sex life, social life, and traveling. One of six answers can be applied to each item (from 0 to 5 points, with a total score of minimum 0 to maximum 50 points). A disability level can be calculated from the total score of the questionnaire: minimal disability, moderate disability, severe disability, crippled, and bedridden or exaggerating.²³ Duke-AD is a brief self-administered scale for the detection of the presence of anxiety and depression. It consists of 7 questions about health and feelings, which are scored from 0 to 2 points. A total score of 5 points or more out of 14 indicates the presence of anxiety and depression.²⁴

Statistical analysis

We used SPSS 13.0 (SPSS Inc., Chicago, IL, USA). We calculated the descriptive statistics. In the univariate analysis we used independent sample t-test, χ^2 test and linear correlation. In the multivariate analysis we used linear regression. We entered the variables that showed statistical difference in

Table 3: Multivariate analysis for lower quality of life on EQ-5D^a.

Dependent variable	Independent variable	B	S.E. (B)	p
EQ-5D ^b score	Female gender	0.018	0.212	0.932
	Primary education	0.307	0.252	0.225
	Higher VAS ^c score	0.314	0.053	<0.001
	Anxiety and depression	1.183	0.204	<0.001
	Chronic disease	0.403	0.198	0.044

^a Model $F=19.274$, $R^2=0.409$, $p<0.001$

^b 5-dimension EuroQol

^c Visual analog pain scale

univariate analysis at $p < 0.1$. For other statistical tests the statistical significance was set at $p < 0.05$. For the cut point in continuous variables to dichotomize the variables we used median values of the variables. A score for disability on ODI was calculated on the basis of the following equation: total score/50x100. The result was given in percentages, with minimum 0% and maximum 100%. The disability scores of 0% to 20% were rated as minimal disability, scores from 21% to 40% as moderate disability, scores from 41% to 60% as severe disability, scores from 61% to 80% as crippled, and scores from 81% to 100% as disability when patients were bedridden or exaggerating the symptoms.²³

Results

Demographic and clinical characteristics of the patients

In the study period, 858 patients with low back pain were admitted to our out-patient department for physical therapy and 671 (78.2%) of them did not meet the inclusion criteria. In a final study sample we included 187 (21.8%) patients, out of whom 85 (45.5%) were men (Table 1). Mean age \pm SD of the patients was 50.1 ± 10.1 years (minimum 24, maximum 77), mean BMI was 27.3 ± 4.7 kg/m² (minimum 18, maximum 48) and mean duration of musculoskeletal pain was 119.3 ± 107.5 months (minimum 3, maximum 480). Mean score on VAS was 6.0 ± 2.1 points (minimum 0, maximum 10) and of Duke-AD scale 4.9 ± 2.6 points (minimum 0, maximum 12) (Table 1).

Disability

Cronbach's α of ODI was 0.890. Mean ODI score was 14.6 ± 9.0 (minimum 0, maximum 41). Mean ODI disability score was 29.2 ± 18.0 points (minimum 0, maximum 82). According to the disability, patients were assigned to 5 groups: minimal disability (67, 35.8%), moderate disability (53, 28.3%), severe disability (38, 20.3%), confined to their home (7, 3.7%), and bedridden (1, 0.5%). Missing data was observed in 21 (11.2%) patients. Biggest problems were reported in the following ODI items: lifting (2.5 ± 1.6), pain intensity (2.3 ± 1.6) and sitting (2.2 ± 1.1).

Quality of life

Cronbach's α of EQ-5D was 0.676. Mean score of EQ-5D was 3.6 ± 1.6 points (minimum 0, maximum 8), and of EQ-VAS 55.4 ± 18.3 points (minimum 10, maximum 100). No problems on any of EQ-5D dimension were reported by 6 (3.2%) of patients, a moderate problem on at least one dimension was reported by 174 (93.3%) of patients. Biggest problems were reported in the following EQ-5D items: usual activity (1.1 ± 0.5), pain and discomfort (0.9 ± 0.5) and mobility (0.7 ± 0.5).

Univariate analysis

The correlation of ODI with VAS scale, EQ-5D, and EQ-VAS was good ($r = 0.612$, $p < 0.001$; $r = 0.711$, $p < 0.001$; $r = -0.514$, $p < 0.001$, respectively). Men reported better quality of life than women on EQ-5D (3.3 ± 1.5 vs. 3.8 ± 1.8 , $p = 0.036$), on EQ-

Table 4: Multivariate analysis for greater disability on ODI^a.

