Effect of Applying an Educational Program for Patients with lumbar laminectomy on Their Knowledge and Self-Care Activities

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Abstract

Background: Lumbar laminectomy is one of the most commonly performed spinal surgical procedures for treatment of a wide variety of pathologies. **The study aimed** to evaluate the effect of applying an educational program for patients with lumbar laminectomy on their knowledge and self-care activities. **Research Design:** A randomized-controlled trail research design was utilized in this study to achieve the aim of this study. **Setting:** The study was conducted at neurosurgery department at Benha University Hospital. **Sample:** A purposive sample of ٨٠ adult patients with lumbar laminectomy divided into two equal groups, ٤٠ patients for study group and ٤٠ patients for control group; (I) study group was received educational program along with the routine hospital care. (II) Control group was received the routine hospital care only. **Tools:** Four tools were used in the study. **Tool (١):** Patients' assessment sheet consists of two parts, **part ١:** Socio-demographic characteristics of patients, **part ٢:** Patients' health history. **Tool (٢):** knowledge assessment questionnaire **Tool (٣):** Visual Analogue Pain scale (VAPS) and **Tool (٤):** Barthel Index of Activities of Daily Living. **Results:** Showed that, there was marked improvement in study group regarding level of knowledge post program compared to control group. There was significant statistical differences between study and control groups post program implementation regarding Barthel Index Scale. There was positive correlation between total knowledge score and total barthel index scale among study and control groups' pre and post program implementation. **Conclusion:** The educational program has positive effect in improving knowledge and self-care activities for patients with lumbar laminectomy. **Recommendation:** Replication of the study using a larger probability sample from different geographical areas to attain more generalizable results.

Key Words: Lumbar laminectomy, Educational program, knowledge, self-care activities.

Introduction

Laminectomy is an elective procedure rather than emergency surgery performed to remove the posterior arch of the vertebra that called the lamina (between the spinous process and the pedicles) that covers the spinal canal. It is most commonly done in the lumbar spine and less often in the cervical spine and rarely in thoracic spine. It may be

done for a single vertebra or multiple levels depending on the disease levels ***(Estefan and Willhuber, ٢٠١٩).***

Lumbar laminectomy is indicated only after more conservative measures as medications, physical therapy and steroid injections have failed or if serious neurological deficits are present such as weakness, or loss of bowel or bladder control. It is aimed to widen and relieve pressure placed on the spinal cord or nerve roots. Lumbar laminectomy has been found to restore function, decrease pain, and enhance quality of life in properly selected patients ***(Desai, ٢٠١٨).***

Lumbar spinal stenosis (LSS) is the most common indication of lumbar laminectomy which the spinal canal narrows and compresses the neural structures. It is clinically manifested by walking disability, back pain and radiating pain in the buttocks and lower extremities. Also, feelings of numbness and muscular weakness are common. LSS is caused by disc prolapse, tumors, local infection, trauma, metabolic disorder as Paget's disease, a thickened ligamentum Flavum and osteophytes from osteoarthritic changes in the facet joint. Degeneration in the segment sometimes leads to a slip forward of the adjacent upper vertebra as degenerative spondylolisthesis which might be a contributing factor to the stenosis ***(Jameson, et al., ٢٠١٨).***

Lumbar laminectomy is contraindicated for patients with poor general health and comorbidities that prohibit safe anesthesia, as well as risk factors associated with poor outcomes. Other contraindications include inadequate association between symptoms and findings on physical examination, neurologic examination, imaging, or other diagnostic testing. Also, chronic low back pain alone without dominant leg symptoms may be considered a relative contraindication for lumbar laminectomy ***(Mao, ٢٠١٩).***

Lumbar laminectomy is typically performed under general anesthesia and the patient is positioned prone on a spine frame or in the kneeling position with the abdomen hanging free. Postoperative complications involve complications related to immobility especially respiratory, digestive, vascular, integumentary and musculoskeletal problems. Also, complications related to surgical procedure as neurological impairment, urinary problems, cerebrospinal fluid leaks, cauda equina syndrome and surgical trauma or hematoma, spinal instability requiring spinal fusion and residual leg and back pain. Also, wound complication may occur ***(The Canadian Orthopaedic Nurses Association, ٢٠١٧).***

