STM JOURNALS

International Journal of
Orthopedic Nursing and Practices

Volume 1, Issue 1, 2023
January—June
DOI (Journal): 10.37591/IJORNP

https://journals.stmjournals.com/ijornp

Research IJORNP

Thoracolumbar Spine Surgery: Peri-operative Nursing Care Needs and Quality of Life

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Abstract

Aim and Objective: *To explore the nursing care needs of the patients after thoracolumbar spine surgery during preoperative, post-operative, home care and to assess the quality of life.* ***Design:*** *An exploratory study.* ***Methods:*** *The study was conducted among 50 patients who had undergone thoracolumbar spine surgery in neurosurgery units of tertiary care hospital from July 2018 to September 2020. The nursing needs were assessed by interviewing participants telephonically using an interview schedule to assess physical, psychological, functional, and other problems and WHOQOL-BREF to assess the quality of life. The data was coded and analyzed using SPSS version 20.* ***Results:*** *The physical problems were pain, numbness, and weakness of limbs. The psychological problems were worry, sleeplessness, dysthymia, and anger. The functional problems were difficulty in toileting and transferring. Patients also reported lack of understanding of the surgical procedure and its outcomes and difficulty in understanding specific instructions. Pain was reduced from 98% to 90% after surgery but was consistently there during the peri-operative period. There was a reduction in numbness after surgery (98% to 68%). The quality of life in psychological and physical domain is more affected as compared to environmental and social domain. More than half of the patients reported quality of life as "neither poor nor good" and 14% reported dissatisfaction with their health.* ***Conclusion:*** *Patients who had undergone thoracolumbar spine surgery experienced various problems during their peri-operative period. Besides physical problems, patients also reported psychological problems and knowledge deficit regarding home care. Physical and psychological domains of quality of life was more affected as compared to environmental and social domains.* ***Impact:*** *There is a need to develop nursing guidelines and nurse-led counselling is necessary to address the many physical and psychological concerns that patients confront throughout their peri-operative time.*

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Received Date: May 23, 2023
Accepted Date: June 21, 2023
Published Date: June 30, 2023

Citation: Geeta Thapar, Manju Dhandapani, Sivashanmugam Dhandapani, Navneet Singla. Thoracolumbar Spine Surgery: Peri-operative Nursing Care Needs and Quality of Life. International Journal of Orthopedic Nursing and Practices. 2023; 1(1): 13–23p.

Keywords: Thoracolumbar spine surgery, WHOQOL-BREF, peri-operative period, nursing care needs, nurse-led counselling

INTRODUCTION

Around the world, degenerative disc disorders and low back pain are the leading causes of disability. The prolapsed intervertebral disc (PIVD), spondylosis, spondylolisthesis, and lumbar canal stenosis are some of the conditions covered. Thoracolumbar spine surgery is indicated when conservative therapies fail to improve pain, neurological and functional symptoms and disability. During peri-operative course, patients experience various physical, psychological, functional and other problems. The purpose of this

study is to investigate the nursing care needs of patients following thoracolumbar spine surgery during the peri-operative period, as well as to assess quality of life (QOL) following thoracolumbar spine surgery.

BACKGROUND

In 2010, over 500,000 spine operations were performed in the United States for disc herniation, stenosis, and degenerative changes [13]. Every year, 266 million people worldwide suffer from degenerative disc degeneration and low back pain. Spondylolisthesis affects 39 million people worldwide, symptomatic disc degeneration affects 403 million people, and spinal stenosis affects 103 million people worldwide each year [17]. Degenerative disc diseases and disc herniation is common in lumbar spine followed by cervical spine and least in thoracic spine. This is due to the biomechanical forces in the flexible part of spine [7].

Surgery is recommended if 6 weeks of rigorous conservative treatment fails to reduce radicular discomfort and with worsening neurological deficits [12]. According to Scheffel et al. [26], the most prevalent surgical procedures for low back pain are lumbar discectomy and spinal fusions. Patients' problems after thoracolumbar spine surgery during various phases of peri-operative period are poorly documented. To assist patients to return to normal function and achieve post-operative outcomes, effective need-based nursing rehabilitation is critical [17]. As a result, it is necessary to determine the patients' health-related concerns and nursing care needs.

