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Effect of Educational Program for Patients Post Herniated Cervical Disk Surgery on Their Knowledge and Daily Living Activities

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Abstract: **Cervical disc herniation is a common disorder of the spine that can lead to neck and/or arm pain and defects of daily living activities. Surgical treatment has been documented with favorable results in an abundant number of cases. Aim: The study aimed to evaluate the effect of educational program for patients post herniated cervical disk surgery on their knowledge and daily living activities. Design: A quasi-experimental research design was utilized. Setting: The study was conducted in neurosurgery department at the Benha University Hospital, Egypt. Sample: A purposive sample of 40 adult patients post herniated cervical disk surgery. Tools: three tools were used for data collection;(Tool I): Patients' knowledge assessment questionnaire to assess patients' knowledge regarding post herniated cervical disk surgery, (Tool II): Barthel Index scale of Activities of Daily Living to assess the patients' ability to perform activities of daily living and (Tool III): Visual Analogue Pain scale to assess severity of pain for patients post herniated cervical disk surgery. Results: showed that there was marked improvement in patients' level of knowledge from 32.5% preprogram to 77.5% post program. Moreover, 40.0% of patients complained of severe pain preprogram compared by none of them post program. Also, there was marked improvement regarding Barthel index scale of activities of daily living from 45.0% completely dependent preprogram to7.5% completely dependent post program implementation. 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 pain severity. Also, there was statistically significant positive correlation between total knowledge score and total barthel index scale post program implementation. Recommendations: 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 surgical outcomes for patients with herniated cervical disk surgery.**

Keywords: **Daily living activities, Educational program, Herniated cervical disk surgery, Patients.**

I. INTRODUCTION

Cervical disc herniation (CDH) is a group of diseases based on cervical disc degeneration. The spinal cord and nerve roots are compressed by the protruding intervertebral disc due to a slight external force, which causes neck and shoulder pain with upper limb radiation pain as the main clinical symptoms, or a small proportion of patients with limb sensory disorders, decreased muscle strength, and other symptoms of spinal cord compression ***(Hammera, et al., 2016).*** Most patients with symptomatic cervical disc herniation report severe neck and arm pain. The arm pain typically follows a myotomal pattern, whereas the sensory symptoms (e.g, burning, tingling) follow a dermatomal distribution. These radicular symptoms may also be associated with reflex changes and motor weakness of the upper extremity ***(Wong, et al., 2014).***

The prevalence of cervical disc herniation increases with age for both men and women and is most common in people with their third to fifth decades of life. It occurs more frequently in females, accounting for more than 60% of cases. For both sexes, the most frequently diagnosed patients were in the age group of 51 to 60 years ***(Kolenkiewicz, et al., 2018, Kim, et al., 2018, & Sharrak, 2020).*** Conservative care is recommended as the first line of treatment for symptomatic disc herniation with radiculopathy. It is estimated that 26% of patients with cervical radiculopathy require surgery which should be considered when pain persists after conservative therapy for 6 to 12 weeks or when there is evidence of progression of a functionally important motor deficit ***(Wong, et al., 2014).***

The goal of the majority of cervical spine operations is the successful return to the activities of daily life. Patients often report improvements in the way they feel immediately after surgery. However, strengthening the weakened muscles and soft tissue surrounding and supporting the neck requires a long-term program of exercise and therapy. The unhealthy postoperative living or work habits of some patients result in recurrence of symptoms and place a substantial economic burden on the patient. Therefore, maintenance of postoperative efficacy and prevention of the recurrence of symptoms are the focus of clinical treatment and follow-up ***(Samini, et al., 2014).***

Some exercises or stretches may need to be modified to reduce pain or target certain muscles. In time, most patients are able to continue neck exercises and stretches at home to maintain neck strength and flexibility over the long term. Strengthening and stretching the neck may help it to become more resistant to pain. Some exercises, such as chin tucks, may also help the head and neck to maintain better posture. Weakened neck muscles are more likely to lead to forward head posture and neck pain. When the head is instead held in neutral alignment with the ears directly above the shoulders, less stress is placed on the cervical spine and its discs ***(Staehler, 2019).***

Recently, nursing intervention has a major role in every clinical health care setting. The goal of intervention is to improve the efficacy of clinical nursing care, shorten hospital stay, reduce the incidence of complications, minimize physical dysfunction and accelerate the recovery of patients by optimizing surgical and perioperative management ***(Moore, et al., 2018).***

Nursing assessment is a very important issue while providing nursing care. Nurses have to ask the patient about past injuries to the neck and symptoms of arthritis in the injured joint of the cervical spine. Assessment also includes determining the onset, location, radiation of pain, limited movement, and diminished function of the neck, shoulders, and upper extremities. The area around the cervical spine is palpated to assess muscle tone and tenderness. Range of motion in the neck and shoulders is evaluated.The patient is asked about any health concerns that may influence the postoperative course. The nurse determines the patient's need for information about the surgical procedure and reinforces what the physician has explained. Strategies for pain management are discussed with the patient ***(Walker, 2018).***

II. SIGNIFICANCE OF THE STUDY

Injury to the cervical spine occurs frequently as a result of trauma. More than 13 million patients are assessed each year in emergency departments across the United States; of these, 30,000 (0.2%) will have cervical spine injuries (CSI) and of this group, only 10,000 (0.08%) will have spinal cord injuries (SCI) ***(Fredø, et al., 2012)***. A similar national registry in Egypt is unfortunately currently not available.

Most patients with CSI are males and young people aged 15 to 45 years. Most studies reported motor vehicle accidents to be the most common mechanism of injury leading to CSI. Spinal cord injury (SCI) is reported to occur in 10 to 50% of cases with CSI ***(Tian, et al., 2009).*** Surgery is indicated in cases of spinal instability or cord compression ***(Awad & Elqazaz, 2014).***

In the absence of a national data registry on cervical spine injury, a study entitled "Profile of Traumatic Cervical Spine Injuries in Assiut University Hospital" was done in Egypt by ***El-Beshbeshy, et al., (2020),*** and aimed to establish the demographic characteristics of patients with CSI presenting to the Trauma Unit of Assiut University Hospital. The study results showed that, total number of patients was 267 patients presented with CSI. The most common causes of CSI were road traffic accidents (62.2%), falling injuries (32.6%), and heavy object trauma (5.2%). Out of 267 patients with CSI, 159 (59.5%) had neurological insults and 77 (28.8%) complete quadriplegia. Traumatic cervical disc prolapse occurred in 63patients (23.6%), the preoperative in-hospital mortality rate was 14.6% (39 patients).

Benha university hospital documented the previous year census report of admission in neurosurgery department was 100 patients ***(Benha university Hospital statistical office, 2019).*** Evidence shows that the application of educational nursing programs about perioperative care for patients have achieved good results. In addition there are rare reports about the use of educational nursing programs in cervical disk surgery. This study may help such group of patients to deal with ADL and enhance their functional ability.

Aim of the Study:

The study aimed to evaluate the effect of educational program for patients post herniated cervical disk surgery on their knowledge and daily living activities.

III. 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' pain severity levels will be decreased post program implementation than before.

H3: Patients' will be able to perform activities of daily living on their own (without assistance) post program implementation.

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

IV. SUBJECTS AND METHODS

Research design:

A quasi-experimental research design was utilized in this study.

Setting:

The study was conducted in neurosurgery department at Benha University Hospital. The neurosurgery department contains four rooms, including 20 beds, one nursing station and a physician office.

