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Research

How Can we Improve the Comfort Level and Sleep Quality After Surgery?

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ABSTRACT

Purpose: The aim of this study was to determine the effect of progressive relaxation exercises on the comfort level and sleep quality of patients undergoing lumbar disc herniation surgery.
Methods: The study was conducted between July 2015 and October 2016 in the neurosurgery clinic. The sample consisted of 96 patients (n = 56, experimental patients; n = 40 control patients) randomized into groups. The data was collected by using the personal information form, The Perianesthesia Comfort Questionnaire, The General Comfort Questionnaire and Visual Analog Sleep Scale.
Findings: In the postoperative General Comfort Scale that there was a statistically significant difference between the mean of the control group and experimental group on the final test ($P < .05$). When the Visual Analog Sleep Scale mean of the experimental and control group patients were compared between the groups, there was a statistically significant difference on the postoperative 2nd day and 3rd day ($P < .05$).
Conclusion: This study supports previous work that progressive relaxation exercises are feasible and effective to improve patient comfort levels after lumbar disc surgery.

Disc hernia is the most common diagnosis among the degenerative anomalies of the lumbar spine. In 90% of patients, disc herniations are observed at the lumbar level because this part of the spine supports most of the load of the whole body.[1,2] It has become an important health problem due to its high prevalence worldwide; 2% to 3% of the world population—4.8% of men and 2.5% of women over the age of 35—are affected.[3] In studies conducted in Turkey, discal hernia is more common in women than in men and is usually seen between the ages of 35 to 65 years.[4]

Lumbar disc disease may present with complaints of intermittent low back pain, stiffness in the waist, and/or sciatica and needs to be treated due to the risk of progressive neurological involvement.[5] In lumbar disc herniation (LDH), conservative treatment methods aim to prevent the need for surgical treatment and to mitigate complaints that negatively affect the quality of life.[5] For this purpose, short-term bed rest, analgesics and anti-inflammatories, exercise, physical therapy, manual therapy, and orthoses are prescribed.[5] Unresponsiveness to medical treatment, recurrent sciatica, disc herniation in the narrow canal floor, and recurrent neurological deficits are relative surgical indications. Definite surgical indications are sphincter disorder and progressive motor deficit.[6,7]

Surgical interventions have an important role in preserving people's health, but they may also have undesirable but predictable results such as poor sleep quality.[8] Postoperative pain and uncertainty following surgical intervention, ambient noise, and crowded or stuffy patient rooms are factors that negatively affect the sleep patterns and comfort levels of postoperative patients.[9–11]

People naturally have a strong preference for physical comfort in their daily lives, and it becomes indispensable for prompt and successful convalescence following surgery. Therefore, providing and maintaining patient comfort is one of the goals of nursing, in line with the commitment to protect patients and promote rest, as almost every stage of the surgical process impairs patient comfort and sleep quality.[12–14] Briefly, comfort is a significant criterion for initial, ongoing, and discharge assessment and management of perianesthesia patients.[15]

The healing role of sleep is crucial during illness. Disruption of the sleep pattern will have a negative effect on the comfort level of patients. if patients have complaints about not sleeping well, it is the nurse's responsibility to identify and eliminate the factors that negatively affect the patient's sleep needs and provide an effective and relaxing sleep environment to help the patient sleep normally.[16–19]

In surgical clinics, pharmacological and non-pharmacological methods are used by nurses to improve the sleep quality of patients in the postoperative period in order to ensure and maintain their comfort. In the literature, progressive relaxation exercises have been recommended to alleviate skeletal muscle tension and contractions

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in patients, divert attention away from pain to reduce anxiety, and achieve more comfortable sleep in patients with sleep disorders.[20–22]

A study conducted by Büyükünal[23] recommended the inclusion in training programs of nonpharmacological methods to be used in conjunction with pharmacological methods to provide patient comfort after surgery.

Although there are studies relating to improving the sleep quality and comfort level of patients using progressive relaxation exercises, there are no studies using such methods in surgical clinics for patients with sleep problems. This study was carried out to evaluate the effects of progressive relaxation exercises to relieve sleep problems and increase comfort levels after lumbar disc hernia surgery.

