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Quality of life among patients undergoing lumbar spine surgery at Viet Duc University Hospital in 2025

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ABSTRACT

***Objective**: To describe the preoperative quality of life and identify factors associated with the preoperative quality of life among patients with lumbar spine diseases indicated for surgery at Viet Duc University Hospital in 2025. **Subjects and Methods**: A cross-sectional descriptive study was conducted on 339 patients diagnosed and indicated for lumbar spine surgery from January to June 2025. Quality of life was assessed using the SF-36 questionnaire through patient interviews before surgery and analyzed with SPSS 20.0 software, employing descriptive statistics and non-parametric tests to explore related factors. **Results**: Preoperative patients had a poor quality of life, with mean physical quality of life scores of 32.21 ± 12.30, mental quality of life scores of 38.17 ± 14.26, and overall quality of life scores of 35.19 ± 12.96 (on a 100-point scale). Factors significantly associated with quality of life included gender, age group, place of residence, occupation, income, marital status, alcohol consumption habits, and preoperative diagnosis ($p < 0.001$). **Conclusion**: To improve the preoperative quality of life of patients, attention should be paid to psychological and social factors in addition to physical treatment.*

***Keywords**: Quality of life, lumbar spine surgery, SF-36.*

INTRODUCTION

Quality of life (QoL) is a comprehensive indicator reflecting an individual's perception of their position in life, encompassing physical health, mental well-being, and social integration. QoL is considered an important measure to evaluate the overall effectiveness of medical interventions, especially in chronic diseases.

One of the major health issues of concern is lumbar spine disorders (LSDs). According to the World Health Organization (WHO), LSDs are among the leading causes of chronic pain and disability worldwide, creating a substantial socioeconomic burden[1]. Symptoms such as persistent back pain and radiating leg pain cause significant physical limitations, impair daily functioning and work capacity, and also have a severe psychological impact, increasing the risk of anxiety and depression [1, 2].

International studies have clearly demonstrated that the QoL of patients with LSDs is markedly lower than that of the general healthy population [1]. When conservative treatment fails, spinal surgery

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becomes the optimal solution. Importantly, studies have confirmed that preoperative QoL is not only a descriptive indicator but also a strong predictor of postoperative recovery and patient satisfaction [3, 4]. This highlights the essential role of comprehensive QoL assessment during the preoperative phase.

In Vietnam, Viet Duc University Hospital is one of the leading centers for spinal surgery, admitting a large number of patients requiring spinal procedures each year [5]. However, domestic research has mainly focused on postoperative clinical outcomes, with limited studies assessing the comprehensive preoperative QoL of patients and its related factors [6].

Therefore, this study was conducted to provide scientific evidence on the current status of preoperative QoL, thereby proposing timely nursing and psychological interventions to improve comprehensive treatment outcomes with the objective to describe the preoperative quality of life among patients undergoing lumbar spine surgery and to identify some factors associated with their quality of life.

SUBJECTS AND METHODS

Study subjects: Patients diagnosed with lumbar spine disorders and indicated for surgery at Viet Duc University Hospital.

Inclusion criteria: Patients aged 18 years or older. Conscious and oriented. Willing to participate in the study.

Exclusion criteria: Patients with postoperative complications requiring reoperation. Patients with psychiatric disorders or cognitive impairment.

Study period and setting: The study was conducted from January 2025 to June 2025 at Viet Duc University Hospital.

Study design: A cross-sectional descriptive study.

Sample size and sampling method: The sample size was calculated using the formula for estimating a population proportion:

$$n = Z^2_{(1-\alpha/2)} \frac{p(1-p)}{d^2}$$

Where:

n = required sample size. $Z_{(1-\alpha/2)}$ = 1.96 (for a 95% confidence level);

p = 0.328, the proportion of patients with good QoL after surgery, taken from Nguyen Thi Thin et al. (Viet Duc Hospital, 2023) [2];

d = 0.05, the desired margin of error.

Substituting the values gives a minimum sample size of 339 patients.

The study employed total sampling, including all eligible patients during the data collection period (March–May 2025), yielding 339 participants, meeting the required minimum sample size.

Research instruments: Quality of life was assessed using the Vietnamese version of the SF-36 Health Survey, which has been standardized and validated. This instrument consists of 36 questions divided into 8 domains, representing two main components:

Physical health: physical functioning, role limitations due to physical problems, bodily pain, and general health;

Mental health: vitality/fatigue, social functioning, role limitations due to emotional problems, and mental health.

