Original Article

Congruence of Pain Assessments between Nurses and Lumbar Spinal Surgery Patients

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Abstract

Background: Assessment of pain is an important part of nursing care. Since pain is multidimensional and an individual experience, there are some problems in its evaluation.
Aims: The aim of this study was to determine the congruence of pain assessment between nurses and lumbar spinal surgery patients.
Methods: This descriptive study was conducted between October 2016 and March 2017 with 46 adult patients who underwent lumbar spinal surgery and 24 nurses. Patients and nurses assessed the severity of pain with a Visual Analog Scale. Pain assessment was performed three times a day, while the patient was at rest and before analgesic administration.
Results: In this study, 67.4% of the patients were male and their average age was 40.04 ± 13.22 years. The average age of the nurses was 33.04 ± 6.72 years, and 83.3% of them were educated at the undergraduate level. The patients had a moderate to mild level of pain, and their intensity of pain decreased over the time. The congruence was high between the patient-nurse assessments. There was no statistically significant relationship between the pain score and the sociodemographic characteristics of the patients.
Conclusions: Nurse-patient congruence was high and nurse-patient pain assessments were similar after lumbar spinal surgery. The findings of this study will contribute to increasing the awareness of nurses and to becoming more aware of pain assessments after lumbar spinal surgery.

Keywords: congruence; nursing; pain; pain assessment; spinal surgery

Introduction

The frequency of spinal surgery has increased significantly in the last decade (Mathiesen et al. 2013), and surgeries for degenerative spinal disorders and disc surgeries have been routinely applied (Bono et al. 2013, Suri et al. 2017). Most patients who underwent spinal surgery experience severe pain in the early postoperative period due to extensive tissue and bone damage (Bono et al. 2013, Elder, Hoh & Wang, 2008, Kaptain, Bregnballe & Dreyer, 2017). The pain of these patients continues for a few days (Firouzian et al. 2018), and sometimes the pain may not be relieved completely (Drow et al. 2016, Kaptain, Bregnballe & Dreyer, 2017, Suri et al. 2017). Due to insufficient pain assessment and ineffective pain control, the severity of the pain, and the risk of complications, the length of stay in hospitals is increasing. The recovery period can become prolonged, and mobilization and a return to daily routine are delayed (Elder, Hoh & Wang, 2008, Firouzian et al. 2018, Wooldridge & Branney, 2020). Therefore, patients' pain should be well evaluated, and effective treatment should be provided in the postoperative period (Chou et al. 2016, Kim et al. 2014, Wooldridge & Branney, 2020).

An effective pain treatment can only be provided after a correct assessment of pain. (Bozimowski 2012, Duignan & Dunn, 2008). Because the pain is subjective, its assessment depends on patient reporting (Bono et al. 2013, Latina et al. 2015, Yildirim et al. 2015). Therefore, national and international organizations recommend postoperative pain assessment, and active patient participation with the assessment is required for a successful pain management (Kaptain, Bregnballe & Dreyer, 2017, Wooldridge & Branney, 2020). Notably, one of the basic elements of pain control is that nurses and patients evaluate pain intensity using the same criteria (Alemdar & Aktas, 2014). Although the congruence between patients and nurses is very important in the pain assessment, it has been reported that nurses cannot correctly evaluate postoperative pain (Duzel, Aytac & Öztunc, 2013, Giusti, Reitano & Gili, 2018, Latina et al. 2015, Yang et al. 2020, Yildirim et al. 2015). Studies have also shown that patient participation in the postoperative pain assessment is still not fully achieved (Kaptain, Bregnballe & Dreyer, 2017), the patient's pain is not believed (Dequeker, Van Lancker & Van Hecke, 2018, Duignan & Dunn, 2008, Yildirim et al. 2015), and the pain assessment by the healthcare staff is not always compatible with that of the patients (Giusti, Reitano & Gili, 2018, Latina et al. 2015, Lidén et al. 2012, Yang et al. 2020). In studies evaluating pain after spinal surgery, pain was generally evaluated once, and it was stated that patients had moderate to severe pain. However, the change in pain over the time has not been studied (Bono et al. 2013, Jankowski et al. 2019, Kaptain, Bregnballe & Dreyer, 2017). In addition, the congruence of pain severity assessments between the patient and the nurse has been investigated in various studies in the literature (Davoudi et al. 2008, Dequeker, Van Lancker & Van Hecke, 2018, Giusti, Reitano & Gili, 2018, Marco, Kanitz & Jolly, 2013, Melotti et al. 2009), but there is no study on the accuracy of nurses' pain assessments in patients having spinal surgery. Therefore, there is a need for a study designed to provide more information about the congruence of nurses with patients in assessing patients' pain severity. Based on this requirement, in this study, we aimed to determine the congruence of pain assessment between nurses and lumbar spinal surgery patients. The results of this study will be a guide for the assessment of pain in order to provide effective pain management after lumbar spinal surgery.

