JURNAL KEDOKTERAN DIPONEGORO
(*DIPONEGORO MEDICAL JOURNAL*)
Online : http://ejournal3.undip.ac.id/index.php/medico
E-ISSN : 2540-8844
DOI : 10.14710/dmj.v15i3.54310
JKD (DMJ), Volume 15, Number 3, May 2026 : 185-197

DETERMINANTS OF QUALITY OF LIFE OF LOW BACK PAIN PATIENTS

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Keywords:
Determinants,
Health-related quality of life,
Low back pain,
Medical rehabilitation

Received: 24 December 2025
Revised: 27 January 2026
Accepted: 04 February 2026
Available online: 01 May 2026

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ABSTRACT

Background: Low back pain (LBP) is a common condition that leads to significant physical and mental health challenges worldwide. It is the primary contributor to years lived with disability (YLDs) and adversely affects quality of life (QoL). In Indonesia, there is a lack of research on the factors affecting QoL among patients with LBP. **Objective:** This study aims to investigate the factors that influence the QoL of LBP patients at William Booth Hospital in Semarang, Indonesia. **Methods:** An analytic observational study with a cross-sectional design was conducted from July to August 2023, involving 95 LBP patients. Data were collected using questionnaires, including the SF-36v1 for QoL assessment. The data were analyzed using chi-square tests and binary logistic regression to identify significant determinants. **Results:** The study found that 82.1% of respondents reported poor physical health, while 87.4% indicated good mental health. Factors such as older age, subacute to chronic LBP, severe pain, low education levels, and dependency in daily living activities significantly impacted the physical health domains. No significant associations were observed between QoL and gender, BMI, or occupational risk. Severe pain and limited independence in daily tasks emerged as critical determinants of reduced QoL. **Conclusion:** The findings emphasize the need for targeted interventions, such as pain management, rehabilitation programs, and educational initiatives, to enhance the QoL of LBP patients—especially among older adults and those with low education levels. These measures are essential to reduce the socioeconomic burden of LBP in Indonesia.

INTRODUCTION

Low back pain (LBP) is a significant problem that is expected to worsen due to global population growth and aging demographics. By 2050, there will likely be 843 million cases of low back pain (LBP) worldwide, up from 619 million cases reported in 2020.[1] About 44.29% of middle-aged adults in Indonesia also reported suffering from LBP for 12 months.[2] Low back pain is located at the back of the body, stretching from the lower ribs to the horizontal crease between the buttocks. The duration of an episode of low back pain lasting less than six weeks is commonly referred to as acute low back pain, between six and twelve weeks is referred to as sub-acute low back pain, and more than twelve weeks is referred to as chronic low back pain.[3] A systematic analysis in 2019 showed that low back pain patients with musculoskeletal disorders contributed the most to the need for medical rehabilitation services.[4] The following characteristics were found to be risk factors for lower back pain (LBP): gender, age, body mass index (BMI), level of education, carrying severe things, working posture, working hours, lifestyle, and stress scale.[2,5] In addition, low levels of physical activity, smoking, obesity, and high levels of physical stress at work are risk factors for non-specific LBP according to the World Health Organization.[6] Of all the chronic illnesses that affect people in the

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workforce, low back pain (LBP) is the most common and is linked to high socioeconomic effects, as well as being one of the leading causes of years lived with disability (YLDs) and overtime.[7] Chronic low back pain also has a substantial negative influence on the general population's quality of life in relation to health, mental health, and physical function and limitations among adults in the Central region of Singapore.[8]

The quality of life of individuals is greatly affected by the numerous correlations that have been shown between long-term physical illness and mental health. According to WHO definitions, quality of life refers to how a person feels about their place in life in relation to their objectives, standards, expectations, and worries as well as the culture and value systems in which they live.[9] Health-related quality of life (HRQoL) is also known to be associated with the disease of low back pain (LBP). A cross-sectional study in Uganda showed that the quality of life was poor in patients with low back pain.[10] The HRQoL was worse in patients with low back pain who reported higher levels of mental distress.[11] Poor physical function and fatigue are also seen in patients with non-chronic LBP.[12] There has never been any research on the variables that affect the quality of life of people with low back pain in Semarang City. Therefore, this study aimed to examine the relationship between LBP risk factors and LBP patients' quality of life as well as determinant factors associated with low back pain patients' quality of life in Semarang City based on previous studies. It is expected that the community and medical professionals will benefit from the knowledge provided by this study in conducting medical rehabilitation for LBP patients.

METHODS

Study design and setting

Analytic observational with a cross-sectional study design was conducted from July to August 2023 at William Booth Hospital Semarang City. The subjects of this study were patients who visited the medical rehabilitation polyclinic of William Booth Hospital Semarang who had been confirmed to suffer from low back pain (LBP) and met the inclusion criteria, namely LBP patients in the outpatient polyclinic of William Booth Hospital Semarang City, could communicate well, and were willing to become research subjects by signing an informed consent form. Patients under 20 years old were excluded. The study's sample size was calculated using the Slovin formula with an error tolerance limit (e) of 5%; N, the population size of 60 subjects. Hence, the minimum research sample size was 52.17, rounded to 52 samples. Sampling was done by simple random sampling method.