Sample:

A purposive sample of 40 adult patients post herniated cervical disk surgery during a period of six months were included in this study according to the following criteria:

Inclusion criteria:

- Adult patients, from both sexes.
- Conscious, diagnosed with herniated cervical disk.
- Willing to participate, and able to communicate with others.

Exclusion criteria:

- Physical or mental handicapped.
- Disoriented & comatose patients.
- Patients on mechanical ventilation.
- Patients with other cervical spine pathologies such as trauma, tumor, infection, or deformity.
- Patients with multiple-level cervical disc prolapse.

Tools for data collection:-

Data were collected using the following tools:-

Tool I: Patients' assessment questionnaire:-

This tool was developed by the researchers into Arabic language after reviewing of relevant related literatures such as ***Lemone & Bruke, (2014)*** and ***Mohamed & Mostafa, (2018)*** to assess patients knowledge regarding post herniated cervical disk surgery and it included three parts:-

Part 1: Demographic characteristics of patients; this part included data related to age, sex, marital status, level of education, residence, occupation, and current work situation.

Part 2: patients' health history; this part used to assess patients' health history. It covered past health history, present medical and surgical history, family history, and medications used.

Part 3: Patients' knowledge assessment questionnaire; this part used to assess patients' knowledge regarding the disease. It was composed of 40 closed ended questions. It involved knowledge about the following items:

- The operation and anesthesia "10 questions".
- Complications "5 questions".
- Proper positions after operation "2 questions".
- Wound care "3 questions".
- Pain and medication "7questions".
- Nutrition "4 questions".
- ADLs and discharge instructions "9 questions".

Knowledge scoring system:

Each question was graded as (1) for correct answer, and (zero) for incorrect answer, with the total score was 40 scores (100%). These scores were summed-up and converted into a percent score. It was categorized as follow:

- Score < 75 % (less than 30 degrees) was considered "unsatisfactory level of knowledge".
- Score ≥ 75 % (30 degrees or more) was considered "satisfactory level of knowledge".

Tool II: Barthel Index Scale of Activities of Daily Living:

This tool was adopted from ***(Jain, 2017)*** 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, continent bowels, continent bladder, toilet use, transfers (bed to chair and back), mobility (on level surfaces, 45-meter walk), and stairs (up and down). The scale had total scores of 100, with higher score indicating better performance of ADLs in patients.

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".

Tool III: Visual Analogue Pain Scale:

It was adopted from ***Griensven, et al., (2013),*** to assess the severity of pain levels for patients with herniated cervical disk surgery. The scale composed of 5 items ranged from "no pain" to "worst pain possible".

Pain Scale scoring system:

The total scores of visual analogue pain scale ranged from (0-10), the higher scores reflect the worst pain. It was categorized as the following:

- 0 was considered "no pain".
- 1-3 was considered "mild pain".
- 4-6 was considered "moderate pain".
- 7-9 was considered "severe pain".
- 10 were considered "worse pain possible".

❖ **Educational program:**

The educational program was developed by the researchers in simple Arabic language based on patients' assessment after reviewing related literatures such as: the booklet of cervical spine surgery of ***Ottawa Hospital, (2013)*** and it was consisted of two parts:

1-Theoretical part:

It included; brief anatomy of the spinal column, definition and indications for cervical disk surgery and related diagnostic procedures, preventive measures of postoperative complications, ADLs, how to deal with pain, wound care, follow up and discharge instructions as: life style modifications regarding weight control, rest and sleep, physical activity and exercises, smoking cessation, stress reduction, avoided positions etc….

***2-Practical part*:**

This part included performed 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. Also patients were demonstrated about neck stretches to relieve pain as: lateral bend, scalene stretch, and neck rotation. And also exercises to must be avoided as running, jumping, powerlifting, or anything that involves sudden sharp movements, and lifting heavy objects.

Content validity:

The tools and the program were revised and ascertained by a panel of five experts from medical surgical nursing department, Faculty of Nursing, Benha University (two professors and three assistant professors). Their opinions were regarding the content, format, layout, consistency, accuracy and relevancy of the tools. According to their opinion the modifications were done.

Reliability:

Testing reliability of the developed tool was done statistically through cronbach's alpha test that was (0.96) for the patient's knowledge questionnaire.

Pilot study:

Pilot study was conducted on 10% of the study sample (4) patients post herniated cervical disk surgery in order to test feasibility, clarity and applicability of the tools then necessary modifications were carried out. Also, the pilot study had served to estimate the time needed for each patient to fill the questionnaire. Patients who were included in the pilot study were also included in the main study because minor modifications were done after conducting the pilot study.

Ethical considerations:

All ethical issues were taken into considerations during all phases of the study which included:

- Approval consent was obtained from dean of faculty of nursing and medical director of Benha University Hospital and head of neurological department.

- The aim of this study was explained to patients and they were reassured that all information are confidential and it will be used for research propose only.

- Patients were informed that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time without giving any reason.

Fieldwork:

The fieldwork was performed over a period of six months started from the beginning of July 2020 till the end of September 2020.The study was conducted on four phases: preparatory phase, assessment phase, implementation phase and evaluation phase as follow**:**

Preparatory Phase:

Preparatory phase included reviewing of the current available literature using books, articles and scientific journals to develop tools for data collection. An exploratory visit was done to the study setting to gain cooperation form physicians and nurses working at neurosurgery department.

Assessment phase:

An oral permission was taken from patients after explaining the purpose of the study. During this phase the researchers interviewed each patient after his/her admission to collect baseline data about demographic data, medical data and knowledge assessment questionnaire using tool (I) before explaining the program. Patients were assessed for the ability to perform activities of daily living using tool (II). Also, patients were assessed for degree of pain using tool (III). The assessment was done for two times: the first one preprogram and the second done post program implementation.

Implementation phase:

The implementation phase included the following steps:

-Setting general and specific objectives.

-Preparation of materials needed for sessions' implementation.

-The researchers divided the studied patients into five groups, and each group consisted of eight patients.

-The program implementation was carried out for each group separately through the conduction of sessions according to the studied patients' actual needs assessment.

-The implementation was conducted in 6 sessions, two sessions per week. Each session lasted about 30-45 minutes, including periods of discussion according to the patients' progress and feedback. Each patient took a copy of the booklet that included all the required instructions and training.

- The first session covered anatomy & physiology and surgical procedure. The Second session started with reviewing the previously presented principles and advancement to the next step, which centered on expected complications. The third session concentrated on preventive measures for complications. The fourth session began by reviewing the points that were previously instructed and demonstrating about proper positioning post-surgery. The fifth session concentrated on showing practical pain management techniques and wound care. The content presented and demonstration of how to apply wound care was done through simulation on some patients. The sixth session concentrated on proper nutrition and discharge instructions.

-Different teaching tools and media were used, including seminars and group discussions.

-The data collection continued over six months, from beginning of July 2020 till the end of September 2020.

Evaluation Phase:

The evaluation was done after one month after surgery by utilizing telephone call after discharge because of difficulties for patients in moving and transferring. There was an open channel of communication between the researchers and the patients or family for consultation, feedback, and follow-up visits at outpatient clinics. Using the same tools of pretest the

researchers reassessed knowledge, activities of daily living, and pain severity by comparing results pre and post implementation of the program.

Limitations:-

There are certain limitations of our study because it is a retrospective series. The number of subjects was also limited.

Statistical Analysis:

The collected data were structured, tabulated, and statistically analyzed using SPSS (Version 20 of the statistical computer software package). Average and standard deviations were determined for the spectrum of quantitative variables. The number and percentage distribution were computed for qualitative variables. A Chi-square test was used to analyze the relationship between qualitative variables. Significance was adopted at $p \leq 0.05$ and highly statistically significant at $p \leq 0.001$.

