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Original research article

Quality of life of patients with chronic lower back pain

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Abstract
Introduction: Chronic pain has become a common problem in primary care and can negatively impact the lives of patients.
Objective: To evaluate and investigate the impact of chronic lower back pain on patients' quality of life (QoL) using quantitative and qualitative data.
Methods: A standardized SF-36 quality of life questionnaire was used. The group included 161 respondents aged 18 and over, with chronic lower back pain, lasting at least 6 months, with a diagnosis of lumbosciatica radicular syndrome. The average age of the respondents was 49.8 years.
Results: The RP (Role Physical) and DZ (change in health) had the lowest average score. The values of the individual domains of the sexes are comparable. The most significant difference is in the Physical Functioning domain, which was rated higher by women (W; d = 62.9; M; d = 52.3). All domains have significant correlations with age ($p < 0.001$), with the exception of VT – vitality, and MH – mental health. The statistical significance was also determined between Seniority (Employment) and RP – physical restrictions, Bodily Pain and Physical Component Summary. They worsen with seniority. All domain scores correlate with employment. A strong statistical relationship between Physical Component Summary and Mental Component Summary was demonstrated.
Conclusions: The results show that the quality of life of patients with chronic lower back pain decreases significantly with age. Seniority deepens physical restrictions (Role Physical) and worsens Bodily Pain as well as Physical Component Summary.

Keywords: Chronic back pain; Quality of life; SF-36

Introduction

Chronic non-specific lower back pain syndrome is a serious health problem in developed countries. It occurs in high-, middle-, and low-income countries, and in all age groups from children to the elderly population. Globally, the number of years lived with disability due to lower back pain has increased by 54%, mainly due to population growth and ageing, with the largest increase in low- and middle-income countries. Lower back pain is now the leading cause of disability worldwide (Hartvigsen et al., 2018).

In the case of acute pain, it lasts up to 6 weeks, in the case of subacute lumbosacral pain, it lasts from 6 to 12 weeks. Chronic pain lasts longer than 12 weeks. In the case of a non-specific diagnosis of back pain, it is possible to define a clear cause in only 15% of cases (Járomi et al., 2021).

Chronic pain, such as lower back pain, can be a significantly disabling condition that impairs people's quality of life (Alemanno et al., 2019). It is common for middle-aged and older adults to suffer the consequences in relation to functional ability and quality of life. It is associated with impaired physical functioning, a higher level of subclinical anxiety and depression, along with an increased risk of clinically relevant affective and anxiety disorders (Wettstein et al., 2019).

Measuring the quality of life is among the elements that serve to subjectively evaluate the state of health and can significantly help in the effective introduction of individualized health care. It allows us to determine and, to a large extent, evaluate the social aspects of the quality of life, and to reveal indicators of the patient's motivation (Bártlová et al., 2020). According to Calvert et al. (2013), subjective assessment of the extent of dysfunction and its impact on the patient's life is essential. In the case of chronic diseases, the assessment of the quality of life becomes one of the decisive factors when making fundamental strategic decisions about treatment, the overall approach to a specific patient, and the entire nosological unit (Kalová et al., 2005).

Chronic lower back pain (CLBP) affects nearly 20–25% of the population over 65 years of age. It is currently the leading cause of disability in both developed and developing countries. It is important to achieve optimal treatment of this condition in elderly patients to improve their quality of life (Vadalà et al., 2020).

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Objective: To investigate and evaluate the impact of chronic back pain on patients' quality of life using quantitative and qualitative data. The scores are important to examine different areas of patient satisfaction and quality of life. A critical assessment of these results is essential to improving our understanding of the impact of chronic lower back pain on patient well-being and quality of life.

Materials and methods

The study was focused on determining, evaluating, and comparing the level of quality of life of patients depending on sex, age, seniority, and BMI, in the context of chronic pain experienced.

