Effect of Nursing Rehabilitation Protocol on self-care Agency and Daily Living Activities in Patients undergoing Lumbar Discectomy

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ABSTRACT

Background: Lumbar disc herniation is a common spinal disease that interferes with daily activities and patient's rehabilitation regimen can greatly aid in their recovery. **Aim:** evaluate effect of nursing rehabilitation protocol on self-care agency and daily living activities in patients undergoing lumbar discectomy. **Subjects and method: Research design:** Quasi-experimental design (study/ control). **Setting:** Orthopedic Surgery and Traumatology Department and Outpatient Spine Clinic at Assiut University Hospital. **Subjects:** A purposive sample of sixty adult patients scheduled for lumber discectomy from both sexes was randomly assigned equally into two groups. **Tools:** A structured interview, Exercise for Self-Care Agency Scale, and Modified Barthel Index were assessed and analyzed before intervention and 3 months after surgery in two groups. **Results:** There was no difference between Self-Care Agency and daily living activities mean scores before rehabilitation protocol between study and control group ($P > 0.05$). Highly statistically significant difference was found in self-care agency mean score of study group (110.4 ± 15.23) vs control group (88.13 ± 5.72) with P value (<0.001). Additionally daily living activities mean score (88.13 ± 6.31) vs (72 ± 6.86) after the rehabilitation protocol was significantly higher in the study than in the control group ($p < 0.001$). **Conclusion:** Rehabilitation protocol increased the patients' self-care agency and enhanced participants' independence in daily living activities. **Recommendations:** Necessity provision of simple illustrated rehabilitation protocol as a teaching approach for patients undergoing lumbar discectomy.

Keywords: Daily Living Activities, Lumber discectomy, Nursing rehabilitation protocol, Self-care agency.

INTRODUCTION

One of the most common spine conditions in the world is lumbar disc disease (LDD). It is one of the most significant problems the healthcare system is currently dealing with, and it becomes a costly burden on society **(Chen et al., 2023).**

Lumbar disc herniation (LDH) is the most prevalent disease which affects lumbar spine. Although it can happen anywhere along the spine, a herniated or prolapsed disc most frequently affects the lower back, or "lumbar spine" which refers to localized or focal displacement of lumbar disc material outside of the intervertebral disc space's typical boundary **(Akhaddar, 2024).** It is the most prevalent diagnosis for lumbar spine degenerative anomalies, one of the most common reasons of low back pain and leg pain "sciatica". The incidence of LDH, which is estimated to be 5–20 cases per 1000 adults yearly, is highest among adults in their third to fifth decade of life, with a male to female ratio of 2:1. Over 95% of LDH in patients aged 25 to 55 occurs at L4-L5 or L5-S1 **(Pojskic et al., 2024).**

The treatment depends on disease severity and patients' conditions. To treat mild to moderate pain and muscle spasm, medical professionals may prescribe muscle relaxants and over-the-counter painkillers. Physiotherapy also helps patients with lumbar disk disease to perform exercises to improve strength, flexibility, and range of motion. Corticosteroid epidural injections also reduce pain and inflammation. However, sometimes surgical intervention is necessary when medical treatments are inadequate, especially when severe symptoms significantly impair quality of life. Surgical techniques for lumbar disc disease treatment include micro-discectomy, laminectomy, and artificial disc replacement. A lumbar discectomy is a minimally invasive or open surgical operation used to remove a herniated or degenerative disc from the lower spine **(Zhang et al., 2023).**

For optimal results following spine surgery, patients require nursing care protocols as well as an effective interventional and rehabilitation plan. In order to enhance patients' functional status and help them reach their recovery goals, postoperative rehabilitation is crucial. In the short term, this involves helping patients with personal care and housekeeping tasks; in the long run, it involves getting back to work and sports **(Barbosa et al., 2023).**

Following surgery, nursing care emphases on guiding patients how to practice deep breathing and coughing exercises and promoting patient mobility in order to prevent deep vein thrombosis. The nursing intervention focus on reducing the level of patient pain, improving patient mobility and helping the patient get ready for the rehabilitation phase, which focuses on various postures and exercises to help keep the spine in its neutral position and prevent the recurrence of spinal discs **(Quan, 2022).**

The majority of patients were discharged from the hospital one to three days after the surgery, meaning that the patient and their family must take care of themselves. This is because minimally invasive surgical techniques are preferred in light of technological advancements. Patient self-care agency which is the capacity to start or carry out the actions necessary to preserve, protect, and enhance one's own health decreases or becomes inadequate following surgical intervention. Patients and their families should receive education in order to enable them to be highly capable of taking care of themselves and to minimize or avoid complications following surgical procedures. The person's high level of self-care agency makes it possible for them to carry out daily tasks (**Kang et al., 2018).**

Daily life activities are known as activities that are necessary to sustain life. These include keeping a safe environment, communicating, breathing, eating, excretion, maintaining hygiene, clothing, controlling body temperature, and moving around **(Edemekong et al., 2023).** Since anesthesia, discomfort, and movement restrictions may interfere with the patient's daily activities throughout the recovery phase, the goal of postoperative care is to help the patient become independent **(Lewandrowski et al., 2021).** Following surgery, it is critical for patients to be independent in their everyday activities and to have a high level of self-care. Thus, education of patients and their caregivers is essential during the rehabilitation protocol **(Özden et al., 2022).**

Operational definition

Nursing rehabilitation protocol: It describes the core skills and information essential for patients with a lumbar discectomy to properly improve self-care and daily life activities **(Haghighat et al., 2024).**

Self-Care agency: The individuals' ability to recognize their needs, to identify and perform self-care actions to achieve a desired outcome. **(Rababah & Al-Hammouri., 2022).**

Daily Living Activities: Capacity to perform daily self-care tasks in order to meet one's requirements. These include toileting (bladder and bowel elimination), dressing/grooming, personal hygiene/bathing, feeding, transferring, mobility, and climbing stairs—all essential skills for achieving independence **(Peterson et al., 2023).**

AIM OF THE STUDY

The current study aimed to determine the effect of nursing rehabilitation protocol on self-care agency and activities of daily living among patients undergoing lumbar discectomy.