V. RESULTS

Table (1): Shows distribution of studied patients regarding their demographic characteristics**.** It illustrated that there were 60.0% of patients aged between 31-50 years with mean age of 41.9 ±11.75 years. As well, 55.0% of patients were males. Also, 92.5% were married. Moreover, 72.5% resided in rural areas. In addition 42.5% of patients can read & write. As well, 32.5% of patients were technical workers. Furthermore, 100% of patients didn't change their work.

Table (2): Shows distribution of studied patients regarding their health history. This table represents that there were 40.0% of patients had chronic disease and 54.5% of them had diabetes mellitus. Also, 55% of patients were non-smokers. Furthermore 32.5% of patients had previous surgeries. Moreover, 87.5% of patients had no family history. Concerning present history, 65.0% of patients were on continuous medications. Also, 73.1% of patients took neurologic medications. In addition, 85 % of patients complained of swelling or tenderness in neck and 75% of patients complained of numbness or weakness in arms. Moreover, 75% of patients stated that cervical disk herniation was between C6-C7.

Table (3): Shows distribution of studied patients regarding their total knowledge score pre and post program implementation. This table represents that there were high statistically significant differences between pre and post program implementation regarding all items of knowledge as observed (P- value =0.000**)**.** As well, 2.5%, 30%, 7.5% and 2.5%of patients had correct answers about anatomy & physiology, expected complications; proper positioning and discharge instructions respectively preprogram implementation which improved to become correct answers as observed: 97.5%, 52.5%, 60.0% and 57.5% respectively post program implementation.

Figure (1): Illustrates distribution of patients regarding their total knowledge score pre and post program implementation .This figure depicts that there was marked improvement in patients' level of knowledge from 32.5% preprogram to 77.5% post program**.**

Table (4): Shows distribution of studied patients regarding their pain severity pre and post program implementation, This table illustrates that there was high statistically significant differences pre and post program implementation regarding pain severity, (P- value =0.000**)**.**

Table (5): Shows distribution of studied patients regarding activities of daily living (ADL) pre and post program implementation. This table represented that there were high statistically significant differences between all items post program implementation (P- value =0.000**) except grooming and toileting there was statistically significant differences post program implementation (P- value =0.05*).

Figure (2): Illustrates distribution of studied patients regarding their total barthel index of daily activities pre and post program implementation, This figure depicts that there was marked improvement regarding barthel index scale of activities of daily living from 45.0% completely dependent preprogram implementation to 7.5% post program implementation.

Table (6): Shows relation between patients' total knowledge score and their educational level pre & post program implementation; there was significant statistical relation between total knowledge of patients and their educational level pre and post-program implementation**.**

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Table (7): Shows the relation between total activities of daily living (ADL) scale of patients ,their age and occupation pre & post program implementation, there were no statistically significant relation between barthel index of patients and their age and occupation pre and post-program implementation.

Table (8): Shows the relation between pain severity of patients and their age & occupation pre and post-program implementation, there was no statistically significant relation between pain severity with age as well occupation pre and post-program implementation.

Table (9): Shows the correlation between total pain score, barthel index of daily activities and knowledge score pre and post program implementation, there was a statistically significant negative correlation between total pain score and total knowledge score post program implementation. Also, there was statistically significant negative correlation between total pain score and total barthel index scale pre and post program implementation. Moreover, there was a statistically significant positive correlation between total knowledge score and total barthel index scale post program implementation.

Table (1): Distribution of studied patients regarding their demographic characteristics (n=40).

Items	Patient data	N=40	
		N	%
Age (in years)	< 30	5	12.5
	31-50	24	60.0
	51-60	11	27.5
	Mean ±SD	41.9 ±11.75	
Sex	Male	22	55.0
	Female	18	45.0
Marital status	Single	2	5.0
	Married	37	92.5
	Widow	1	2.5
Residence	Rural	29	72.5
	Urban	11	27.5
Educational level	Illiterate	4	10.0
	Read and write	17	42.5
	Secondary education	10	25.0
	University education	9	22.5
Occupation	Desk work	10	25.0
	Technical work	13	32.5
	No work	3	7.5
	House wife	11	27.5
	Retired	3	7.5
Occupational change	Yes(light work)	0	0.0
	No	40	100.0

Table (2): Distribution of studied patients regarding their health history (n=40).

Items	Medical data	N=40	
		N	%
Presence of Chronic disease	Yes	16	40.0
	No	24	60.0
	If yes	N=16	
	Diabetes Mellitus	12	54.5
	Hypertension	6	27.3
	Cardiac diseases	3	13.6
	Liver diseases	1	4.5
Smoking	Yes	18	45.0
	No	22	55.0
Previous surgeries	Yes	13	32.5
	No	27	67.5

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Family history	Yes	5	12.5
	No	35	87.5
Medications	Yes	26	65.0
	No	14	35.0
	If yes	**N=26**	
	Antihypertensive medications	6	23.1
	Hypoglycemic medications	11	42.3
	Cardiac medications	3	11.5
	Neurologic medications	19	73.1
	Chest medications	0	0.0
Main complain (Presenting symptoms)	Swelling or tenderness in neck	34	85.0
	Numbness or weakness in arms	30	75.0
Affected cervical spine	C3-C4	0	0.0
	C5-C6	10	25.0
	C6-C7	30	75.0

Some patients choose more than one answer.

Table (3): Distribution of studied patients' total knowledge pre and post program implementation (n=40).

Knowledge items	Pre- program				Post- program				X^2	P- value
	Correct		Incorrect		Correct		Incorrect			
	N	%	N	%	N	%	N	%		
Anatomy & physiology	1	2.5	39	97.5	39	97.5	1	2.5	49.56	.000**
Surgical procedure	7	17.5	33	82.5	28	70.0	12	30.0	24.75	.000**
Expected complications	12	30.0	28	70.0	21	52.5	19	47.5	14.58	.000**
Proper positioning	1	2.5	39	97.5	24	60.0	16	40.0	24.65	.000**
Wound care	5	12.5	35	87.5	24	60.0	16	40.0	17.28	.000**
Pain management	8	20.0	32	80.0	20	50.0	20	50.0	13.09	.000**
Nutrition	6	15.0	34	85.0	31	77.5	9	22.5	28.87	.000**
Preventive measures for complications	22	55.0	18	45.0	36	90.0	4	10.0	12.17	.000**
Discharge instructions	3	7.5	37	92.5	23	57.5	17	42.5	22.79	.000**

