Research Paper

Low Back Pain, Disability and Quality of Life in Nursing Personnel: A Cross-Sectional Study

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ABSTRACT

Background and Purpose: Low back pain (LBP) is a global health problem and one of the leading causes of disability. Also, LBP is a major occupational problem among nursing staff. The study aims to determine LBP, disability, quality of life (QoL), and the relationship between LBP and job-related risk factors and dimensions of QoL in nurses.

Materials and Methods: In this cross-sectional study with a descriptive-analytic approach, eligible nurses working in teaching hospitals affiliated with Mazandaran University of Medical Sciences were included in the study by census method. Data were collected based on the demographic questionnaire, Visual Analog Scale (VAS), Quebec Back Pain Disability Scale (QBPDS), and Short-Form 36 (SF-36) health survey questionnaire. Data were analyzed (descriptive, logistic regression, spearman correlation) using SPSS software, version 23.

Results: This study included 402 nurses with a mean age of 36.47±7.1 years and employment mean of 11.83±6.4 years of an employment. The prevalence of LBP was 86.3% and the mean of pain intensity and disability were 4.8±2.7 and 30.4±17.4, respectively. The mean QoL components, such as physical and mental were 58.03±19.6 and 57.42±18.3, respectively. The factors that were significantly associated with LBP were body mass index (BMI) (P<0.0001), frequent bending (P=0.004), and workplace communication (P=0.008). LBP affected dimensions of QoL, especially physical function (P=0.008), role physical (P=0.02), general health (P<0.0001), and social function (P=0.03).

Conclusion: This study showed the high prevalence of LBP among nurses and the role of individual and workplace factors in the occurrence of LBP. Such cognition facilitates the design of an educational program and undertakes the targeted preventive actions.

Keywords: Nurse, Low back pain, Disability, Quality of life (QoL)

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1. Introduction

Nursing is one of the main disciplines of the care chain, and nurses are essential factors in improving the quality of care [1]. Despite the importance and necessity of nurses' health, they are still exposed to threatening physical and mental health [2]. The nurses who work to protect and improve health problems for individuals and families spend more time with the patients compared with other health professionals [3]. Therefore, nurses are at higher risk for work-related musculoskeletal injuries and disorders, such as low back pain (LBP) than other health professionals [4-7]. Studies show that LBP is the most common musculoskeletal problem among nurses, with a prevalence of 66%–77% [8, 9]. The prevalence of LBP among Iranian hospital nurses was 64.8% [10]. LBP is a common health problem in the workplace [11]. The intrinsic nature of activities in nursing, such as twisting, bending, sustained posture, and repeated movements create favorable conditions for LBP [12, 13]. Recent studies demonstrate that work-related LBP is often influenced by socio-demographic attributes, gender, age, marital status, body mass index, and work experience [13-18]. Further, lifestyle factors, including smoking, obesity, physical inactivity, and psychological factors, such as stress, communication, and job satisfaction affect the development of LBP [18-20]. As well, studies reveal that workplace conditions, such as overtime work, working posture, long working hours, and shift work are the main predictors of LBP [13, 14, 16, 20-22].

The literature review points out that even mild LBP results in significant functional loss and decreases the quality of life (QoL) for individuals [23]. As well as, LBP results in loss of workforce, reduced labor productivity, and significant economic loss. Therefore, it can influence the society and the economy of the country where the individual lives [24]. Previous investigation has shown that LBP causes an estimated 83 million disability-adjusted life years (DALYs) in 2010 [25]. The impact of LBP on nurses is major and includes work absenteeism, increased risk of chronicity, associated personal and economic costs, reduced nursing workforce efficiency, decreased QoL, and fatigue [26].

The objectives of this study were to determine the prevalence of LBP in nursing personnel, to investigate disability and the dimensions of QoL, and to explore the relationship between LBP and job-related risk factors and dimensions of QoL.