A standardized generic Short Form 36 Health subject Questionnaire (SF-36) was used. The global assessment of the SF-36v2 questionnaire consists of two indices. The PCS (Physical Component Summary) is a measure of quality of life related to physical health, and the MCS (Mental Component Summary) gives information about quality of life related to mental health (Hawker et al., 2011). This questionnaire is a frequently used tool for assessing the quality of life in patients in various branches of medicine. It evaluates 8 basic qualities of health:

PCS – Physical Component Summary:
- Physical functioning (PF – Physical Functioning)
- Physical restrictions (RP – Role Physical)
- Bodily pain (BP – Bodily Pain)
- General health (GH – General Health)

MCS – Mental Component Summary:
- Vitality (VT – Vitality)
- Social functioning (SF – Social Functioning)
- Emotional problems (RE – Role Emotional)
- Mental health (MH – Mental Health)

The questionnaire contains one item that does not belong to any dimension. It evaluates the current health status compared to the health status one year ago (referred to as 'dZ').

The respondent has a choice of several answer options and each answer is assigned a point value. The total score in each item ranges from 0 to 100; the higher the score, the higher the quality of life. If the score is under 50, the respondent falls below the general population norm set by the questionnaire (Hawker et al., 2011).

Conditions for inclusion in the study group were chronic lower back pain that lasted at least 6 months ¬– with a diagnosis of lumbosciatica radicular syndrome. 161 respondents aged 18 or over were included in the group, regardless of sex and social status. Since the variability in the treatment of patients with chronic lower back pain is extensive, we did not investigate the method of treatment in the included respondents. The average age of the respondents was 49.8 years. The collection of input data was carried out at neurological clinics in the Banská Bystrica self-governing region. Due to the places where the respondents were approached, the use of a standardized tool, their voluntary involvement in the research and the absolute exclusion of personal data about patients or their health care, the approval of the ethics commissions of individual medical facilities was not requested. The research was carried out in 2021 and 2022. Statistical procedures were used to analyze the results.

Results

Descriptive statistics of all domains can be found in Tables 1 and 2.

Table 1 provides an overview of the assessment of individual domains of the SF-36 questionnaire for the entire group of respondents. The lowest average scores were obtained in the domains of RP – physical restrictions, and DZ – change in health.

Table 1. The assessment of domains for the entire group

ALL	*N*	D	SD	Median	Min	Max
AGE	161	49.8	14.6	51.0	18.0	90.0
BMI	161	26.1	4.8	25.7	16.3	50.5
SENIORITY	141	21.4	13.0	20.0	0.0	49.0
PF	161	59.1	28.8	60.0	0.0	100.0
RP	161	28.7	39.3	0.0	0.0	100.0
RE	161	56.3	45.6	67.0	0.0	100.0
VT	161	47.5	21.0	50.0	0.0	100.0
MH	161	63.7	18.3	64.0	8.0	100.0
SF	161	57.7	25.0	50.0	0.0	100.0
BP	161	48.0	24.7	45.0	0.0	100.0
GH	161	48.4	17.6	50.0	5.0	90.0
DZ	161	37.6	25.5	25.0	0.0	100.0
PCS	161	46.1	22.6	41.3	9.5	96.3
MCS	161	56.3	22.1	57.3	7.0	100.0

Notes: N – number; D – mean; SD – standard deviation; Min, Max – minimum and maximum in the group; PF – physical functioning; RP – physical restrictions; RE – restriction due to emotional problems; VT – vitality; MH – general mental health; SF – social functioning; BP – bodily pain; GH – general perception of health; DZ – change in health; PCS – Physical Component Summary; MCS – Mental Component Summary.

Table 2 shows a comparison of domain assessment results by sex. There were more women than men. The values of the individual domains of the sexes are comparable. The most significant difference is in the Physical Functioning (PF) domain, which was rated higher by women.

Table 3 shows the test results of Spearman's correlation coefficient [$r(S)$] and the corresponding probability value (p). All domains have significant correlations with age, apart from VT – vitality, and MH – mental health. The obtained values show that the quality of life of patients with chronic lower back pain decreases significantly with age. Correlations between individual domain scores and sex were not demonstrated.

Table 4 shows the results of the correlation analysis of the impact of employment and seniority on domain values with the non-parametric Spearman correlation coefficient [$r(S)$] and the corresponding probability value (p). There are significant correlations with seniority in the domains RF – physical restrictions, BP – bodily pain, and PCS – physical component summary, which worsen with seniority. All domain scores correlate with employment.

