

Effectiveness of Applying an Educational Program on Health Outcomes for Patients with Cervical Disc Herniation

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Abstract

Context: Most people experience back or neck pain at some point in their lives, many daily activities become difficult to do, a common cause of back or neck pain is a herniated disk. An Educational program were developed to enhance patient's health outcome by improve ability to perform activity of daily living and their quality of life. **Aim:** This study aimed to evaluate the effectiveness of applying an educational program on health outcomes for patients with cervical disc herniation. **Design:** A quasi-experimental (pre/posttest) research design was utilized. **Setting:** the study was carried out at the orthopedic department at Benha University Hospitals. **Subjects:** A purposive sample of 33 patients of both genders who admitted to the orthopedic department and diagnosed with cervical disc herniation. **Tools:** two tools were used for data collection include **I:** Structured questionnaire assessment divided into two parts: Patients' socio demographic data and patients' knowledge assessment about cervical disc herniation, **II: Patient health outcome** dived into two parts, **part one** :Barthel Index Scale of Activities of Daily Living and **part two:** Quality of life questionnaire. **The results:** It showed statistically significant improvement in patients' level of knowledge post program. Also, there was statistically significant regarding activities of daily living post program implementation and there was statistically significant in patients' quality of life post program implementation compared to pre implementation level P. value = 0.000 **Conclusion:** Patients had marked improvement in their level of knowledge post program implementation compared to preprogram. Statistically significant differences were found between pre and post program implementation regarding all items of Barthel index scale and quality of life and there was statistically significant positive correlation between total knowledge score Quality of life post program implementation P. value = 0.000 . **Recommendations:** Provide and implement written educational programs for Patients with Cervical Disc Herniation , Replication of the study on larger probability sample to attain more generalization of results. Moreover, further research is needed to assess the effects of preoperative education on health outcomes for patients with Patients with Cervical Disc Herniation.

Keywords: Educational program, Patients, Cervical Disc Herniation, Health outcomes

Introduction:

Vertebral Disk Herniation disc is one of the most common spinal disorders. It is occur when the gelatinous center of the intervertebral disc pushes out through a tear in the fibrous and adds pressure to the surrounding spinal nerves causing mild to severe pain. It occur anywhere along the spine, most often in

the lower back, but can affects the smaller disks in the neck (**Atsidakou et al., 2021**).

The most consistent complaints for cervical disc herniation are pain and shoulder stiffness, pain range from an aching in the neck, arm, and/or hand to electric-like pain that radiates into these same areas which resulting in shoulder stiffness (**Stahler, 2019**

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). While the most consistent complaints for lumbar intervertebral disc herniation include continual low back pain, sciatica. The pain describe as sharp, dull, or burning pain radiates into lower extremity(**Weheida et al., 2022**).

In addition to pain, patients which are diagnosed with intervertebral disc herniation have unbalanced and weakened flexor and extensor body muscles that leading to disability which have negative effect on the patient's healthy lifestyle. Therefore, it is necessary to follow an appropriate exercise program to improve patients health outcomes through reduce pain, disability and improve strength of neck and back muscles(**Atsidakou et al., 2021**). As well as conservative treatments, such as pharmacological treatment, and physical therapy, as well as surgery are recommended for intervertebral disc herniation (**Akram et al., 2023**).

To improve patient's health outcomes, physicians and nurses must spend more time with patients to identify and responsive to the patient's health needs and promote patient education according to their condition. Therefore, this educational program were developed using recent review of the literatures and research papers, providing by the researcher with best evidence practice.

Significance of the study:

According to medical records and statistical data of the orthopedic Department in the Benha University Hospital revealed that, the incidence of cervical disc herniation about 80patients were admitted to this department last year from January 2022 to January 2023 (Statistical data in the Benha University Hospital, 2023). In view of the fact that cervical disc herniation is a common neuromusculoskeletal disease characterized

by rapid onset of complication that affect the patient's activities of daily living and quilety of life Thus, patients with cervical disc herniation need some measures to improve outcomes (**Wong et al., 2014**).

Aim of the study:

This study aimed to evaluate the effectiveness of applying an educational program on health outcomes for patients with cervical disc herniation

Research hypotheses:

- To fulfill the aim of the study, the following research hypotheses were formulated:

H1: Patients' knowledge will be improved post program implementation than before.

H2: Patients' will be able to perform activities of daily living on their own (independently) post program implementation compared to before the program implementation.

H3: Quality of life for Patients with cervical disc herniation will be improved post program implementation than before.