Pre-operative nursing care is primarily focused on decreasing pain, neurological assessment and ensuring adherence to a proper diet. A nurse's duties include providing the patient with information on how to prepare for surgery, postoperative care, and reassuring the patient. The first problems that occur after surgery are related to the patient's physical reaction to general anesthesia, so care at this stage is centered on alleviating the symptoms ***(Goodman & Spry, ٢٠١٧).***

In the immediate postoperative period, the nurse has to monitor vital signs and observe the surgical wound. Attention should be paid to the patient's neurological condition including an assessment of pain intensity, active range of limb motion, and sensory and bladder functions. Also, the nurse participates in physiotherapy aimed at prevention of thromboembolic and respiratory complications, and conducts physiotherapy to help the patient regain mobility. Nursing care also provides basic information on self-care, wound care, providing clear information to discharged patients ***(Adugbire and Aziato, ٢٠١٨).***

Patient education has been described as a planned, organized learning experience designed to facilitate voluntary adoption of behaviors or beliefs conducive to health through influencing the patient's knowledge and health behavior. Traditionally patient education has focused on providing information and technical skills, however, there is a move towards self-management through directed education that facilitates patients taking an active role in identifying their problems, and provides techniques and skills to help them make decisions and take appropriate actions as they encounter changes in their disease or circumstance ***(Jones and Rivett, ٢٠١٩).***

Self-care was described by Orem as one of the modules of self-care nursing philosophy. The value of self-care conception is linked to human's need for preserving, supporting health and recovery, absence of healthcare education, insufficient access to health facilities for the whole community, and improved expenditure of healthcare services. Self-care educational actions improve symptoms, reduce complications, shorten recovery, and decrease hospital stay and re-hospitalization rate ***(Mohamed and Mostafa, ٢٠١٨).***

The unique role of the nurses is to help patients and their families learn new behaviors that have a positive impact on their health and their lives. Much of this is accomplished through patient education. As the nurse enters the patient's world, she work with the patient in mutually deciding what to teach, when to teach, and how to teach. Furthermore, it is important for the nurse to share with the patients their worries and concerns regarding the long-term care through developing a nurse-patient relationship which is based on understanding and trust to assist the patients cope with their stress and improve their quality of lives ***(Khorais, et al, ٢٠١٨).***

Significance of the study

Lumbar laminectomy is one of the most commonly performed spinal surgical procedures for the treatment of a wide variety of pathologies ***(Karukonda, et al, ٢٠١٩).*** It is a common low back pain surgery related to spinal stenosis. The rates of lumbar laminectomies are increasingly growing related to the high prevalence of low back pain that is a very common health problem worldwide and a major cause of disability affecting performance at work and general well-being. The incidence of low back pain over the course of a person's life is approximately ٦٠٪ to ٩٠٪ ***(De Kelft, ٢٠١٦)***. **In Egypt**, the prevalence is ١,٦٧٩,٠٦٠ out of ٧٦, ١١٧, ٤٢١٢ estimated population ***(Mohamed et al, ٢٠١٣).***

Low back pain (LBP) specifically has been estimated to affect ٨٠–٨٥٪ of the world's population at some point during a lifetime related to lumbar spinal stenosis that has become the most common cause. The number of surgical treatments has increased dramatically, especially in the US, where the number of spinal laminectomy per year has increased by ٥٥٪ during the last decade. Although a relatively low proportion of patients need to undergo surgery, the high number of LBP cases makes the total number of surgeries high ***(Ólafsson, ٢٠١٩)***.

Lumbar laminectomy continues to be one of the most common lumbar procedures performed for spinal stenosis. According to the Healthcare Cost and Utilization Project (HCUP) Nationwide Inpatient Sample (NIS), the annual estimate of laminectomy discharges averages around ٣٤ discharges per ١٠٠,٠٠٠ adults from ١٩٩٨ to ٢٠٠٨. Mean total hospital charges have more than doubled from $١٤,٣٠٨ in ١٩٩٨ to $٣٥,٢٥٦ in ٢٠٠٨ ***(Bydon, et al, ٢٠١٥).***

Benha university hospital documented that the admitted patients for lumbar laminectomy in year (٢٠١٦), (٢٠١٧) and (٢٠١٨) were about (٢٠٠), (١٦٠) and (١٠٠) patients respectively ***(Benha University Hospital statistical office, ٢٠١٦, ٢٠١٧& ٢٠١٨).*** It has been documented that lack of self-care training and knowledge in patients, is the central reason for frequent referring to healthcare centers, re-hospitalization and prolonged recovery ***(Mohamed and Mostafa, ٢٠١٨).*** Therefore this study conducted to find out the effectiveness of program for these patients as a main part in nursing management to help them restoring their normal activities.

