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Effectiveness of Nursing Rehabilitation Program on Patients' Pain after Lumbar Vertebral Discectomy

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ABSTRACT

Objective(s): to determine the effectiveness of nursing rehabilitation program on patients' pain after lumbar vertebral discectomy based on Analog pain scale.
Methods: A quasi-experimental study was conducted on patients after lumbar vertebral discectomy surgery. They have been selected and divided into two groups (study and control) with the application of the pre-test and post-test approach to the both groups after applying the nursing rehabilitation program. The validity, reliability, and interval scale of APS have been established. Data were collected in four phases: first baseline data (before any intervention presented to the study group) and then after each phase of the rehabilitation program. The study period was from January31st, 2022, to June30th, 2023. Data were analyzed by using SPSS version 23.
Results: The results of this study showed that there was a significant difference between the baseline time and after phase three in pain scales at P value lower than .005. the mean of APS for the study group was dropped from 6.24 at baseline evaluation to 0.76 after phase 3 of the program.
Conclusion: The study concluded that nursing rehabilitation program has a significant improvement on patients' outcomes concerning back pain.
Recommendations: The study recommended that the current nursing rehabilitation program applied for all eligible patients after lumbar vertebral discectomy. Nurses and rehabilitation teams encouraged and motivated to participate in training programs concerning rehabilitation processes. Establishing advanced guidelines and recommendations of post spinal surgeries rehabilitation.

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فاعلية برنامج التأهيل التمريضي في آلام المرضى بعد عملية استئصال القرص الفقري القطني

المستخلص

الأهداف: لتحديد فاعلية برنامج التأهيل التمريضي في آلام المرضى بعد استئصال القرص الفقري القطني على أساس مقياس الألم التناظري.

المنهجية: أجريت دراسة شبه تجريبيةعلى مجموعة من المرضى بعد اجراء عملية استئصال القرص الفقري القطني بعد تقسيمهم الى مجموعتين (مجموعة الدراسة و المجموعة الضابطة) مع تطبيق منهجي الاختبار القبلي والبعدي على المجموعتين بعد تطبيق برنامج التأهيل التمريضي.لقد تم إثبات صحة وموثوقية ومقياس الفاصل الزمني لـ APS. وتم جمع البيانات على اربع مراحل: البيانات الأساسية الأولى (قبل تقديم أي تدخل لمجموعة الدراسة) ثم بعد كل مرحلة من مراحل برنامج التأهيل التمريضي على مجموعة الدراسة. كانت فترة الدراسة من 31كانون الثاني 2022 إلى 30 حزيران 2023. تم تحليل البيانات باستخدام الإصدار 23 من SPSS.

النتائج: أظهرت نتائج هذه الدراسة أن هناك فرقًا معنويًا بين الوقت الأساسي وبعد المرحلة الثالثة في مقاييس الألم عند قيمة P أقل من 005. حيث بينت ان معدل الالم على مقايس APSلمجموعة الدراسة انخفض من 6.24 عند التقييم الأساسي الى 0.76 بعد المرحلة الثالثة من البرنامج.

الاستنتاجات: خلصت الدراسة إلى أن برنامج إعادة التأهيل التمريضي له تحسن كبير في نتائج المرضى فيما يتعلق بآلام الظهر.

التوصيات: أوصت الدراسة بضرورة تطبيق برنامج إعادة التأهيل التمريضي الحالي على جميع المرضى المؤهلين بعد استئصال القرص الفقري القطني. تشجيع الملاكات التمريضية وفرق إعادة التأهيل وتحفيزهم على المشاركة في برامج التدريب المتعلقة بعمليات إعادة التأهيل. وضع إرشادات وتوصيات متقدمة لإعادة التأهيل بعد جراحات العمود الفقري.

الكلمات المفتاحية: برنامج إعادة التأهيل التمريضي ، استئصال القرص الفقري القطني ، مقياس الألم التناظري.

Introduction

Intervertebral disc disease (IDD) is one of the most common musculoskeletal problems that affect the back [(1)]. The most frequent procedure used to treat lumbar-related problems worldwide is a lumbar discectomy [(2)]. The majority of patients with lumbar vertebral surgery are seen by rehabilitation team during their hospitalization. In early rehabilitation, they commonly focus on resuming walking [(3)].