H4: There will be a positive correlation between total knowledge score and total barthel index scale post program implementation

H5: There will be a positive correlation between total knowledge score and quality of life post program implementation.

Operational definitions:

Patient's outcomes: are the central measures used to identify the effectiveness of health care provided for patient (**Mohammed et al., 2023**). It was included occurrence of complications, (levels of neck pain and disability), activity of daily living and quality of life.

Subjects and Methods:

Research design:

Quasi experimental (pre/post test) research design was used in this study.

Research Setting:

The present study was conducted in the orthopedic department at Benha University Hospitals. The orthopedic department is located at third floor of the medical building, and it contains five rooms, two rooms for female and three room for male. Each one contains 4 beds.

Subjects:

A purposive subject of 33 patients of both sexes who diagnosed with cervical disc herniation. The sample size of patients was calculated based on the previous year's census report of admission in the orthopedic department from Benha University Hospital Census, 2022, utilizing the following formula (Naing, 2003).

calculation for a one group pre-post study with 90% power, based on the data provided:

Using the sample size formula for a dependent t-test:

$$n = (Z_{\alpha/2} + Z_{\beta})^2 \times \sigma d^2 / d^2$$

Where: $Z_{\alpha/2} = 1.645$ for 90% confidence $Z_{\beta} = 1.28$ for 90% power σd = pooled standard deviation

d = desired difference to detect

Let's detect a mean difference of 10 points.

The pooled SD is calculated as: $\sigma d = \sqrt{[(SD_{pre}^2 + SD_{post}^2) / 2]}$ $\sigma d = \sqrt{[(12.32 + 9.22) / 2]} = 10.91$

Plugging this into the formula:

$$n = (1.645 + 1.28)^2 \times 10.912 / 10^2 \quad n = 33$$

Therefore, with 90% power and a 10 point minimum detectable pre-post difference, the required sample size is 33 participants

Inclusion criteria:-

- Adult patients' of both genders (male and female) who accepted to participate in this study.
- Conscious patients and able to communicate.

Tools for data collection:

Two tools were used to collect study data.

Tool 1: Structured interview questionnaire:

This tool was developed by researchers in the Arabic language based on recent and related review of literature (Mohammed et al., 2022). It divided into two parts:

Part I: Patients' socio demographic data: It aimed to assess the patients profile as age, gender, their level of education, marital status, income, residence and occupation.

Part II: Patients' knowledge

Patients' knowledge assessment sheet:

It was developed by the researcher after reviewing the related and recent literature (Bohinski, 2022), (Wheeler, 2023) & (Sharrak & Al Khalili, 2023), it consist of two parts. **Part I:** consisted of 14 MCQ questions used to assess the patients' knowledge about cervical disc herniation disease. **Part II:** consisted of 8 MCQ questions used to assess the patients' knowledge about complication and treatment options. **Part III:** Concerned with questions used to assess the patients' knowledge about exercises for cervical disc herniation patients, it consisted of 5 MCQ questions.

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Knowledge scoring system:

Total knowledge: Correct answer one score and incorrect zero. Total was Satisfactory if score 70% or more, Unsatisfactory if score <70%.

Tool II: Patient health outcome:

Part I: Barthel Index Scale of Activities of Daily Living: This tool was adopted from (liu, et al., 2015) and modified by the researchers to assess the patients' ability to perform activities of daily living independently. The scale comprises 10 items of daily living activities (feeding, bathing, dressing, grooming, bowel control, bladder control, toilet use, walking, mobility and stairs (up and down).

Barthel Index Scale scoring system:

The scores responses for every item were as follows: Completely dependent was scored (0), Need assistant was scored (1), and Independent was scored (2). The total scores of independency level ranged from 0-20, the higher scores reflect the higher independency level. It was categorized as the following: - 0-6 was considered "completely dependent". - 7-13 was considered "need assistance ". - 14-20 was considered "independent".

Part II: Quality of life questionnaire:

This tool was adopted from (Lu et al. 2002).

It Included: General health, Physical functioning: Limitations in moderate activities, physical functioning: limitations in climbing stairs, role limitations due to physical problems, role limitations due to emotional problems, social functioning, bodily pain, vitality, social functioning and general health.

Scoring system for quality of life questionnaire:

Quality of life: High if score > 70%, Moderate if score 50% to 70% and low if score <50%

The educational program about cervical disc herniation:

This program aimed to improve cervical disc herniation patients' knowledge, practices and health outcome, it was designed by the researcher through a reviewing of relevant literatures and scientific references as (Mahmoud & Abo El-Fadl, 2021), (Mohamed & Atiyah 2020), (Mbada., et al., 2022) &(Sharrak & Al Khalil, 2023). The educational program was contained two parts concerning with providing patients of essential information and instruction about disease.