Aim of the Study

This study aimed to evaluate the effect of applying an educational program for patients with lumbar laminectomy on their knowledge and self-care activities**.**

Research Hypotheses:

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

١- Knowledge of the study group will be improved after applying the program than the control group.
٢- The study group will be able to perform self-care activities on their own (without assistance) after applying the program than the control group.

Subjects and Method

Research design:

A Quasi-experimental research design was utilized to fulfill the aim of the present study.

Setting:

The study was conducted in neurosurgery department at Benha University Hospital. The neurosurgery department contains ٢٠ beds included in three rooms; two

rooms for males patients (٨ beds in one room and ٤ beds in the other room) while, females room contains ٨ beds.

Sample:

A purposive sample of ٨٠ adult patients with lumbar laminectomy were included in this study from both sexes (male &female), their age ranged from ١٨ to ٦٠ years old and willing to participate in the study. According to statistical office in Benha University, the total annual numbers of patients with lumbar laminectomy were ١٠٠. Sample size was calculated according to the following equation that adopted from ***Taylor, (٢٠١٤):***

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

Where: n = sample size, N= total population size, e = margin error ٠.٠٥.

After doing the equation, the sample was ٨٠ patients divided into two equal groups, ٤٠ patients for study group and ٤٠ patients for control group.

- **Group I** (study group): received the educational program along with the routine hospital care.
- **Group II** (control group): received the routine hospital care only.

Exclusion criteria of the patients:-

As these conditions effect on patients educational needs. The following will be excluded:

- Physical or mental handicapped.
- Disoriented & comatose patients.
- Patients on mechanical ventilation.
- Patients with hemiplegia or quadriplegia.

Tools for data collection:-

Data was collected using the following tools:-

Tool I - Patients' assessment sheet:-

This tool was developed by the researcher into Arabic language after reviewing of relevant related literatures ***Abd-El Mohsen, Ammar and Mohammed, (٢٠١٩)*** and it included two parts:-

First part: **socio-demographic characteristics of patients:-**

It included data related to; age, sex, marital status, level of education, residence, occupation, and current work situation.

Second part: patients' health history:-

It composed of ٢٢ questions. It involved; present health history, past medical and surgical history, family history, medications, bowel and urinary assessment, diagnostic studies as well habits and life style.

Tool II - knowledge assessment questionnaire:-

This questionnaire was developed by the researcher after reviewing the related literatures ***Abd Elwahhab, Shehata and Abd Elghaffar, (٢٠١٩)***. It was composed of ٤٥ closed ended questions; it was aimed to assess the patients' knowledge regarding operation. It involved the following items:

- Knowledge about surgical operation "١٠ questions".
- Knowledge about complications and its affecting factors "٥ questions".
- Knowledge about proper positions "٥ questions".
- Knowledge about wound care "٣ questions".
- Knowledge about pain and medication "٧questions".
- Knowledge about nutrition "٣questions".
- Knowledge about preventive measures from complications "٣ questions".
- Knowledge about life style and discharge instructions "٩ questions".

Scoring system for knowledge assessment:

Each item in the questionnaire was given one score with the total score was ٤٥ scores ١٠٠٪. One score was given for each correct answer and zero score for the incorrect answer. These scores were summed-up and converted into a percent score (%). It was categorized as follow:

- **Score < ٧٥ %** was considered "unsatisfactory level of knowledge".
  Score ≥ ٧٥ % was considered "satisfactory level of knowledge".

Tool III: **Visual Analogue Pain Scale:**

It was adopted from ***Griensven, Strong and Unruh, (٢٠١٣)*** to assess the intensity of pain levels for patients with lumbar laminectomy. The scale composed of ٥ items ranged from "no pain" to "worst pain possible".