Study hypotheses

- H1: Nursing rehabilitation protocol provided for patients undergoing lumbar discectomy would enable better self-care agency of the study group compared to control group.
- H2: Nursing rehabilitation protocol provided for patients undergoing lumbar discectomy would enable better independence levels in activities of daily living of the study group compared to control group.
- H3: There would be a positive correlation between self-care agency and daily living activities post implementation of nursing rehabilitation protocol.

SUBJECTS AND METHOD

A. Technical design

Study design

Quasi experimental design was conducted by using test-retest approach for two groups (study and control).

Setting

The research was carried out at Orthopedic Surgery and Traumatology department and outpatient spine clinic in Assiut University Hospital. The researchers selected this setting as it is the core referral center for most of Upper Egypt. It is specialized in receiving, providing an integrated medical service, and treating cases of various orthopedic diagnoses.

Subjects

A purposive sample of sixty adult patients with lumbar disc herniation scheduled for lumbar discectomy were involved in this study (male &female); their age ranged from 18 to 65 years. Patients who were physically or mentally handicapped, disoriented & comatose patients, patients with neurological disorders, patients with hemiplegia or quadriplegia, patients with multiple-level disc prolapse, patients with additional lumbar spine conditions such as injuries, tumors, infections, or deformities, and patients who declined to participate in the research were excluded.

According to Assiut University Hospital statistical record, patients with lumbar disc herniation admitted in 2021 who met the inclusion criteria were 70.

The sample size was determined using the following formula, which was adopted from **Taylor, (2014):**

$$n = \frac{N}{1 + N(e)^2}$$

Where: n = sample size, N= total population size (Patients performed lumbar discectomy from hospital record), e = margin error 0.05.

$$\mathbf{n} = \frac{70}{1 + 70(0.05)2} = 59.57$$

Consequently, the required sample size was 60 patients, which were divided equally into 30 for study group and 30 for control group.

- Group (1): Study group received the nursing rehabilitation protocol with routine hospital care.

- Group (2): Control group was received the routine hospital care only.

Tools

To achieve the purpose of the current study, three tools were used for data collection.

Tool I: A structured interview:

It was developed by the researchers after reviewing of recent related literature to assess personal, health related data & medical history and vertebral disc history & clinical examination of patients. It included three parts:

Part 1: **Personal data as:** gender, age, occupation, marital status, educational level and residence.

Part 2: Health related data & medical history such as: life style habits as smoking, body mass index and presence of comorbid diseases as diabetes mellitus, hypertension etc.

Part 3: Vertebral disc history and clinical examination: (level of lumbar disc herniation, previous LDH surgery and regular exercise status, assessment of neurological status; included reflexes as (patellar reflex and Achilles) and muscle tone).

Tool (II): Exercise for Self-Care Agency Scale (ESCA)

Firstly, it was developed by **Kearney and Fleischer (1979);** after that, it was modified by **Yamishita (1998).** It was adopted by researchers to measure patients' self-care agency. It has 43 items on a 5-point Likert-type scale each item on the scale is scored between 0 and 4 points, with the following meanings: 0 = "it does not describe me at all;" 1 = "it does not describe me much;" 2 = "I have no idea;" 3 = "it defines me a little;" 4 = "it defines me a lot."

Scoring system

The total score of ESCA range from (0 to 172). If the score is ≥ 66% of the total score (≥113.52points), it indicates a high level of self-care agency, and <66%- 33% (<113.52- 56.76 points) of the total score indicates a middle level and if the total score

less than 33% (<56.76 point), it indicates low self-care agency level. Higher scores mean higher self-care agency.

Tool (III): Modified Barthel Index (MBI)

It was developed by (**Mahoney & Barthel., 1965**) and modified by (**Shah et al., 1989**). It was adopted by researchers to measure daily living activities; it encompasses ten activity domains: chair/bed transfers, ambulation, stair climbing, toilet transfers, bowel control, bladder control, bathing, dressing, grooming, and feeding.

Scoring: Each daily activity was given the score ranging from 0 (unable to perform task) to a maximum of 5, 10, or 15 (fully independent- exact score depends on the activity being evaluated). The total score was obtained by summing points for each item. The total score may range from (0 to 100), the higher score indicating greater independence.

Scoring system of level of dependence was categorized as the following:

0–20 points, total dependence, 21–61; severe dependence, 62–90; moderate dependence, 91–99; slight dependence and 100; independent.

B- Operational design

Validity of tools

The tools and nursing rehabilitation protocol were reviewed and evaluated by a panel of five specialists from medical- surgical nursing department, faculty of nursing at Assiut University. They had comments on the tools' applicability, accuracy, consistency, and content. According to their opinions minor modification was applied.

Reliability

Testing tools reliability was done through Cronbach's alpha test, for Exercise for Self-Care Agency Scale was 0.893 and for Modified Barthel Index was 0.80.

Field work

The directors of Orthopedic Surgery and Traumatology department and outpatient spine clinic provided official written permission for the study's conduction, and the data was collected through one year starting in June 2022 and ending in May 2023. The researchers attended to the hospital two days/week at morning or afternoon shift.

Phase one: Assessment phase: (pre-intervention for study and control groups).

The researchers interviewed patients, introduced themselves, and then invited them to participate in the study. After their agreements to participate, consent was obtained. To gain cooperation; the researchers explained the research's aims for the patients. Patient who met inclusion criteria was interviewed separately. After that, the researcher explained to the participants the tools of the study and interviewed each patient individually to assess personal data, health related data, vertebral disc history& clinical examination, Exercise for self-care agency scale, and Modified barthel index scale during interview before surgery by using (tool I, II, III) for both groups.