Methods

Study Design: This descriptive study was conducted in the Neurosurgery Department of an Education and Research Hospital between October 2016 and March 2017. This descriptive study's reporting adheres to the STROBE Checklist.

Participants: The patient population was all patients who had lumbar spinal surgery in the clinic during the time of the study. The sample size of the study was determined as 46 patients with the preassumptions that the interclass correlation would be above 0.9 for a 95% confidence interval for each patient and nurse evaluation and that there would be no congruence in cases of interclass correlations less than 0.8. Patients > 18 years of age who underwent spinal surgery, did not have any vision or hearing problems or physical or mental illness were included in the study. Due to the incision and tissue cutting during spinal surgery, nociceptors at the nerve terminals are stimulated and may cause postoperative pain. However, the intensity may be different for different surgical areas (Dhandapani et al. 2016). Therefore, in this study, only 46 patients who undergoing lumbar region surgery and who met the research criteria were interviewed, and then postoperative pain assessments were performed.

Twenty-four nurses working in the Department of Neurosurgery were interviewed and all of them volunteered for the study. The study was carried out with these 24 nurses. During the data collection phase, each nurse evaluated the pain of the patients under their care.

Data Collection: Before starting the study, all nurses were told about the purpose and methods of the study and about how and when to assess the pain. In addition, all patients were interviewed before the surgery, instructed about how and when to assess the pain and about how to score the pain they felt through the Visual Analog Scale (VAS). The patients were told not to score any pain intensity while the nurse was in his/her room. Patients sociodemographic data were collected during the preoperative period and including age, sex, education, and marital status, body mass index (BMI). Nurses sociodemographic data including age, education level, and working years were collected. The VAS was used for pain assessment after surgery and recorded pain follow-up form. This form was prepared as two pages for patients and nurses to prevent patient-nurse interactions during the pain assessment.

In this study, patients and nurses were interviewed face-to-face, and then the pain assessment was performed. The first assessment was made just after the patient came into the room from the post-anesthesia care unit, and the pain assessments were continued during the follow-up of the patient in the clinic. The pain severity of the patients was routinely assessed in every 8 hours for 2 days postoperatively.

In order not do affect the results in this study, pain assessment of the patients was performed while the patient was at rest and before analgesic application. During the patient's assessment of the severity of the pain, the nurse, who also assessed the patient's pain, was expected to leave the room so that the nurses were not affected by the VAS score reported by the patient. After the nurse left the room, the patient was asked to report the severity of pain through use of the VAS. The patient reported the severity of pain only to the researchers. After evaluating the patient's pain in the patient's room, the nurse who was providing care to the patient and assessed the level of pain was interviewed and was asked to score the patient's pain on a VAS according to his/her assessment. In the assessment of each patient, we attempted to ensure that the same nurse responded as much as possible.

Ethical Considerations: In this study, Clinical Research Ethics committee approval (Date: 12 April 2016, Decision No:303-16/1648-948) and institutional permission were obtained. Written consent was obtained from the patients and nurses. It was explained to the patients that they can decline to participate whenever they wanted to and that this situation will not cause any problems in their treatment. The nurses were also told that they could quit the study at any time.

Data Analysis: SPSS v.25 (IBM Corp.) was used for data analysis. The conformity of the measurement values obtained in the scope of the study to a normal distribution was examined with the Kolmogorov-Smirnov test. Categorical variables were reported as frequency (%), and continuous variables were reported as mean, (standard deviation). In the evaluation of the demographic features and intermeasurement analysis, the Mann-Whitney U test, Kruskal-Wallis test, Spearman correlation and analysis of variance (ANOVA) were used in the repeated measurements. The congruence of the pain intensity between the patients and nurses was evaluated with an intraclass correlation coefficient (ICC). The ICC was interpreted as follows: ≤0.20 indicated slight agreement, 0.21–0.40 indicated fair agreement, 0.41–0.60 indicated moderate agreement, 0.61–0.80 indicated substantial agreement and ≥0.81 indicated almost perfect agreement (Dequeker, Van Lancker & Van Hecke, 2018, Landis & Koch, 1977). Statistical significance was set at $P < .05$.