Variables and data collection

The independent variables in this study consisted of sociodemographic information, including age (Adult if aged 20 – 59, and Elderly if ≥ 60 years old), gender (male and female), body mass index (BMI), education level (low if ≤ junior high school and high if ≥ senior high school), type of work, physical activity (Activities of Daily Living and Instrumental Activity of Daily living), duration of LBP, and severity of LBP. The dependent variable in this study was the health related to quality of life of LBP patients at William Booth Hospital, Semarang City. The BMI of the respondents was calculated through the formula of body weight divided by height squared, with the provisions that BMI <18.5 and >25.0 means abnormal, while BMI 18.5 – 25.0 is normal BMI. Occupational risk data taken is the type of work, length of service, duration of work, and duration of work position (sitting, standing, bending), which is then interpreted as “At risk” and “No risk”.

The Collin Modified Barthel Index instrument was used to gather data on basic activities of daily living (ADLs), which are defined as ten self-care chores carried out on a regular basis to preserve physical health and were referred to as “basic ADLs”. The instrument has a score range of 0 (complete dependency) to 20 (functional independence) which then written as “dependent” and “independent”.16 In addition, the Lawton Instrumental Activities of Daily Living (Lawton IADL) scale, which has eight domains of function, was used to collect data on various self-care chores that required higher degrees of thinking and complexity (many stages), which were then collected as “complex ADLs” data with “dependent” and “independent” results. Traditionally, men have not been rated in the areas of food preparation, housekeeping, and laundry. Women are assessed in all eight areas of function. For women, a summary score falls between 0 and 8 (high function, independent), while for men, it runs from 0 and 5.17

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The severity of LBP was measured using a Visual Analog Scale (VAS), which was initially proposed by Hayes and Patterson (1921). Pain is measured on a 10-centimeter (cm) line with 10 mm (0.01 cm) at each point on the scale (0 = no pain, 1-3 = mild, 4-6 = moderate, and 7–10 = severe pain).18 We modified the scale to be dichotomous, where 0-3 = mild pain and 4-10 = moderate-severe pain.

Respondents' quality of life data was obtained from filling out the Indonesian version of the Short Form 36v1 (SF-36 version 1) questionnaire by respondents. All question items except the question "Compared to one year ago, how would you rate your general health today?" (self-reported health transition item) were used to assess eight quality of life domains consisting of 2-10 question items. The eight QoL domains were then summarized into two component scales, namely the Physical Component Summary (PCS) consisting of the domains physical functioning (PF), bodily pain (BP), role-physical (RP), and general health (GH), while the other component was the Mental Component Summary (MCS) consisting of the domains vitality (VT), social functioning (SF), role-emotional (RE), and mental health (MH). The eight domains and two-component scales have a score range of 0-100.

Data analysis

Data were analyzed using SPSS 26.0 software. Univariate analysis was performed to determine the frequency of sociodemographic information and quality of life description. Bivariate analysis of the relationship between sociodemographic factors and quality of life was tested using the Chi-Square test. Determinant factors were analyzed through multivariate analysis using Binary Logistic Regression test with FIT model significance p value <0.05 and 95% confidence interval.

RESULTS

An overview of the respondents' characteristics

Table 1 displays data regarding the characteristics of the respondents. A total of 95 respondents participated in this study, 55 of whom were adults (57.9%) and 40 of whom were elderly (42.1%), with an age range of 22 - 83 years. The majority of respondents were female (75.8%), 69.5% had an abnormal BMI (15.24 - 37.46 kg/m^2), 63.2% had higher education, and 89.5% of respondents had work environments that put them at risk of developing low back pain.

About half of the respondents (55.8%) were able to perform basic physical activities of daily living independently, as well as more than half of the respondents (60%) were able to perform more complex activities of daily living on their own. Ninety respondents (94.7%) suffered from subacute to chronic low back pain, while sixty respondents (63.2%) reported having severe pain.

Table 1. An Overview of Sociodemographic Characteristics of Low Back Pain Patients

Variables	Frequency (n=95)	Percentage (%)	Mean (Min-Max)
Age (years)			56.16 (22 – 83)
- Elderly (≥60)	40	42.1	
- Adult (20-59)	55	57.9	
Gender			
- Female	72	75.8	
- Male	23	24.2	
Duration of LBP			
- Subacute-Chronic	90	94.7	
- Acute	5	5.3	
BMI (kg/m^2)			
- Abnormal (<18.5 or >25.0)	66	69.5	26.32 (15.24 – 37.46)
- Normal (18.5 – 25.0)	29	30.5	
Education Level			
- ≤ Low	35	36.8	
- ≥ High	60	63.2	
Occupational Risk			
- At risk	85	89.5	
- No risk	10	10.5	
LBP Severity			
- Severe pain	60	63.2	
- Mild-Moderate pain	35	36.8	
Basic ADLs			
- Dependency	42	44.2	
- Independent	53	55.8	
Complex ADLs			
- Dependency	38	40.0	
- Independent	57	60.0	