First part: Covered disease overview related to anatomy and importance of spinal cord, definition of cervical disc herniation, causes/risk factors, signs/symptoms, stages, diagnostic methods and complication of disease. Also covered cervical herniation treatment...etc.

Second part: Covered the effectiveness of educational program on health outcomes related to daily living activities (feeding, bathing, dressing, grooming, continent bowels, continent bladder, toilet use, transfers (bed to chair and back), mobility (on level surfaces, - meter walk), and stairs (up and down). And also covered quality of life for cervical disc herniation' patients.

Administrative design:

An official permission to conduct the study obtained from Hospital directors and head of orthopedic department affiliated to Benha University Hospital .A letter was issued to them from dean of the Faculty of Nursing , Benha University .

Personal communication was done between researcher with nurses and physician's to explain the purpose of the study and gain their best possible cooperation

Ethical consideration:

Research proposal approval obtained from the Scientific Research and Ethical committee in faculty of nursing in Benha university before starting the study and verbal and written consent was obtained from the patients. confidentiality of data, privacy of the patients .

Content validity and reliability:

The data collection tools were revised for comprehensiveness, appropriateness, and legibility by a panel of five experts in medicine and nursing to test the face and content validity. The same experts validate the educational program's objectives and content. The modification was carried out according to the panel's judgment on the clarity of sentences, appropriateness, and completeness of the content. Cranach's Alpha coefficient test tested the reliability of the tools, it was 0.833 for the knowledge assessment questionnaire which revealed that Good reliability, 0.912 for the quality of life , which revealed that Excellent reliability ,0.807 for the Daily living activity ,which revealed that Good reliability.

Pilot study:

A pilot study was carried out on 10 % cervical disc herniation patients (three) patients in order to evaluate the developed tool for the, clarity and applicability in providing the required data, the necessary modification was done. Patients who participated in the pilot study were excluded from the main study sample.

Field work:

The data collection process extended, from the beginning of October 2023, until February 2024. The study was carried out through four phases (preparatory and assessment, planning, implementation, and evaluation).

The preparatory and assessment phase included reviewing the available literature and studies related to the research problem and theoretical knowledge using textbooks, evidence-based articles, internet periodicals, and journals.

The researchers visited the orthopedic department three days weekly (morning & afternoon) to collect the data using previous tools. The researchers interviewed the available patients, an average of six patients were interviewed per/day. At the beginning of the interview, the researchers greeted patients in the orthopedic department, explained the nature, aims, and expected outcomes of the study, and took their verbal approval to participate in the study before data collection; then The data collection was done through the following phases :

Assessment phase:

The researcher assessed the patients knowledge of cervical disc herniation by knowledge assessment questionnaire and patient health outcome (Tools I and II). This interview took about 25-35 minutes. This period is called pre implementing phase of the educational program (pre-test).

Planning phase:

Based on the information obtained from pilot study and patients' assessment, in addition to the recent related literature, the researcher designed an educational program and putted general and main objective for this program and chapters' contents. Preparation of materials needed for sessions' implementation. Teaching methods and aids were determined.

Teaching methods: This included lectures, group discussion and brain storming

Media used: Suitable teaching aids were specially prepared for the intervention as booklets, pictures, Posters and power point presentation and educational videos and

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content; it was developed by the researcher based on patient's needs assessments.

It includes educational program construction developed by the researcher for the purpose of improving patients' knowledge for care of patients with cervical disc herniation .

Implementation phase:

The implementation phase was achieved through educational sessions. It was carried out into six sessions. That included three theoretical and three practical sessions. The researcher was available 3 days per week in the morning (9-12 A.M) in orthopedic department at Benha University Hospital. Time of each session ranged from 30-45 minutes. The researchers divided the studied patients into five groups, and each group consisted of 6-7 patients. Each session started by a summary of the previous session and objectives of the new one. Taking into consideration, the use of Arabic language that suits the patients' educational level. Motivation and reinforcement during session were used in order to enhance motivation for the sharing in this study, researcher answered any raised questions and gave feedback. The final form of the educational booklet was developed and given to each patient.