Results

Of the 46 patients included in the study, 31 (67.4%) were male, their mean age was 40.04 ± 13.22 years, and their mean BMI was 26.11±4.04, 73.9% of the patients were married, 37.0% were primary school and 37.0% were high school graduates, and 67.4% were working. In addition, 73.9% of the patients had lumbar disc herniation (LDH) and 26.1% had spinal stabilization surgery. All of the nurses included in the study were women, and their average age was 33.04±6.72 years. We found that 83.3% of the nurses had only undergraduate education and that their average working years was 11.91±7.89 years (Table 1). The VAS scores reported by the nurses and patients were found to be of moderate and mild severity (Min/Max: 2.54/5.48 for patients; Min/Max: 2.17/4.76 for nurses). The most severe VAS score was reported in the 1st evaluation by both patients and nurses, and the VAS score decreased significantly over time. The VAS scores evaluated by the patients and nurses were found to be an ICC coefficient of 0.932 and above, and there was a strong correlation between the patient and nurse evaluations. In addition, it was determined that the patient and nurse evaluations were similar and that there was no significant difference between them ($P > .05$) (Table 2). There was no statistically significant relationship between the patients' VAS score assessment and sociodemographic characteristics or the type of surgery ($P > .05$). Similarly, there was no statistically significant relationship between the VAS score assessment and the sociodemographic characteristics of the nurses ($P > .05$) (Table 3).

Table 1. Demographic Characteristics of Nurses and Patients

Characteristics				
Patient				
	$\overline{X}$	**SD**	**Min**	**Max**
Age	40.04	13.22	20	68
BMI	26.11	4.04	18.49	35.81
	n		**%**	
Gender				
Male	31		67.4	
Female	15		32.6	
Marital status				
Single	12		26.1	
Married	34		73.9	
Educational status				
Primary education	17		37.0	
High school	17		37.0	
University	12		26.1	
Occupation				
Military personnel	8		17.4	
Retired	7		15.2	
Housewife	8		17.4	
Officer	8		17.4	
Private sector	15		32.6	
Diagnosis				
LDH surgery	34		73.9	
Stabilization surgery	12		26.1	
Nurse				
	$\overline{X}$	**SD**	**Min**	**Max**
Age	33.04	6.72	24	46
Working time	11.91	7.89	2	28
	n		**%**	
Marital status				
Single	12		26.1	
Married	34		73.9	
Educational status				
Associate degree	2		4.3	
Bachelor's degree	20		43.5	
Postgraduate	2		4.3	
Working time				
0-5 years	6		25.0	
6-10 years	5		20.8	
11 years and more	13		54.2	

BMI: Body Mass Index, SD: Standart Deviation, LDH: Lumbar Disc Herniation, Min: Minimum; Max: Maximum

Table 2. Analysis Results for Visual Analog Scale Score Averages At Six Time Point and Correlation of Patient-Nurse Visual Analog Scale Score

	T_1 $\bar{X}$ ±SD	T_2 $\bar{X}$ ±SD	T_3 $\bar{X}$ ±SD	T_4 $\bar{X}$ ±SD	T_5 $\bar{X}$ ±SD	T_6 $\bar{X}$ ±SD	F/p*
Patient	5.48±2.355	4.39±2.745	3.72±2.373	3.48±2.229	3.28±2.544	2.54±2.268	**8.436/0.000[a]**
Nurse	4.76±2.609	3.54±2.545	2.98±2.246	2.87±1.928	3.02±2.371	2.17±1.947	**6.076/0.000***
ICC	0.938	0.957	0.932	0.959	0.975	0.968	
t/p**	0.632/0.545	1.549/0.147	1.627/0.125	3.857/0.096	3.294/0.063	3.071/0.052	

*a:*p<0.001, * Repeated Measures ANOVA ** t test ICC= Intraclass corelation coeficient, SD: Standart Deviation, VAS: Visual Analog Scale

Table 3- The Relationship Between the Sociodemographic Data of Nurses and Patients and Their Visual Analog Scale Evaluations