Each item has its own scoring system and is converted to a standardized scale from 0 to 100, according to Ware & Sherbourne (1992), where higher scores indicate better

QoL. Domain scores are calculated as the mean of the converted item scores, allowing easy comparison across domains.

Based on total scores, QoL was categorized into four levels:

+ Poor (0–25)

+ Fair (26–50)

+ Good (51–75)

+ Excellent (76–100)

Data collection methods: Data on QoL and related factors were collected once only, between 12 and 24 hours before surgery, depending on each patient's surgical schedule. The researcher explained the study's purpose and procedures, then conducted face-to-face interviews at the ward using the structured questionnaire. Each interview lasted approximately 15–20 minutes.

Data analysis: Data were cleaned, verified, and entered into Epidata, then analyzed using SPSS version 20.0. Descriptive statistics (frequency, percentage, mean, standard deviation, minimum, maximum) were used to describe sample characteristics.

Before performing inferential statistics, the normality of the dependent variable (QoL score) was tested using Histogram plots, Shapiro–Wilk, and Kolmogorov–Smirnov tests.

Since the QoL variable did not follow a normal distribution, non-parametric tests were applied: Wilcoxon–Mann–Whitney test for two-group comparisons; Kruskal–Wallis test for comparisons among three or more groups. A p-value < 0.05 was considered statistically significant.

Ethical considerations: The study was approved by the Ethics Committee in Biomedical Research of Nam Dinh University of Nursing, under approval number 580-GCN/HĐĐĐ dated March 5, 2025. All patient information was coded and kept confidential, used solely for research purposes.

RESULTS

Table 1. General characteristics of study participants (n = 339)

Characteristics		n	%
Age (years): Mean ± SD (min – max): 54 ± 18 (19 – 93)			
Gender	Male	132	38.9
	Female	207	61.1
Age group	≤ 30 years	51	15
	31 – 45 years	69	20.4
	46 – 60 years	111	32.7
	≥ 61 years	108	31.9

Characteristics		n	%
Place of residence	Urban	177	52.2
	Rural	162	47.8
BMI	< 18.5 (Underweight)	67	19.8
	18.5 – 22.9 (Normal)	256	75.5
	≥ 23 (Overweight/Obese)	16	4.7
Occupation	Farmer	59	17.4
	Worker/Laborer	13	3.8
	Government officer/Employee	100	29.5
	Student	26	7.7
	Retired	70	20.6
	Self-employed	28	8.3
	Unemployed	43	12.7
Monthly income (VND)	< 5 million	28	8.3
	5 – 10 million	130	38.3
	> 10 million	112	33
	No income	69	20.4
Health insurance	Yes	272	80.2
	No	67	19.8
Marital status	Single	34	10
	Married	260	76.7
	Widowed/Separated/Divorced	45	13.3

The study was conducted on a total of 339 patients scheduled for spinal surgery, with a mean age of 54 ± 18 years (range: 19–93). The majority were female (61.1%, n = 207), and 64.6% (n = 219) were aged 46 years or older. Most participants lived in urban areas (52.2%, n = 177). A large proportion had a normal BMI prior to surgery (75.5%, n = 256). Government employees accounted for the highest proportion (29.5%, n = 100), and most had a monthly income of 5–10 million VND (38.3%, n = 130). The majority of patients were covered by health insurance (80.2%, n = 272) and were married (76.7%, n = 260).

Table 2. Patient-related characteristics (n = 339)

Characteristics		n	%
Lifestyle	Alcohol consumption	90	26.5
	Smoking	40	11.8
	Regular physical exercise	211	62.2
Sleep quality (average daily sleep duration)	6 – 8 hours per day	128	37.8
	4 – 6 hours per day	152	44.8
	Less than 4 hours per day	59	17.4
History of chronic disease	Yes	90	26.5
	No	249	73.5
Preoperative diagnosis	Lumbar disc herniation	106	31.3
	Spinal canal stenosis	119	35.1
	Spinal trauma	76	22.4
	Other spinal disorders	38	11.2

As shown in Table 2, most patients reported having regular exercise habits (62.2%, n = 211), while 44.8% (n = 152) reported sleeping 4–6 hours per day. The majority of participants had no history of chronic diseases (73.5%, n = 249), and 35.1% (n = 119) were diagnosed with spinal canal stenosis prior to surgery.

Table 3. Preoperative quality of life of patients (n = 339)

Quality of life components	Mean ± Standard Deviation
Physical quality of life	32.21 ± 12.30
Mental quality of life	38.17 ± 14.26
Overall quality of life	35.19 ± 12.96

Regarding preoperative quality of life, the mean scores for the physical component, mental component, and overall quality of life among the 339 patients were 32.21 ± 12.30, 38.17 ± 14.26, and 35.19 ± 12.96 out of a total of 100 points, respectively.