An overview of the respondents' quality of life

Table 2. Frequency Distribution of Quality of Life of Low Back Pain Patients

QoL Domain	Quality of Life				U.S. General Population
	Poor		Good		
	N	%	N	%	Mean±SD
Physical Function (PF)	59	62.1	36	37.9	84.15±23.28
Role-Physical (RP)	71	74.7	24	25.3	80.96±34.00
Bodily Pain (BP)	79	83.2	16	16.8	75.15±23.69
General Health (GH)	57	60.0	38	40.0	71.95±20.34
Vitality (VT)	26	27.4	69	72.6	60.86±20.96
Social Functions (SF)	32	33.7	63	66.3	83.28±22.69
Role-Emotional (RE)	41	43.2	54	56.8	81.26±33.04
Mental Health (MH)	7	7.4	88	92.6	74.74±18.05
Physical Component Summary (PCS)	78	82.1	17	17.9	50.00±10.00

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Mental Component Summary (MCS)	12	12.6	83	87.4	50.00±10.00

As shown in Table 2, more than half of the respondents indicated poor physical function (62.1%), role-physical (74.7%), bodily pain (83.2%), and general health (60%). On the other hand, over half of the respondents with low back pain reported having good mental health (92.6%), role-emotional health (56.8%), social function (66.3%), and vitality (72.6%). These showed that the majority of respondents had poor physical health (76.8%), according to the Physical Component Summary status. Meanwhile, most respondents had good mental health (81.1%), as summarized by the Mental Component Summary status.

The changes in respondents' health status in the year before the SF-36 data collection are shown by the proportion of health transitions by age group (Figure 1). As they grew older, 42.5% of respondents said that their health was slightly worse now than it was a year ago. Conversely, 41.8% of adults said that their health was marginally better now than it was a year ago.

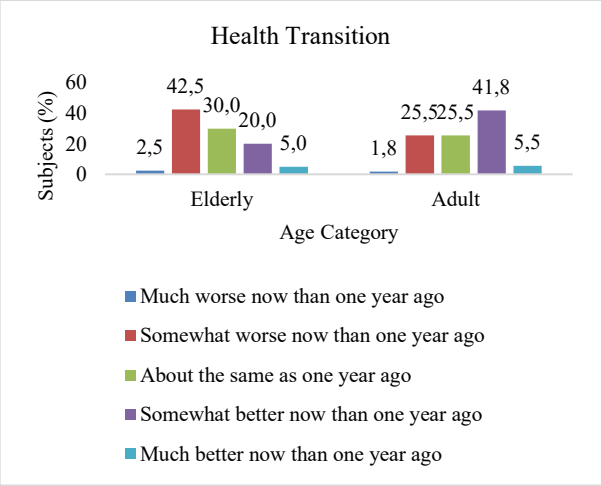

Figure 1. An verview of respondents' changes in health status during the year prior to administration of the SF-36 according to age (Elderly – n=40; Adult – n=55)

Factors related to SF-36 health-related quality of life

Table 3 shows factors related to low back pain patients' quality of life and its determinants. Bivariate analysis revealed that being elderly correlates significantly with various quality of life domains, such as physical function (PF), bodily pain (BP), general health (GH), and the physical component summary (PCS). Compared to adults, the elderly experience a marked decline in quality of life. Additionally, patients suffering from subacute to chronic LBP were significantly more likely to report decreased quality of life than those with acute LBP, particularly in the PCS.

Patients with lower education levels exhibit significantly poorer quality of life scores across the physical function (PF), physical component summary (PCS), and mental component summary (MCS) domains when compared to those with higher education levels. Severe pain levels associated with LBP lead to increased bodily pain (BP), reduced social function (SF), and deterioration in the physical component summary (PCS).

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Table 3. Factors Related to Quality of Life and Determinant Factors of Quality of Life