Scoring system:

The total scores of visual analogue pain scale ranged from ٠-١٠, the higher scores reflect the worst pain. It was categorized as the following:

- ٠ was considered "no pain".
- ١-٣ was considered "mild pain".
- ٤-٦ was considered "moderate pain".
- ٧-٩ was considered "severe pain".
- ١٠ were considered "worse pain possible".

Tool IV: Barthel Index of Activities of Daily Living:

This tool was adopted from ***Jain, (٢٠١٧)*** to assess the patient's ability to perform activities of daily living independency. The scale composed of ١٠ categories "bowels control, bladder control, grooming, toileting, feeding, transferring, mobility, dressing, stairs climbing and bathing". Each category has ٣ items "completely dependent, needs assistant and independent".

Scoring system:

The scores responses for every item were as follows:

Completely dependent was scored ٠, Need assistant was scored ١, and Independent was scored ٢.

The total scores of independency level ranged from ٠-٢٠, the higher scores reflect the higher independency level. It was categorized as the following:

- ٠- ٦ was considered "completely dependent".
- ٧-١٣ was considered "needs assistance ".
- ١٤-٢٠ was considered "independent".

Content validity

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

Reliability

Testing reliability of the developed tool was done statistically through Cronbach's alpha test that was ٠.٩٦ for the patient's knowledge questionnaire and ٠.٨٠ for the barthel index.

Pilot study:

Pilot study was conducted on ١٠٪ of the study sample ٨ patients with lumbar laminectomy 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 needed time for each patient to fill the questionnaires. The patients who were included in the pilot study were excluded from the study sample because minor modifications were done after conducting the pilot study.

Ethical consideration:

The aim of this study was explained to patients and they were assured that all information would be confidential and it would be used only for research purpose 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 reasons.

Fieldwork :(Data collection)

The fieldwork was performed over a period of six months started from the beginning of March, ٢٠١٩ till the end of August, ٢٠١٩.The study was conducted on four

phases: Preparatory Phase, assessment phase, interventional phase and evaluation phase as following**:**

Phase one; **Preparatory Phase:**

Preparatory phase included reviewing of the current and past available literature using books, articles and magazines to develop the tool for data collection.

An official permission for data collection and implementation of the research was obtained from dean of Faculty of Nursing to the chief administrator of Benha university Hospital and head of neurological department to request permission and cooperation to conduct the study.

Phase two: Assessment phase: (for both study and control group).

- An oral permission was taken from patients after explaining the purpose of the study.
- During this phase the researcher interviewed each patient after his/her admission to the hospital to collect baseline data on socio-demographic data, medical data and knowledge assessment sheet using tool I and II for both study and control groups before explaining the program.
- Both groups were assessed for pain using tool III (Visual Analogue Pain Scale).
- Both groups were assessed for the ability to perform activities of daily living independency using tool IV (Barthel Index of Activities of Daily Living).
- The assessment was done for two times: the first was done before the educational program while, the second done immediately after the educational program.

Phase three : Interventional phase : (for study group only)

This phase started with designing the educational program, the general objective was to improve knowledge and perform self-care activities related to lumbar laminectomy.

Content of the educational program:

The content of the educational program were designed to meet the patients' needs regarding knowledge and self-care activities and it was consisted of the following:

- Brief anatomy of the spinal column.
- Definition of lumbar laminectomy.
- Indications of lumbar laminectomy.
- Contraindications of lumbar laminectomy.
- Presenting manifestation of lumbar laminectomy.
- Diagnostic procedures.
- Complications of lumbar laminectomy.
- Predisposing factors of complications.

- Instructions about self-care:-
  - Correct positions after operation.
  - Exercises after operation.
  - Wound care.
  - Pain management.
  - Medications.
  - Diet (nutrition).
  - Preventive measures of complications:-
    - Constipation.
    - Deep venous thrombosis.
  - Activities of daily living.
  - Follow up and discharge instructions

Teaching methods:

All the patients received the same intervention content using the same teaching methods, which included the following:

- Lectures.
- Practical training.
- Group discussion.
- Demonstration on patients.

The teaching aids:

Suitable teaching aids were specially prepared for the educational program as booklets, power point presentation, videos, and posters.

Implementation of the educational program.