In the United States, there are about 5 to 20 cases of a herniated disc per 1000 adults [(4)]. It is most common in people who are in their third to the fifth decade of age [(4)].

It's important to maintain a suitable workout regimen for patients with lumbar spine herniation since they also have imbalanced and weaker flexor and extensor body muscles in addition to discomfort. Exercise regimens that are put into place following lumbar disc herniation surgery have been shown in prior research to significantly lower postoperative pain, disability, and increase back muscular strength, return to work, and patient-reported outcomes functional scores [(5)].

The majority of experts advise beginning post-operative exercise regimens as soon as possible, within 1-6 weeks after surgery. Even though it's important to follow the surgeon's guidelines about activity restrictions, research suggests that commencing certain exercises immediately after a discectomy under the guidance of a qualified therapist may aid the recovery process. Initiating a muscle-strengthening routine within six weeks after a discectomy may help patients have less discomfort and return to work sooner [(6)].

The successful recovery from low back surgery depends on regular back strengthening exercises and a gradual return to normal activity through rehabilitation [(7)].

Patients, according to the rehabilitation unit in Neurosurgery Teaching Hospital; do not adhere to the routine exercise programs after the lumbar vertebral surgery for the

planed period of time. The majority of them do not adhere to visit rehabilitation center after two or three rehabilitation sessions. So, they need education programs to do the most important exercises helping them to get better.

Methods

Study Design and Setting

A quasi-experimental study had been applied with the use of pretest-posttest approach for two groups of samples (Study and control) during the period January31st, 2022, to June30th, 2023. In order to get valid and comprehensive data, the study has been done at Neurosurgery teaching hospital in Baghdad City/ Iraq.

Study Sample and Sampling

A purposive sample has been selected to obtain representative and accurate data. The size of sample was (50) patients divided into two groups each one contains (25) patents as control group and study group. The study group was exposed to the nursing rehabilitation program while the control group was not exposed to the nursing rehabilitation program.

Data Collection and Study Instruments

The data were collected from (50) patients from different wards at Neurosurgery Teaching Hospital. The data collection included four times duration, pre-test and post-test.

The instrument was consisting of 2 parts which are: 1-Self administrated sheet related to the demographic and clinical characteristics of the patient. 2- Analog Pain Scale (APS) to assess the level of pain.

Nursing Rehabilitation Program

The nursing rehabilitation program which consists of three phases of exercises A-Phase 1: two weeks which includes body mechanics instructions, simple walking program and gentle stretching exercise.

B-Phase 2: three weeks which contains walking progression, exercises to activate the glute muscles and strength training for the upper and lower extremities.

C-Phase 3: three weeks, which consists of advanced stabilization and core-strengthening exercises in addition to strengthening of the upper and lower extremities?

All patients in study sample have been assessed in baseline assessment by using Analog Pain Scale (APS). Data were collected and saved as start point to be compared with results of next assessment.

The rehabilitation program has been explained to all the participant of the study group. All of them agreed to adhere to the exercise program according to the specified period.

The three phases of the program as well as the main health instructions regarding body mechanism have been explained in details for every patient in the study group. After that, the first session and the instructions were given to the participants as videos on their phones.

Globally, APS is frequently used to gauge the severity of pain. The validity, reliability, and interval scale of APS have been demonstrated (8). It has a high degree of repeatability and test-retest reliability. This tool features a continuous scale that is made up of a vertical and a horizontal visual analog scale, respectively. Vertical and horizontal APS have a strong association. The severity or frequency of many different clinical symptoms is measured using the APS in epidemiological and clinical research. Clinical trials APS is widely used as an outcome metric in randomized controlled trials to assess the efficacy of the treatment (9).

Ethical Considerations

The researcher of this study received the first permission to accomplish the study from the Ethical Committee of the Nursing

Faculty at the University of Baghdad. The researcher ensures that all participants receive informed consent to participate in the study. In addition, the study protocol and questionnaire were distributed to the Ministry of Planning (Central Statistical Organization) and to ministry of health to get official permissions to conduct the study before data collection procedure. After that, the permission was sent to the Neurosurgery teaching hospital which gave the agreement to the researcher to do the study.