Variables	Quality of Life Domains Bivariate Analysis Crude OR (95% CI); *p* value	Multivariate Analysis Adjusted OR (95% CI), *p* value
Age (years)	PF = 6.80 (2.46 – 18.81); **0.000**	PF = 0.54 (0.14 – 2.08); 0.375
Elderly	RP = 1.64 (0.62 – 4.32); 0.443	BP = 4.13 (0.75 – 22.83); 0.104
Adult (Ref)	BP = 6.49 (1.39 – 30.44); **0.019**	GH = 0.45 (0.14 – 1.51); 0.198
	GH = 3.84 (1.54 –9.56); **0.006**	RE = 0.60 (0.22 – 1.60); 0.304
	VT = 1.93 (0.78 – 4.80); 0.234	PCS = 0.51 (0.08 – 3.40); 0.487
	SF = 1.63 (0.69 – 3.84); 0.373	
	RE = 2.32 (1.01 – 5.34); 0.075	
	MH = 1.03 (0.22 – 4.90); 1.000	
	PCS = 7.13 (1.53 – 33.26); **0.012**	
	MCS = 2.12 (0.62 – 7.25); 0.365	
Gender	PF = 1.72 (0.67 – 4.46); 0.378	
Female	RP = 1.06 (0.36 – 3.10); 1.000	
Male (Ref)	BP = 0.68 (0.18 – 2.64); 0.753	
	GH = 1.21 (0.47 – 3.13); 0.883	
	VT = 1.48 (0.49 – 4.51); 0.669	
	SF = 0.73 (0.28 – 1.93); 0.703	
	RE = 0.78 (0.30 – 2.00); 0.781	
	MH = 2.00 (0.23 – 17.54); 1.000	
	PCS = 1.39 (0.43 – 4.47); 0.549	
	MCS = 1.69 (0.34 – 8.36); 0.724	
Duration of LBP	PF = 7.25 (0.77 – 67.65); 0.066	RP = 0.33 (0.05 – 2.26); 0.258
Subacute-Chronic	RP = 4.93 (0.77 – 31.49); 0.101	GH = 0.38 (0.04 – 3.91); 0.416
Acute (Ref)	BP = 3.62 (0.55 – 23.67); 0.196	PCS = 0.19 (0.02 – 1.57); 0.124
	GH = 6.59 (0.71 – 61.41); 0.154	
	T = 1.54 (0.16 – 14.44); 1.000	
	SF = 2.10 (0.23 – 19.62); 0.66	
	RE = 3.20 (0.34 – 29.77); 0.386	
	MH = -	
	PCS = 8.14 (1.25 – 53.25); **0.039**	
	MCS = -	
BMI (kg/m^2)	PF = 0.65 (0.26 – 1.64); 0.494	MH = 0.30 (0.06 – 1.43); 0.130
Abnormal	RP = 0.37 (0.11 – 1.20); 0.147	
Normal (Ref)	BP = 1.04 (0.33 – 3.33); 1.000	
	GH = 0.88 (0.36 – 2.16); 0.964	
	VT = 0.77 (0.30 – 2.02); 0.778	
	SF = 1.50 (0.58 – 3.90); 0.550	
	RE = 1.68 (0.68 – 4.16); 0.365	
	MH = 0.30 (0.06 – 1.43); 0.195	
	PCS = 1.30 (0.43 – 3.95); 0.857	
	MCS = 1.37 (0.34 – 5.48); 0.750	
Education Level	PF = 6.41 (2.19 – 18.77); **0.001**	PF = 0.45 (0.11 – 1.80); 0.261
≤ Low	RP = 0.96 (0.37 – 2.51); 1.000	GH = 1.44 (0.42 – 5.01); 0.565
≥ High (Ref)	BP = 2.95 (0.78 – 11.19); 0.174	VT = 0.57 (0.20 – 1.66); 0.304
	GH = 2.19 (0.90 – 5.34); 0.129	RE = 0.53 (0.20 – 1.45); 0.219
	VT = 2.67 (1.06 – 6.73); 0.061	PCS = 0.71 (0.11 – 4.74); 0.722
	SF = 1.90 (0.79 – 4.55); 0.223	MCS = 3.49 (0.93 – 13.04); 0.063
	RE = 2.48 (1.05 – 5.82); 0.059	
	MH = 2.45 (0.52 – 11.66); 0.417	
	PCS = 5.50 (1.18 – 25.71); **0.037**	
	MCS = 4.15 (1.15 – 15.00); **0.023**	
Occupational Risk	PF = 0.68 (0.16 – 2.80); 0.737	GH = 1.82 (0.33 – 9.93); 0.491
At risk	RP = 0.72 (0.14 – 3.63); 1.000	
No risk (Ref)	BP = 0.52 (0.06 – 4.41); 1.000	
	GH = 0.34 (0.07 – 1.70); 0.306	
	VT = 0.87 (0.21 – 3.63); 1.000	
	SF = 0.47 (0.12 – 1.74); 0.297	