The researcher dealed with group II firstly to avoid bias of data then study group. Total number of the studied sample was ٤٠ patients. It was difficult to take all patients at the same time. Thus, they were divided into ١٣ groups. Each group contains three patients in every session. The researcher was attended two days/week from ٩ A.M o'clock to ٤ P.M o'clock.

The researcher met every group for five sessions: Two sessions for theory, two sessions for practice and one session for revision. Each session lasted for ٣٠-٤٠ minutes, including the period of discussion. The educational program has been implemented through ٧٢ sessions and total hours for sessions ٣٦-٤٨ hours. The patients were presented all the time of educational program sessions and the duration of each session was variable, according to its contents as well as the patient's response.

An orientation to the educational program and its process were presented. Each session started with a brief summary about what had been given through the previous

session, then the objectives of the new topics, taking into consideration the use of simple language to suite the level of all patients' education.

Discussion, during the educational program sessions were used to enhance learning. All patients were cooperative with the researcher and at the end of each session the patients participated in discussion to correct any misunderstanding. Also, they were informed about the time of the next session.

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

The researcher reassessed knowledge and self-care activities of the control group by using the same tools of pretest. Also, evaluating the effect of applying the program on knowledge and self-care activities of the study group by comparing the results pre and post program implementation.

Immediately after the educational program, the researcher evaluated both groups for self-care activities and assessed the patients' knowledge using tool II knowledge assessment questionnaire, tool III Visual Analogue Pain Scale and tool IV Barthel Index of Activities of Daily Living.

Comparison was done between the two groups at the end of the study to determine the effect of applying an educational program for patients with lumbar laminectomy on their knowledge and self-care activities.

Statistical Analysis:

Results were collected, statistically analyzed and tabulated using Statistical Package of Social Science (SPSS) version ٢٠. Variety of statistical methods were used to analyze data as qualitative variables that presented as frequencies and percentage (%) and quantitative variables that presented as mean (x) and standard deviation (SD).

The used test was:

- Chi-square test ($x^{٢}$): was used to study association between two qualitative variables.

Levels of significance:

Statistical significance was considered as follow:

- P-value > ٠.٠٥ = non-significant
- P-value ≤٠.٠٥ = significant
- P-value < ٠.٠٠١ = highly significant

Results

Table (١): Distribution of patients (both groups) regarding their socio-demographic characteristics (n=٨٠). Shows that, **,** ٦٠.٠٪ and ٥٢.٥٪ of the study and control groups aged between ٣٠-٥٠ years with mean age ٤١.٩ ±١١.٧٥ and ٤٠.٩±١٢.٢٣ respectively. As well, ٥٥.٠٪ and ٥٢.٥٪ of both groups were males respectively. Also, ٩٢.٥٪ and ٧٢.٥٪ of both groups were married respectively. Moreover, ٧٢.٥٪ & ٧٠.٠٪ of both groups resided in rural

areas respectively. In addition ٤٢.٥٪ & ٤٧.٥٪ of both groups can read & write respectively. As well, ٣٢.٥٪ of study group were technical workers and ٤٥.٠٪ of control group were house wives. Furthermore, ١٠٠٪ & ٩٠.٠٪ of the both groups changed their work. The findings revealed that no statistical significant differences were existed between both groups in relation to all socio- demographic characteristics except marital status and occupational change at P-value = ٠.٠٥ and ٠.٠٤ respectively.

Table (٢): Distribution of patients regarding their past medical, surgical and family history (n=٨٠). ٨٠.٠٪ of the study group and ٧٢.٥٪ of control group took analgesics as conservative measures. As well, ٤٠.٠٪ & ٤٥.٠٪ of both groups had chronic disease and ٥٤.٥٪ & ٦٠.٩٪ of them had diabetes mellitus respectively. Furthermore ٣٢.٥٪ & ٢٧.٥ % of both groups had previous surgical vertebral operation. Moreover, ٩٠٪ & ٨٥٪ as well ٨٧.٥٪ & ٩٠٪ of both groups had no family history of lumbar disease and lumbar surgeries respectively. The findings revealed that no statistical significant differences were existed between study and control groups in all items of their history.