Table 2. Comparison of domain assessment results by sex

	WOMEN						MEN					
	N	D	SD	Median	Min	Max	*N*	D	SD	Median	Min	Max
AGE	103	49.1	14.7	49.0	18.0	90.0	58	51.0	14.3	52.5	20.0	79.0
BMI	103	25.3	4.4	25.0	16.3	39.1	58	27.6	5.2	26.5	19.0	50.5
SENIORITY	93	20.8	12.9	20.0	0.5	49.0	48	22.5	13.3	24.5	0.0	43.0
PF	103	62.9	26.0	65.0	0.0	100.0	58	52.3	32.3	50.0	0.0	100.0
RP	103	30.1	39.2	0.0	0.0	100.0	58	26.3	39.6	0.0	0.0	100.0
RE	103	58.9	43.9	67.0	0.0	100.0	58	51.7	48.4	50.0	0.0	100.0
VT	103	46.3	21.6	50.0	0.0	100.0	58	49.6	20.1	50.0	5.0	85.0
MH	103	63.7	18.7	64.0	8.0	100.0	58	63.6	17.7	64.0	16.0	96.0
SF	103	57.3	25.1	50.0	0.0	100.0	58	58.4	24.9	63.0	0.0	100.0
BP	103	47.9	23.4	45.0	0.0	100.0	58	48.3	27.0	45.0	10.0	100.0
GH	103	48.4	17.4	50.0	5.0	90.0	58	48.5	18.1	45.0	20.0	85.0
DZ	103	38.6	24.9	25.0	0.0	100.0	58	35.8	26.5	25.0	0.0	100.0
PCS	103	47.3	21.6	43.8	9.5	96.3	58	43.9	24.4	36.9	10.0	92.5
MCS	103	56.5	21.5	56.0	7.0	100.0	58	55.8	23.2	59.6	10.0	93.3

Notes: N – number; D – mean; SD – standard deviation; Min, Max – minimum and maximum in the group; PF – physical functioning; RP – physical restrictions; RE – restriction due to emotional problems; VT – vitality; MH – general mental health; SF – social functioning; BP – bodily pain; GH – general perception of health; DZ – change in health; PCS – Physical Component Summary; MCS – Mental Component Summary.

Table 3. Statistical expression of the relationship between age and sex and individual domains

AGE	*N*	*r*(S)	*p*(R)	SEX	Z_{ADJ}	*p*(M–W)
PF	161	–0.245	**0.002**	PF	1.947	0.052
RP	161	–0.251	**0.001**	RP	0.950	0.342
RE	161	–0.235	**0.003**	RE	0.932	0.351
VT	161	–0.026	0.743	VT	–0.851	0.395
MH	161	–0.114	0.151	MH	0.132	0.895
SF	161	–0.206	**0.009**	SF	–0.289	0.773
BP	161	–0.231	**0.003**	BP	0.388	0.698
GH	161	–0.270	**0.001**	GH	0.219	0.827
DZ	161	–0.184	**0.019**	DZ	0.658	0.510
PCS	161	–0.309	**0.000**	PCS	1.382	0.167
MCS	161	–0.208	**0.008**	MCS	0.113	0.910

Notes: N – number; *r*(S) – Spearman's correlation coefficient; test statistics (Z_{ADJ}) α = 0.0; statistical values *p*(M–W) Mann–Whitney.

Table 4. Statistical expression of the relationship between seniority and employment and individual domains

SENIORITY	*N*	*r*(S)	*p*(R)	EMPLOYMENT	H	*p*(K–W)
PF	141	–0.119	0.160	PF	18.272	**0.001**
RP	141	–0.185	0.028	RP	11.532	**0.021**
RE	141	–0.115	0.174	RE	18.972	**0.001**
VT	141	0.139	0.101	VT	10.761	**0.029**
MH	141	0.040	0.640	MH	11.435	**0.022**
SF	141	–0.139	0.101	SF	10.310	**0.036**
BP	141	–0.207	**0.014**	BP	8.774	**0.067**
GH	141	–0.095	0.261	GH	21.173	**0.000**
DZ	141	–0.068	0.423	DZ	10.257	**0.036**
PCS	141	–0.190	**0.024**	PCS	19.940	**0.001**
MCS	141	–0.058	0.492	MCS	17.172	**0.002**

Notes: N – number; *r*(S) – Spearman's correlation coefficient; *p* – statistical significance; H – statistical values *p*(K–W) Kruskal–Wallis.

Correlations between individual domain scores and respondents' BMI were not demonstrated (Table 5).