Phase two: Planning phase

In this phase, the researchers reviewed related literatures, such as books and articles, to develop study tools and design the nursing rehabilitation protocol. The rehabilitation protocol focused on study assessment and researchers reviews of related literatures to meet needs of patients regarding self-care agency and daily living activities **(Mohamed et al., 2022, Saha & Goktas., 2022, and Abd-El Mohsen et al., 2019).** A structured, colored booklet was written in simple Arabic and reinforced by illustrative pictures for the study group as a guide. The protocol was carried out in four sessions.

Phase three: Implementation (for study group only)

The researchers used different methods, such as video, group discussion, power point, demonstration, and re-demonstration. Patients were interviewed individually. The researchers met with every patient for four sessions.

Session (1): The researchers give information for patient about brief anatomy of vertebral column, a brief explanation of the lumbar disc operation, preoperative preparations, and possible complications of surgery.

Session (2): The researchers give instructions about nursing rehabilitation protocol, which include breathing and coughing exercises to enhance lung capacity, leg and foot exercises to prevent deep vein thrombosis, and early mobility instructions in bed and transfers with proper spine positioning.

Session (3): The researchers give teaching for patient the belt used to support the operative site, exercises to be performed, beginning with walking for a short distance, then increasing the distance, proper positioning for climbing up and down bed, climbing up and down stairs.

Session (4): This session involved post-operative care as drain monitoring, wound care using aseptic methods, monitoring of complications, discharge guidelines, and precautions to be taken with regard to sleeping/lying position, bathing, housework/yard work, driving, and returning to work in order to prevent a recurrence of the disc. Patients were instructed to perform stretching and strengthening exercises included knee to chest, hamstring stretch, calf stretch, partial squat, upper back strengthening, and ankle strengthening and standing hip extension. Perform exercises within the 4-6 weeks postoperatively 3 times a day.

20 to 40 minutes have been given for each session. The patient's room was used for explaining sessions. The patients were presented all the time of rehabilitation protocol sessions, and the length of each session varied based on the topics covered and the patient's reaction.

Every session began with a brief review of the previous one's contents, followed by the goals of the next one, which were stated in plain language to accommodate the varying educational backgrounds of the patients. To improve learning, discussions were used during the rehabilitation program sessions.

Every patient cooperated with the researchers, and they participated in a discussion to clarify any misunderstandings at the conclusion of each session. They were also told when the next session will take place. The researchers created a patient handout

in the form of an illustrated, color booklet in Arabic to help the patient and his family understands what to expect after discharge and to support the oral information provided.

Phase four: Evaluation phase (post-intervention for both group (study and control)

Researchers evaluated both groups after 3 months about self-care agency using tool II (Exercise for Self- Care Agency Scale) and reassess activities of daily living using tool III (Modified Barthel Index). At the end of the study comparison was done between both groups to determine the effect of nursing rehabilitation protocol on self-care agency and daily living activities for patients. This phase was done in outpatient spine clinic after telephone contact with patients.

Pilot study

It was done on 10% of the research sample (6) patients with lumbar disc herniation scheduled for lumbar discectomy to check clarity, feasibility and applicability of the tools. Furthermore, the pilot study had helped determine how long it would take each patient to complete the questionnaires. Patients who were a part of the pilot study were excluded from the full trial, because minor changes were made.

Ethical considerations

The research was approved from Faculty of Nursing Assiut university ethical committee in April 2022 before starting the study. Study aims were explained to patients and were assured of their all data with high confidentiality. The studied patients were informed that they choose to participate in the study, refuse and/or withdraw from the study at any time without reason.

C- Administrative design

Administrative and official permission for study implementation was received from the nursing faculty's dean and given to directors of Assiut university Hospital, Orthopedic Surgery and Traumatology department and outpatient spine clinic to ask for approval and assistance in order to carry out the research. After describing current study' goal and gaining their cooperation during the study period, the directors of each department gave written permission to perform the study.

D. Statistical design

Data were collected, coded, and analyzed by using SPSS (Statistical Package of Social Science) version 40. Display data in numbers and percentages used descriptive statistics for qualitative variables, means and standard deviations for quantitative variables. Chi-Square test was used to determine the relation between two categorical variables. Also comparison of means was achieved by using a paired sample t-test. P value ≤ 0.05 was recognized to be statistically significant. A highly significant level value was considered when p value ≤ 0.001, while non-significant results at p value > 0.05.

RESULTS

Table (1): Illustrates that the greatest patient percentages in the study and control groups were between the ages of 40 and 50 years, with mean ages of 41.53±11.76 and 41.77±10.47 years, respectively. Regarding gender, 76.7 % of study group patients and nearly two-thirds (60%) of control group patients were males. Concerning marital status, the majority of study group patients (83.3%) and around two thirds of the control group (66.7%) were married. Regarding residences, 66.7 % of study group patients were residents of rural areas, while half of the patients in the control group live in urban areas and the others in rural areas. The research's findings illustrated that slightly more than one-third (36.7%) of the study group and half of the control group patients had secondary education. Related to occupation, 46.7% of study group patients and 50.0% of control were workers.

Table (2): Shows that the highest percent of study group patients (70%) and the control group (53.3%) were smokers. Regarding BMI, (33.3%) of the study group and (36.7%) of the control group were overweight.

Figure (1): Demonstrates that the highest percentage in both groups (73.3% &70%) didn't have comorbid disease. Those patients who had comorbid diseases the highest percentages of them in study group had diabetes while in control group they had hypertension.

Table (3): Shows that, highest percent in both groups (70%, 50%) had lumbar disc herniation on level of L 4-5. 66 .7% of patients in study group and 60% of control group had received a history for medication administration as a treatment for LDH. 66

.7% of patients in study group and 76.7% of control group patients didn't have a previous lumbar disc herniation surgery. The majority of patients in study group (90%) and all patients in control group didn't perform regular exercise. Concerning neurological examination of patellar and Achilles reflexes nearly two thirds of patients in study group (60%) and a highest percentage in control group (76.7%) had normal reflexes. Regarding muscle tone slightly over half of patients in study group (53.3%) and (50%) of patients in control group had normal muscles tone.