2. Materials and Methods

Study population

This study is a part of a trial [27], participants were nurses recruited from educational hospitals affiliated with Mazandaran University Medical of Sciences between March and May 2018. It was a random sample of hospitals. After approval from the Ethics Committee of Tarbiat Modares University and permission from Mazandaran University Medical of Sciences, the researcher directly contacted the senior nurses and supervisors. Then, the objectives of the study and the importance of participation were explained.

Sample/participants

This descriptive-analytical research has been conducted in the field method. The statistical population of the present study included nurses working in educational and research hospitals affiliated with Mazandaran University Medical of Sciences. The data collection was in the form of a census method, and a total of 450 nurses agreed to participate in this study. Finally, 402 questionnaires were returned to the researcher. The inclusion criteria included male and female nurses who having at least one year of work experience and were willing to participate in the study.

Research instruments

Data collection instruments included a demographic questionnaire, visual analog scale (VAS), quebec back pain disability scale (QBPDS), and Short Form 36 (SF-36) health survey questionnaire.

VAS is a consistent measure of pain intensity [28]. For pain intensity, the scale is usually anchored by "no pain" (score of 0) and "pain as bad as it could be" or "worst imaginable pain" (score of 100 [100-mm scale]) [29, 30]. The validity and reliability of this scale have been confirmed many times [31-33]. In this study, we used a 100 mm straight line to assess pain intensity utilizing the usual anchors.

Quebec Back Pain Disability Scale (QBPDS) is a 20-item self-administered instrument designed to assess the level of functional disability in individuals with back pain. Each item was rated on a 5-point Likert scale ranging from 0 to 5 giving a total score of 20 to 100. Higher scores indicated greater disability [34]. Mousavi et al confirmed the validity and reliability of the Iranian version of the questionnaire [35].

60

Kazemi et al. Low Back Pain and Quality of Life in Nurses. Iran J Health Sci. 2023; 11(1):59-66

SF-36 health survey questionnaire was developed in 1992 by Ware and Sherbourne to assess the health status in clinical practice and research in the study of medical outcomes. It contains 36 items covering 8 health concepts, physical function, bodily pain, social functioning, vitality, mental health, general health, emotional health, and physical activity [36] and Montazeri et al confirmed its validity and reliability in Iran [37].

Statistical analysis

We used descriptive statistics (i.e., frequency, percentage, mean, and standard deviation) and inferential statistics (logistic regression, spearman correlation). The normal distribution of numeric variables was assessed with the Shapiro–Wilk test. The data were analyzed using IBM SPSS software version 23.0.

3. Results

Socio-demographic characteristics

A total of 402 nurses, 70 men (17.4%) and 332 women (82.6%) were included. The mean age of participants was 36.47±7.1 years (24 to 56). The mean year of employment was 11.83±6.4 years. The mean working time was 49.35±10.2 hours per week. Table 1 presents the demographic description of the participants.

Descriptive statistics

Table 2 presents the descriptive statistics for the study variables, such as pain, disability, and dimensions of QoL.

The prevalence of LBP in nurses was 86.3% (n=347). Out of 402 subjects, 180 subjects (44.8%) had moderate pain and 66 subjects (16.4%) had the worst pain (n=180) (Table 3).

The prevalence of LBP in male and female were 96.27% and 90.05%, respectively (Table 4). The mean QoL components, such as physical and mental were 58.03±19.6 and 57.42±18.3, respectively.

A high correlation and high level of significance (P<0.0001) was observed between pain intensity and functional disability (Table 5).