Data Analysis

Data were analyzed using SPSS (Statistical Package for Social Sciences) version 23.0 including both descriptive and inferential statistics. Data analysis includes descriptive statistics (frequency, percent, mean, and standard deviation), and inferential statistics (Fisher exact, Chi-square, and t-test).

Result

Table 1. Distribution of the Study Sample According to their Demographic Characteristics Data

Var.	Groups	Study			Control			C.S. (*) P-value
		Freq.	%	Cum. %	Freq.	%	Cum. %	
Age Groups	26-35	5	20	20	5	20	20	χ^2= 17. 2 P=0.799 N.S
	36-45	11	44	64	7	28	48	
	46-55	6	24	88	7	28	7^6	
	56-65	3	12	100	6	24	100	
Mean ± SD		41.8± 8.1			43.4±8.7			
Gender	Male	17	68	68	13	52	52	X^2=1.33 P=0.248 N.S
	Female	8	32	100	12	48	100	
Work	Free work	13	52	52	9	36	36	χ^2= 1.404 P=0.496 NS
	Housekeeper	6	24	76	9	36	72	
	Employer	6	24	100	7	28	100	
Education Levels	Read & write	3	12	12	1	4	4	χ^2= 1.565 P=0.815 NS
	Primary school	6	24	36	9	33	37	
	Intermediate school	6	24	60	7	29	66	
	Secondary school	5	20	80	4	17	83	
	College or Institute	5	20	100	4	17	100.0	

This table displays the frequency counts for selected variables. As mentioned above, the two groups (control versus study) were equal in size. Ages of the participants ranged from < 25 to 65 years (Mean age for the study group =41.8 ± 8.1), (Mean age for the control group=43.4 ±8.7), there were more male patients (68%) than females (32%) in the study group and (52%) were males and (48%) female in the control group. Most common work of the study group participants was free work (52%) also in control group, it was the most frequent work in the same percent (36%) with housekeeper. The most common educational levels were primary and intermediate school (24%) in the study group while primary school was the highest percentage (33%) in the control group.

Table (2): Distribution of the Study Samples (study and Control) According to their Clinical.

Var.	Groups	Study			Control			C.S. (*) P-value
		Freq.	%	Cum. %	Freq.	%	Cum. %	
First presence of signs and symptoms	Less than 6 months	8	32	32	9	36	36	χ^2= 0.397 P=0.820 NS
	6 - 12 months	8	32	64	6	24	60	
	More than a year	9	36	100	10	40	100	
First doctor visit	Less than 6 months	12	48	48	11	44	44	X^2=1.022 P=0.6 NS
	6 - 12 months	8	32	80	6	24	68	
	More than a year	5	20	100	8	32	100	
Decision to have the surgery	Immediately after the diagnosis	4	16	16	8	32	32	X^2=2.702 P=0.259 NS
	Less than 6 months	12	48	64	7	28	60	
	More than 6 month	9	36	100	10	40	100	

Table 2 shows that (36%) of the study sample and (40%) of the control group have experienced the signs and symptoms for more than one year before the surgery. However (48%) of the study group and (44%) of the control group visited the doctor for the first time in less than six months after the appearance of signs and symptoms. On the other hand, (48%) from the participants of study group have decided to do the surgery after less than six months from the diagnoses while (40%) of those in the control group took more than six months to have the surgery done. Statistically, there are no significant differences found between the Study samples (study and control) regarding the first presence of signs and symptoms, first doctor visit and when they decide to have the surgery.

Table 3. Significant Comparison between Pre-test, Posttest 1, Posttest 2 and Posttest 3 of Pain by Using Analog Pain Scale for Study and Control Groups

Pain assessment	GROUP	N	Mean	SD	F	Sig. (2-tailed)
Pre-Test	Study	25	6.24	1.393	.201	.687 N.S
	Control	25	6.08	1.115		
Post test1	Study	25	3.36	1.075	.019	.793 N.S
	Control	25	3.32	.988		
Post test2	Study	25	1.96	.676	1.709	.185 N.S
	Control	25	2.24	.831		
Post test3	Study	25	.76	.597	13.974	.002 H.S
	Control	25	1.52	.823		

N= number. of sample; **Mean**= numeric mean, **SD**= Standard Deviation; **F**= F-test; **P**= P-value. **N.S**= not significant; **H.S**= High significant.