Table (4): There was no statistically significant difference between the ESCA scale mean scores before the rehabilitation protocol between the groups (P > .05). It was observed the increasing ESCA scale mean score post-rehabilitation (110.4±15.23) in the study group compared with pre- rehabilitation (86.4±21.04), was highly statistically significant (P <0.001) in comparison with the control group, the increase in ESCA scale score post- rehabilitation (88.13±5.72) compared with pre- rehabilitation (79.03±9.64).

Figure (2): Denotes no differences in Self-Care Agency levels pre-rehabilitation between the groups P. > 0.05, highly statistically significant difference present after rehabilitation (<0.001). Before rehabilitation protocol majority of study group patients (86.7%) had moderate self-care agency level and only 10% had a high level while after rehabilitation protocol nearly two thirds (60%) had moderate levels while who had high level increased to 40%. In comparison control group; whole patients (100%) had a moderate level of self-care agency before and after rehabilitation protocol.

Table (5): Shows that although before rehabilitation protocol (56.7%) of study group were severe dependent and (40.0%) were moderately dependent and more than three fifths of control group (76.7%) were severely dependent with no statistically significant difference; after rehabilitation the percentage of patients who were slightly dependent increased to (50.0%) and (43.3%) were moderate dependent while control group dependence level was improved to (90.0%) moderate dependence. Noticeably the mean score of Modified Barthel Index score before the rehabilitation between the groups were not statistically significant (P= 0.139), while highly significant differences observed after rehabilitation (<0.001**).

Figure (3): Shows a positive correlation between exercise self-care agency total Score and Modified Barthel index total Score before and after 3 months of the rehabilitation protocol in both groups.

Table (1): Frequency & percentage distribution of personal data for studied patients (n=60).

Personal data	Study (n=30)	Control (n=30)	X²/t	P. value
Age (years)				
Age levels				
18> 30	3(10%)	3(10%)		
30>40	10(33.3%)	9(30%)		
40>50	14(46.7%)	12(40%)	9.206	0.056
50>60	0(0%)	6(20%)		
60- 65	3(10%)	0(0%)		
Mean±SD	41.53±11.76	41.77±10.47	-0.081	0.936
Gender				
Male	23(76.7%)	18(60%)	1.926	0.165
Female	7(23.3%)	12(40%)		
Marital Status				
Single	2(6.7%)	3(10%)		
Married	25(83.3%)	20(66.7%)	2.422	0.490
Divorced	1(3.3%)	3(10%)		
Widow	2(6.7%)	4(13.3%)		
Residence				
Urban	10(33.3%)	15(50%)	1.714	0.190
Rural	20(66.7%)	15(50%)		
Level of education				
Illiterate	8(26.7%)	5(16.7%)		
Primary school	9(30%)	6(20%)	2.574	0.462
Secondary school	11(36.7%)	15(50%)		
University & higher education	2(6.7%)	4(13.3%)		
Occupational status				
Work	14(46.7%)	15(50%)		
House wife	6(20.0%)	10 (33.3%)	5.511	0.138
Not work	7(23.3%)	5(16.7%)		
Retired	3(10%)	0(0%)		

Chi square test for qualitative data between the two groups
Independent T-test quantitative data between the two groups
**Significant level at P value < 0.05, **Significant level at P value < 0.01*

Table (2): Frequency & percentage distribution of health related data for studied patients (n=60).

Health related data	Study (n=30)	Control (n=30)	X^2/t	P. value
Smoking				
Yes	21(70%)	16(53.3%)		
No	9(30%)	14(46.7%)	1.763	0.184
Body mass index (BMI)			-0.684	0.496
Mean±SD	30.41±5.96	29.2±5.19		
BMI levels			0.837	0.406
Normal weight (18.5-24.9)	5(16.7%)	6(20%)		
Overweight (25-29.9)	10(33.3%)	11(36.7%)		
Obese class I (30-34.9)	7(23.3%)	8(26.7%)	0.898	0.826
Obese II (35-39.9)	8(26.7%)	5(16.7%)		

Chi square test for qualitative data between the two groups
Independent T-test quantitative data between the two groups
*Significant level at P value < 0.05, **Significant level at P value < 0.01
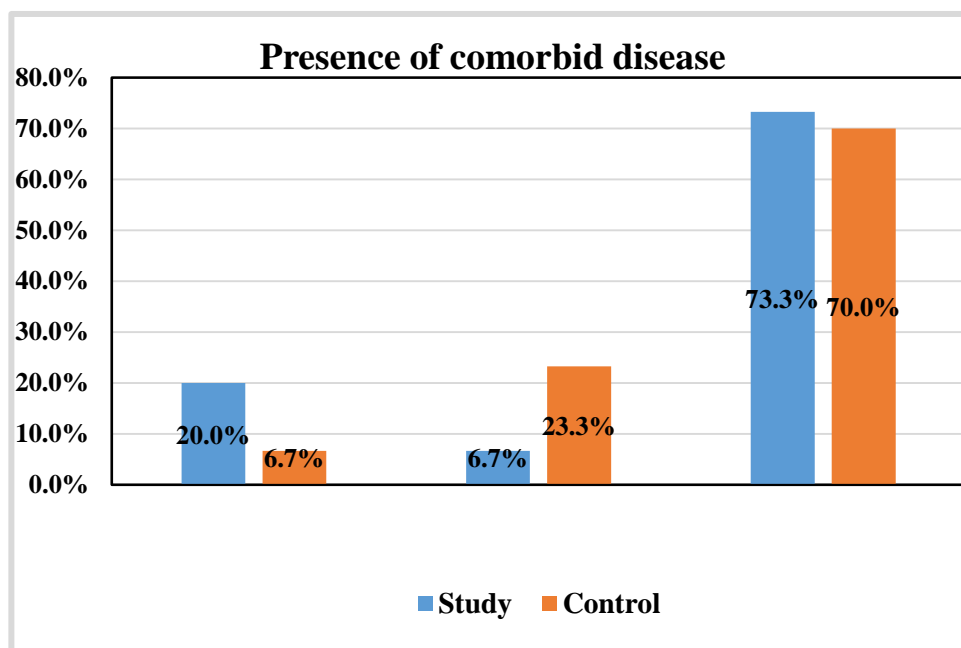
Figure (1): Percentage distribution of the studied patients in relation to presence of comorbid diseases.