Table 6 presents the relationship between LBP and job-related risk factors. A relationship was observed between LBP with body mass index (BMI), frequent bend-

Table 1. The demographic description of the participants

Socio-Demographic Characteristics		Mean±SD/No. (%)
Age, y		36.47±7.1
Height		162.98±7.5
Weight, kg		68.59±12.7
BMI, kg/m^2		25.73±3.9
Work experience, y		11.83±6.4
Work hours		49.35±10.2
Gender	Male	70(17.4)
	Female	332(82.6)
Education level	Associate	13(3.2)
	Bachelor	339(84.3)
	Master	50(12.4)
Marital status	Single	49(12.2)
	Married	347(86.3)
	Divorced	6(1.5)

Abbreviations: BMI, body mass index

Kazemi et al. Low Back Pain and Quality of Life in Nurses. Iran J Health Sci. 2023; 11(1):59-66

61

Table 2. Means, standard deviations, minimum, maximum, skewness, and kurtosis of the study variables (n=402)

	Variabless	Mean±SD	Minimum	Maximum	Skewness	Kurtosis
	Pain (VAS)	4.8±2.7	0	10	-0.41	-0.65
	Disability (Quebec)	30.4±17.4	0.00	93	0.55	-0.021
Quality of life (SF-36)	Physical functioning	62.6±23.6	0.00	125	-0.21	-0.48
	Role physical	65.1±37.3	0.00	100	-0.57	-1
	Bodily pain	57.6±21.0	0.00	100	-0.17	-0.20
	General health	46.7±19.0	0.00	90	0.05	-0.37
	Vitality	53.7±20.8	5	95	0.001	-0.19
	Social functioning	57.6±20.8	0.00	100	-0.04	-0.24
	Role emotional	58.7±40.3	0.00	133	-0.27	-1
	Mental health	59.6±16.9	0.00	100	-0.15	-0.05

Abbreviations: VAS, Visual Analog Scale; SF-36, Short Form 36

Table 3. Categorized pain intensity scores (Visual Analog Scale [VAS])

Pain Intensity	No. (%)
No pain (0-0.4)	55(13.7)
Mild pain (0.5-4.4)	101(25.1)
Moderate pain (4.5-7.4)	180(44.8)
Worst pain (7.5-10)	66(16.4)

ing, and workplace communication. So that LBP increases with increasing BMI (P<0.0001), frequent bending (P=0.004), and workplace communication (P=0.008). The odds of LBP had a significant relationship with BMI, frequent bending, workplace stress, and workplace communication. So that participants with a higher BMI were 10% more likely to have LBP. Also, the probability of LBP was 2.4 times in participants with frequent bending, 1.9 times in participants with workplace stress, and 2.2 times in participants with unfavorable workplace communication.

As well as, Table 7 presents a significant relationship between LBP and dimensions of QoL especially physical functioning (P=0.008), role physical (P=0.02), general health (P<0.0001), and social functioning (P=0.03).

4. Discussion

This study was conducted to determine the prevalence of LBP, disability, the dimensions of QoL, and the relationship between LBP and job-related risk factors and the dimension of QoL in nursing personnel. This study allows for revealing the high prevalence of LBP among nurses. This result is supported by other stud-

Table 4. Categorized pain intensity scores in men and women

Gender	No. (%)			
	No Pain	Mild Pain	Moderate Pain	Sever Pain
Male (n=70)	15(3.73)	14(3.48)	32(7.96)	9(2.24)
Female(n=332)	40(9.95)	87(21.64)	148(36.82)	57(14.18)

Kazemi et al. Low Back Pain and Quality of Life in Nurses. Iran J Health Sci. 2023; 11(1):59-66

Table 5. Correlations between pain intensity and disability (n=402)

Correlation	Pearson Correlation	P
Pain intensity and disability	0.54**	<0.0001

**Correlation is significant at the 0.01 level (2-tailed).

Table 6. The relationship between Low Back Pain (LBP) and independent variables (n=402)

Variables		OR (95% CI)	P*
Age		0.99 (0.91-1.0)	0.91
Gender	Male	1.0 (ref)	0.14
	Female	1.7 (0.83-3.6)	
BMI		1.1 (1.0-1.2)	<0.0001
Work experience		1.0 (0.94–1.1)	0.39
Work hour		1.0 (0.98–1.0)	0.50
Workplace		1.3 (0.72–2.4)	0.36
Movement with major force		1.0 (0.58–1.9)	0.84
Frequent bending		2.4 (1.3–4.3)	0.004
Prolonged standing		1.0 (0.54–1.8)	0.99
Workplace stress		1.9 (1.0–3.6)	0.02
Workplace communication		2.2 (1.2–4.2)	0.008