The following two hypotheses were developed for this study:

H1. Progressive relaxation exercises positively affect the comfort level of patients who have undergone surgery for LDH.

H2. Progressive relaxation exercises positively affect the quality of sleep of patients who have undergone surgery for LDH.

Methods

Design and Study Population

The study population comprised patients with LDH having lumbar micro discectomy under general anesthesia at the Neurosurgery Clinic of Dursun Odabaş Training and Research Hospital of Van Yüzüncü Yıl University between July 2015 and July 2016.

The aim of this study was to examine the effects of progressive relaxation exercises on the comfort level and sleep quality on the first, second, and third post-surgical days in patients who had undergone surgery for LDH.

G Power 3.1.5 was used to calculate the sample size. This study accepted an α value of 0.05 (95% confidence) and a theoretical power $(1 - \beta)$ of 0.90, which meant that a sample size of 38 was needed. Fifty-six patients who had surgery due to lumbar disc herniation and who were found suitable to participate in the study were included in the experimental group. Forty patients who had surgery due to lumbar disc herniation and who were found suitable to participate in the study were included in the control group. The study was completed with 96 patients (40 in the control group and 56 in the experimental group) because some patients in the control group did not agree to participate.

After baseline assessment patients undergoing lumbar micro discectomy surgery were randomly assigned to two groups using a computer program (www.randomizer.org). Group 1 was the control group participants who received no intervention (n = 40); group 2 was the experimental group participants who performed progressive relaxation exercises (n = 56).

The inclusion criteria used for the study were that the participants must be between the ages of 18 and 65, have no cognitive, affective, or verbal impairment, have no acute disease that caused pain or anxiety, use the same type and dose of analgesics as other participants during the postsurgical period, and have no diagnosed psychiatric disorder.

The exclusion criteria were that the participants must not be unable to express pain and sleep status correctly, have no problem(s) that would prevent them from understanding the information provided, have no chronic disease that caused pain or anxiety, and not be using medications to aid sleep.

Research Instruments

The data was collected by using the personal information form prepared by the researchers in line with the literature, The Perianesthesia Comfort Questionnaire (PCQ), The General Comfort Questionnaire (GCQ) and Visual Analog Sleep Scale (VASS).

The Perianesthesia Comfort Questionnaire

The PCQ was developed by Kolcaba.[24] The validity and reliability of the questionnaire to test its use on the Turkish population was conducted by Ustundag and Eti Aslan.[25] Cronbach's Alpha value was found to be 0.83. The questionnaire includes 24 statements questioning the self-understanding and feelings of a patient that reflect the general thoughts about pre- and postoperative periods. Each statement on the questionnaire had a score of between 1 and 6 and ranges from "strongly disagree" towards "strongly agree." The maximum total score on the questionnaire is 144, and the minimum score is 24. The total score obtained is divided by the number of scale statements, and the mean score is then calculated and the result is expressed in the range of 1-6. A low score indicates a poor level of comfort and a high score indicates a good level comfort.

The General Comfort Questionnaire

The GCQ was developed by Kolcaba in 1992.[26] Conformity of the scale to the Turkish population was tested by Kuguoglu and Karabacak.[27] They found Cronbach's Alpha value of the scale to be 0.85 with a high reliability. The scale is in the form of a 4-point Likert scale and includes a total of 48 statements. The maximum total score on the questionnaire is 192, and the minimum score is 48. The total score obtained is divided by the number of scale statements, the mean score is then calculated and the result falls in the range of 1 to 4. A low score indicates a poor level of comfort and high score indicates a good level comfort.

Visual Analog Sleep Scale

The VASS was developed by Verran and Snyder-Halpern[28] in 1988 to evaluate the sleep quality of patients and healthy individuals. The Turkish validity and reliability of the scale was performed by Çetinkaya and Karabulut[29] in 2016. The Turkish form of the scale was created from 10 items without sub-dimensions and some items were removed, unlike the original. Each item in the scale is evaluated using the visual comparison technique (on the left end) between 0 and 100 (on the right end). Scale scoring is between 0 and 1000. The increase in the score obtained from the scale indicates that the quality of sleep decreases. The Cronbach's Alpha coefficient of the scale was found to be 0.94.[29]

Nursing Interventions

Data were gathered through individual face-to-face interviews. To prevent the interaction of patients in the control and experimental groups, the data of the patients in the control group were collected first. Afterwards, the study continued with the patients in the experimental group. The patients did not see each other to avoid being affected.