Table 4. Relationship between patient characteristics and quality of life (n = 339)

Variables	Physical QoL	Mental QoL	Overall QoL
Gender	Z = -4.991; p < 0.001[a]	Z = -6.362; p < 0.001[a]	Z = -6.336; p < 0.001[a]
Age group	H = 43.143; df = 3; p < 0.001[b]	H = 28.185; df = 3; p < 0.001[b]	H = 28.508; df = 3; p < 0.001[b]
Place of residence	Z = -3.948; p < 0.001[a]	Z = -4.077; p < 0.001[a]	Z= -4.064; p < 0.001[a]
Body Mass Index (BMI)	H = 4.899; df = 2; p = 0.086[b]	H = 8.482; df = 2; p = 0.14[b]	H = 8.599; df = 2; p = 0.14[b]
Occupation	H = 142.389; df = 6; p < 0.001[b]	H = 123.202; df = 6; p < 0.001[b]	H = 123.112; df = 6; p < 0.001[b]
Monthly income	H = 57.875; df = 3; p < 0.001[b]	H = 35.884; df = 3; p < 0.001[b]	H = 36.045; df = 3; p < 0.001[b]
Health insurance	Z = -1.644; p = 0.100	Z = -0.44; p = 0.965[a]	Z = -0.060; p = 0.952[a]
Marital status	H = 14.450; df = 2; p < 0.001[b]	H = 31.064; df = 2; p < 0.001[b]	H = 31.029; df = 2; p < 0.001[b]
Alcohol consumption	Z = -4.885; p < 0.001[a]	Z = -5.390; p < 0.001[a]	Z = -5.357; p < 0.001[a]
Smoking	Z = -3.593; p < 0.001[a]	Z = -3.065; p = 0.002[a]	Z = -3.074; p = 0.002[a]
Regular exercise	Z = -0.871; p = 0.384[a]	Z = -1.623; p = 0.105[a]	Z = -1.655; p = 0.098[a]
Sleep quality	H = 11.070; df = 2; p = 0.004[b]	H = 0.475; df = 2; p = 0.789[b]	H = 0.519; df = 2; p = 0.771[b]
History of chronic disease	Z = -4.883; p < 0.001[a]	Z = -5.380; p < 0.001[a]	Z = -2.594; p = 0.010[a]
Preoperative diagnosis	H = 46.267; df = 3. p < 0.001[b]	H = 37.180; df = 3; p < 0.001[b]	H = 37.163; df = 3; p < 0.001[b]

[a]Mann-Whitney U Test; [b]Kruskal-Wallis H

The analysis of the relationships between patients' demographic–sociological characteristics and quality of life (QoL) is presented in Table 4. The Mann–Whitney U test and Kruskal–Wallis H test were used for binary and multi-group variables, respectively.

The results indicated statistically significant associations ($p < 0.001$) between QoL (physical, mental, and overall) and several factors, including gender, age group, place of residence, occupation, income, marital status, alcohol consumption, and preoperative diagnosis.

Specifically, male patients had lower mean QoL scores than females across all three domains. QoL decreased with age, with the lowest scores observed in patients aged 61 years and older ($p < 0.001$). Patients living in rural areas had lower QoL than those in urban settings. Regarding occupation, government employees and students had significantly higher QoL compared with farmers, laborers, and unemployed individuals ($p < 0.001$). QoL also increased with income, with the highest scores in the group earning more than 10 million VND per month.

Married patients had higher QoL scores than single or widowed/separated/divorced individuals ($p < 0.001$). Patients who consumed alcohol or smoked had significantly lower QoL than those who did not ($p < 0.01$). Patients with chronic diseases had lower QoL compared with those without chronic conditions ($p < 0.001$).

Regarding preoperative diagnosis, patients with spinal canal stenosis or disc herniation had lower QoL scores than those with spinal trauma ($p < 0.001$). Other factors such as health insurance, regular exercise, and sleep quality were not significantly associated with overall QoL ($p > 0.05$), except for sleep duration, which was associated with physical QoL ($p = 0.004$); patients who slept 6–8 hours per day had higher physical QoL scores.

DISCUSSION

The results showed that the mean preoperative physical quality of life (QoL) score among patients was 32.21 ± 12.30, the mental component was 38.17 ± 14.26, and the overall QoL score was 35.19 ± 12.96 on a 100-point scale. This indicates that patients had a low quality of life, particularly in the physical domain.