Dependent variable	Independent variable	B	S.E. (B)	p
ODI ^b score	Female gender	1.884	1.248	0.133
	Primary education	2.273	1.506	0.134
	Higher VAS ^c score	2.460	0.312	< 0.001
	Anxiety and depression	2.793	1.200	0.021
	Chronic disease	3.303	0.184	0.006

^a Model $F=20.854$, $R^2=0.441$, $p<0.001$

^b Oswestry disability index

^c Visual analog pain scale

VAS (58.4 ± 15.4 vs. 52.5 ± 20.5 , $p = 0.041$), and lower disability on ODI (11.9 ± 8.2 vs. 16.8 ± 9.0 , $p < 0.001$). Patients with primary education in comparison with others reported lower quality of life on EQ-5D (4.3 ± 1.7 vs. 3.4 ± 1.6 , $p = 0.002$) and greater disability on ODI (19.2 ± 10.4 vs. 13.4 ± 8.3 , $p = 0.001$). Patients with chronic disease in comparison with those without chronic disease reported lower quality of life on EQ-5D (3.9 ± 1.6 vs. 3.3 ± 1.6 , $p = 0.017$) and greater disability on ODI (16.2 ± 8.9 vs. 13.3 ± 8.9 , $p = 0.034$). Patients with signs of anxiety and depression, compared to those without them, reported lower quality of life on EQ-5D (4.2 ± 1.4 vs. 2.7 ± 1.4 , $p = 0.001$), on EQ-VAS (51.4 ± 17.4 vs. 61.4 ± 16.9 , $p < 0.001$), and a greater disability on ODI (17.0 ± 9.1 vs. 11.3 ± 7.8 , $p < 0.001$). Patients that reported no physical activity at all had lower quality of life on EQ-5D (3.8 ± 1.7 vs. 3.0 ± 1.4 , $p = 0.006$) and greater disability on ODI (15.4 ± 9.6 vs. 12.6 ± 7.2 , $p = 0.043$). Patients' age, employment status, body mass index and duration of pain had no effect on disability or quality of life.

Multivariate analysis

Independent factor, associated with lower quality of life on EQ-VAS was higher level of chronic pain (Table 2). Independent factors associated with a lower quality of life on EQ-5D were the presence of anxiety and depression, higher level of chronic pain, and the presence of chronic disease (Table 3). Independent factors associated with greater disability measured on ODI were the presence of signs of anxiety and depression,

higher level of chronic pain, and the presence of any chronic disease (Table 4).

Discussion

Our study showed that one fifth of the patients with chronic non-specific low back pain had severe disability. Also, the majority of the patients had moderate problems on at least one aspect of health-related quality of life. Quality of life and the level of disability were affected by higher musculoskeletal pain intensity, the presence of signs of anxiety and depression and the presence of other somatic chronic diseases.

In Slovenia, the level of disability of chronic low back pain patients or of other populations has not been determined yet. But the level of disability found in our study is comparable with other studies.^{17,25,26} Also, the most difficult items of ODI reported in our study, had been reported in other studies.^{25,26} The quality of life of patients with chronic low back pain in Slovenia has also not been evaluated. But in one study about the quality of life of patients in general practice in Slovenia 73 % of patients reported a moderate problem on at least one EQ-5D dimension and 15 % of patients reported no problems at all.¹⁸ In our study, only 3.2 % of patients reported no problems at all and as many as 93.3 % patients reported a moderate problem on at least one dimension of EQ-5D. This indicates that patients with chronic non-specific low back pain have lower quality of life than the general population that visits family doctors in Slovenia, which is also in concordance with other studies.^{4,15,16,27} The effect of female gender,

pain intensity, anxiety and depression and chronic co-morbidities on the quality of life and disability of patients with low back pain, which was found in our study, had also been found in other studies.^{4,9,15,16,28} Our study confirmed that we should not underestimate the effect of mental diseases on pain intensity, disability and quality of life of chronic low back pain patients. Lifetime depression was found to be an independent risk factor for the patients who experience first episode of low back pain.²⁹ Depression also worsens the prognosis of low back pain and is poorly recognized and treated in those patients.³⁰ Also, a correlation between depression, low back pain and disability exists.²⁹ It is though very important that each patient with chronic low back pain is evaluated for the presence of anxiety and depression. Because depression also correlates with some other chronic diseases,^{31,32} doctors should focus specially on patients with chronic low back pain with co-morbidities.

Our study confirmed the findings of other studies^{13,14} that the parameters defining the quality of life of patients with chronic low back pain are a combination of physical and psychological ones. When faced with the management of such patients, doctors should bear this in mind.

The strengths of our study are a large sample and the use of reliable and valid questionnaires. Also, age and gender of the patients are comparable to those found in a national sample of family practice attendees.³³ This study has also several limitations. We did not have a control group with patients without chronic low back pain, which affects the comparability of data. Another limitation is the inclusion of patients from only one department of physical therapy, which might contribute to a selection bias. Further studies should evaluate disability and quality of life in larger representative samples with the inclusion of control group.

Conclusions

Our study has shown that disability and quality of life as self-reported by patients with chronic low back pain correlate with each other. If we take into account the re-

sults of previous studies showing that clinically evaluated disability and self-reported quality of life did not share a simple linear correlation,¹² we can speculate that there is no simple correlation between clinical signs of disability and self-reported disability in those patients. So, each patient should be evaluated through disability scales without leaving aside doctor's personal clinical experience and literature guidelines.¹² Our study also showed that chronic low back pain could be the cause of greater disability and lower quality of life, especially in patients with somatic and mental co-morbidities, in female patients and in patients with higher levels of chronic pain. Doctors should focus on active search for signs of depression and anxiety and better pain management in patients with chronic low back pain, especially in the presence of somatic co-morbidities. This can importantly lower self-reported disability and improve quality of life, which can be expected to improve management of those patients.

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