Table (3): Frequency distribution of vertebral disc history &clinical examination among the studied patients (n=60).

Vertebral disc history	Study (n=30)	Control (n=30)	X^2/t	P. value
Level of lumbar disc herniation				
Lumbar 4-5	21 (70%)	15 (50%)	2.500	0.114
Lumbar 5- sacral 1	9(30%)	15(50%)		
Medication history				
Yes	20(66.7%)	18(60%)	0.287	0.592
No	10(33.3%)	12(40%)		
Previous LDH surgery				
Yes	10(33.3%)	7(23.3%)	0.739	0.390
No	20(66.7%)	23(76.7%)		
Regular exercise status				
Yes	3(10%)	0(0%)	3.158	0.076
No	27(90%)	30(100%)		
Clinical examination				
Reflexes				
Normal	18(60%)	23(76.7%)	1.926	0.165
Hyporeflexia	12(40%)	7(23.3%)		
Muscle tone				
Normal	16(53.3%)	15(50%)	0.067	0.796
Hypotonia	14(47.7%)	15(50%)		

*Chi square test for qualitative data between the two groups*
*Significant level at P value < 0.05, **Significant level at P value < 0.01

Table (4): Comparison of self-care agency mean scores before and after 3 months of the rehabilitation protocol according to the groups.

Exercise of Self-Care Agency Scale	Before rehabilitation protocol				After 3 months of rehabilitation protocol			
	Study (n=30)	Control (n=30)	X^2/t	P. value	Study (n=30)	Control (n=30)	X^2/t	P. value
Mean±SD	86.4±21.04	79.03±9.64	1.744	0.086	110.4±15.23	88.13±5.72	7.497	**<0.001****

Independent T-test quantitative data between the two groups
*Significant level at P value < 0.05, **Significant level at P value < 0.01
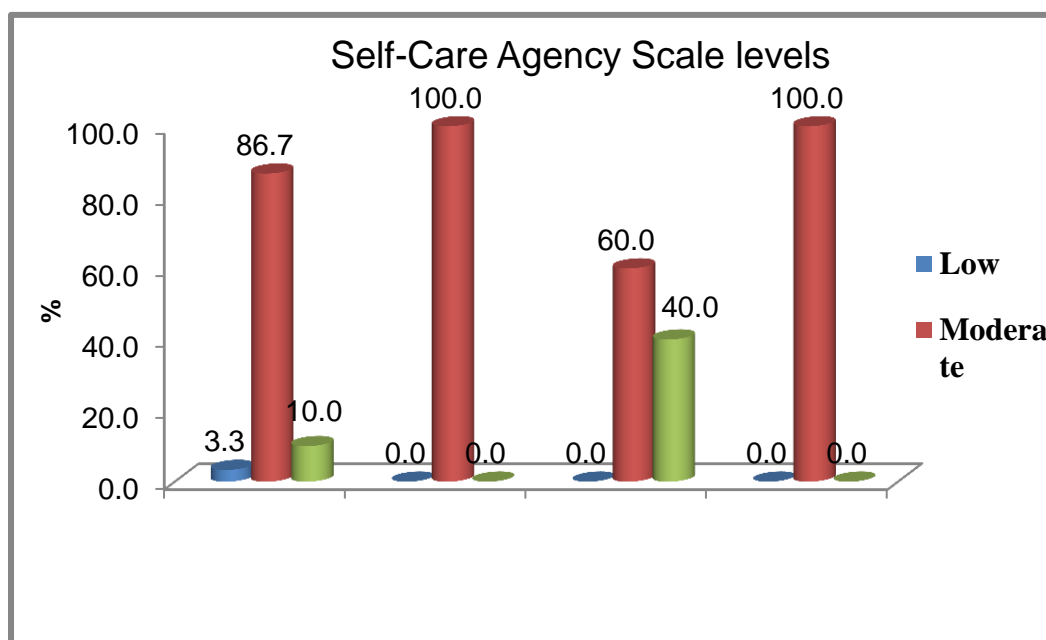
Figure (2): Comparison between levels of self-care agency among studied patients before and after 3 months of the rehabilitation protocol.

Table (5): Comparison of activities of daily living before and after 3 months of the rehabilitation protocol according to the groups (n = 60).

Modified Barthel Index Scores	Before rehabilitation protocol				After 3 months of rehabilitation protocol			
	Study (n=30)	Control (n=30)	X^2/t	P. value	Study (n=30)	Control (n=30)	X^2/t	P. value
Mean±SD	60.63±13.15	56.77±5.08	1.502	0.139	88.13±6.31	72±6.86	9.477	**<0.001****
Barthel Index Scale levels								
Severe dependence	17(56.7%)	23(76.7%)	3.216	0.200	0(0%)	3(10%)	24.900	**<0.001****
Moderate dependence	12(40%)	7(23.3%)			13 (43.3%)	27(90%)		
Slight dependence	1(3.3%)	0(0%)			15 (50.0%)	0(0%)		
Independence	0(0%)	0(0%)			2(6.7%)	0(0%)		