This finding can be explained by the fact that lumbar spine disorders severely affect patients' mobility, daily functioning, and ability to work. Chronic pain, limited mobility, and persistent sleep disturbances lead to fatigue, anxiety, and mild depression before surgery. These results are consistent with Nguyen Quach An Khang et al [6] at the University Medical Center Ho Chi Minh City, where the physical QoL score was significantly lower than the mental component prior to surgery.

Compared with the study by Carreon et al [3] in the United States, the mean QoL scores in this study were notably lower. The difference may be due to socioeconomic conditions, general health status, and accessibility to medical services. In Vietnam, patients often seek medical care at a late stage of disease progression, many presenting with nerve root compression, which markedly reduces their quality of life before surgery.

Regarding the mental component, although higher than the physical aspect, it remained below the average level of the general population. Patients frequently

experience anxiety, fatigue, stress, and sleep disturbances caused by chronic pain and fear of surgical outcomes. This observation aligns with Wagner et al [7], who emphasized that preoperative psychological distress and anxiety significantly affect QoL among surgical patients.

Analysis of associations revealed that several factors significantly influenced preoperative QoL, including gender, age, occupation, place of residence, income, marital status, health behaviors, comorbid chronic diseases, and preoperative diagnosis.

Gender showed a clear effect: female patients had lower QoL scores across both domains. This finding supports Zhang et al [8], who reported that middle-aged women exhibited a higher prevalence of spinal degeneration and emotional disturbances, particularly during perimenopause. Possible explanations include differences in musculoskeletal structure, work-related burdens, and pain tolerance.

Age was inversely correlated with QoL. Older patients exhibited lower scores, consistent with Gao and Zhao [9], who identified age as an independent risk factor for reduced QoL among patients with musculoskeletal disorders.

Occupation and income were strongly associated with QoL. Individuals with stable jobs and higher income achieved better scores, reflecting better access to healthcare and nutrition. Tran Thi Huyen Trang and Tran Thai Ha [10] similarly found that manual laborers had a higher prevalence of lumbar pain due to degenerative changes and lower QoL compared with intellectual workers.

Place of residence also showed significant differences. Urban residents had higher QoL scores than those in rural areas, likely due to better access to healthcare services and health information. A report from Viet Duc University Hospital [5] indicated that most rural patients were admitted only after the disease had progressed to a severe stage.

Marital status had a substantial influence. Married patients showed higher QoL compared to those who were single, widowed, or divorced. Emotional and caregiving support from family members helped stabilize patients' mental state before surgery. This finding is consistent with Ferretti et al [11], who highlighted the positive role of social and family support on mental well-being among spinal patients.

The presence of chronic diseases such as hypertension, diabetes, or osteoarthritis significantly reduced QoL. These comorbidities contributed to fatigue, reduced mobility, and prolonged pain. Similar results were reported by Nguyen Thi Thin et al [2], indicating that chronic diseases exacerbate both physical and psychological burdens.

Finally, preoperative diagnosis showed a strong association with QoL. Patients with spinal canal stenosis or multilevel disc herniation had lower QoL than those with single-level disc herniation or spinal trauma, due to more severe nerve compression and mobility restriction.

Overall, these findings suggest that patients with lumbar spine disorders awaiting surgery experience low preoperative QoL, influenced by a wide range of personal, social, and behavioral factors. Early and comprehensive preoperative screening and interventions are therefore essential. Nurses and physicians should prioritize psychological counseling, pain control, general health improvement, and functional rehabilitation to enhance QoL and postoperative outcomes.

Study limitations: Although designed as a prospective descriptive study, this paper only reports findings on preoperative QoL to address the first research objective. Hence, postoperative changes in QoL were not analyzed. Moreover, data were collected through face-to-face interviews, which may be subject to response bias. The limited sample size and the study being conducted at a single institution may also restrict the generalizability of the findings.

CONCLUSION

Patients with lumbar spine disorders scheduled for surgery at Viet Duc University Hospital in 2025 exhibited low preoperative quality of life, particularly in the physical domain. Statistically significant factors associated with QoL included gender, age, occupation, place of residence, income, marital status, health behaviors, chronic comorbidities, and preoperative diagnosis. Notably, female, elderly, rural residents, low-income individuals, and those with chronic diseases were at higher risk of poor QoL. Comprehensive preoperative screening and assessment of QoL among spinal patients are therefore necessary, with special attention to both physical and psychological support. Implementing counseling, health education, early rehabilitation, and psychological interventions before surgery can improve physi\cal condition, pain control, and anxiety reduction, thereby enhancing overall QoL and postoperative recovery outcomes.

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