MATERIAL AND METHODS

Aim

This descriptive exploratory study is designed to explore the nursing care needs of the patients after thoracolumbar spine surgery during all phases of their peri-operative period, that is preoperative period, post-operative period, during home care and to assess QOL after thoracolumbar spine surgery.

Participants

Using total enumeration sampling technique, 50 patients who underwent thoracolumbar spine surgery from July 2018 to September 2020 at the Neurosurgery Unit were enrolled in the study. The contact details of the patients were obtained from the Neurosurgery Department. The inclusion criteria set was patients who had undergone thoracolumbar spine surgery. The exclusion criterion was patients with malignancy, altered sensorium, and patients after cervical spine surgery.

Tool

The tool used for data collection was an interview schedule comprising (a) sociodemographic profile of patient, (b) clinical variables, and (c) questionnaires to assess physical, psychological, functional and other nursing care needs of the patients during pre-operative, post-operative and after discharge. The tool was developed based on the review of the literature and also through consultation with experts. WHOQOL-BREF (World Health Organization Quality of Life Brief Version) scale was used to assess the QOL after thoracolumbar spine surgery. The content validity of the interview schedule was obtained after consultation with research guides and experts from the nursing and neurosurgery department. The reliability of the tool was checked by Cronbach's alpha ($r = 0.8$).

Data Collection and Ethical Considerations

Ethical approval was obtained from the Institute Ethical Committee (NK/6710/MSc/458) prior to data collection. The interviews were conducted by the research nurse telephonically after taking informed consent through WhatsApp message. The patient information sheet was sent telephonically. It took 10 to 15 minutes to complete the interview.

Data Analysis

The data was entered and analyzed in SPSS (Statistical Package for Social Sciences) version 20. Descriptive statistics, that is, mean, median, frequency, percentage, and standard deviation were used for describing the variables.

RESULTS

Socio-demographic and Clinical Profile of the Patients

Table 1 shows that the mean age of the patients was 47.25 ± 12.44 years with a range of 23 to 79 years. Half of the patients were in the age group of 41 to 60 years. Most patients were males (72%) and 28% were females. Furthermore, less than half (44%) of the patients were graduates, 68% were non-vegetarian and all were married and 62% belonged to upper socio-economic status.

Table 1. Socio-demographic and clinical profile of the patients (n = 50).

Sample characteristics		Frequency, *n* (%)
Age (years)		
20–40	Mean ± SD 47.25±12.44 years	16 (32)
41–60		26 (52)
>60		8 (16)
Gender		
Male		36 (72)
Female		14 (28)
Education status		
Illiterate		9 (18)
Primary		9 (18)
Secondary		10 (20)
Graduate or above		22 (44)
Diet		
Vegetarian		16 (32)
Non-vegetarian		34 (68)
Tobacco chewing		7 (14)
Smoking		6 (12)
Alcoholism		12 (24)
Socioeconomic status		
Upper class		31 (62)
Upper middle class		10 (20)
Middle class		3 (6)
Lower middle class		6 (12)
Diagnosis		
Prolapsed intervertebral disc		34 (64.2)
Listhesis		3 (5.7)
Lumbar canal stenosis		6 (11.3)
Combined diagnosis*		7 (13.2)
Type of spine surgery		
Microscopic spine surgery		12 (22.6)
Endoscopic spine surgery		13 (24.5)
Open spine surgery		25 (47.2)
Duration since surgery		
1–6 months	Mean ± SD 14 ± 8 months	10 (18.9)
7–12 months		13 (24.5)
1–2 years		22 (41.5)
More than 2 years		5 (9.4)
Length of hospital stay (days)		
0–10	Mean ± SD 7 ± 6 days	45 (84.9)
11–20		4 (7.5)
>20		1 (1.9)

Alcoholism was reported by 24% of patients followed by tobacco chewing (14%) and smoking (12%). Two-thirds of the patients were diagnosed with prolapsed intervertebral disc (64.2%) followed by patients with combination of prolapsed intervertebral disc, listhesis, and lumbar canal stenosis (13.2%), lumbar canal stenosis (11.3%) and listhesis (5.7%). Open spine surgery was performed in 47.2% followed by microscopic surgery in 22.6% and endoscopic surgery in 24.5% of the patients. The mean duration of the length of hospital stay was 7 ± 6 days after surgery. The mean duration from surgery till the data collection was 14 ± 8 months.