Theoretical sessions: were carried out into three sessions. That included the following:

At the beginning of this first session, the researcher introduced her-self, gave introduction on educational program and its importance and explained the objectives of the educational program. Covered items related to knowledge about disease overview regarding anatomy and definition of disease and signs/symptoms

Session (1): Covered items related to knowledge about disease overview regarding definition and signs/symptoms causes and risk

factors , complications and treatment options of cervical disk herniation.

Session (2): Contained items related to knowledge about, life style modifications regarding weight control, rest and sleep, physical activity and exercises.

Practical Session (3): included activities such as wearing cervical collar at all times, the avoided exercises such as strengthening exercises or forceful stretching of the neck for 6 weeks, sleeping & sitting positions. Session (5): Contained instructions related

At the end of these sessions, the researcher informed the patients that they will be evaluated by the researcher after one month from sessions.

The evaluation phase:

Each patient was interviewed individually after implementing educational program for post-test using the same pre-test tools, it was done after one month following implementing the program (utilizing tool I part two and tool II).

Comparison between patient's pre-test and post-test finding were done to determine the effect of educational program on health outcomes for patients with cervical disc herniation

Statistical analysis

SPSS statistical software, version 25 (SPSS). A P value less than .05 was considered statistically significant. Categorical variables were presented as absolute values, and percentages were compared by use of the χ^2 test or the Fisher test, as appropriate. Continuous variables were expressed as mean \pm SD. The Student F test as performed to compare continuous variables. Correlations among variables were assessed by Pearson correlation analysis.

Results:

Table (1): Shows frequency and percentage distribution of studied patients regarding their demographic characteristics. It illustrates that there were 30.3% of patients aged 34 to more than 48 years. As well, 60.6% of patients were males. Also, 18.2% of patients can read & write 72.7% were married. 66.7 had insufficient income. Moreover, 54.6% resided in urban. In addition. As well, 72.7% of patients were workers.

Table (2): Shows the comparison of studied patients' knowledge score pre and post program implementation. This table reveals high statistically significant differences between pre and post program implementation regarding all items of knowledge as observed (P- value =0.000**). As well, 24.2, 18.2%, 18.2% had satisfactory knowledge about definition of Cervical Disc Herniation, Clinical Presentation and Diagnosis, Rehabilitation and Quality of Life preprogram implementation which improved to become correct answers as observed: 69.7%, 87.9%, 84.8% respectively post program implementation. Also reveals that 21.2% of patients had satisfactory level of knowledge pre-program which improved to 81.8% post-program

Table (3): Shows comparison of studied patients' activities of daily living (ADL) pre and post program implementation. This table represents that there were high statistically

significant differences between all activities post program implementation (P- value =0.000**)

Figure (1): Illustrates Comparison between patients' quality of life pre and post program implementation. there was high statistically significant differences pre and post program implementation at (P- value =0.000**).

The table (4) shows the correlation between three studied variables pre intervention: Daily Living Activity, Quality of Life, and Total Knowledge, Daily Living Activity and Quality of Life show a significant positive correlation ($r = 0.613$, $p = 0.001$). Also, Daily Living Activity and Total Knowledge also have a significant positive correlation ($r = 0.401$, $p = 0.006$). In addition, Quality of Life and Total Knowledge have a significant positive correlation as well ($r = 0.430$, $p = 0.005$).

Table (5): Shows the correlation between three studied variables post intervention: Daily Living Activity, Quality of Life, and Total Knowledge, Daily Living Activity and Quality of Life show a significant positive correlation ($r = 0.628$, $p = 0.001$). Also, Daily Living Activity and Total Knowledge also have a significant positive correlation ($r = 0.417$, $p = 0.005$). Furthermore, Quality of Life and Total Knowledge have a significant positive correlation as well ($r = 0.448$, $p = 0.004$).

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Table (1): Frequency and percentage Distribution of studied patients' demographic characteristics (n = 33).

Items	N	%
Age:		
18 - <28	8	24.2
28 - <38	5	15.2
38 - <48	10	30.3
48 or more	10	30.3
Gender:		
Male	20	60.6
Female	13	39.4
Education level:		
Not read and write	5	15.2
Read and write	6	18.2
Primary education	7	21.2
Preparatory	5	15.2
Secondary	6	18.2
University	4	12.0
Marital status:		
Married	24	72.7
Un married	9	27.3
Income:		
Sufficient	11	33.3
Insufficient	22	66.7
Residence:		
Rural	15	45.4
Urban	18	54.6
Occupation:		
Work	24	72.7
Not work	9	27.3

Table (2): Compare between patients' knowledge pre and post intervention (n=33).