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	RE = 0.74 (0.20 – 2.73); 0.741 MH = 0.68 (0.07 – 6.33); 0.553 PCS = 1.17 (0.23 – 6.06); 1.000 MCS = 0.53 (0.10 – 2.87); 0.610	
LBP Severity	PF = 1.68 (0.72 – 3.96); 0.327	BP = 3.79 (1.14 – 12.58); **0.030**
Severe	RP = 1.31 (0.51 – 3.39); 0.747	GH = 0.58 (0.22 – 1.57); 0.285
Mild-moderate (Ref)	BP = 5.04 (1.58 – 16.10); **0.009**	VT = 0.55 (0.19 – 1.63); 0.283
	GH = 2.56 (1.09 – 6.05); 0.051	SF = 0.23 (0.08 – 0.68); **0.008**
	VT = 2.42 (0.86 – 6.77); 0.142	PCS = 0.21 (0.06 – 0.75); **0.017**
	SF = 4.91 (1.68 – 14.38); **0.005** RE = 1.23 (0.53 – 2.86); 0.795 MH = 0.41 (0.09 – 1.94); 0.417 PCS = 5.74 (1.82 – 18.15); **0.004** MCS = 1.88 (0.47 – 7.48); 0.526	
Basic ADLs	PF = 2.07 (0.88 – 4.89); 0.146	RP = 0.59 (0.21 – 1.63); 0.310
Dependent	RP = 1.84 (0.70 – 4.84); 0.316	GH = 0.42 (0.16 – 1.11); 0.080
Independent (ref)	BP = 0.76 (0.26 – 2.22); 0.814	SF = 0.47 (0.19 – 1.18); 0.109
	GH = 3.58 (1.47 – 8.74); **0.008**	MCS = 2.20 (0.58 – 8.27); 0.245
	VT = 2.12 (0.85 – 5.30); 0.164 SF = 2.54 (1.06 – 6.08); 0.057 RE = 1.16 (0.51 – 2.64); 0.876 MH = 1.75 (0.37 – 8.31); 0.696 PCS = 0.87 (0.30 – 2.49); 1.000 MCS = 2.88 (0.80 – 10.34); 0.172	
Complex ADLs	PF = 26.61 (5.83 – 121.54); **0.000**	PF = 0.06 (0.01 – 0.31); **0.001**
Dependent	RP = 1.88 (0.69 – 5.10); 0.311	BP = 0.68 (0.15 – 3.13); 0.621
Independent (Ref)	BP = 3.45 (0.91 – 13.05); 0.105	GH = 0.44 (0.14 – 1.36); 0.154
	GH = 4.17 (1.63 – 10.64); **0.004**	VT = 0.52 (0.18 – 1.48); 0.221
	VT = 2.73 (1.08 – 6.88); 0.054 SF = 1.86 (0.79 – 4.43); 0.232 RE = 1.91 (0.83 – 4.39); 0.190 MH = 1.14 (0.24 – 5.39); 1.000 PCS = 14.44 (1.83 – 114.27); **0.004** MCS = 1.59 (0.47 – 5.37); 0.534	PCS = 0.15 (0.02 – 1.35); 0.091

LBP: Low Back Pain; ADLs: Activities of Daily Living; Ref: Reference; PF: Physical Function; RP: Role-Physical; BP: Bodily Pain; GH: General Health; VT: Vitality; SF: Social Function; RE: Role-Emotional; MH: Mental Health; PCS: Physical Component Summary; MCS: Mental Component Summary; OR: Odds Ratio; CI: Confidence Interval; bolded numbers: significant *p* value (<0.05)

Dependence on activities of daily living (ADLs), including both basic and complex tasks, was associated with worse outcomes in physical health. This reliance not only impacted overall health (GH) but also significantly affected the quality of physical function (PF), general health (GH), and the physical component summary (PCS). Specifically, the need for assistance with more complex daily activities was linked to lower quality in these physical health domains.

Conversely, this study found no significant differences in quality of life across the various domains when considering gender, body mass index (BMI), or occupational risk.

Determinant factors of health-related quality of life of low back pain patients

Multivariate analysis using binary logistic regression is presented in Table 3. The analysis identified several determinants of poor physical function (PF) quality: being elderly, having subacute-chronic low back pain (LBP), and possessing low education levels. However, these relationships were inversely related (Adjusted Odds Ratio [OR] < 1).

Additionally, subacute-chronic LBP and dependence on basic activities of daily living (ADLs) were associated with poor role-physical (RP) quality; these relationships were also inverse (Prevalence Odds Ratio [POR] < 1) and statistically insignificant. Severe pain emerged as the most significant factor related to poor bodily pain (BP). Further, having an at-risk occupation and low education levels were associated

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with poor general health (GH), but these relationships were found to be insignificant.

Low education levels, severe pain, and dependence on complex ADLs were identified as determinants of poor vitality (VT) quality, though these relationships were inversely related and statistically insignificant. Similarly, severe pain and dependence on both basic and complex ADLs were inversely associated with poor social function (SF) quality, but again were insignificant. Being elderly and having low education levels were also found to be insignificant inverse determinants of poor role-emotional (RE) quality. An abnormal body mass index (BMI) was identified as the only factor associated with poor mental health (MH) quality, although this relationship was also insignificant.

Finally, being elderly, having subacute-chronic LBP, possessing low education levels, suffering from severe pain, and dependence on complex ADLs were all found to be insignificant inverse factors related to poor physical component summary (PCS) quality. In this context, severe pain and dependence were the most significant factors. Meanwhile, low education levels and dependence on basic ADLs were determinants of poor mental component summary (MCS) quality, with low education levels being the most significant factor.

DISCUSSION

This study's mean score of SF-36 health-related quality of life scales showed similar results as in Brazil, in which the mean score decreased in the physical function, role-physical, bodily pain, general health, and physical component (PCS).[13] These results illustrate that most low back pain respondents had poor physical function, role-physical, bodily pain, general health, and PCS.