*Derived from logistic regression. Abbreviations: OR, odds ratio; CI, confidence interval; BMI, body mass index

Table 7. The relationship between Low Back Pain (LBP) and the dimensions of Quality of Life (QoL) (n=402)

Variables	OR (95% CI)	P*
Physical functioning	0.90 (0.96-0.99)	0.008
Role physical	0.98 (0.97-0.99)	0.020
Bodily pain	0.99 (0.96-1.0)	0.40
General health	0.95 (0.93-0.97)	< 0.0001
Vitality	1.0 (0.97-1.0)	0.450
Social functioning	1.0 (1.002-1.045)	0.031
Role emotional	1.0 (.99-1.01)	0.930
Mental health	0.98 (0.95-1.01)	0.191

*Derived from logistic regression. Abbreviations: OR, odds ratio; CI, confidence interval

Kazemi et al. Low Back Pain and Quality of Life in Nurses. Iran J Health Sci. 2023; 11(1):59-66

63

ies. Ojo et al. estimated the prevalence of LBP in nurses to be 72.1% [38]. Suliman reported the prevalence of LBP in nurses to be 69% [39]. Boughattas et al. found a prevalence of 87% in nurses working t Farhat Hached Teaching hospital in Sousse [40]. In the literature, the prevalence of LBPas the most common musculoskeletal problem in nursing staff ranges from 66% to 77% [8, 9]. A systematic review by Mohammadi et al. estimated the prevalence of LBP in Iranian nurses to be 64.8% [10].

LBP is a public health problem worldwide and is a common cause of work-related disorders in the nursing profession [41]. LBP is currently the number one cause of disability worldwide [42, 43]. This study's finding indicates a moderate correlation between LBP and disability. Some studies support our findings [44, 45].

The etiology of LBP is determined by several individual and work-related factors (physical, and psychosocial factors) [46, 47]. The literature reports individual factors, such as genetic predisposition, age, gender, and also occupational factors, such as stress and workload [39]. Lifting, bending, pulling, pushing and sustained positions were identified as occupational risk factors for LBP in Dlungwane et al. study [41]. However, in this study, frequent bending, workplace stress, and workplace communication were identified as factors associated with LBP. Also, in Rezaee's study, frequent bending was predicted as one of two ergonomic factors on LBP [48]. Evidence found a relationship between LBP and material handling, including load lifting, carrying, and frequent bending [17].

Another study reported older age, female gender, being overweight, and nursing experience as factors associated with LBP [39] but based on our study, overweight or high BMI was related to LBP, while no significant interaction was observed between LBP and age and gender. Perhaps it was due to the disproportionate number of male and female participants.

Nursing is a stressful profession [38, 49]. Psychosocial factors, such as stress play a crucial role in pain and associated physical and psychosocial disability [50] and considerably affected the development of LBP [19]. According to the results of the study, a significant positive relationship was observed between LBP and stress. While a systematic review showed that stress reduction can be associated with short-term effects on pain intensity and physical functioning [51]. More importantly, our findings show that communication or social relationship is one of the factors related to LBP.

5. Conclusion

This study shows the high prevalence of LBP among nurses and the role of individual and workplace factors in the development of LBP. This finding facilitates the design of an educational program and the implementation of targeted preventive measures.

One of the limitations of this study was self-reporting. Although self-reporting is considered original information, it may lead to bias. It was impossible to explain the differences in prevalence in these wards because the samples were randomly collected from different wards, therefore it is impossible to say in which wards the prevalence of back pain is higher, and this requires research.

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66

Kazemi et al. Low Back Pain and Quality of Life in Nurses. Iran J Health Sci. 2023; 11(1):59-66