		Pre		Post		Chi-square p. value
		N	%	n	%	
General knowledge about cervical disc herniation disease	Satisfactory	10	30.3	25	75.8	10.342 0.000
	Unsatisfactory	23	69.7	8	24.2	
Knowledge about complication and treatment	Satisfactory	6	18.2	29	87.9	8.761 0.001
	Unsatisfactory	27	81.8	4	12.1	
Knowledge about exercise for cervical disc herniation	Satisfactory	9	27.3	26	78.8	10.555 0.000
	Unsatisfactory	24	72.7	7	21.2	
Total	Satisfactory	7	21.2	27	81.8	13.081 0.000
	Unsatisfactory	26	78.8	6	19.2	

Highly significant: P. value = 0.000**

Table (3) Compare between mean score of patients' daily living activity pre and post intervention (n=33).

	Pre	Post	T test	p. value
	Mean (SD)	Mean (SD)		
Feeding	0.87 (0.10)	1.54 (0.32)	11.480	0.000
Grooming	0.79 (0.09)	1.43 (0.29)	12.108	0.000
Bathing	0.83 (0.08)	1.51 (0.39)	9.811	0.000
Dressing	0.64 (0.03)	1.29 (0.19)	19.412	0.000
Toilet Use	1.1 (0.21)	1.82 (0.41)	8.978	0.000
Bladder Control	0.94 (0.11)	1.70 (0.38)	11.036	0.000
Bowel Control	0.99 (0.12)	1.76 (0.39)	10.840	0.000
Mobility	0.94 (0.09)	1.65 (0.29)	13.432	0.000
Stairs	0.63 (0.02)	1.33 (0.28)	14.324	0.000
Walking	0.78 (0.10)	1.39 (0.40)	8.4989	0.000
Total	8.51 (1.6)	15.42 (3.5)	10.314	0.000

Highly significant: P. value = 0.000**

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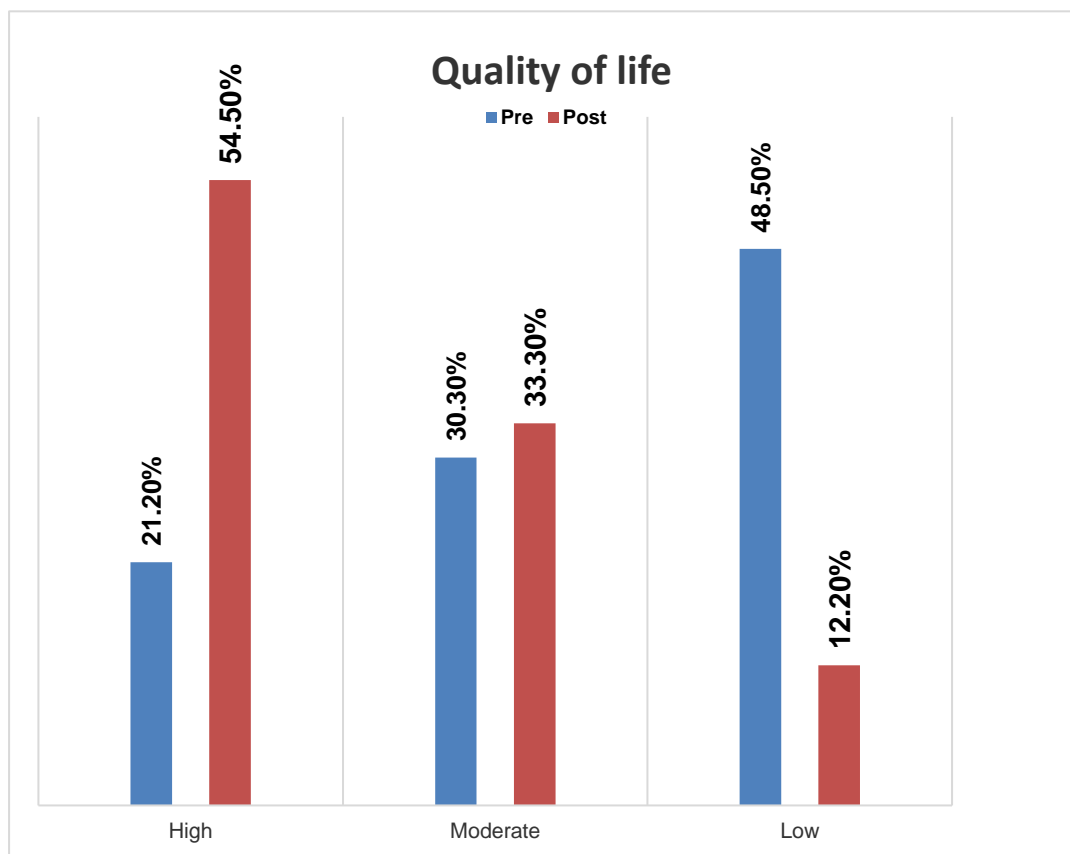


Figure (1) Compare between patients' quality of life pre and post intervention (n=33)

$X^2 = 11.776$ P. value = 0.000**

Table (4): Correlation between studied variables pre intervention (n=33).