Table 3 reveals that the mean scores of pain for both groups were comparable at all levels of evaluation except at posttest 3 which shows that the mean of the study group was (0.76) while

the mean of the control group was (1.52). Statistically there was significant difference in mean of two groups after posttest 3 when compared by ANOVA at P value ≤ 0.005.

Discussion

Results of the present study revealed that age of the study participants ranged from < 25 to 65 years. These results were different from results of another study that had been done in Egypt, which applied on patients with lumbar discectomy and found that one third of patients were less than 30 years of age [(10)]. This could reveal that age of patients with lumbar disc herniation who perform discectomy in Iraq is different (as older) from those outside Iraq, which could reflect that younger patients are affected by disc herniation outside Iraq (the researcher). In relation to the participants' gender, there were about two thirds of the patients were males while one third were females in the study group and about a half were males in the control group.

This result was different from result of study done at Al-Yarmouk Teaching Hospital, in Baghdad, which found that more than half of patients with lumbar discectomy were females [(11)]. This reflected that both genders in Iraq are affected by lumbar disc herniation at comparable level (the researcher).

Related to the job status of the study participants, about half of the study group and the same percent were presented with the control group have free work. While, results of another study that had been done in Egypt revealed that most of the participants were housewives [(10)].

This result reflected that free work affect more Iraqi patients with lumbar disc herniation, while in area outside Iraq, housework can cause herniation disc (the researcher). Corresponding to the education level, the most common educational levels were primary and intermediate stage which was about quarter of the study group participants while primary school was one third of the control group. These findings would suggest that the randomization process provide an acceptable level of equality between the groups. Statistically, there are no significant difference among, gender, work and level of educational.

Results of the present study showed that about one third of the study group and less than a half of the control group have experienced the signs and symptoms for more than one year before the surgery. However, about a half of the study group and half of the control group visited the doctor for the first time in less than six months after the appearance of signs and symptoms. On the other hand, about half of the study group has decided to do the surgery after less than six months from the diagnoses while more than one third of participants in control group took more than six months to have the surgery done.

Statistically, there were no significant differences found between the Study samples (study and control) regarding the first presence of signs and symptoms, first doctor visit, and when they decide to have the surgery.

These results were disagreed by results of another study that had been done in Egypt which found that the majority of the study sample has no previous diseases, and more than half of the study sample has no previous surgery or even previous back surgery [(10)]. This could reflect that most of participated Iraqi patients in this study have experienced from disorders in their lumbar vertebra and have pain for long time before visiting physicians to receive care and help.

Results of this study revealed that the mean scores of pain for both groups were comparable at all levels of assessment except at posttest 3 which showed that the mean of the study group was (0.76) while the mean of

the control group was (1.52). Statistically there was significant difference in mean of two groups after phase 3 of the program when compared by ANOVA at P value ≤ 0.005.

This result come in agreement of results of another study that has been done in Canada which reported that upon 524 patients with lumbar vertebral discectomy number of patients experienced leg pain, back pain, and disabilities [12]. Moreover, a study has been done in the United States applied on 24 patients with lumbar disc herniation reported that early rehabilitation for patients with lumbar discectomy can assist in decreasing complications, decreasing pain, and improving outcomes [13].

According to these listed findings, pain of patients with herniated disc can be affected by early rehabilitation and improved surgical interventions.

Conclusion

The recent study concluded that the mean of back pain has been significantly decreased for patients in the study group when tested at post test3 which indicated that the nursing rehabilitation program has a significant improvement on patients' outcomes concerning back pain.

Recommendations

The study recommends that the current nursing rehabilitation program applied for all eligible patients after lumbar vertebral discectomy. Nurses and rehabilitation teams need to be encouraged and motivated to participate in training programs concerning rehabilitation processes. Establishing advanced guidelines and recommendations of post spinal surgeries rehabilitation. Conducting more future researches about rehabilitation for patients with lumbar vertebral discectomy.

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