Nursing Care Needs of Patients During Pre-operative Period

Table 2 shows the nursing care needs of patients who had undergone thoracolumbar spine surgery during their pre-operative period prior and after hospitalization. The majority of the patients experienced physical problems like pain (98%), numbness (98%), weakness of limbs (72%), stiffness in limbs (20%), and loss of bladder (24%) and bowel control (12%).

The psychological problems that patients faced were worried about the surgical outcome (86%), sleeplessness (88%), fear of surgical procedure (72%) and fear of death (16%). The activities of daily living related problems that patients faced were dependence in toileting (52%), difficulty in bathing (52%), difficulty in transferring (50%), dependence in dressing (40%) and needed assistance in grooming (32%). Most of the patients were unaware of deep breathing and coughing exercises (72%) and some had difficulty in understanding the specific instructions (24%).

Nursing Care Needs of Patients During Post-operative Period Before and After Discharge

Table 3 shows the nursing care needs of patients who had undergone thoracolumbar spine surgery during post-operative period before and after discharge. The most common physical problems after surgery were pain (96%), numbness (78%), post-operative hypothermia (32%) and phlebitis (32%). Some patients had post-operative nausea (22%), urine retention / urine infection after surgery (22%), decreased muscle strength (20%), fever (18%), stiffness (12%), constipation (12%), and infection at wound site (8%).

Table 2. Nursing care needs of patients during pre-operative period (n = 50).

Variable	Frequency, *n* (%)	
	Pre-hospitalization	***Post-hospitalization***
Pain (back and lower limbs)	49 (98)	49 (98)
Numbness	49 (98)	49 (98)
Sleeplessness	44 (88)	44 (88)
Worry about surgical outcome	43 (86)	45 (90)
Lack of understanding surgical procedure and its outcomes	42 (84)	
Lack of awareness about deep breathing and coughing exercises	36 (72)	
Limb weakness	36 (72)	36 (72)
Dysthymia	36 (72)	
Fear of surgical procedure	28 (56)	37 (74)
Difficulty in bathing	26 (52)	26 (52)
Dependence in toileting	26 (52)	28 (56)
Difficulty in transferring	25 (50)	24 (48)
Dependence in dressing	20 (40)	20 (40)
Needs assistance in grooming	16 (32)	16 (32)
Anger due to disease process	15 (30)	
Difficulty in understanding specific instructions	12 (24)	14 (28)
Stiffness	10 (20)	
Faced problem where to report for admission	8 (16)	
Fear of death	8 (16)	
Loss of bowel control	6 (12)	
Needs assistance feeding	4 (8)	

Table 3. Nursing care needs of patients during post-operative period before and after discharge (n = 50).

Variable	Frequency, *n* (%)	
	Before discharge	***After discharge***
Pain (back and lower limbs)	48 (96)	45 (90)
Early awakening	43 (86)	43 (86)
Sleeplessness	42 (84)	42 (84)
Numbness in limbs	30 (78)	34 (68)
Worry about dependency on others	38 (76)	33 (66)
Difficulty regarding follow up in OPD		37 (74)
Difficulty in bathing	38 (76)	31 (62)
Fear regarding prognosis	37 (74)	27 (54)
Dependence in toileting	37 (74)	27 (54)
Difficulty in transferring	34 (68)	25 (50)
Dependence in dressing	33 (66)	24 (48)
Lack of understanding about exercise after surgery	29 (58)	29 (58)
Difficulty in understanding how to change side (log rolling)	27 (54)	
Lack of understanding of postoperative instructions		26 (52)
Difficulty in carrying out wound dressing		26 (52)
Stress regarding role responsibility of family		25 (50)
Anxiety to return to your job		20 (40)
Needs assistance in grooming	26 (52)	
Hypothermia	16 (32)	
Phlebitis (intravenous cannula)	16 (32)	
Post op nausea	11 (22)	
Urine retention / urine infection after surgery	11 (22)	
Decreased muscle strength	10 (20)	
Fever	9 (18)	
Stiffness	6 (12)	
Constipation	6 (12)	
Needs assistance in feeding	6 (12)	
Infection at wound site	4 (8)	
Nightmares	2 (4)	