Age and its impact on LBP patients' quality of life

The present study showed that older age was tend to had poor physical function, bodily pain, general health, and physical component summary. These results are similar to some previous cross-sectional studies.[14] Decreased muscle mass (sarcopenia), altered sensory perception, reduced aerobic capacity, and reduced joint range of motion, lead to diminished mobility and fitness in elderly. Engaging in physical activity helps older people maintain their strength and balance, which improves their physical function and quality of life.[15]

The elderly in this study had a higher risk of having poor bodily pain quality. The results of interviews with LBP patients showed that elderly patients have limitations in moving their bodies and muscles. This is because ageing causes the cartilage to become denser and more disordered, which increases the risk of low back pain (LBP) in older adults and causes intervertebral disc degeneration. Changes in the intervertebral disc structure can disrupt the load distribution on the vertebrae's bony surface. The pressure on the nerve endings in these structures will cause more severe pain.[16]

LBP and functional disability were linked to older adults' self-perceptions of their health or how they assess their health. The previous study found that low back pain in the elderly with arthritis increased the likelihood of worse self-rated health.[17] When back pain-affected older adults were compared to matched pain-free controls, it was found that the former had significantly worse HRQoL ratings and significantly worse self-assessments of general health.[18] Other studies also supported these conclusions by demonstrating a link between LBP's negative beliefs and a higher degree of disability.[19]

The decline in quality of life in physical aspects with increasing age is further strengthened by the decreasing quality of the physical component summary (PCS) in this study. A study by Mutubuki et al. (2019) highlighted that older adult with chronic low back pain exhibited significantly lower PCS scores compared to their pain-free counterparts.[20] In addition, bodily pain is a critical factor influencing the quality of life in older adults with LBP. Another study suggest that age-related factors, such as muscle weakness and decreased mobility, exacerbate the effects of LBP on physical functioning. The authors found that older adults with severe LBP reported significantly worse general health outcomes compared to those with mild or no pain.[21]

Gender and its correlation with LBP's patients' quality of life

Low back pain is a prevalent condition that affects individuals across various demographics, but emerging evidence suggests that gender may influence both the experience of pain and the subsequent quality of life outcomes. In this study, based on gender,

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DOI : 10.14710/dmj.v15i3.54310
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women with LBP experienced a greater decline in quality of life than men. Research indicates that women generally report higher levels of pain and disability associated with LBP compared to men. For instance, Salamanna et al. (2023) conducted a comprehensive review highlighting that woman often present with worse health-related quality of life (HRQoL) outcomes following both conservative and surgical treatments for LBP. This study emphasized that women tend to seek medical help later than men, often presenting with more severe conditions, which could contribute to poorer postoperative outcomes and overall quality of life (QoL).[22]

In the results of this study, no significant relationship was found between gender and LBP's patient quality of life. This result is in line with study focused on chronic non-specific low back pain (cnsLBP) indicated no significant differences in QoL scores between male and female patients. The study emphasized that factors such as age, education level, and employment status played a more critical role in determining QoL than gender alone. This finding suggests that while gender may influence the experience of LBP, it does not necessarily dictate the overall quality of life for all patients.[3]

Duration of LBP and its correlation with LBP's patients' quality of life

The duration of low back pain is a significant factor influencing the quality of life of affected individuals. In this study indicates that patients with acute and subacute LBP often experience a more pronounced decline in their quality of life compared to those with chronic LBP. This phenomenon can be attributed to various factors, including the intensity of pain, functional limitations, and psychological impacts associated with the duration of the condition. Studies have shown that acute and subacute LBP are typically characterized by higher levels of pain and disability, leading to greater impairments in QoL.[23] For instance, a study by Aminde et al. (2020) found that individuals suffering from LBP for less than three months reported significantly lower health-related quality of life (HRQoL) scores compared to those with chronic conditions. The acute phase is often accompanied by heightened anxiety and fear of movement, which can exacerbate pain perception and disability, further diminishing QoL.[24]

In the results of this study, significant relationship was found between duration of LBP and LBP's patient quality of life, particularly in physical component summary (PCS). Research indicates that as the duration of LBP increases, patients often report a decline in their health-related quality of life (HRQoL). This correlation is particularly evident in individuals suffering from acute and subacute LBP, who tend to experience more severe impairments compared to those with chronic conditions. This result is in line with study by Anselmo et al. (2024) explored how acute low back pain affects various dimensions of HRQoL. The researchers found that patients with acute LBP reported significant impairments in physical functioning, social interactions, and psychological well-being. Their findings indicated that as the duration of pain increased, there was a corresponding decrease in all dimensions of QoL measured by the SF-36 questionnaire. This suggests that prolonged acute pain not only affects physical health but also has broader implications for mental and social well-being.[25]

Body Mass Index (BMI) and its correlation with LBP's patients' quality of life

In this study, based on BMI, patient with abnormal BMI experienced a greater decline in quality of life than normal BMI. Biomechanically, individual with higher body weight increases mechanical stress on the spine and surrounding structures. This additional load can exacerbate existing pain conditions and lead to further degeneration of spinal components, such as intervertebral discs and joints.