Table (٣): Distribution of patients regarding their current medical health history (n=٨٠). Shows that, ٦٥.٠٪ & ٧٠.٠٪ of the study and control groups were on continuous medications respectively. Also, ٨٥.٠٪ & ٨٧.٥٪ of both groups had low back pain respectively. In addition, ٣٧.٥٪ & ٤٧.٥٪ of both groups complained of lumbar disc prolapse respectively. Moreover, ٦٧.٥٪ of both groups had operated level in L٤-L٥. There were no statistical significant differences between study and control groups regarding to current medical health history.

Table (٤): Distribution of patients regarding characteristics of pre-operative pain (n=٨٠). shows that, ٧٥.٠٪ and ٥٢.٥٪ of the study and control group had gradual onset of pain respectively. Also, ٧٧.٥٪ & ٧٥.٠٪ and ٧٧.٥٪ & ٥٥.٠٪ of both groups had continuous and chronic pain respectively. As well, ٦٧.٥٪ and ٥٥.٠٪ of both groups had severe pain. Moreover, ٧٥.٠٪ and ٤٧.٥٪ of both groups had pain because of lifting heavy objects respectively. As well, ٧٥.٠٪ and ٧٧.٥٪ of both groups their pain was aggravated by excessive twisting respectively. Furthermore, ٩٠.٠٪ and ٦٧.٥٪ of both groups relieved their Pain by analgesics. In addition, ٥٠.٠٪ and ٤٧.٥٪ of both groups had bilateral lower limb pain respectively. As well, ١٠٠.٠٪ and ٩٧.٥٪ of both groups their pain was affected on ambulation. There were no statistical significant differences between study and control groups regarding to pain characteristics except for onset of pain and alleviating measures at p-value (٠.٠٣٦ & ٠.٠٤٠)respectively.

Figure (١): Distribution of patients (both groups) regarding their total knowledge score pre and post program (n=٨٠). This figure illustrated that, there was marked improvement in study group regarding satisfactory level of knowledge from ٣٢.٥٪ preprogram to ٧٧.٥٪ post program compared to control group. Regarding control group there was no improvement noticed pre and post program implementation.

Table (٥): Distribution of patients (both groups) regarding their pain severity pre and post program (n=٨٠). shows that, there was no significant statistical difference between study and control groups before program implementation regarding all items of pain. While, there was significant statistical differences between them post program

implementation. As well, ٤٠.٠٪ of the study group complained of severe pain preprogram with mean pain level ٦.١٧ ± ١.٨١ compared by none of them post program with mean ٢.١٥±١.١٦, while, there was no improvement in the severity of pain among the control group pre and post program implementation.

Figure (٢): Distribution of patients (both groups) regarding their total barthel index of daily activities pre and post program (n=٨٠). **This figure illustrated that,** there was marked improvement in study group regarding barthel scale of activities of daily living from ٤٥.٠٪ completely dependent preprogram implementation to ٧.٥٪ post program implementation where , there was no improvement noticed pre and post program implementation in the control group.

Table (٦): Relation between pain severity of both groups and their age & occupation preprogram implementation. Shows that, there was no significant statistical relation between pain severity of both groups and their age as well occupation preprogram implementation.

Table (٧) : Relation between pain severity of both groups and their age & occupation post program. shows that, there was no significant statistical relation between pain severity of both groups and their age as well occupation preprogram implementation.

Table (٨): Relation between total knowledge of both groups and their educational level preprogram implementation. shows that, there was significant statistical relation between total knowledge of study group and their educational level regarding preprogram implementation. While, there was no significant statistical relation among control group.

Table (٩): Relation between total knowledge of both groups and their educational level post program implementation. shows that, there was significant statistical relation between total knowledge of study group and their educational level regarding post program implementation. While, there was no significant statistical relation among control group.

Table (١٠): Correlation between total pain score and total barthel index of daily activities among study and control groups pre and post program implementation. shows that, there were a negative correlations 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 them pre and post program implementation.

Table (١١): Correlation between total knowledge score and total barthel index among study and control groups pre and post program. shows that, there was a positive statistically significant correlation between total knowledge score and total barthel index scale among study group post program implementation.

Table (١): Distribution of patients (both groups) regarding their socio-demographic characteristics (n=٨٠).