*High statistically significant at (p≤0.001) ** x2=chi-square test*

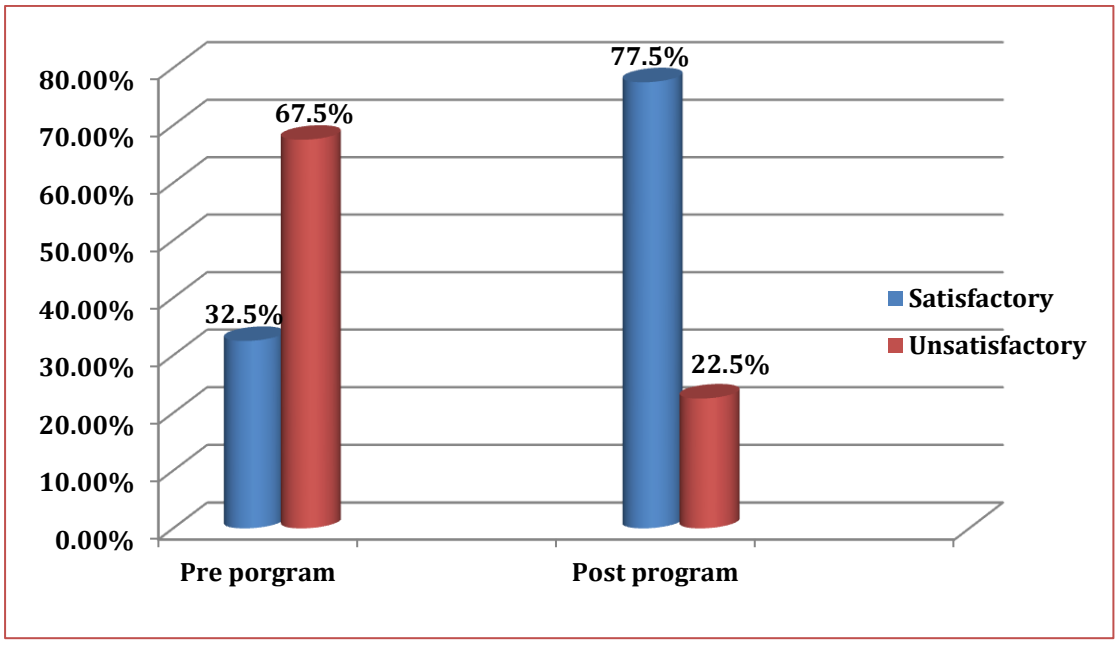

Figure (1): Distribution of studied patients regarding their total knowledge score pre and post program implementation (n=40).

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Table (4): Distribution of studied patients regarding their pain severity pre and post program implementation (n=40).

Pain severity	Pre-program		Post-program		X^2	P- value
	N	%	N	%		
Mild	3	7.5	35	87.5	39.46	.000**
Moderate	21	52.5	5	12.5		
Severe	16	40.0	0	0.0		
Mean ±SD	6.17±1.81		2.15±1.16			

*High statistically significant at (p≤0.001) ** x2=chi-square test*

Table (5): Distribution of studied patients regarding activities of daily living (ADL) pre and post program implementation (n=40).

Items	Dependency level	Pre		Post		X^2	P- value
		N	%	N	%		
Bowel	Completely dependent	22	55.0	29	72.5	32.90	.000**
	Needs assistance	14	35.0	11	27.5		
	Independent	4	10.0	0	0.0		
Bladder	Completely dependent	22	55.0	24	60.0	47.27	.000**
	Needs assistance	17	42.5	16	40.0		
	Independent	1	2.5	0	0.0		
Grooming	Completely dependent	11	27.5	16	40.0	11.07	.005*
	Needs assistance	22	55.0	19	47.5		
	Independent	7	17.5	5	12.5		
Toilet	Completely dependent	20	50.0	14	35.0	9.28	.005*
	Needs assistance	17	42.5	21	52.5		
	Independent	3	7.5	5	12.5		
Feeding	Completely dependent	6	15.0	14	35.0	24.99	.000**
	Needs assistance	25	62.5	21	52.5		
	Independent	9	22.5	5	12.5		
Transferring	Completely dependent	21	52.5	29	72.5	33.92	.000**
	Needs assistance	18	45.0	7	17.5		
	Independent	1	2.5	4	10.0		
Mobility	Completely dependent	16	40.0	24	60.0	27.07	.000**
	Needs assistance	22	55.0	16	40.0		
	Independent	2	5.0	0	0.0		
Dressing	Completely dependent	22	55.0	17	42.5	24.66	.000**
	Needs assistance	17	42.5	21	52.5		
	Independent	1	2.5	2	5.0		
Stairs Climbing	Completely dependent	33	82.5	29	72.5	22.76	.000**
	Needs assistance	4	10.0	11	27.5		
	Independent	3	7.5	0	0.0		
Bathing	Completely dependent	26	65.0	30	75.0	29.55	.000**
	Needs assistance	13	32.5	10	25.0		
	Independent	1	2.5	0	0.0		

Statistically significant at (p≤ 0.05) High statistically significant at (p≤0.001) ** x2=chi-square test*

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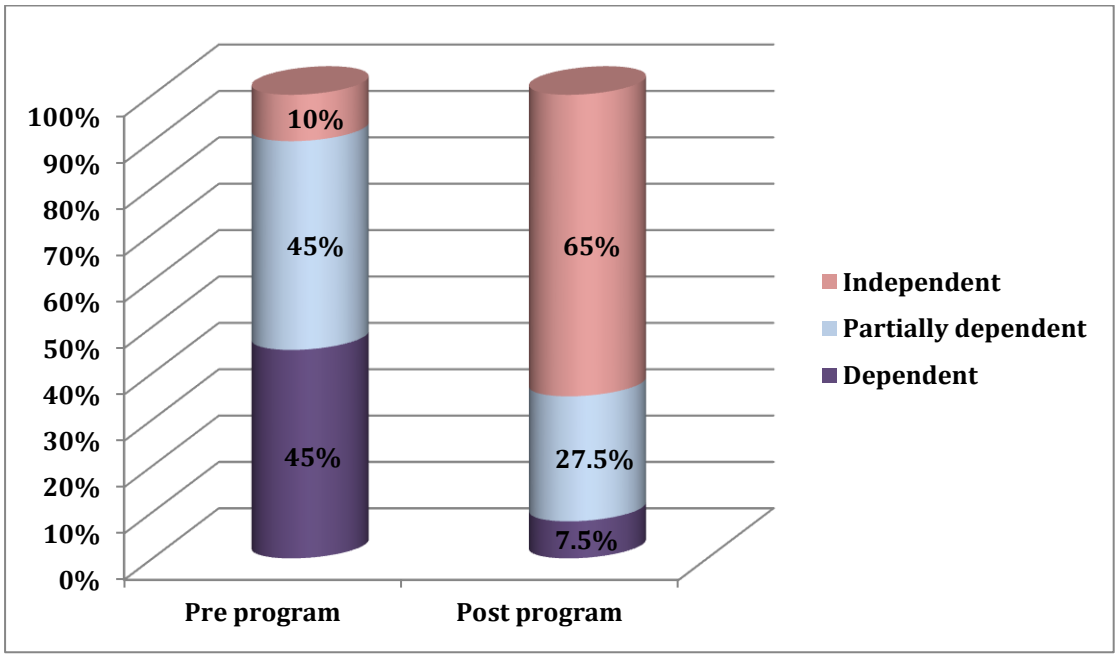

Figure (2): Distribution of studied patients regarding their total barthel index score pre and post program implementation (n=40)

Table (6): Relation between patients' total knowledge score and their educational level pre & post program implementation (n=40).

Knowledge items	Pre- program				$X^2_{(1)}$	P-value	Post- program				$X^2_{(2)}$	P-value
	Satisfactory (13)		Unsatisfactory (27)				Satisfactory (31)		Unsatisfactory (9)			
	N	%	N	%			N	%	N	%		
Illiterate	1	7.69	3	11.1	11.44	<0.05*	3	9.6	1	11.1	8.51	<0.05*
Read and write	9	69.2	16	59.2			14	45.1	3	33.3		
Secondary	2	15.3	5	18.5			8	25.8	2	22.2		
University	1	7.69	3	11.1			6	19.4	3	33.3		

Statistically significant at (p≤0.05) x2=chi-square test*

Table (7): Relation between total barthel index score of patients and their age & occupation pre & post program implementation (n=40).