Table 5. Statistical expression of the relationship between BMI and individual domains

BMI	H	*p*(K–W)
PF	3.795	0.150
RP	4.799	0.091
RE	0.114	0.945
VT	0.468	0.792
MH	0.395	0.821
SF	4.169	0.124
BP	3.740	0.154
GH	4.196	0.123
DZ	0.820	0.664
PCS	5.023	0.081
MCS	0.354	0.838

The results show a significant statistical correlation between individual domains and Physical Component Summary and Mental Component Summary (Tables 6 and 7).

Table 6. Statistical expression of the relationship between PCS and MCS and individual domains

PSC vs MCS	*n*	*r*(S)	*p*(R)	*n*	*r*(S)	*p*(R)
PF	161	0.857	0.00 0	161	0.481	0.000
RP	161	0.823	0.000	161	0.507	0.000
RE	161	0.479	0.000	161	0.851	0.000
VT	161	0.473	0.000	161	0.734	0.000
MH	161	0.415	0.000	161	0.781	0.000
SF	161	0.717	0.000	161	0.779	0.000
BP	161	0.829	0.000	161	0.579	0.000
GH	161	0.689	0.000	161	0.538	0.000
DZ	161	0.400	0.000	161	0.333	0.000

Table 7. Statistical expression of the relationship between PCS and MCS

MSC vs PCS	*n*	*r*(S)	*p*(R)
	161	0.638	0.000

Discussion

The results of our quality of life assessment show that patients with chronic back pain report a lower quality of the physical component of life than mental component of life. The Mental Component Summary (MCS) is slightly above the general population norm. The Physical Component Summary (PCS) is below the general population norm (Table 1). Comparable evaluation results were also reported by Járomi et al. (2021). The results of their quality of life assessment were significantly lower than the normal values of a healthy population, with the exception of the Social Functioning (SF) dimension, which, although lagging behind the average value of a healthy population by a few points, was not significantly different. Indeed, studies have shown that chronic pain can affect various cognitive functions, such as attention, verbal memory, and executive functions (Alemanno et al., 2019).

According to available study results, chronic lower back pain syndrome increases linearly from the third decade of life, and affects more women than men (Meucci et al., 2015). Studies do not indicate the reason for it.

In our group of respondents, there were more women than men (Table 2). The values of the individual domains of the sexes are comparable (Table 2). The scores are not significantly dependent on the sex of respondents (Table 3). Almost all domains, apart from Vitality and Mental Health, are statistically significantly affected by the age of the respondents (Table 3).

According to Járomi et al. (2021), the prevalence of chronic lower back pain syndrome is also strongly associated with socio-demographic determinants; primarily with age, as it is the most characteristic musculoskeletal disorder in middle-aged adults. According to the above- mentioned authors, women are more often affected, as well as people with sedentary occupations, or those who perform heavy physical work that includes lifting heavy loads. Employment significantly affected the quality of life of our respondents in all domains, while seniority demonstrably negatively affected the domains of Bodily Pain (BP), Role Physical (RP), and Physical Component Summary (PCS) (Table 4). The authors also identify obesity as a risk factor for the syndrome (Járomi et al., 2021). However, this was not confirmed as a risk factor in our research (Table 5). According to Hartvigsen et al. (2018), people with physically demanding work, physical and mental comorbidities, smokers, and obese individuals are most at risk of lower back pain. According to Wettstein et al. (2019), treating the pain can be more difficult with advancing age due to further age-related loss of physical, sensory, and other resources, leading to higher disability and lower quality of life. Alternatively, older patients may feel less impaired and report a higher quality of life than younger patients because chronic pain is more expected in old age. The results of a study by Wettstein et al. (2019) show that although disability in patients with chronic lower back pain increases with age, quality of life indicators are the same or even higher in older patients. Also, according to Bártlová et al. (2020), the occurrence of chronic diseases is associated with an older population. Using the SF-36 questionnaire, they reached the same conclusion that the assessment of quality of life in the domain of General Health decreases with age. A long-term clinical development of chronic pain and the state of health affect the quality of life in all dimensions. The results obtained show a significant statistical dependence between the mental and physical component summaries and all domains that form the respondents' quality of life (Table 6). People with lower back pain often experience concurrent pain elsewhere in the body, as well as more general physical and mental health problems. Pain processing mechanisms activate psychological, social, and biophysical factors that are related to pain (Hartvigsen et al., 2018). Therefore, symptomatic treatment – without taking into account all the contributing risks factors and the overall quality of life – is not enough for effective prevention (Meucci et al., 2015). According to Geneen et al. (2017), there is evidence that physical activity and exercise is an intervention with few adverse effects that can decrease pain severity and improve physical function – and consequently the quality of life. Effects on mental functions have also been confirmed. However, further research is needed, which

should focus on increasing the number of respondents, including participants with a wider spectrum of pain severity, and on extending the intervention itself and the follow-up period.