Additionally, the inflammatory theory suggests that obesity can lead to systemic inflammation, which may contribute to chronic pain conditions like LBP. Studies have shown that excess body fat can produce pro-inflammatory cytokines, which may exacerbate pain pathways in the body. Underweight patients may have lower muscle mass and strength, which can hinder their ability to support spinal structures effectively. Research indicates that this lack of physical support can lead to increased vulnerability to injury and pain.[26]

In the results of this study, no significant relationship was found between BMI and LBP's patient quality of life. A study conducted by Thiono et al. (2022) examined the relationship between BMI and LBP among medical students during the COVID-19

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pandemic. The results indicated no significant association between BMI and LBP, with a p-value of 0.420. This finding suggests that, at least within this young adult population, BMI may not be a critical factor influencing the occurrence of LBP, highlighting the need for further research in different demographic groups.[26] Research conducted by Alhowimel et al. (2022) also supported these findings by demonstrating no significant association between BMI and LBP among participants in their study. They noted that while lifestyle factors related to obesity could contribute to musculoskeletal issues, the direct link between BMI and LBP was not statistically significant within their sample population.[27]

Education level and its impact on LBP patients' quality of life

In this study, based on education level, patient with low education level experienced a greater decline in quality of life. Individuals with lower education levels typically have limited access to resources, including healthcare, which can adversely affect their health outcomes. A study by BMC Public Health (2020) found that patients with lower educational qualifications reported significantly lower HRQoL scores compared to those with higher education. This discrepancy can be attributed to a lack of knowledge about effective pain management strategies and limited engagement in preventive health behaviors, leading to worse outcomes for LBP patients.[28] Another research indicates that individuals with lower educational attainment may also face higher levels of stress and anxiety related to their condition, exacerbating their pain experience and leading to poorer QoL outcomes.[28]

In the results of this study, significant relationship was found between education level and LBP's patient quality of life, particularly in physical function (PF), physical component summary (PCS), and mental component summary (MCS). This result is line with study by BMC Public Health (2020) assessed health-related quality of life and patient knowledge in individuals with chronic non-specific low back pain. The researchers found significant differences in health-related quality of life scores based on educational attainment.[28]

Occupational risk and its impact on LBP patients' quality of life

In this study, based on occupational risk, patient with occupational risk experienced a greater decline in quality of life. The biomechanical theory posits that the physical demands of certain occupations, such as lifting heavy objects, prolonged sitting or standing, and awkward postures, can lead to increased strain on the musculoskeletal system. A study by Aleku et al. (2021) highlighted that healthcare workers are particularly susceptible to LBP due to the nature of their work, which often involves lifting and moving patients. This study found that these occupational risk factors significantly contribute to the prevalence of LBP and associated disability, ultimately leading to a lower quality of life for affected individuals.[21]

The ergonomics theory emphasizes the importance of workplace design and practices in preventing LBP. Poor ergonomic conditions can exacerbate physical strain on workers' bodies, leading to higher incidences of pain and disability. A study by Russo et al. (2021) found that healthcare workers exposed to poor ergonomic practices were at a significantly higher risk for developing LBP, which negatively impacted their quality of life.[29]

In the results of this study, no significant relationship was found between occupational risk and LBP's patient quality of life. This result is line with study by Ahmed et al (2020) that investigated the relationship between LBP, disability, and quality of life among healthcare workers. Although it found a negative correlation between pain intensity and quality of life, it also indicated that various factors, including coping strategies and social support, played a more significant role in determining quality of life than occupational risk alone.[30]

LBP Severity and its impact on LBP patients' quality of life

In this study, based on LBP severity, patient with severe pain experienced a greater decline in quality of life. The severity of pain can lead to physical limitations that hinder daily activities, resulting in reduced functional capacity and increased disability. A study by Ahmed et al (2020) found that higher pain intensity was significantly correlated with lower QoL scores among healthcare workers suffering from LBP. The research indicated that as LBP severity increases, individuals experience greater restrictions in their

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JKD (DMJ), Volume 15, Number 3, May 2026 : 185-197

physical and social functioning, leading to a marked decline in their overall quality of life.[30] Individuals who perceive their pain as more severe may experience heightened emotional distress and anxiety. This psychological response can exacerbate the perception of pain and lead to avoidance behaviors that further limit physical activity and social engagement. A systematic review by Aleku et al. (2021) highlighted that individual with chronic low back pain who reported higher levels of catastrophizing also experienced significantly worse quality of life outcomes.[21]

In the results of this study, significant relationship was found between severity and LBP's patient quality of life, particularly bodily pain, social function, and physical component summary. Another study assessed the impact of low back pain on disability and quality of life among healthcare workers. The findings indicated a significant negative correlation between pain severity and quality of life, as measured by the Roland-Morris Disability Questionnaire (RMQ) and the Short Form-36 (SF-36). The study emphasized that higher levels of pain intensity were associated with increased functional disability, which in turn led to a decline in health-related quality of life.[30]