Items	Patient data	Pre- program						$X^2_{(1)}$	P-value	Post- program						$X^2_{(2)}$	P-value
		Dependent (18)		Partially dependent (18)		Independent (4)				Dependent (3)		Partially dependent (11)		Independent (26)			
		N	%	N	%	N	%			N	%	N	%	N	%		
Age	< 30	3	16.6	2	11.1	0	0.0	.428	>0.05	0	0.0	1	9.1	4	15.3	.015	>0.05
	30-50	10	55.5	12	66.6	2	50.0			3	100	7	63.6	14	53.8		
	> 50	5	27.7	4	22.2	2	50.0			0	0.0	3	27.2	8	30.7		
Occupation	Desk work	5	27.7	3	16.6	2	50.0	.299	>0.05	0	0.0	3	27.2	7	26.9	.642	>0.05
	Technical work	2	11.1	9	50.0	2	50.0			1	33.3	3	27.2	9	34.6		
	No work	1	5.5	2	11.1	0	0.0			0	0.0	1	9.1	2	7.6		
	House wife	9	50.0	2	11.1	0	0.0			1	33.3	3	27.2	7	26.9		
	Retired	1	5.5	2	11.1	0	0.0			1	33.3	1	9.1	1	3.8		

Statistically in-significant at (p>0.05) Statistically significant at (p≤0.05) x2=chi-square test*

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Table (8): Relation between pain severity of patients and their age & occupation pre and post-program implementation (n=40).

Items	Patient data	Pre- program						$X^2_{(1)}$	P-value	Post- program						$X^2_{(2)}$	P-value
		Mild (3)		Moderate (21)		Severe (16)				Mild (35)		Moderate (5)		Severe (0)			
		N	%	N	%	N	%			N	%	N	%	N	%		
Age	< 30	0	0.0	3	14.2	2	12.5	2.31	>0.05	5	14.2	1	20	0	0.0	12.49	>0.05
	30-50	3	100	12	57.1	9	56.2			19	54.2	3	60	0	0.0		
	> 50	0	0.0	6	28.5	5	31.2			11	31.4	1	20	0	0.0		
Occupation	Desk work	1	33.3	6	28.5	3	18.7	3.13	>0.05	10	28.5	1	20	0	0.0	11.97	>0.05
	Technical work	2	66.6	6	28.5	5	31.2			13	37.1	1	20	0	0.0		
	No work	0	0.0	2	9.5	1	6.2			3	8.5	1	20	0	0.0		
	House wife	0	0.0	6	28.5	5	31.2			6	17.1	1	20	0	0.0		
	Retired	0	0.0	1	4.7	2	12.5			3	8.5	1	20	0	0.0		

Statistically in-significant at (p>0.05) Statistically significant at (p≤0.05) x2=chi-square test*

Table (9): Correlation between total pain score, barthel index score and knowledge score pre and post program implementation (n=40).

Items	Pain				Barthel index			
	Pre		Post		Pre		Post	
	r	p-value	r	p-value	r	p-value	r	p-value
Knowledge	-0.11	0.46	-0.35	0.02*	0.19	0.23	0.33	0.03*
Barthel index	-0.52	0.000**	-0.56	0.000**				

Statistically in-significant at (p>0.05) Statistically significant at (p≤0.05) High statistically significant at (p<0.001**)*

VI. DISCUSSION

Cervical disk surgery is one of the most commonly performed spinal surgical procedures for the treatment of a wide variety of pathologies. The need for information is reported to be a significant theme among qualitative studies from spinal surgery. Perioperative education is a core component to enhance recovery after surgery which aims to empower patients to undertake positive health actions and support autonomous decision making. Also, providing patients with health-related information, teaching them skills aimed at reducing discomfort & complications and offering psychological support. There is evidence to suggest that patients who gain sufficient knowledge can improve their coping ability and subsequently engage in appropriate attitudes and behaviors ***(Burgess, et al., 2019)***.

The present study aimed to evaluate the effect of educational program for patients post herniated cervical disk surgery on their knowledge and daily living activities. The study hypothesized that: (H1) patients' knowledge will be improved post program implementation than before, (H2) patients' pain severity levels will be decreased post program implementation than before, (H3) patients' will be able to perform activities of daily living on their own (without assistance) post program implementation, and (H4) there will be a positive correlation between total knowledge score and total barthel index scale post program implementation.

The discussion of current study covered five main parts; the first part Socio-demographic characteristics of patients , second part patients' health history data , third part patients' of knowledge related to pre/ post nursing guidelines of post herniated cervical disk surgery, the fourth part was pain severity and activity of daily living pre/ post nursing guidelines of post herniated cervical disk surgery and finally the fifth part discuss the correlation between total pain score, barthel index of daily activities and knowledge score pre and post program implementation.

Regarding patients' demographic characteristics, the present study revealed that more than half of patients aged between 31-50 years and were males. These results agreed with ***Ahmed & Galal, (2020),*** who studied "Single level anterior

cervical discectomy and fusion versus dynamic cervical implant: clinical and radiological outcome", and found that, more than half of patients were males and their age ranged from 32 to 60 years.

Regarding marital status, the results of the present study revealed that the majority of patients were married. It might be explained that age categories of the study subjects were within the marital age according to the Egyptian social culture. This result was supported by ***Kanaan, et al., (2014),*** who reported in their study entitled "predicting discharge placement and health care needs after lumbar spine laminectomy" who reported that, more than two thirds 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 residence, the current study findings 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.

This result was supported by ***Al Shurbaji, et al., (2017),*** who studied "surgery for lumbar disc herniation, demographic data and analysis of complications at King Hussein medical city" and found that, about three quarters of both groups lived in rural areas.

Concerning the educational level, the results of the current study revealed that, more than one third of patients can read & write. This result was in contrast with ***Abd Elwahhab, et al., (2019)***, who studied "effect of rehabilitative nursing program on functional status among patients with discectomy" and found that, more than one third of study & control groups had secondary education.

Owning to occupation, the current study findings showed that more than one third of patients had technical work. This result may be explained that technical workers were more prone to cervical disc herniation due to heavy workload and continuous bending and working This result was supported by ***Gupta, et al., (2017)***, who reported in their study entitled "an epidemiological study of low back pain in a tertiary care hospital of Jammu" that, more than one third of their patients were non-sedentary workers. In addition, ***Abd Elwahhab, et al., (2019),*** found that about half of study group and control group worked manually.

As regard to occupational change, the current study findings showed that all patients didn't have change their work. This result was in contrast with ***Garczyk, et al., (2013),*** in the study "patient satisfaction with nursing after surgery due to cervical or lumbar discopathy" emphasized that about one quarter of their patients had changed their quality of work because of pain. Also, ***Ólafsson, (2018),*** in the study entitled " cost of low back pain: results from a national register study in Sweden " who documented that pain affects work in more than two thirds related to sick leave and early retirement.

Concerning patients' health history, the current study revealed that more than one third of patients had chronic disease and more than half of them had diabetes mellitus. These results were inconsistent with ***Bonati Spine Institute, (2017),*** who stated in an article entitled "The Link between Degenerative Disc Disease and Smoking", that, medical conditions such as diabetes and high cholesterol were not associated with worsening cervical disc degeneration.

Concerning smoking, the present study illustrated that, more than half of studied patients were non-smokers. This result was consistent with ***Chen, et al., (2018),*** who studied "A retrospective study: Does cigarette smoking induce cervical disc degeneration?" and stated that, Smoking could accelerate the process of cervical disc degeneration, presenting with more severe neck-shoulder pain and the impact of smoking on the lower cervical discs is greater than the upper cervical discs. In addition, ***Rehan, (2019)***, mentioned in his article entitled "Smokers with Cervical Degenerative Disc Disease Have Surgery Earlier and More Often" that, smokers were more than twice as likely to undergo cervical spine surgery as non-smokers.