The Progressive Relaxation Exercises information leaflet and the Relaxation Exercises CD were used in the nursing intervention.[30–32] Patients in the experimental group were provided training on progressive relaxation exercises in their room in a quiet environment, and they then listened to the relaxation exercises on the CD provided. Following this, the exercises on the CD were first demonstrated by the researcher, and then patients were asked to perform them. They were provided instructions to ensure correct performance of the exercises. The training took approximately one hour for each patient. The leaflet contained step-by-step instructions and described the effects the exercises would have on the body.

The contents of the CD are separated into three chapters. Chapter 1 describes 10 minutes of deep relaxation, the purpose of the exercise, and the techniques to be followed during the exercise are explained. In Chapter 2, relaxation exercises that take approximately 30 minutes to perform are explained with verbal instructions and the sound of ocean waves in the background. Chapter 3 also lasts for approximately 30 minutes and contains solely relaxation music.

The experimental group. Patients were asked to fill out a demographic characteristics identification form upon admission to the hospital. Later, patients were given training on the use of exercises preoperatively upon admission to the clinic. On the morning of their surgery, they were asked to fill out the GCQ, and 24 hours after surgery, they were asked to complete the PCQ. These patients were asked to perform progressive relaxation exercises, as planned in the nursing intervention stage, on the first and second day in the afternoons and evenings (17:00 and 20:00). The VASS was applied early in the morning on the days following each exercise day to assess the patients' sleep quality.

On the first day following surgery, sleep quality of the previous night was determined using VASS as soon as the patient was awake. In the afternoon (17:00) and evening (20:00) of the same day, the progressive relaxation exercises taught to the patients were performed together. Sleep quality was assessed on the morning of the second day using the VASS. The progressive relaxation exercises were repeated, and the following morning, VASS was applied once more to evaluate the sleep status. To ensure the patients were comfortable and relaxed enough during the progressive relaxation exercises, their companions were asked to leave the room, there was no urgent need to use the bathroom, the room was quiet and tranquil, and the CD was playing at an appropriate sound volume. Finally, the patients were asked to fill out the GCQ one last time before being discharged from the hospital.

Control group. Patients filled out a demographic characteristics identification form upon admission. VASS and the GCQ were applied on the morning of surgery, and the PCQ was applied within 24 hours following surgery. VASS was applied on the first, second, and third mornings following surgery. The GCQ was administered one last time the day the patients were discharged. To allow the control group patients to benefit from the progressive relaxation exercises and receive treatment equivalent to the interventional group patients, they were encouraged to perform the progressive relaxation exercises starting from the third day, after all the required data were collected.

Ethical Considerations

The study was approved by the ethics committee and conducted according to the guidelines established in the Declaration of Helsinki. Permission to conduct the study was also obtained from the relevant institution. Written consent was obtained from patients who agreed to enroll in the study. All participants were informed about the purpose and design of the study and were assured of their anonymity and confidentiality. Furthermore, patients were informed that they could withdraw from the study at any time if they wished.

Statistical Analysis

Statistical analyses were performed using SPSS (SPSS Inc., Chicago, IL) for Windows, version 21. The data were screened to confirm the normality of distributions. Baseline characteristics were compared between the two groups using the Chi Square test and a t test for independent samples.

Results

Demographic Characteristics

Table 1 presents information regarding the comparison of patient demographic characteristics in the experimental and control groups. Age, gender, marital status, education level, occupation, employment status, working hours, smoking habits, and chronic disease history in both groups were examined. No significant differences were found between the two groups in terms of demographic data ($P > .05$, Table 1). While there were patients with a history of surgery in the experimental group (16.1%), there was no patient in the control group, and the difference was significant ($P < .05$, Table 1).