Items	Patient data	Study group n=٤٠		Control group n=٤٠		X^2	P-value
		N	%	N	%		
Age	< ٣٠	٥	١٢.٥	٩	٢٢.٥	٢.٠٣	٠.٥٦
	٣٠-٥٠	٢٤	٦٠.٠	٢١	٥٢.٥		
	> ٥٠	١١	٢٧.٥	١٠	٢٥.٠		
	Mean ±SD	٤١.٩±١١.٧٥		٤٠.٩±١٢.٢٣			
Sex	Male	٢٢	٥٥.٠	٢١	٥٢.٥	٠.٢٠١	٠.٦٥
	Female	١٨	٤٥.٠	١٩	٤٧.٥		
Marital status	Single	٢	٥.٠	٥	١٢.٥	٥.٨٢	٠.٠٥*
	Married	٣٧	٩٢.٥	٢٩	٧٢.٥		
	Widow	١	٢.٥	٦	١٥.٠		
Residence	Rural	٢٩	٧٢.٥	٢٨	٧٠.٠	٠.٠٦١	٠.٨٠
	Urban	١١	٢٧.٥	١٢	٣٠.٠		
Educational level	Illiterate	٤	١٠.٠	٤	١٠.٠	٠.٢٢	٠.٩٧
	Read and write	١٧	٤٢.٥	١٩	٤٧.٥		
	Secondary	١٠	٢٥.٠	٩	٢٢.٥		
	University	٩	٢٢.٥	٨	٢٠.٠		
Occupation	Desk work	١٠	٢٥.٠	٨	٢٠.٠	٣.٧٨	٠.٤٣
	Technical work	١٣	٣٢.٥	٩	٢٢.٥		
	No work	٣	٧.٥	٤	١٠.٠		
	House wife	١١	٢٧.٥	١٨	٤٥.٠		
	Retired	٣	٧.٥	١	٢.٥		
Occupational change	Yes(light work)	٠	٠.٠	٤	١٠.٠	٤.٢١	٠.٠٤*
	No	٤٠	١٠٠.٠	٣٦	٩٠.٠		

In-significance (p>٠.٠٥) **significance*(p≤ ٠.٠٥)** **x^2=chi-square test**

Table (٢): Distribution of patients regarding their past medical, surgical and family history (n=٨٠).

Items	Medical characteristics	Study group n=٤٠		Control group n=٤٠		X^2	P-value
		N	%	N	%		
Conservative measures	Physiotherapy	١٤	٣٥.٠	١٦	٤٠.٠	١.٠٦	٠.٧٨
	Hot compresses	٧	١٧.٥	٤	١٠.٠		
	Analgesics	٣٢	٨٠.٠	٢٩	٧٢.٥		
	Steroid injection /Radiofrequency	٣	٧.٥	٢	٥.٠		
Chronic disease	Yes	١٦	٤٠.٠	١٨	٤٥.٠	٠.٢٠٥	٠.٦٥
	No	٢٤	٦٠.٠	٢٢	٥٥.٠		
	If yes	N=١٦		N=١٨			
	Diabetes Mellitus	١٢	٥٤.٥	١٤	٦٠.٩	٣.٢٦٦	٠.٣٥
	Hypertension	٦	٢٧.٣	٨	٣٤.٨		
	Cardiac diseases	٣	١٣.٦	٠	٠.٠		
	Liver diseases	١	٤.٥	١	٤.٣		
Previous surgical vertebral operations	Yes	١٣	٣٢.٥	١١	٢٧.٥	٠.٢٣	٠.٦٢
	No	٢٧	٦٧.٥	٢٩	٧٢.٥		
Family history of Lumbar disease	Yes	٤	١٠.٠	٦	١٥.٠	٠.٤٥	٠.٤٩
	No	٣٦	٩٠.٠	٣٤	٨٥.٠		
Family history of Lumbar Surgery	Yes	٥	١٢.٥	٤	١٠.٠	٠.١٢٥	٠.٧٢
	No	٣٥	٨٧.٥	٣٦	٩٠.٠		

- Some patients choose more than one answer.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x^2=chi-square test**

Table (٣): Distribution of patients regarding their current medical health history (n=٨٠).