Basic ADLs and its impact on LBP patients' quality of life

In this study, based on basic ADLs, patient with dependency on doing ADL experienced a greater decline in quality of life. As pain severity increases, patients experience greater difficulty in performing basic ADLs, which can lead to a decline in their quality of life. Another study found that patients with more severe LBP reported significantly higher levels of disability in performing ADLs. The research indicated that this functional impairment was inversely related to quality of life scores; as the severity of LBP increased, patients experienced greater limitations in their daily activities, leading to a marked decline in their overall quality of life.[21]

In the results of this study, significant relationship was found between basic ADLs and LBP's patient quality of life, particularly general health. This result is line with study by Mutubuki et al (2019) examined the longitudinal relationships between pain severity, disability, and health-related quality of life among chronic LBP patients. The researchers found that higher levels of disability, which included dependence on basic ADLs, were significantly associated with lower health-related quality of life scores.[20] Another study indicated a significant negative correlation between dependence on basic ADLs and quality of life, as measured by the Roland-Morris Disability Questionnaire (RMQ) and the Short Form-36 (SF-36). The study emphasized that higher levels of disability in performing essential tasks such as bathing and dressing were associated with increased functional limitations and poorer overall health outcomes.[30]

Complex ADLs and its impact on LBP patients' quality of life

Dependency on doing IADLs (complex activities of daily living) is the factor that is significantly related to poor physical function in this study. A low quality of life can hurt day-to-day activities, independence, productivity, and job market competitiveness, even causing a person to miss much time at work.[10] Respondents who experienced dependence in performing complex ADLs measured using the Lawton IADLs instrument in this study showed that they experienced the most dependence in doing "food preparation", "laundry", "housekeeping", "shopping", "ability to use telephone", and "mode of transportation". Meanwhile, "responsibility of own medication" and "ability to handle finance" were the domains that had the lowest level of dependency.

In the results of this study, significant relationship was found between complex ADLs and LBP's patient quality of life, particularly in physical function, general health, and physical component summary. This result is line with study by Grabovac et al (2019) examined the association between LBP and everyday performance outcomes, including complex ADLs such as work ability and social functioning. The authors found that LBP significantly worsened self-reported disability levels, making complex ADLs much harder for patients to perform. The study emphasized that patients with LBP often report difficulties in routine functioning and participation in daily activities, which adversely affects their quality of life.[7]

CONCLUSION

This study on low back pain (LBP) patients at William Booth Hospital reveals several key factors that affect their quality of life (QoL). Older patients

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JKD (DMJ), Volume 15, Number 3, May 2026 : 185-197

reported worse physical function, more pain, and poorer health, likely due to age-related muscle and joint degeneration. While women often report experiencing more pain, this study found no significant difference in QoL between genders. Gender may influence pain perception but does not necessarily determine overall QoL.

Patients with acute and subacute LBP experienced a greater decline in QoL, particularly in physical functioning, due to more intense pain and limitations in daily activities. The study found no significant relationship between body mass index (BMI) and QoL in LBP patients, suggesting that other factors, such as pain severity, might play a more significant role.

Lower education levels were linked to poorer QoL, likely due to limited access to healthcare and knowledge of pain management. Additionally, no significant connection was found between occupational risk and QoL, indicating that other aspects, like coping strategies, might have a more considerable impact.

Severe LBP resulted in greater functional limitations and emotional distress, significantly reducing QoL. Difficulties in performing daily activities, such as moving, dressing, or completing household chores, led to a substantial decline in QoL.

In summary, the study highlights that both physical and mental factors influence the quality of life for LBP patients. Improving pain management, encouraging physical activity, and increasing access to healthcare can help enhance QoL, especially for older patients and those with lower education levels.

ETHICAL APPROVAL

This study adhered to the principles outlined in the Declaration of Helsinki and has obtained permission from the Ethics Commission of the Faculty of Medicine, Diponegoro University (Number 228/EC/KEPK/FK-UNDIP/V/2023). We also secured clearance from William Booth Hospital in Semarang. The informed consent form is attached to the front page of the questionnaire and must be signed by the patient as a form of approval before filling out the research questionnaire.

CONFLICTS OF INTEREST

The authors declare no conflict of interest.

FUNDING

No specific funding was provided for this article.

AUTHOR CONTRIBUTIONS

Conceptualization, all authors; Methodology [HPJ, SH, HS, AB]; Investigation [HPJ, AS], Writing – Original Draft [HPJ, AS], Writing – Review & Editing [HPJ, SH, HS, AB], Supervision [SH, HS, AB].

ACKNOWLEDGMENTS

This work was supported by Department of Physical Medicine and Rehabilitation, Faculty of Medicine, Universitas Diponegoro.

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Online : http://ejournal3.undip.ac.id/index.php/medico
E-ISSN : 2540-8844
DOI : 10.14710/dmj.v15i3.54310
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