Patient	T_1	T_2	T_3	T_4	T_5	T_6
Age						
r/p[a]	-0.275/0.064	-0.126/0.404	-0.082/0.586	-0.025/0.870	-0.067/0.660	-0.117/0.438
BMI						
r/p[a]	-0.309/0.063	-0.076/0.614	-0.044/0.771	-0.092/0.543	-0.019/0.900	-0.017/0.913
Gender						
Female	5.93±2.86	5.20±2.93	4.06±2.15	4.46±2.26	3.06±2.28	2.73±2.54
Male	5.25±2.08	4.00±2.60	3.54±2.48	3.00±2.08	3.38±2.69	2.45±2.15
Z/p[b]	-0.662/0.508	-1.485/0.137	-0.888/0.375	-2.252/0.150	-0.731/0.397	-0.391/0.379
Marital status						
Married	5.35±2.38	4.38±2.84	3.85±2.42	3.50±2.29	3.05±2.25	2.47±2.32
Single	5.83±2.32	4.41±2.53	3.33±2.26	3.41±2.10	3.91±3.26	2.75±2.17
Z/p[b]	-0.656/0.512	-0.076/0.940	-0.670/0.503	-0.215/0.830	-0.481/0.631	-0.819/0.413
Educational status						
Primary education	5.00±2.06	4.47±3.16	3.94±2.30	3.70±2.02	2.88±2.20	2.29±2.11
High school	6.17±2.72	5.11±2.66	3.76±2.33	3.52±2.52	3.41±2.64	3.05±2.38
University	5.16±2.12	3.25±1.91	3.33±2.67	3.08±2.19	3.66±2.96	2.16±2.36
X^2/p[c]	1.777/0.441	3.311/0.191	0.464/0.793	0.559/0.756	0.470/0.791	1.973/0.373
Occupation						
Military personnel	4.37±2.26	3.62±1.84	2.87±2.03	3.12±2.23	2.62±2.13	2.00±2.00
Retired	6.00±2.82	5.14±3.80	4.85±3.43	3.85±2.26	3.42±2.50	3.42±3.04
Housewife	4.37±2.13	3.75±2.65	3.37±1.99	3.62±2.19	1.62±1.18	1.12±1.24
Officer	6.12±2.58	5.25±2.81	4.87±2.03	4.62±2.19	5.00±2.92	3.12±2.58
Private sector	6.06±2.01	4.33±2.74	3.20±2.17	2.80±2.24	3.53±2.69	2.86±2.09
X^2/p[c]	2.470/0.291	1.164/0.559	3.526/0.172	1.476/0.478	2.059/0.357	0.848/0.654
Diagnosis						
LDH surgery	5.41±2.42	4.17±2.89	3.50±2.03	3.41±2.11	2.91±2.26	2.38±2.21
Stabilization surgery	5.66±2.22	5.00±2.25	4.33±3.17	3.66±2.60	4.33±3.08	3.00±2.44
Z/p[b]	-0.341/0.733	-0.843/0.339	-0.809/0.419	-0.152/0.879	-1.531/0.126	-0.742/0.458
Nurse						
Age						
r/p[a]	0.112/0.601	0.118/0.583	0.002/0.991	0.063/0.769	0.043/0.843	0.180/0.399
Working timer/p[a]	0.135/0.531	0.090/0.676	0.002/0.994	0.071/0.741	0.044/0.837	0.204/0.339
0-5 years	3.83±2.48	3.50±2.16	2.50±1.51	3.50±2.07	3.16±2.92	2.16±2.48
6-10 years	5.00±3.67	2.40±2.50	4.20±2.94	3.40±3.43	4.20±4.49	2.00±2.91
11 years and more	3.84±2.26	4.00±2.64	3.00±2.79	2.84±1.57	2.92±1.60	2.61±2.32
X^2/p[c]	0.468/0.791	1.719/0.423	1.198/0.549	0.298/0.862	0.045/0.978	1.185/0.553
Educational status						
Associate degree	5.50±2.50	3.54±2.66	2.81±1.91	2.59±1.73	2.77±2.06	1.95±1.32
Bachelor's degree	4.20±2.48	3.70±2.55	3.45±2.62	3.35±2.10	3.50±2.74	2.55±2.48
Postgraduate	6.00±2.82	4.00±2.82	1.50±0.70	2.00±1.41	2.00±1.41	1.00±1.41
X^2/p[c]	3.436/0.064	1.338/0.247	1.218/0.270	0.484/0.487	0.403/0.525	0.055/0.815

[a]Spearman Corelation, [b] Mann-Whitney U test, [c] Kruskall Wallis test, LDH: Lumbar Disc Herniation, VAS: Visual Analog Scale

Discussion

Pain is the leading problem encountered after surgery (Chou et al. 2016, Subramanian et al. 2016). In spinal surgery, patients experience varying degrees of pain from moderate to severe after the surgical procedure due to muscle dissections, vertebrae, intervertebral joints, ligaments, and nerve root compressions and damages (Kaptain, Bregnballe & Dreyer, 2017, Kim et al. 2014). In our study, the VAS scores reported by the patients were moderate in the first 24 hours and then mild. Similarly to our study, Drow et al. (2016) and Jankowski et al. (2019) reported that moderate to mild pain with LDH patients. However, Dhandapani et al. (2016) stated that 94% of patients with lumbar region surgery reported moderate or severe pain. It was thought that the differences in the results may be related to the number of spinal levels involved during the spinal surgeries. As the number of spinal levels involved during spinal surgery increases, the severity of the pain increases (Dhandapani et al. 2016).