The psychological problems that patients faced were early awakening (86%), sleeplessness (84%), worry about physical dependence on others (76%), and fear regarding prognosis (74%). The activities of daily living related problems patients experienced were difficulty in bathing (76%), dependence in toileting (74%), difficulty in transferring (68%) and needed assistance in dressing (66%), and grooming (52%) after surgery. Furthermore, some patients felt a lack of understanding about post-operative exercise (58%) and changing side by log rolling (54%).

Comparison of Nursing Care Needs of Patients During Four Phases of Peri-operative Period

Figure 1 shows the comparison of nursing care needs of patients after thoracolumbar spine surgery during four phases of peri-operative period. The pain was consistently there during all phases of peri-operative period. There was a marked reduction in numbness after surgery.

Weakness of the limbs also improved. The problems related to the activity of daily living like toileting and bathing showed a similar trend. There was a lack of understanding about post-operative exercise during post-operative period in the hospital and even after discharge during home care.

Distribution of Quality of Life Score of Patients

The QOL of the patients, overall QOL rated by patients and health satisfaction of patients who had undergone spine surgery using the WHOQOL-BREF scale are presented in this section. The QOL is

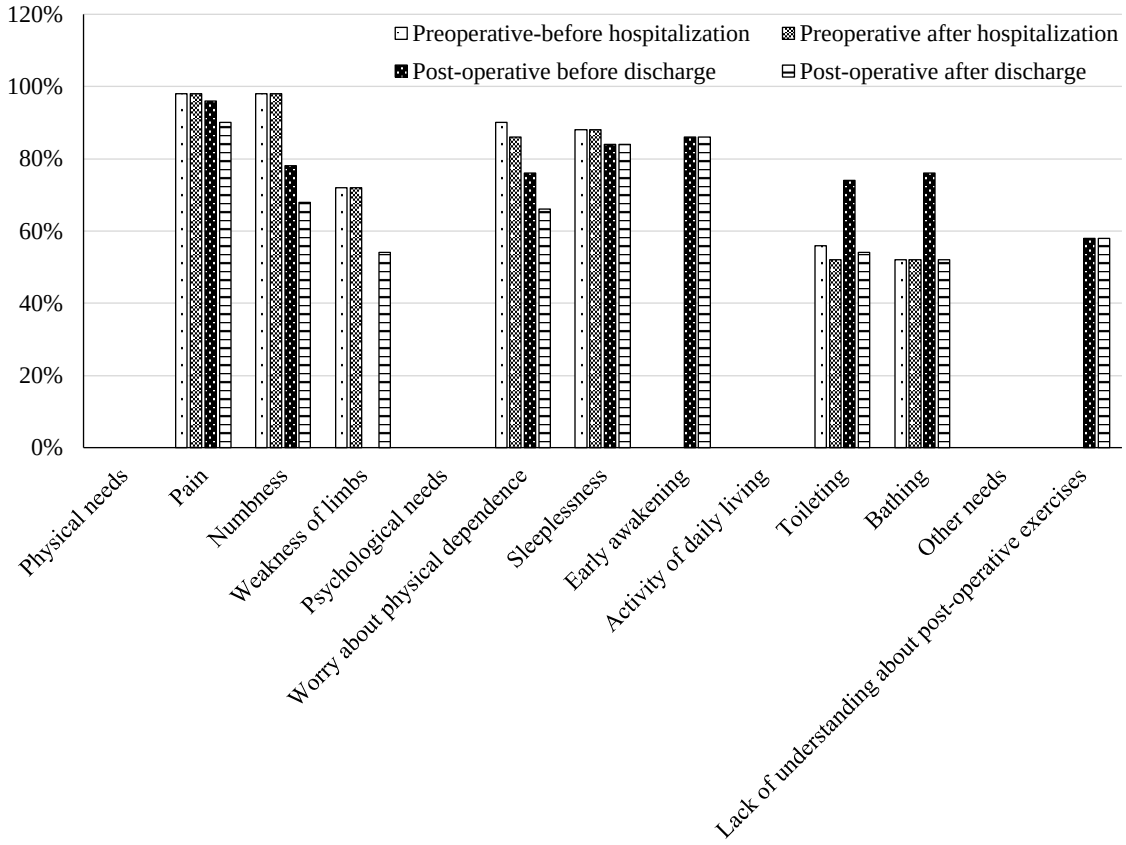

Figure 1. Graph showing comparison of nursing care needs of patients during four phases of peri-operative period.

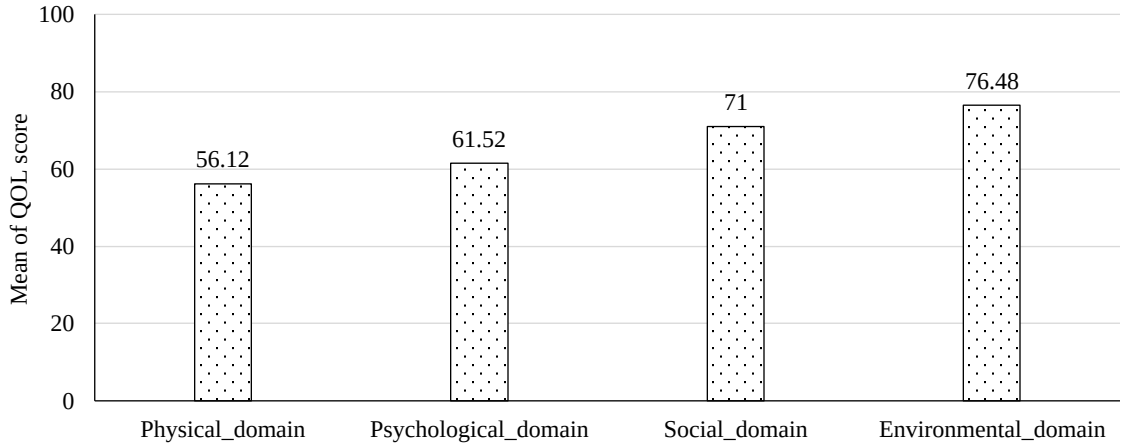

Figure 2. Domains of quality of life of patients.

assessed in four different domains, namely, physical domain, psychological domain, social domain, and environmental domain. The maximum possible score was 100. As the score increases, the QOL becomes better.

As shown in Figure 2, the QOL scores under environmental (76.48 ± 12.567) and social (71.00 ± 10.868) domains is better in comparison to the scores under psychological (61.52 ± 13.170) and physical (56.12 ± 14.614) domains. Hence, it can be inferred that the QOL under physical and psychological domains was affected more after spine surgery than QOL under the social and environmental domains.

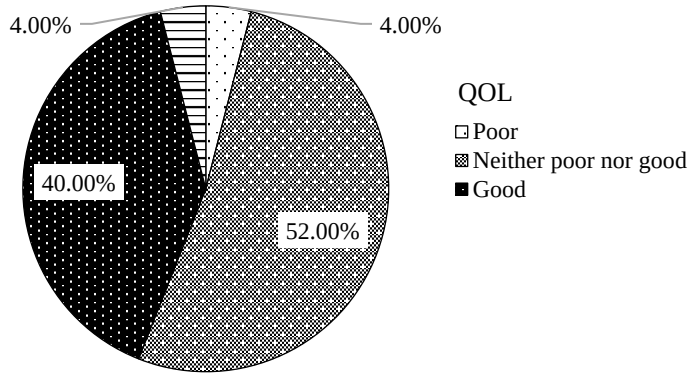

Figure 3. Quality of life (QOL) of patients after thoracolumbar spine surgery.