Owing to previous surgical operations, the current study showed that more than one third patients had previous surgical operations. This result was in agreement with ***Kesanen, et al., (2017),*** who studied "Increased Preoperative Knowledge Reduces Surgery-Related Anxiety" and found that stated that, one third of study and control groups had previous spine surgeries.

Concerning medication, the current study findings showed that more than two thirds of patients were on continuous medication which was neurological medications. This result may be attributed to these medications was the prescribed

medications to alleviate symptoms of disease before the operation. This result was consistent with ***The American Association of Neuroscience Nurses, (2014),*** in study entitled "thoracolumbar spine surgery: a guide to preoperative and postoperative patient care" who reported that majority of patients had preoperative neurological medications to alleviate symptoms of disease.

Regarding main complain, In addition the majority of patients complained of swelling or tenderness in neck, also three quarters complained of numbness or weakness in their arms. These results were agreed with ***Yeung, et al., (2012),*** who reported in their study entitled "Cervical disc herniation presenting with neck pain and contralateral symptoms" that, patients were presented with neck pain and left-sided pain of the upper and lower extremities.

Concerning the affected cervical spine, the current study revealed that three quarters of patients stated that cervical disk herniation was between C6-C7. This result was in agreement with ***Vital et al., (2013),*** who found in their study entitled "C6-C7 Cervical disc arthroplasty in cervical disc herniation" that, the herniated disk was at the C6-C7 level. In addition, ***Simoens (2020),*** emphasized this result and mentioned in his article entitled "Disk Herniation" that, C6- C7 is the most common herniation disc in the cervical spine. In contrast this result was disagreed with ***Yeung, et al., (2012),*** who reported that; herniated disc was at the C5 to C6 level.

In relation to patients' total knowledge score, the current study revealed that nearly one third of patients had satisfactory level of knowledge pre-program which improved to more than three-quarters post-program. This finding supports the first research hypothesis that assumed improvement in patients' knowledge post-program implementation. This result was in the same line with ***Alshehri, et al., (2019),*** who studied "Awareness of disc herniation among general population in Asee province, Saudi Arabia" that, awareness regarding disc herniation among the general population, was very poor. However, this result was in contrast with ***Sahrah, et al., (2016),*** who studied "Disc prolapse awareness among population in Taif-Saudi Arabia" and reported high knowledge level regarding disc herniation and its risk factors.

Concerning pain severity, the present study illustrated that nearly less than half of patients complained of severe pain pre-program with a mean pain level of 6.17 ± 1.81 compared by none of them post program with mean a mean pain level of 2.15±1.16. Also there was high statistically significant differences pre and post-program implementation. From the researchers point of view this may be due to the effect of the educational program in decreasing pain severity which supports the second research hypothesis.

This result was in agreement with ***Mostofi, et al., (2018),*** who reported in their study entitled "Preliminary results of anterior cervical arthroplasty by porous alumina ceramic cage for cervical disc herniation surgery" that, average pain severity was 7.01 in the preoperative period. It was reduced to 3.02 in 3 months, to 1.95 in 6 months. In addition, this result was in the same line with ***Guo, et al., (2019),*** who studied "The rehabilitation nursing program for patient after minimally invasive spine surgery" and reported that, there was no significant difference in pain score between the two groups before nursing intervention but after nursing intervention, the pain scores of both groups were significantly lower than those before nursing intervention.

Regarding patients' total barthel index score pre and post-program implementation. The current study represented that, there was high statistically significant difference between all items post educational program implementation such as bowel, bladder, feeding , transferring , mobility and dressing (p=0.00**). This implies that the educational program improved independency level of patients with cervical disk surgery. So, this result supports the third research hypothesis.

This result was in the same line with ***Guo, et al., (2019),*** who reported that, there was no significant differences in the barthel index score between the two 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 was noted in the observation group than in the control group (P<0.001). Also, this result was in agreement with ***Weheida, et al., (2018),*** who studied "Effect of pre-discharge instructions on patients' activities and functional ability post spinal cord injury" and reported that, there was high statistically significant difference between pre and post-instructions in ADL score (P<0.000).

Moreover, this results was agreed with ***Rice, et al., (2013),*** who studied "Impact of the clinical practice guidelines for preservation of upper limb function on transfer skills of persons with acute spinal cord injury", that, Intervention group with implemented dependent activities, showed significant improvements in a number of areas including exercise,

transferring, driving, toileting, bathing, wheelchair movement, and eating. Also bowel and bladder control. All of these changes contributed to an improvement in functional independence.

Concerning relation between patients' total knowledge score and their educational level pre & post program implementation; there was statistically significant relation between total knowledge score of patients and their educational level pre and post-program implementation**.** This result was supported by ***Alkatheri & Albekairy, (2013)***, in the study "does the patients' educational level and previous counseling affect their medication knowledge" who found that education level of the patient has positive effect on their knowledge. However, ***Weheida, et al., (2018),*** found no significant relation between educational levels of studied patients and their knowledge level.

Concerning relation between total Barthel index scale of patients & their age and occupation pre & post program implementation, there were no statistically significant relation between barthel index of patients and their age and occupation pre and post-program implementation. These results may be related to the pain sensation has the effect on the ability of patients to perform their daily activities.

The results were supported by ***Manusov, (2012),*** who studied" evaluation and diagnosis of low back pain" who reported that heavy physical work and prolonged standing were correlated with increased risk of disability. This result was on the contrary with, ***Radaković & Radaković, (2015),*** who studied "the effectiveness of the functional magnetic stimulation therapy in treating sciatica syndrome" and found a positive correlation between pain and physical activities.

Concerning relation between pain severity of patients and their age & occupation pre and post-program implementation, there was no statistically significant relation between pain severity with age as well occupation pre and post-program implementation.

These results were consistent with ***Moradi & Hajbaghery, (2013),*** who studied "Quality of care for patients with traction in kashan" and showed that, there was no relation between age and occupation and pain level. Moreover, ***Zhang, et al., (2014),*** who studied "The Effect of Health Education in Patients with Chronic Low Back Pain" and reported that, there were no significant relations observed between the two groups in terms of age, sex, and back and leg pain severity. Also, ***Kesanen, et al., (2017),*** who illustrated that, age, did not demonstrate any significant effect on pain.

Concerning correlation between total pain score and total knowledge score, the current study findings showed that**,** there was a statistically significant negative correlation between total pain score and total knowledge score post program implementation which means that when patients' knowledge increase, pain severity decrease. These findings may be related to effect of the educational program in increasing patients' knowledge about daily living activities and also decreasing pain severity post program implementation.

This result was consistent with ***Papanastassiou, et al., (2011),*** who studied "Effects of Preoperative Education on Spine Surgery Patients" and found that, educational intervention had a positive impact on patients' satisfaction, especially in terms of pain management. In addition, ***Kesanen, et al., (2017),*** who reported that increased patients' knowledge affect positively on pain relieving. Moreover, ***Lee, et al., (2018),*** who studied "effects of educational intervention on state anxiety and pain in people undergoing spinal surgery" and reported that, there was a significant correlation between patient's pain level and knowledge after receiving the education intervention.

Pertaining to correlation between total pain score and total barthel index score, the current study findings revealed that**,** there was a negative correlation between total pain score and total barthel index of daily activities among study and control groups pre and post program implementation and also there was statistically significant correlations between both group pre and post program implementation. These results may be related to the pain sensation has the effect on the ability of patients to perform their daily activities.