		Daily living activity	Quality of life	Total knowledge
Daily living activity	r.		0.613	0.401
	p		0.001**	0.006**
Quality of life	r.			0.430
	p			0.005**
Total knowledge	r.			
	p			

Highly significant: P. value = 0.000**

Table (5): Correlation between studied variables post intervention (n=33).

		Daily living activity	Quality of life	Total knowledge
Daily living activity	r.		0.628	0.417
	p		0.001**	0.005**
Quality of life	r.			0.448
	p			0.004**
Total knowledge	r.			
	p			

Highly significant: P. value = 0.000**

Discussion:

Cervical disc herniation is a common cause of neck pain in adults. The severity of the disease can range from mild to severe, and even life-threatening. Herniation is more likely to occur posterolateral, where the annulus fibrosus is thinner and lacks the structural support from the posterior longitudinal ligament. Due to the proximity of the herniation to the traversing cervical nerve root, a herniation that compresses the cervical root as it exits can result in radiculopathy in the associated dermatome (**Sharrak & Al Khalil, 2023**). The study aims to evaluate the effectiveness of applying an educational program on health outcomes for patients with cervical disc herniation.

Regarding age, the present research revealed that more than half and near to two third of the studied patients were in the age category 38 - < 48 and 48 or more years old. This may be related to the strong association between adulthood and over activity as simply; adulthood is the active period of life. Adulthood period associated with many activities, responsibilities, and stressors. On the other hand, various psychological and social variables play a role in developing and increasing cervical disc prolapse in this period of life.

This finding was consistent to the finding of **Mahmoud & Abo El-Fadl, (2021)**, whose study was about "Effect of Educational Program for Patients Post Herniated Cervical Disk Surgery on Their Knowledge and Daily Living Activities" and stated that more than half of the patients aged between 31-50 years.

Also, this result was in the same line with the result of **Almushayt et al., (2022)**, whose study was about "Pattern of cervical

magnetic resonance imaging findings in diagnosed cases of degenerative disc disease among adult patients with persistent neck pain" and reported that patient classified according to age groups less than 30 and 30 years or more.

Pertaining to gender, the result of current research shows that males were more prevalent and constituted more than half of the patients. This finding supported by **Mohammed & Abo El-Fadl, (2021)**, and reported that more than half of patients were males. But this finding disagreed with **Lin et al., (2022)**, who study has entitled "Factors Associated with Postoperative Hospitalization in Patients with Cervical Disc Herniation" they stated that about half of Cervical Disc Herniation cases in females.

Concerning the educational level, the results of the current research reveal that, more than one third of patients can read & write. This result supported by **Said & Mahmoud, (2021)**, who studied "Effect of Educational Program for Patients Post Herniated Cervical Disk Surgery on Their Knowledge and Daily Living Activities" and found that, nearly half of study and control groups can read and write.

This result was contrast with **Weheida et al., (2022)**, whose study was about "Effect of Applying an Educational Program on Knowledge and Self-Care Activities of Patients Undergoing Lumbar Discectomy" and reported that the highest percentage of patients in both groups control and study were illiterate.

Concerning marital status, the finding of present research denotes that about two thirds of patients were married. This finding supported by **Unaler & Kirimlioglu, (2022)**, whose study was about "The

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Importance of Informing the Patients Receiving Physical Therapy and Rehabilitation Services for Cervical Disc Hernia about Healthy Lifestyle" and mentioned that about three quarters of patients were married.

Also, this result was agreed with **Nerland et al., (2015)**, who studied " the risk of getting worse: predictors of deterioration after decompressive surgery for lumbar spinal stenosis" and documented that about three quarters of patients were married.

Pertaining to monthly income, the results of current study reveals that two thirds of studied patient had insufficient income. This finding was contrast with finding of **Mohamed & Atiyah, (2020)**, who studied "Effectiveness of an Instructional Program on Knowledge for Patients with Lumbar Disk Prolapse at Baghdad Teaching Hospitals", who stated that the majority of the study group the monthly income was sufficient.