Conclusions

The results show that chronic lower back pain negatively affects the quality of life of patients in all domains of the evaluation questionnaire, and that quality of life significantly decreases with age. Seniority deepens physical restrictions (Role Physical) and worsens Bodily Pain as well as Physical Component Summary.

Patients with chronic pain in general – and therefore also with back pain – require an individual approach and complex therapy; a combination of pharmacological and non-pharmacological. Measuring the quality of life of patients with chronic lower back pain is vital in determining the area most burdening the patient's life, in the effective introduction of individualized health care, and also in estimating the progress of the pathological process. One form of non-pharmacological therapy that may have specific benefits in reducing the severity of chronic pain is exercise, as well as the more general benefits associated with improving overall physical and mental health and physical functioning. Physical activity and exercise programs are increasingly being offered in various health care systems, for various conditions of chronic pain, and as effective preventive measures within routine, daily measures. It is therefore important to establish the effectiveness and safety of these programs at this stage. To address the burden of lower back pain as a public health problem, there is a clear need for increased research and global initiatives, as well as wider collaboration between physiotherapists and nurses. The evaluation of the quality of life of patients with chronic lower back pain using the SF-36 questionnaire affects not only public health – the necessity of preventive measures, but also psychology – the need for psychological interventions in the field of mental health and emotional problems. Moreover, it affects the social sphere – frequent invalidation of patients with the above-mentioned diagnosis.

Ethical aspects and conflict of interests

The authors have no conflict of interests to declare.

Kvalita života pacientov s chronickou bolesťou dolnej časti chrbtice

Súhrn

Úvod: Chronická bolesť sa stala bežným problémom v rámci primárnej starostlivosti a môže negatívne ovplyvniť životy pacientov.
Cieľ: Zhodnotiť a preskúmať vplyv chronickej bolesti dolnej časti chrbtice na kvalitu života pacientov (QoL) pomocou kvantitatívnych a kvalitatívnych údajov.
Metodika: Bol použitý štandardizovaný dotazník kvality života SF-36. Do súboru bolo zaradených 161 respondentov od 18 rokov veku, s chronickou bolesťou v dolnej časti chrbta, v trvaní minimálne 6 mesiacov s diagnózou lumboischiadický radikulárny syndróm. Priemerný vek respondentov bol 49,8 rokov.
Výsledky: Najnižšie priemerné skóre celého súboru bolo dosiahnuté v doménach obmedzenie fyzickej aktivity a v doméne zmena zdravia. Hodnoty jednotlivých domén sú medzi pohlaviami porovnateľné. Najvýraznejší rozdiel bol zaznamenaný v doméne fyzická aktivita, ktorú ženy hodnotili vyššie (Ž; d = 62,9; M; d = 52,3). Boli zaznamenané významné korelácie hodnotenia všetkých domén s vekom ($p < 0,001$), s výnimkou domény VT vitalita a PZ celkové psychické zdravie. Signifikancia bola dokázaná aj medzi dĺžkou praxe (zamestnania) a obmedzením fyzickej aktivity, a telesnou bolesťou a súhrnom fyzických komponentov, ktoré sa dĺžkou praxe zhoršujú. So zamestnaním koreluje hodnotenie všetkých domén. Bol dokázaný silný štatistický vzťah medzi súhrnom fyzických a psychických komponentov.
Záver: Z dosiahnutých výsledkov vyplýva, že kvalita života pacientov s chronickou bolesťou dolnej časti chrbta sa vekom významne štatisticky znižuje. Dĺžkou praxe sa prehlbuje obmedzenie fyzickej aktivity, zhoršuje sa telesná bolesť, ale aj súhrn fyzických komponentov.

Kľúčové slová: chronická bolesť chrbta; kvalita života; SF-36

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