Since the inflammatory mediators increase during the first 24 hours, the pain intensity is higher (Dhandapani et al. 2016). Additionally, the excitability of neurons in the early postoperative period is increased and the patients being more sensitive to stimuli and sensory inputs during this period (Kim et al. 2014). In our study, the VAS score decreased significantly after the first evaluation, and the severity of pain decreased over time. Drow et al. (2016) and Kim et al. (2014) reported that the patients experienced the most severe pain during the first assessment and that the pain decreased over time. It was thought that the reduction in postoperative inflammatory mediators, which are high after surgery, and a decrease in reflex spasms in the paraspinal muscles may be effective in pain relief. Pain is a subjective, personal experience. There is no physiological marker to directly demonstrate its severity (Bono et al. 2013, Davoudi et al. 2008, Yang et al. 2020). Therefore, the most reliable way to assess pain is to trust the patient's self-expression of their pain (Bono et al. 2013, Davoudi et al. 2008, Duignan & Dunn, 2008). However, it has been reported that the severity of pain reported by the patients is higher than that reported by nurses in various studies and in studies with different patient groups (Bozimowski, 2012, Giusti, Reitano & Gili, 2018, Martin et al. 2018, Marco, Kanitz & Jolly, 2013). Additionally, studies have shown that the assessment of pain by health personnel is not always compatible with the patients' ratings. (Giusti, Reitano & Gili, 2018, Davoudi et al. 2008).In our study, unlike the previous literature, it was determined that the VAS scores given by patients and nurses were similar, and there were no statistically significant differences between the VAS scores. Also we found that that the congruence was high between the patient and nurse assessments. This result is pleasing as it shows clinical success in pain assessment. Because, the strongest indicator of a failure in pain management is the inadequate evaluation of pain and the inconsistency between the pain severity felt by the patient and the pain severity predicted by the medical staff (Bozimowski, 2012, Duignan & Dunn, 2008).

The one of the reason for why the congruence in the pain assessment is weak is the prejudices and attitudes that nurses have developed regarding pain throughout their professional life. For this reason, it has been stated that there is a tendency to overestimate the severity of pain by young nurses with a short working-time period, while there is a tendency to predict pain at a lower level among those with a long working-time period. In studies similar to the previous literature, it is observed that nurses with a young age and short working-time score higher on pain assessment (Davoudi et al. 2008, Giusti, Reitano & Gili, 2018). In our study, unlike the previous literature, it was observed that there was no relationship between the VAS score given by the nurses and their age, working years, and education level. This result is gratifying as it demonstrates our clinical success in pain assessment. Because we thought that nursing experience may assist in accurately evaluating the pain of patients. As a result of our study, we think that the working experience is useful for pain assessment.It has previously been reported that there is a relationship between extensive clinical experience and the accuracy of pain assessment (Davoudi et al. 2008).

Many individual factors such as age, occupation, sex, and the region of surgery can be associated with pain, and such factors may increase the severity of pain (Drow et al. 2016). In our study, no statistically significant relationship was found between the patients' VAS score and age, BMI, sex, marital status, educational status, occupation, or type of surgery. In previous studies, it was shown that there was no relationship between the severity of pain and the age, sex, education, marital status, BMI, or occupation of the patients (Drow et al. 2016, Dhandapani et al. 2016, Subramanian et al. 2016). Our results are similar to those of previous studies.

Limitations: Although this study provides new information about the congruence between patient-nurse pain assessments, it should be noted that there are some limitations. One of them is that this research was carried out in a single hospital. Therefore, these results apply only to these patients and cannot be generalized to other patients. Another limitation is that only patients who underwent lumbar region surgery were included in this study.

Conclusion: In this study, in which the congruence between patient-nurse pain evaluations was assessed in patients who underwent spinal surgery, it was found that congruence was high between patient-nurse pain assessment. In addition, it was observed that the severity of pain reported by the patients was similar to nurses and there was no difference between them.

Findings from the study will contribute to increase the awareness of nurses and pay more attention to pain assessment after spinal surgery. In successful pain management, which focuses on maintaining, improving health and improving care outcomes, nurses will begin to pay more attention to the importance and individuality of pain assessment, not determining the presence and severity of pain. For this reason, nurses should accept patients' notifications in pain assessment. Thus, the difference between patient and nurse in pain assessment can be eliminated.

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