Regarding living areas, the result of current research reveals that more than half of studied patients were living in urban areas. This result may be explained by the fact that , the proportion of the population living in rural areas has continued to decline as people move to major cities in search of work and a higher standard of living.

This finding disagree with the finding of **Mahmoud & Abo El-Fadl, (2021)**, who showed that nearly three quarters of the studied patients lived in rural areas. The researchers' opinion was that patients may have difficulties in attaining the health care services.

Regarding occupation, the results of the current research reveals that more than

two third of studied patients were employees. From researcher point of view, this result may be due to higher prices and an increase in the cost of living push the person to work.

This result agreed with **Feninets et al., (2022)**, whose study was about "The Effect of Preoperative Educational Intervention on Anxiety and Pain of Patients Undergoing Spinal Decompression Surgery: A Pilot Randomized Controlled Study" and reported that more than half of studied patients were employees. Also agree with **Weheida et al., (2022)**, who reported that more than half of patients in the study group were laborers.

Second part: Patients' Knowledge pre and post intervention educational program.

Concerning patients' knowledge regarding cervical disc herniation, the results of present research reveals that, the lowest percentage of studied patients' knowledge pre-program implementation related to definition of CDH, clinical presentation and diagnosis, rehabilitation and quality of life are increased post program. In addition, there were highly statistically significant differences in knowledge regarding disease between pre and post program implementation regarding all the knowledge elements at P value 0.001. From the researcher point of view, this result may be due to that studied patient had inadequate knowledge pre-program and the patients not participated in any educational program before.

This result supported by **Alshehri et al., (2019)**, whose study was about Awareness of disc herniation among general population in Aseer province, Saudi Arabia"

and stated that the general population in Aseer region recorded very poor awareness regarding disc prolapse, risk factors, treatment, and preventive measures. As the majority of the sample was highly educated, this poor awareness may be due to lack of health education sessions, community indifference regarding this problem which may end in permanent disability.

This finding was in the same line with **Ahmed et al., (2023)**, whose study was about "The Effect of Nursing Rehabilitation Program on Quality of Life for Patients with Vertebral Disc in Beni-suef City" that showed a highly statistically significant difference between vertebral disc knowledge items, including meaning, risk factor, types, symptoms, complication, diagnosis, management, and methods for prevention of vertebral disc knowledge pre and post-program phases

Also, this finding agreed with the result of **Sahrah et al., (2016)**, whose study was about "Disk Prolapse Awareness Among Population in TAIF- SAUDI ARABIA" and revealed that more than half of the studied patients have poor knowledge levels regarding vertebral disc about diagnosis of disc prolapse at pre the preprogram phase.

In relation to patients' total knowledge score, the current research reveals that nearly one fourth of patients had satisfactory level of knowledge pre-program which improved to more than three-quarters post-program. From the researchers' point of view, these results might be due to the positive impact of the program on improving patients' knowledge regarding vertebral disc. This finding supports the first research hypothesis that assumed improvement in

patients' knowledge post-program implementation.

This finding agreed with the result of **Sahrah et al., (2016)**, and revealed that nearly one third of patients had satisfactory level of knowledge pre-program which improved to more than three-quarters post-program.

Regarding patients' daily living activity, the current study reveals that, there were statistically significant differences regarding patients' daily living activity pre and post implementation of program such as bowel, bladder, feeding, transferring, mobility and dressing. From the researcher point of view, this result may be due to that studied patient had inadequate practices pre-program and the patients not participated in any educational program before. These findings are supporting the second research hypothesis.

This finding was in line with the result of **Ahmed et al., (2023)**, and reported that highly statistically significant differences in the Barthel index score pre and post implementation of program

This result also agreed with **Mohamed et al., (2024)**, whose study was about "Discharge Plan: It's Effect on Low Back Pain Disability and Activities of Daily Living for Patients Undergoing Herniated Lumbar Disc Surgery" and revealed that, there were high statistically significant differences between study and control groups regarding ability to perform activities of daily living pre and post implementation of discharge plan.

This result was in the same line with **Guo et al., (2019)**, whose study was about "Rehabilitation nursing for patient

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rehabilitation after minimally invasive spine surgery" and reported that, there was no significant differences in the Barthel index score between the study and control groups before nursing intervention. While, after nursing intervention, Barthel index scores of both groups were substantially higher than those before nursing intervention. Significantly higher score in a number of areas including exercise transferring, driving, toileting, bathing, wheelchair movement, and eating.