Chi square test for qualitative data between the two groups
Independent T-test quantitative data between the two groups
*Significant level at P value < 0.05, **Significant level at P value < 0.01
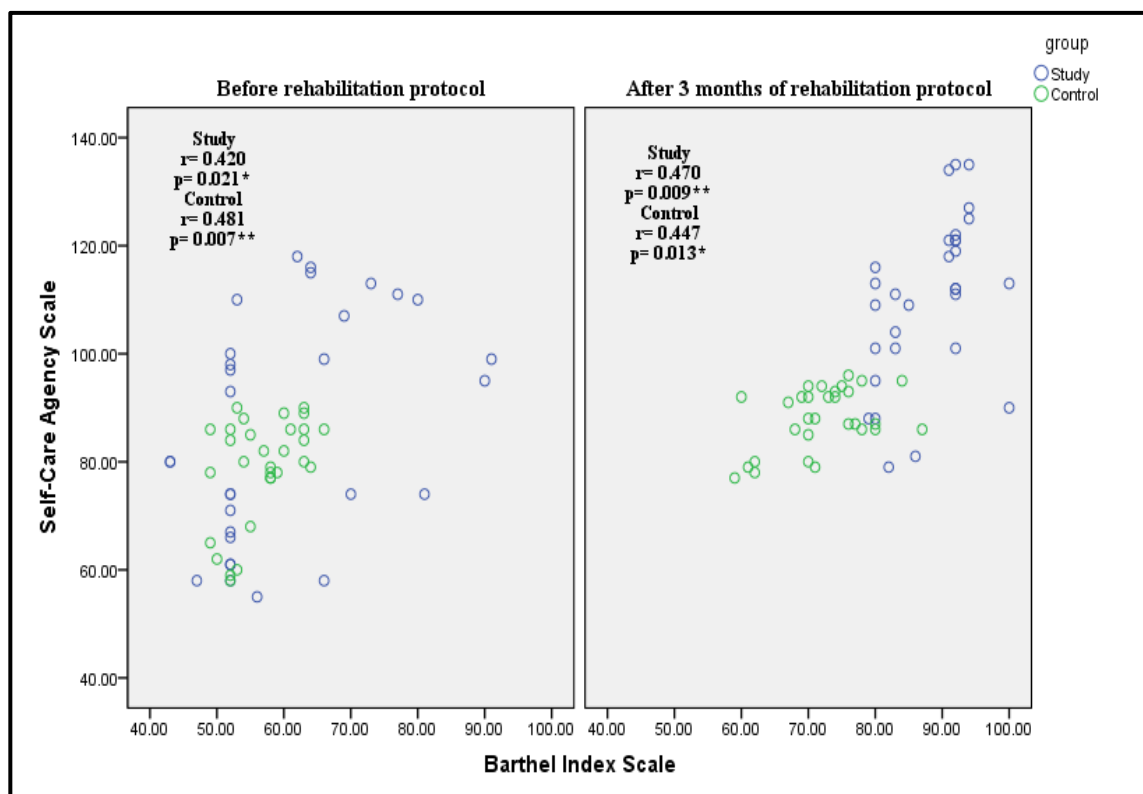
Figure (3): Correlation coefficients between total score of self-care agency and daily living activities before and after 3 months of the rehabilitation protocol according to the groups.

DISCUSSION

Lumbar disc herniation is considered one of the most widespread spinal conditions in the world and results in physical impairment requiring surgical treatment **(Jiang et al., 2022).** Lumbar discectomy is the most common spinal surgery for the treatment of herniated lumbar discs **(Karukonda et al., 2020)**.

Concerning to personal data of studied patients, present study illustrated that both groups (study and control) greatest patient percentages were between the ages of forty and fifty year with mean ages of 41.53±11.76& 41.77±10.47 respectively. As regarding gender the majority of patients were males. This may be due to higher prevalence of lumbar disc herniation and the frequent exposure of younger adults who comprise the working-age population and also association between adulthood and over activity, responsibilities among males.

This result in the same context with an Egyptian study by **El-Aziz et al., (2024)** titled as "Discharge Plan for Patients Undergoing Herniated Lumbar Disc Surgery;" they

clarified over two thirds of intervention group and over three quarters of control group aged less than fifty years with mean 42.2 & 41.03 respectively and added that about two thirds of intervention group and above two thirds of control group were males. Moreover **Pojskic et al., (2024)** supported this finding who confirmed that the incidence of LDH was common in adults, with a ratio of male to female was 2:1.

Previous result was in agreement with research finding by **Hablass et al., (2020)** who documented that above half of patients, their age were 30 to 50 years old. Also **Amer et al., (2017)** reported that, the lumbar discectomy surgery more common in male patients who constitute sixty four percent of all lumbar discectomy in their study.

In another way this result contradicts the results by **Abd-El Mohsen et al., (2019)** who revealed that over one third of   patients were less than 30 years old and the majorities were females.

In terms of marital status, the majority of patients in the study group and over two thirds of those in the control group were married. This finding was in line with **Jeong & Lee., (2021)** who stated that majority of patients in both groups were married.

According to the results of this study, half of the control group and two thirds of the study group's patients lived in rural areas. The results also showed that half of the patients in the control group and slightly more than a third of the study group had only completed secondary education. This might be because urban people could access appropriate university hospitals for medical care. It may be due to the availability of Assiut University Hospital for urban patients, which helped them attain and get medical treatments.

These results corroborated those of Ebrahim Abd-Elzaher et al., (2023), who pointed out that over two thirds of the study's patients were from rural areas and over two fifths had completed secondary school.

Within the same framework, Abd Elwahhab et al., (2019) noted that over two thirds of both groups were rural residents, and over a third of the intervention and control groups had completed secondary school. Furthermore, according to Saeed Ahmed et al., (2023), over two thirds of the study sample was from rural areas and over one third had only completed secondary school education. In the same context Ibrahim & Atya, (2023)

illustrated that more than one-third of the study group and one-third of the control group had secondary education and more than two-thirds of the study and control group live in rural areas.

The study revealed that concerning occupation, workers made up about half of the study group's patients and half of the control group's patients. This was coinciding with Zakariea et al., (2022) who showed that majority of adult patient with lumbar disc had worker occupation.