Postsurgical Comfort

Evaluation of Table 2 reveals that the average score on the 1st postoperative day PCQ is 4.67 ± 0.46 in the experimental group and 4.69 ± 0.47 in the control group. The difference is not statistically significant at $P > .05$, indicating that there are no meaningful differences between scores of patients in the two groups on the early postoperative PCQ.

As shown in Table 3, the average GCQ pre-test score was 2.91 ± 0.18 for the control group and 2.94 ± 0.14 for the experimental group. Again, the difference between the two groups is not

Table 1
Comparison of Demographic Characteristics of Experimental and Control Group Patients (N = 96)

		Experiment Group (n = 56)		Control Group (n = 40)	
		N	%	n	%
Age group	30 years and below	2	3.6	3	7.5
	31-40 years	6	10.7	10	25.0
	41-50 years	19	33.9	7	17.5
	50 years and above	29	51.8	20	50.0
		$\chi^2 = 5.888$ $P = .117$			
Gender	Male	31	55.4	20	50.0
	Female	25	44.6	20	50.0
		$\chi^2 = .269$ $P = .604$			
Marital Status	Single	1	1.8	2	5.0
	Married	55	98.2	38	95.0
		$\chi^2 = .796$ $P = .372$			
Education Level	Elementary	49	87.5	28	71.8
	Secondary	1	1.8	4	10.3
	High school	2	3.6	5	12.8
	University	4	7.1	2	5.1
		$\chi^2 = 6.651$ $P = .084$			
Occupation	Housewife	25	44.6	18	45.0
	Worker	12	21.4	7	17.5
	Retired	4	7.1	7	17.5
	Self-employed	9	16.1	4	10.0
	Civil servant	3	5.4	3	7.5
	Other	3	5.4	1	2.5
		$\chi^2 = 3.601$ $P = .604$			
Employment	Yes	18	32.1	13	32.5
	No	38	67.9	27	67.5
		$\chi^2 = .001$ $P = .971$			
Working Hours	Full time	20	87.0	12	85.7
	Part time	3	13.0	2	14.3
		$\chi^2 = .011$ $P = .915$			
Surgery history	Yes	9	16.1	0	0.0
	No	47	83.9	40	100.0
		$\chi^2 = 7.094$ $P = .008$			
Smoking habit	Yes	13	23.2	13	32.5
	No	43	76.8	27	67.5
		$\chi^2 = 1.019$ $P = .313$			
Chronic Sleep Disorder	Yes	5	8.9	0	0.0
	No	51	91.1	40	100.0
		$\chi^2 = 3.77$ $P = .07$			

Table 2
Comparison of Average Scores on Early Postoperative Perianesthesia Comfort Questionnaire (EPPCQ) for Experimental (n = 56) and Control Group Patients (n = 40)

	Experiment Group Mean ± SD	Control Group Mean ±SD	Test and Significance
EPPCQ	4.67 ± .46	4.69 ± .47	t = .154 *P* = .824

Table 3
Comparison of Average Pre- and Final Test Scores on the General Comfort Questionnaire of Control and Experimental Group Patients (N = 96)

	Control Group Mean ± SD (n = 40)	Experiment Group Mean ± SD (n = 56)	Test and Significance
Pre test	2.91/0.18	2.94 ± 0.14	t = 0.694 *P* = .492
Final test	3.38/0.12	3.82 ± 0.58	t = 22.15 *P* = .000

statistically significant at $P > .05$, indicating that the scores on the GCQ for the control and experimental group patients do not differ. On day of discharge GCQ, the control group score was 3.38 ± 0.12, while it was 3.82 ± 0.58 for the experimental group. The difference between the two groups was statistically significant at $P < .001$.

As shown in Table 4, the average VASS score for control group patients on the morning of surgery was 869.35 ± 37.72, while it was 865.19 ± 49.94 for the experimental group. The difference was not statistically significant at $P > .05$. On the first day, the average VASS score was 791.57 ± 42.74 for the control group and 778.71 ± 30.68 for the experimental group. The difference between these data is not statistically significant at $P > .05$. The average VASS score for the experimental group was 761.92 ± 47.53 on the second day following surgery, while it was 576.05 ± 40.78' for the experimental group, and the difference was statistically significant at $P < .001$. On the third day, the average VASS score was 674.80 ± 32.44 for the control group and 472.89 ± 32.74 for the experimental group. The difference was again statistically significant at $P < .001$ (Table 4).