Regarding patients 'quality of life, the current research reveals that, the quality of life was improved as the patients had a high level of quality of life in the post-program phase, compared with of them in the pre-program. On the other hand, the level of low quality of life among studied patients decreased in the pre-program phase compared with of them in the post-program. Also, there was statistically significant difference in overall quality of life of study patients post-program. From the researchers' point of view, these results might be due to the positive impact of the program on improving patients 'quality of life regarding vertebral disc.

This research is supported by the research study done by **Emmanuel et al., (2014)**, who conducted a study entitled "Protocol and two types of endurance activities' effects on individuals with chronic mechanical low-back pain's quality of life "found that there was a highly statistically significant difference in overall quality of life, general health perception of study patients post-program.

Also, this finding agreed with the result of **Aldemir & Gurkan, (2021)**, who conducted a study entitled "The effect of pedometer-supported walking and

telemonitoring after disc hernia surgery on pain and disability levels and quality of life" found that there was a highly statistically significant difference in overall quality of life of study patients post-program implementation.

Owing to the correlation between studied variables pre intervention, the current research reveals that, there was a positive correlation between knowledge and quality of life and daily living activities of the studied patients. This result in accordance with **Ahmed et al., (2023)**, who revealed that there is a highly statistically significant positive correlation between knowledge and the quality of life of the studied patients.

Also, this finding agreed with the result of **Said & Mohamed, (2021))**, who found that, there was a statistically significant positive correlation between total knowledge score and total Barthel index scale preprogram implementation.

According to correlation between studied variables post intervention, the current research represented that, there was a positive correlation between knowledge and quality of life and daily living activities of the studied patients. This suggests that, this result may be due to that the program has a positive effect on patients' knowledge and their quality of life and daily living activities post implementation.

This result was in agreement with **Said & Mohamed, (2021)**, who found that, there was a statistically significant positive correlation between total knowledge score and total Barthel index scale post program implementation.

Conclusion:

Implementing of an educational program for cervical disc herniation patients had improved of patients' health outcomes through high significantly increased level of their knowledge and practice.

Recommendations:

- 1- Developing and designing an in-service training program for nurses' staff members on applying the evidence-based nursing practice in the field of nursing care, especially for patients with cervical disc herniation.
- 2- Replication of the research on larger probability sample to attain more generalization of results.
- 3- For future research, the period of follow up need to be longer than 6 month it is suggested to be 6-12 month.

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فعالية تطبيق برنامج تعليمي على النتائج الصحية لمرضى الانزلاق الغضروفي العنقي

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يمكن أن يسبب الانزلاق الغضروفي العنقي العديد من أنواع الألم المختلفة، وهو السبب الأكثر شيوعاً لآلام الرقبة والذراع ويمكن حدوثه في أي مكان على طول العمود الفقري ويؤدي الى عوائق في أنشطة الحياة اليومية لدى المرضى. لذلك هدفت الدراسة الى تقييم فعالية تطبيق برنامج تعليمي على النتائج الصحية لمرضى الانزلاق الغضروفي العنقي. تم استخدام تصميم شبه تجريبي لتحقيق هدف الدراسة. وقد اجريت الدراسة في قسم العظام بمستشفى بنها الجامعي. تم تطبيق الدراسة على ٣٣ مريض تم تشخيصه الانزلاق الغضروفي العنقي. تم استخدام ثلاثة أدوات لجمع البيانات: الأداة الأولى: استبيان مقابلة شخصية. الأداة الثانية: استمارة تقييم ممارسات ومعلومات المرضى. الأداة الثالثة: استمارة تقييم النتائج الصحية للمرضى. حيث كشفت النتائج على أنه كشفت أن ما يقرب من ربع المرضى كان لديهم مستوى مرض من المعرفة قبل البرنامج والذي تحسن إلى أكثر من ثلاثة أرباع بعد البرنامج. وجود فروق ذات دلالة إحصائية في القدرة على أداء أنشطة الحياة اليومية قبل وبعد تطبيق البرنامج. تم تحسين نوعية الحياة للمرضى حيث كان لدى المرضى مستوى عالٍ من جودة الحياة في مرحلة ما بعد البرنامج، مقارنة بهم في مرحلة ما قبل البرنامج. التوصيات: يوصى بتطوير وتصميم برنامج تدريب لأعضاء هيئة التمريض حول تطبيق الممارسة التمريضية المبنية على الأدلة في مجال الرعاية التمريضية ، وخاصة للمرضى الذين يعانون من الانزلاق الغضروفي العنقي.