Current result revealed no statistical significance differences between both two groups related their demographic characteristic, which indicates that both groups' characteristics nearly homogenous. The findings align with the research conducted by El-Aziz et al. (2024), which verified that, no statistically differences between (study and control) group related socio-demographic data.

Regarding smoking habit the highest percent in two groups' patients were smokers. El-seadi et al., (2022) were agreed with the study results as they discovered that over half of the patients in the trial and control groups had smoking habit. Likewise Kim et al., (2020) found that the greatest percentage of patients undergoing disc surgeries were smokers.

This result also is supported by Rajesh et al., (2022), who concluded in their study that cigarette smoking is a risk factor for debilitating diseases and the researches now finding an association between smoking and degenerative spine diseases. Their study documented that smoking is a significant risk factor for lumbar disease, lead to worse outcomes and potential post-surgery complications.

As regard body mass index the greater percentages in both groups were in overweight and obesity class I. This may be due to weight increased stress on the vertebrae of patient that lead to raise the risk of disc herniation. It was congruent with Elghannam et al., (2024) who documented that most of control group and treatment groups were obese. In the same line Ibrahim & Atya, (2023) stated that half in study and control group patients had overweight which support current study findings. Moreover, Çatal & Cebeci., (2023) support the study result; they reported that most of the intervention and control group patients were overweight.

Current results confirmed that the highest percent of patients in both groups didn't have comorbid diseases, and patients who had comorbid diseases had the highest percentage of them in the study group having diabetes, while in the control group they had hypertension. This result was consistent with Ibrahim & Atya., (2023) study results, which clarified that most of the patients in both groups did not suffer from chronic diseases. Of those patients, an equal percent as almost half of intervention group had DM, the same had hypertension, and in the control group, more than half had hypertension. Furthermore, Abd Elwahhab et al. (2019) disclosed that most study subjects had no chronic disease history.

In this regard Hoffeld et al., (2023) mentioned that there are many risks when investigating the epidemiology of LDH. Factors that increase the risk includes, middle ages, male gender, overweight, chronic disease as diabetes, smoking habit, occupation, sedentary lifestyles, lifting of heavy objects.

As regarding vertebral disc history the present study showed above two- thirds in study group participants but half in control group had lumbar disc herniation on level of L 4-5. This could be caused by increased loads on the L4-L5. Concerning reflexes a highest percentage in both two groups had normal reflexes. Regarding muscle tone a highest percentage of patients had normal muscles tone. This result in the same line with the result by Abdelmowla et al., (2020) reported that about two thirds of study participants and over two thirds in control group had lumbar disc herniation on level of L 4-5 but slightly above a third in intervention group and nearly one third control had disc herniation at lumbar 5, sacral 1. Also, they added that, related to the clinical assessment baseline, the majority of groups (control and intervention) had normal reflexes and muscle tone.

According to the results of the present research, about two-thirds of the patients in the study group and nearly two-thirds of the patients in the control group previously received medication as a form of treatment for LDH. This was compatible with Hablass et al., (2020), who mentioned that all patients in both groups received various conservative measures, a majority of which involved the use of analgesics for the study group and control group.

In this study, two- thirds of patients in study participants and over two- thirds of control group didn't undergo lumbar disc herniation surgery. The majority of participant patients didn't perform regular exercise. This may be due to non-surgical treatment approaches are considered the preferred initial management methods including physical therapy modalities and alternative therapies as a conservative treatment and most patients prefer conservative treatment over surgery because it carries a lower risk of complications and lower costs. As regarding exercise performance; this may be due to effect of herniation which significantly impacts a patient's physical function and daily life. The pain and discomfort associated with LDH can make it difficult to bend forward, twist, or move the back in certain ways. Individuals may also experience muscle spasms that further limit their range of motion. In the same context Saha & Goktas., (2022) stated that majority of patients in both groups didn't undergo LDH surgery and most patients didn't practice any regular physical exercise.

Concerning self-care agency scale the existing results clarified that no statistically significant differences was found between the two participated groups pre rehabilitation protocol. It was determined that there was an increase in self-care agency after rehabilitation in the study group when compared to before the rehabilitation protocol, with a highly significant difference in comparison with the control group.

Before the rehabilitation protocol, the greatest percentage of study group patients had moderate self-care agency; a slight percentage had a high level, while after the rehabilitation protocol, nearly two-thirds had a moderate level, and patients with a high level increased. In comparison to the control group, the whole patient had a moderate level before and after the rehabilitation protocol. This can be attributed to the positive effects of the surgery and nursing interventions regarding self-care, which maximized spinal stability, coordination, improved mobility, and decreased pain, leading to an improvement in self-care ability. This finding supported the first research hypothesis.

In this respect, Saha & Goktas., (2022) mentioned that, after the training exercise, an increase in self-care agency score was higher in the intervention group than the control group. Also, Wan Ting et al., (2020) stated that training postoperatively for patients with LDH surgery improved the self-care abilities of the study group patients. Additionally, El-Shrnouby et al., (2023) found that self-care abilities in overall patients improved after three months of implementing the self-care teaching module.

As regarding activities of daily living; a major finding of current research is that the study group patients showed marked improvement in dependence level; there were also no significant statistical differences between the two groups before rehabilitation protocol; the highest percentage in the study and control groups were severe dependent. After rehabilitation, patients dependence levels improved, and half of the study group patients had a slightly dependent level and nearly half of those patients had a moderate dependent level, while the majority of control group's dependence level was moderate.

Noticeably, the mean Modified Barthel Index score before the rehabilitation protocol between the groups was not statistically significant, while a highly statistically significant difference was found after the rehabilitation. From the researchers' view, this finding could be referred to, providing teaching handouts illustrated with pictures for patients that improve their awareness about self-care activities. These results are consistent with the second study's hypothesis.