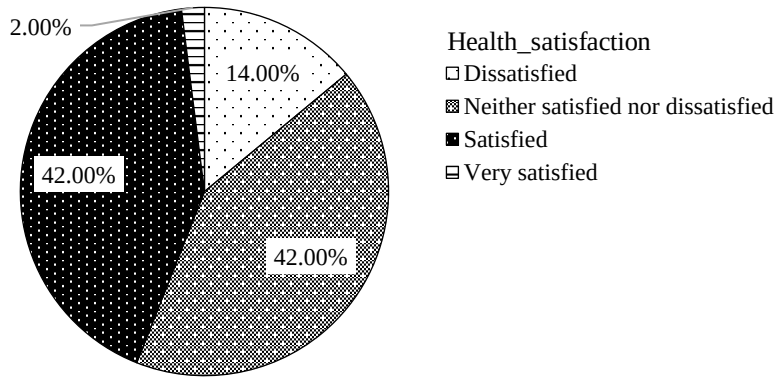

Figure 4. Health satisfaction of patients after thoracolumbar spine surgery.

Figure 3 depicts that more than half (52%) of the patients reported their QOL as "neither poor nor good" and patients who considered their QOL as "good" after spine surgery were 40%. An equal number of the patients considered their QOL as poor (4%) and very good (4%).

Figure 4 shows that an equal percentage (42%) of patients reported satisfied and neither satisfied and nor dissatisfied with their health. Only 14% of patients reported dissatisfaction with their health and a few (2%) were very satisfied with their health.

DISCUSSION

This study intended to explore the nursing care needs of the patients undergoing thoracolumbar spine surgery and to assess the quality of life after spine surgery. Several observational studies [10, 14, 15, 23, 28] have been undertaken to measure the QOL of patients following spine surgery, but there is scant literature [31] addressing the challenges that patients confront and their nursing care needs. The current study is one of the first to use a comprehensive method to assess the peri-operative nursing care needs of spine surgery patients.

Patients with disc herniation experience a variety of motor and sensory symptoms, the most common of which are pain, numbness, and weakness. Numerous studies have produced consistent results [4, 33, 34]. In our study, all of the patients mentioned pain as a major symptom. Despite the fact that decompression alleviated pain to some extent, some patients still complained of pain following surgery [6]. Pain has an impact on patients' everyday functioning and QOL. Nonpharmacological methods, in addition to pharmacological interventions, are critical for pain control following spine surgery. After spine surgery, these methods include heat pack therapy, ice, transcutaneous electrical nerve stimulation (TENS), post-operative exercises, and body mechanics [19].

Similarly, numbness and weakness of lower limbs are also common physical symptoms reported by patients throughout their peri-operative period. The persistence of these symptoms is due to significant nerve root compression. Nerve fibers will get demyelinated as a result of the constant compression [18]. The regeneration of the demyelinated nerve root will take 6 months or more. To aid regeneration, a vitamin D- and vitamin B1-rich diet, as well as physical therapy such as stretching, range of motion, and muscle strengthening exercises, should be incorporated into one's daily routine. Patients experienced an improvement in a few symptoms such as numbness and pain post-surgery, as a result of nerve root decompression. Surgery has been successful in improving the symptoms and activities of daily living [5].

The psychological health of the patients is also impacted in this study, as evidenced by the QOL score in the psychological domain of health. Many studies have found that patients undergoing spine surgery experience concern about their prognosis, long waiting period for surgery, return to work, and surgical outcomes [29]. To improve patient-reported outcomes, it is necessary to address the mental health of patients undergoing spine surgery. Depressive symptoms, such as anxiety about physical dependence, insomnia, and dysthymia, are catastrophizing psychological symptoms that can affect post-surgical outcomes and quality of life. These findings are consistent with other studies [2, 25].