These results were supported by ***Manusov, (2012)***, who reported that heavy physical work and prolonged standing were correlated with increased risk of disability. This result was in contrast with, ***Radaković & Radaković, (2015),*** who found a positive correlation between pain and physical activities.

Owing to correlation between total knowledge score and total barthel index score, the current study findings showed that**,** there was a positive statistically significant correlation between total knowledge score and total barthel index scale post

program implementation. These findings may be attributed to that the program has positive effect on their knowledge and daily living activities. So, this result supports the fourth research hypothesis

These results were supported by ***Koekenbier, et al., (2016),*** who studied "empowering knowledge and its connection to health-related quality of life" and reported that, empowering knowledge was associated with high postoperative health-related quality of life. Moreover, ***Burgess, et al., (2019)***, who studied "The Effect of Preoperative Education on Psychological, Clinical and Economic Outcomes in Elective Spinal Surgery" and reported that, patients who gain sufficient knowledge can improve their coping ability and then engage in appropriate attitudes and behaviors.

Finally, based on the study results, significant differences were observed after implementing educational program for patients with cervical disk surgery, and were effective in relieving their pain, and improving their ability to perform ADLs.

VII. CONCLUSION

Based on the findings of the current study, it can be concluded that providing an educational program has shown to be effective for improving patients' knowledge and activities of daily living. Statistically significant differences were found post program implementation regarding patients' knowledge and pain severity. Statistically significant correlations were found post program implementation between patients' knowledge, pain severity and activities of daily living.

VIII. RECOMMENDATIONS

Based on results of the present study, the following can be recommended:

A- Recommendations for patients :

- Patients must be educated about the importance of following instructions given by their caregivers to improve their knowledge and health related outcomes.

B- Recommendations for nurses :

- Nurses should be aware about instructions given to patients before discharge and inform patients the importance of follow-up.

C- Recommendations for administration:

- Establishment of health care educational center in the neurosurgery department to educate patients necessary instructions about their conditions using booklets and illustrated pamphlets for each patient especially those who cannot read and write.

D- Recommendations for future researches:

- Replication of the study using a larger probability sample for generalization of results.
- Further research is needed to assess the effects of preoperative education on surgical outcomes for patients with herniated cervical disk surgery.

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REFERENCES

[1] ***Abd Elwahhab, A., Shehata, A. and Abd Elghaffar, S. (2019).*** Effect of rehabilitative nursing program on functional status among patients with discectomy. Journal of Nursing and Health Science; 8 (6):82-92.

[2] ***Ahmed, O., and Galal, A., (2020).*** Single level anterior cervical discectomy and fusion versus dynamic cervical implant: clinical and radiological outcome, The Egyptian Journal of Neurology, Psychiatry and Neurosurgery, 56:26. DOI: https://doi.org/10.1186/s41983-020-0153-0.

[3] ***Alkatheri, A., and Albekairy, A., (2013).*** Does the Patients' Educational Level and Previous Counseling Affect Their Medication Knowledge? Annals of Thoracic Medicine; 8(2):105-108.

[4] ***Alshehri, A., Alshehri, T., Alyali, S., and Alshahrani, A., (2019).*** Awareness of disc herniation among general population in Aseer province, Saudi Arabia, Journal of Family Medicine and Primary Care. Vol. 8, issue (3):Pp.1159, DOI: 10.4103/jfmpc.jfmpc_462_18.

[5] ***Al Shurbaji, A., Said, A., Al Qroom, R., and Abu Salma, Z., (2017).*** Surgery for lumbar disc herniation, demographic data and analysis of complications at King Hussein medical city. Journal of the Royal Medical Services; 24 (1):55-58.

[6] ***Awad, T., and Elqazaz, M., (2014).*** Cervical spine injuries in Fayed Resort: shallow water accidents. Egyptian Spine J 12(1):15–20.

[7] ***Benha University Hospital Statistical Office, (2019).*** Census report of admission in neurosurgery department.

[8] ***Bonati Spine Institute., (2017).*** The Link between Degenerative Disc Disease and Smoking. Available at: https:// www.orthogate.org/articles/spine/the-link-between-degenerative-disc-disease-and-smoking. Accessed on 20/9/2020.

[9] ***Burgess, L., Arundel, J. and Wainwright, T., (2019).***The Effect of Preoperative Education on Psychological, Clinical and Economic Outcomes in Elective Spinal Surgery: A Systematic Review. Healthcare Journal (Basel, Switzerland); 7(1): 48.

[10] ***Chen, Z., Li, X., Pan, F., Wu, D., and Li, H., (2018).*** A retrospective study: Does cigarette smoking induce cervical disc degeneration? International Journal of Surgery, Volume 53, Pp. 269-273. https://doi.org/10.1016/j.ijsu. 2018.04.004.

[11] ***El-Beshbeshy, M., Hassan, M., Zohney, A., and El-Sharkawi, M., (2020).*** Profile of Traumatic Cervical Spine Injuries in Assiut University Hospital. The Egyptian spine journal, Vol, 35:53-60, DOI: 10.21608/esj.2020. 39611.1143.

[12] ***Fredø, H.L., Rizvi, S.A.M., Lied, B., Rønning, P., and Helseth, E., (2012).*** The epidemiology of traumatic cervical spine fractures: a prospective population study from Norway. Scand J Trauma Resusc Emerg Med 20(1):85.

[13] ***Garczyk, D., Jankowski, R., Misterska, E., Głowacki M. , Żukiel, R. and Kowalska, A., (2013).*** Patient satisfaction with nursing after surgery due to cervical or lumbar discopathy. Journal of in Medical Sciences Monitor; 19(7): 892-902.

[14] ***Griensven, H., Strong, J., and Unruh, A., (2013).*** Pain; a textbook for health professionals, 2nd edition, Elsevier, China, P.97.

[15] ***Guo, X. , Hou, X., Ding, S. and Chang, S., (2019).*** Rehabilitation nursing for patient rehabilitation after minimally invasive spine surgery, Int J Clin Exp Med, 12(3):2450-2455.

[16] ***Gupta, R., Mahajan, S., Dewan, D. and Gupta, R., (2017).*** An epidemiological study of low back pain in a tertiary care hospital of Jammu .International Journal of Research in Medical Sciences; 5(3) 835-839.

[17] ***Hammera, C., Hellerb, J., and Keplera, C., (2016).*** Epidemiology and pathophysiology of cervical disc herniation. Seminars Spine Surg. vol.28, issue (2): Pp.64–7.

[18] ***Jain, K., (2017).*** Textbook of Hyperbaric Medicine, 6th edition, Springer International Publishing, p.248.

[19] ***Kanaan, S., Yeh, H., Waitman, R., Burton, D., Arnold, P. and Sharma, N., (2014).*** Predicting discharge placement and health care needs after lumbar spine laminectomy. Journal of applied health; 43(2): 88-97.

[20] ***Kesanen, J., Leino-Kilpi, H., Lund, T., Montin, L., Puukka, P. and Valkeapää, K., (2017).*** Increased Preoperative Knowledge Reduces Surgery-Related Anxiety: A Randomized Clinical Trial in 100 Spinal Stenosis Patients**.** European Spine Journal; 26(10):2520–2528. DOI 10.1007/s00586-017-4963-4.

[21] ***Kim, Y.K., Kang, D., Lee, I., and Kim, S.Y., (2018).*** Differences in the Incidence of Symptomatic Cervical and Lumbar Disc Herniation According to Age, Sex and National Health Insurance Eligibility: A Pilot Study on the Disease's Association with Work. International journal of environmental research and public health.