Discussion

Nursing care plays an important role in the success of surgical interventions on the nervous system. In surgical clinics, pharmacological and non-pharmacological methods are used by nurses to enhance the sleep quality of patients in the postoperative period and to ensure and maintain their comfort. Proper nursing can increase sleep quality and the comfort level of patients by providing relaxation with progressive relaxation exercises, a non-pharmacological method.

On the GCQ, the mean score of the experimental group was 4.67 ± 0.46 and that of the control group was 4.69 ± 0.47. There was no statistically significant difference between them. We can observe that the mean scores of the two groups are similar; the difference is not statistically significant, because no intervention or application other than routine nursing care was performed on the patients in either group in the early stages before and after surgery.

The control group's mean score on the GCQ post-test was 3.38 ± 0.12, and for the experimental group it was 3.82 ± 0.58, significantly different from the control group. After lumbar disc hernia surgery, the mean score for general comfort level of the experimental group was higher. These results support hypothesis 1.

We can confirm that progressive relaxation methods increase the comfort level of patients due to such effects as reducing stress and anxiety, drawing attention away from pain, relieving muscle tension and contractions, facilitating sleep, and reducing sensitivity to fatigue and pain. This study had similar findings to other studies about progressive relaxation with surgical patients in particular[33,34] and hospital patients in general.[35]

This study found no statistically significant difference between the mean scores on the VASS of patients in the experimental and control groups on the morning of surgery and the first day after surgery, and there were statistically significant differences between their scores on the second and third days after the operation. These results support hypothesis 2. We can explain this situation by the inability of the patients to fully concentrate on exercises and to do them effectively on the the first day after surgery. We also observed that the ocean sounds played during the progressive relaxation exercises evoked inner peace in the patients, reduced pain and anxiety affecting the emotional state, and as a result, had a positive effect on the sleep quality of patients.

In a study conducted by Çetinkaya and Karabulut,[29] the researchers found that patients in the group using progressive relaxation exercises had fewer sleep disturbances, fell asleep more easily, got enough sleep, and felt rested when they woke up. Bahçeli and Karabulut[36] found that progressive relaxation exercises applied to patients with LDH surgery decreased their 'anxiety and pain levels and enhanced sleep quality. Akmeşe and Oran[37] determined that relaxation exercises provided relaxation for patients and increased their sleep quality.

In their study, Rabin et al.[38] found that the sleep quality of the group using progressive relaxation exercises was better than that of their control group. Means et al.[39] found that the wakefulness period of the group who used progressive relaxation exercises significantly decreased and the quality and duration of their sleep improved.

These findings are similar to results reported in studies conducted with different disease groups. Thus, controlling the factors affecting patients' sleep and enhancing its quality can be attributed to progressive relaxation exercises.

That progressive relaxation exercises are unique and meaningful in non-pharmacological nursing care practices has been emphasized in much of the literature. We concur that progressive relaxation exercises have a positive effect on comfort level and sleep quality in the postoperative period. In light of these findings, we recommend that nurses working in surgical services apply relaxation exercises to patients.

Conclusion

Nurses should be encouraged to include progressive relaxation exercises as a component of their nursing activities in all surgical

Table 4
Comparison of Average Scores on the VASS for the Experimental and Control Groups on the Morning of Surgery and the First Three Postsurgery Days (N = 96)

	Control Group Mean ± SD (n = 40)	Experiment Group Mean ± SD (n = 56)	Test and Significance
Surgery morning	869.35 ± 37.72	865.19 ± 49.94	t = 0.44 *P* = 0.66
1st day following surgery	791.57 ± 42.74	778.71 ± 30.68	t = 1.72 *P* = .09
2nd day following surgery	761.92 ± 47.53	576.05 ± 40.78	t = 20.54 *P* = .00
3rd day following surgery	674.80 ± 32.44	472.89 ± 32.74	t = 29.90 *P* = .00

VASS, Visual Analog Sleep Scale.

clinics. In order to improve the comfort level of patients, we recommend that progressive relaxation is adapted in hospitals and used in surgical patients.

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