So, a nurse must be able to recognize these indications and intervene appropriately. Pre-surgical screening is also a critical strategy for detecting psychological suffering. Many studies have shown that nurse-led counseling improves outcomes [9, 27, 30]. As a result, prehabilitation is required for better surgical outcomes. Prehabilitation is a modern concept that involves pre-surgery exercise and physical therapy, as well as nutritional optimization and psychological counseling [3, 4].

The surgical outcomes are heavily influenced by the functional impairment induced by physical and psychological problems. After thoracolumbar spine surgery, activities of daily life, particularly those involving the lower limbs, such as toileting, washing, and transferring, are severely altered. With persistent musculoskeletal pain, there is an increase in impairment, as indicated by the fear-avoidance model. After spine surgery, fear of movement increases the chance of further disability [1, 32]. As a result, a psychological information strategy, incorporating the patient in the treatment plan, should be used [22].

The activities involving lower limbs, such as ambulation, bathing, and toileting, were the most common problems linked to the activity of daily living issues identified by patients in the current study. This could be related to a fear of movement or a lack of clear mobility guidelines. Fear of moving is also linked to a reduction in activities of daily living [25]. According to the Wilson and Clearly model [8], symptom status, such as pain and fear, has an impact on functional status, or the ability to execute particular tasks. To improve functional ability or activities of daily living, interventions such as clear instructions about activity, exercise protocol, pharmacologic and non-pharmacologic pain management should be offered [9].

Other nursing care demands or perceived problems reported by patients included follow-up in the outpatient department (74%), difficulty in understanding postoperative exercises (58%), lack of understanding of postoperative instructions (52%), and difficulty in wound dressing (52%). This may be due to insufficient explanations concerning discharge recommendations. It implies that nurses and other members of the multidisciplinary care team should deliver accurate information to patients. Mohsen et al. [21] found that patient knowledge improves significantly following nursing rehabilitation in the form of a leaflet prior to surgery.

Lack of knowledge about post-operative exercises was the major problems that patients addressed in the present study. This could be due to a lack of clarity in the patient's understanding of expected post-

operative consequences. Many studies have demonstrated that patient education can help improve surgical outcomes [18, 24].

In comparison to the social and environmental domains, physical and psychological well-being has the greatest impact on QOL. However, according to other studies [11, 16], the physical domain is the most affected element of health after thoracolumbar spine surgery. Heider et al. [11] observed a significant improvement in physical wellbeing after surgery from baseline data to 6 months. This suggests that patients' QOL increases over time. The functional problems would have resulted in poor QOL in the physical and psychological domain in our study [19].

Nowadays, therapeutic efficacy is measured by patient satisfaction. In our study, a similar number of patients (42%) said they were content, neither satisfied nor dissatisfied with their health. According to Menendez et al. [20], seven factors influence patient satisfaction: pain, functional capacity, surgical outcome, patient expectations, health features, post-operative care, and caregiver interpersonal manner. The dimensions that were affected in our study were physical problems, a lack of information about expected outcomes, and post-operative exercise. As a result, there is a need for multidisciplinary communication about expected outcomes and post-surgery care [30]. Hence, patients face a slew of issues during their post-operative recovery period.

Implications to Clinical Practice

This study shows that nurse-led counseling is necessary to address the many physical and psychological concerns that patients confront throughout their peri-operative time. This study gives nurses a better understanding of how physical and psychological issues affect the QOL following spine surgery. There is a need to make a support group of patients who have undergone spine surgery. Need-based nursing care guidelines can be developed for patients undergoing thoracolumbar spine surgery.

LIMITATIONS

The study was limited to thoracolumbar spine surgery patients only. The sample size was small due to COVID-19 pandemic. There can be response bias and recall bias as we have collected self-reported data.

CONCLUSION

Patients who had undergone spine surgery due to different pathologies of the thoracic and lumbar spine experience various problems during their perioperative period. Besides physical problems, patients also reported psychological problems and knowledge deficit regarding post-operative home care. Physical and psychological domains of QOL were more affected compared to environmental and social domains. There is a need to develop an appropriate nursing protocol to guide and manage patients at various phases of peri-operative period.

Conflict of Interest

The authors report no conflict of interest.

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