In agreement with the findings of the current study, El-Aziz et al., (2024) stated in their study that a majority of patients in the study group and half of patients in the control group were independent in terms of their overall capacity to carry out activities of daily living following the implementation of the discharge plan and added that there were strong statistically significant differences between the research group's performance on activities of daily living before and after the discharge plan had been implemented.

In this regard, Mohamed et al., (2022) confirmed this, patients undergoing disc surgery their knowledge and self-care activities was improved after providing educational programs to those patients. Study group patients had significant improvement regarding independence in daily life activities after implementation of this program in comparison with control group, as well as all items of Barthel index.

Furthermore, El-Seadi et al., (2022) concluded that the implementation of nursing protocol improved the activities of daily living of participants. Hablass et al., (2020) in their study also showed great improvement in study groups related barthel scale as before implementing program the patients activities of daily living were complete dependent and became nondependent post- program. Also the same finding agree with Guo et al., (2019) who noticed no significant difference in overall items of barthel index between control and study pre- interventions compared to post- implementation. Moreover, Quan, (2022)

reported that the barthel index improved after nursing care in two groups of patients in comparison with before. The improvement of the barthel index in trial group scores was significantly higher than in the in the control group.

The present study demonstrated a positive correlation between the self-care agency total score and the modified Barthel index total score before and after 3 months of the rehabilitation protocol in the studied groups. In the researcher's opinion, individuals' high perceptions of health can also mean that they have high expectations about themselves; therefore, it can positively affect the agency of self-care, enabling them to carry out ADL independently. Also another explanation may be due to the positive effect of surgery and patient's compliance with the treatment regimen and providing patients with rehabilitation protocols, all of these improved their self-care agency, which was an important factor for patients in performing their activities of daily living, and they needed adequate self-care agency as an instrumental help to be able to perform these activities of daily living. This result was consistent with the third study's hypothesis.

In this respect, Özden et al., (2022) supported the current study result as they represented that self-care agency also affects individuals' ability to carry out daily life activities. And it was recommended that the training provided for patients should cover their overall practices. Independence in daily activities is necessary post-surgery, so the rehabilitation protocol is important for the patient.

The present study finding was in the same line as Zakariea et al., (2022), who reflected that statistical relations were noted between self-care practices and activities of daily living in adult patients. In addition, Kang et al., (2018) stated that the highest self-care agency in individuals assisted them to perform daily practices.

The result was also supported by Ali and Hamed., (2019), who mentioned that, educational programs had significant improvement in knowledge, practices which improved patient's outcomes.

CONCLUSION

Rehabilitation protocol plays a positive role in improving self-care agency and independency level during all daily living activities for patient with lumbar discectomy.

Positive correlation was documented between self-care agency and dependence in performance of activity of daily living. These findings supported research hypothesis.

RECOMMENDATIONS

- Nursing rehabilitation guidance contains comprehensive information, including proper self-care practice should be provided for patients undergoing lumbar discectomy in orthopedic department.
- Nurses in orthopedic department encouraged to attendance of workshops about nursing role in disc surgeries to be equipped with the recent advances information and performance.

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تأثير بروتوكول إعادة التأهيل التمريضى على قدرة الرعاية الذاتية وأنشطة الحياة اليومية لدى المرضى الخاضعون لعملية استئصال القرص القطني

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الـخـلاصـة

الخلفية: الانزلاق الغضروفى القطني هو مرض شائع في العمود الفقري يتداخل مع الأنشطة اليومية ويمكن لنظام إعادة تأهيل المريض أن يساعد بشكل كبير في شفائه. **الهدف:** تقييم تأثير بروتوكول إعادة التأهيل التمريضي على قدرة الرعاية الذاتية وأنشطة الحياة اليومية لدى المرضى الذين يخضعون لاستئصال القرص القطني. **طرق البحث: تصميم البحث:** تم استخدام تصميم البحث شبه التجريبي (مجموعة دراسة ومجموعة ضابطة) لتحقيق هدف الدراسة. **العينة:** عينة هادفة مكونة من ستين مريضا يخضعون لعملية استئصال القرص القطني من كلا الجنسين، تم تقسيم المرضى عشوائيا إلى مجموعتين متساويتين، 30 مريضا فى مجموعة الدراسة و30 كمجموعة ضابطة. **مكان الدراسة:** قسم جراحة العظام والكسور والعيادة الخارجية للعمود الفقري بمستشفى جامعة أسيوط. **أدوات البحث:** تم تقييم وتحليل مقابلة منظمة ومقياس قدرة الرعاية الذاتية ومؤشر بارثيل المعدل قبل التدخل وبعد 3 أشهر من الجراحة في مجموعتين. **النتائج:** لم يكن هناك فرق بين متوسط درجات قدرة الرعاية الذاتية وأنشطة الحياة اليومية قبل بروتوكول إعادة التأهيل بين مجموعة الدراسة والمجموعة الضابطة (قيمة احتمالية > 0.05). وجد ذو دلالة إحصائية عالية في متوسط درجات قدرة الرعاية الذاتية لمجموعة الدراسة (110.4 ± 15.23) مقابل المجموعة الضابطة (88.13 ± 5.72) بقيمة احتمالية (0.001>). بالإضافة إلى ذلك، كان متوسط أنشطة الحياة اليومية (88.13 ± 6.31) مقابل (72 ± 6.86) بعد بروتوكول إعادة التأهيل أعلى بكثير في الدراسة منه في المجموعة الضابطة (قيمة احتمالية > 0.001). **الاستنتاج:** أدى بروتوكول إعادة التأهيل إلى زيادة قدرة الرعاية الذاتية للمرضى وتعزيز استقلالية المشاركين في أنشطة الحياة اليومية. **التوصيات:** ضرورة توفير بروتوكول إعادة تأهيل مصور وبسيط كنهج تعليمي للمرضى الذين يخضعون لعملية استئصال القرص القطني.

الكلمات المرشدة: أنشطة الحياة اليومية، استئصال القرص القطنى، بروتوكول إعادة التأهيل التمريضى، قدرة الرعاية الذاتية.