[22] ***Koekenbier, K., LeinoKilpi,H., Cabrera,E., Istomina, N., Stark, Å., Katajisto, J., Lemonidou, C.,Papastavrou,E., Salanterä,S., Sigurdardottir, A., Valkeapää, K. and Eloranta, S., (2016).*** Empowering knowledge and its connection to health-related quality of life: A cross-cultural study. Journal of Applied Nursing Research; 29(16):211-216.

[23] ***Kolenkiewicz, M.,Włodarczyk, A., and Wojtkiewicz, J., (2018).*** Diagnosis and Incidence of Spondylosis and Cervical Disc Disorders in the University Clinical Hospital in Olsztyn, in Years 2011-2015. BioMed research international.

[24] ***Lee, C., Liu, J., Lin, S., Hsu, T., Lin, C. and Lin, L., (2018).*** Effects of Educational Intervention on State Anxiety and Pain in People Undergoing Spinal Surgery: A Randomized Controlled Trial. Journal of Pain Management Nursing; 19(2):163–171.

[25] ***LeMone, R., and Burke, L., (2014).*** Medical-Surgical nursing; critical thinking for person centered care, 2nd Australian edition, Pearson, China, p.1585.

[26] ***Manusov, E., (2012).*** Evaluation and Diagnosis of Low Back Pain. Primary care Journal; 39(3):471-479.

[27] ***Mohamed, S. A., and Mostafa, H.A., (2018).*** The effects of educational intervention on self-care behavior and expected clinical outcome in patient undergoing spine transplantation, Journal of Nursing Education and Practice,8(9),Pp.102-112.

[28] ***Moore, J.L, Friis., S., Grahamm, I.D., Gundersen, E.T., and Nordvik, J.E.,(2018).*** Reported use of evidence in clinical practice: a survey of rehabilitation practices in Norway. BMC Health Serv Res; 18: 379.

[29] ***Moradi, T., and Hajbaghery, M., (2013).***Quality of care for patients with traction in kashan shahid Beheshti, Archives of trauma Research 2(2):85-90.

[30] ***Mostofi, K., Moghaddam, B., Peyravi, M., and Khouzani, R., (2018).*** Preliminary results of anterior cervical arthroplasty by porous alumina ceramic cage for cervical disc herniation surgery, Journal of Craniovertebral Junction & Spine, 9 (4): 223-226, DOI: 10.4103/jcvjs.JCVJS_95_18.

[31] ***Nerland, U., Jakola, A., Giannadakis, C., Solheim, O., Weber, C., Nygaard, Ø., Solberg, T., and Gulati, S., (2015).*** The risk of getting worse: predictors of deterioration after decompressive surgery for lumbar spinal stenosis, Journal of World Neurosurgery, 84(4), Pp.2152-2160.

[32] ***Ólafsson, G., (2018).*** Cost of low back pain: results from a national register study in Sweden. European Spine Journal; 27(11): 2875–2881.

[33] ***Papanastassiou, I., Anderson, R., Barber, N., Conover, C. and Castellvi, A. (2011).*** Effects of Preoperative Education on Spine Surgery Patients. SAS Journal, Elsevier; 5(11): 120-124.

[34] ***Radaković, T., and Radaković, N., (2015)***. The Effectiveness of the Functional Magnetic Stimulation Therapy in Treating Sciatica Syndrome. Journal of Therapy and Rehabilitation; 3(3):63-69.

[35] ***Rehan, K., (2019).*** Smokers with Cervical Degenerative Disc Disease Have Surgery Earlier and More Often, available at: https://www.spineuniverse.com/conditions/degenerative-disc/smokers-cervical-degenerative-disc-disease-have-surgery-earlier-more. Accessed on 15/8/2020.

[36] ***Rice, L.A., Smith, I., Kelleher A.R., Greenwald, K., Hoelmer, C., and Boninger, M.L., (2013).*** Impact of the clinical practice guideline for preservation of upper limb function on transfer skills of persons with acute spinal cord injury. Arch Phys Med Rehabil 94:1230–1246.

[37] ***Sahrah, H., Mansour, M., Elhussein, N., Ahmed, R., and Alzahrani, A., (2016).*** Disc prolapse awareness among population in Taif-Saudi Arabia. International Journal of Advanced Research; 4(10):188-97. DOI: 10.21474/ IJAR01/2070.

[38] ***Samini, F., Mashhadinejad, H., and Ehsaei, M., (2014).*** Comparison of surgical and medical treatments for cervical spondylosis: a prospective study. Neurosurg Quarterly. Vol.24, issue (1): Pp.18–21.

[39] ***Sharrak, S., (2020).*** Cervical disk herniation, available at: https://www.statpearls.com/ArticleLibrary/viewarticle/ 19225, Accessed on 20/4/2020.

[40] ***Simoens, F., (2020).*** Disk herniation, available at: https://www.physio-pedia.com/Disc_Herniation, accessed on 22/4/2020.

[41] ***Staehler, R., (2019).*** Conservative Treatment for a Cervical Herniated Disc. Available at: https://www.spine-health.com/conditions/herniated-disc/conservative-treatment-a-cervical-herniated-disc. Accessed on 12/7/2020.

[42] ***The American Association of Neuroscience Nurses., (2014).***Thoracolumbar spine surgery: a guide to preoperative and postoperative patient care. Available at https://www.jackson.org/media/1251/aann14_cpg-thoraciclumbarspine-1.pdf. Accessed on 17/7/2020.

[43] ***The Ottawa Hospital (2013).*** Patient Information Cervical Spine surgery, CP 21 B, available at: https://www. ottawahospital.on.ca/en/documents/2017/01/cervical-spine-surgery.pdf/, access at 3/2/2021.

[44] ***Tian, H.L., Guo, Y., Hu, J., Rong, B.Y., Wang, G., and Gao, W.W., (2009).*** Clinical characterization of comatose patients with cervical spine injury and traumatic brain injury. J Trauma Acute Care Surg 67(6):1305–1310.

[45] ***Vital, J., Boissiere, L., and Obeid, I., (2013).*** C6-C7 cervical disc arthroplasty in cervical disc herniation, European Spine Journal, 22 (9), DOI: 10.1007/s00586-013-2939-6.

[46] ***Walker, F., (2018).*** The Patient Undergoing a Cervical Discectomy, Medical Surgical Nursing: Management of Patients with Oncologic or Degenerative Neurologic Disorders. Available at: http://www.brainkart.com/article/ Nursing-Process--The-Patient-Undergoing-a-Cervical-Discectomy_32548/. Accessed on 15/7/2020.

[47] ***Weheida, S. M., Shabaan, E. G., and Fehr, A., (2018).*** Effect of pre-discharge instructions on patients' activities and functional ability post spinal cord injury, Egyptian Nursing Journal, Vol. 15 No. 2, Pp.135–143.

[48] ***Wong, J., Pierre, C., Quesnele, J., Stern, P., and Mior, S., (2014).***The course and prognostic factors of symptomatic cervical disc herniation with radiculopathy: a systematic review of the literature, the Spine Journal; vol.14, Pp.1781-1789.

[49] ***Yeung, J., Johnson, J., and Karim, A., (2012).*** Cervical disc herniation presenting with neck pain and contralateral symptoms: a case report, Journal of medical case reports, 166 (6). ISSN: 1752-1947. DOI:https://doi.org/10.1186/ 1752-1947-6-166.

[50] ***Zhang, Y., Wan, L., and Wang, X., (2014).*** The Effect of Health Education in Patients with Chronic Low Back Pain, the National Center for Biotechnology Information, Vol 42 (3) PP. 815-820.