Items	Medical characteristics	Study group ٤٠		Control group ٤٠		X^2	P-value
		N	%	N	%		

Medications	Yes	٢٦	٦٥.٠	٢٨	٧٠.٠	٠.٢٢٨	٠.٦٣
	No	١٤	٣٥.٠	١٢	٣٠.٠		
	If yes	N=٢٦		N=٢٨			
	Antihypertensive medication	٦	٢٣.١	٧	٢٥.٠	٥.٢٢	٠.٢٦
	Hypoglycemic medications	١١	٤٢.٣	٩	٣٢.١		
	Cardiac medications	٣	١١.٥	٠	٠.٠		
	Neurological medications	١٩	٧٣.١	١٩	٦٧.٩		
	Chest medications	٠	٠.٠	٢	٧.١		
Main Complain (Presenting symptoms)	Low back pain	٣٤	٨٥.٠	٣٥	٨٧.٥	٠.٠٧٧	٠.٧٨
	Radiating lower limbs pain	٣٠	٧٥.٠	٣٤	٨٥.٠		
Current medical diagnosis/ surgical indication	Lumbar disc prolapse	١٥	٣٧.٥	١٩	٤٧.٥	٠.٨٧	٠.٦٤
	Lumbar spinal canal stenosis	١٤	٣٥.٠	١١	٢٧.٥		
	Lumbar spinal canal tumor	١١	٢٧.٥	١٠	٢٥.٠		
Operated vertebra /Levels involved	L٢-L٣	٥	١٢.٥	٩	٢٢.٥	١.٤٤	٠.٦٩
	L٣-L٤	١٠	٢٥.٠	٨	٢٠.٠		
	L٤-L٥	٢٧	٦٧.٥	٢٧	٦٧.٥		
	L٥-S١	٢٥	٦٢.٥	٢٣	٥٧.٥		

- Some patients choose more than one answer.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x٢=chi-square test**

Table (٤): Distribution of patients regarding characteristics of pre-operative pain (n=٨٠).

Items	characteristics of pain	Study group ٤٠		Control group ٤٠		X^2	P- value
		N	%	N	%		
Onset of pain	Sudden	١٠	٢٥.٠	١٩	٤٧.٥	٤.٣٨	٠.٠٣٦*
	Gradual	٣٠	٧٥.٠	٢١	٥٢.٥		
Frequency of pain	Continuous	٣١	٧٧.٥	٣٠	٧٥.٠	٠.٠٦	٠.٧٩
	Intermittent	٩	٢٢.٥	١٠	٢٥.٠		
Type & duration of pain	Sub-acute pain (< ٧ days)	٦	١٥.٠	٩	٢٢.٥	٥.١٢	٠.٠٧٧
	Acute pain (> ٧ days- < ٧ weeks)	٣	٧.٥	٩	٢٢.٥		
	Chronic pain (> ٧ weeks)	٣١	٧٧.٥	٢٢	٥٥.٠		
Pain severity	Mild	٢	٥.٠	٠	٠.٠	٤.٢٠	٠.١٢٢
	Moderate	١١	٢٧.٥	١٨	٤٥.٠		
	Severe	٢٧	٦٧.٥	٢٢	٥٥.٠		
Causes of	Faulty position	١٦	٤٠.٠	١٦	٤٠.٠	٦.٤٦	٠.٠٩١

pain	Lifting heavy object	٣٠	٧٥.٠	١٩	٤٧.٥		
	Accident	٥	١٢.٥	١٠	٢٥.٠		
	Aggressive twisting	٨	٢٠.٠	٢	٥.٠		
Activities that increase pain (Aggravating factors)	Prolonged Sitting / standing	٢٤	٦٠.٠	٢٤	٦٠.٠	٢.٩٢	٠.٥٧
	Prolonged walking /climbing stairs	٢٣	٥٧.٥	٢٣	٥٧.٥		
	Excessive twisting	٣٠	٧٥.٠	٣١	٧٧.٥		
	Constipation / straining	١٧	٤٢.٥	٢٠	٥٠.٠		
	Cough / sneeze	٥	١٢.٥	١	٢.٥		
Alleviating measures of pain	Sitting	٣	٧.٥	١١	٢٧.٥	٦.٤١	٠.٠٤٠*
	Lying down	٦	١٥.٠	٩	٢٢.٥		
	Analgesics	٣٦	٩٠.٠	٢٧	٦٧.٥		
Laterality of lower limb pain (radiation)		(n=٤٠)		(n=٤٠)			
	Right sided	١١	٢٧.٥	١٣	٣٢.٥	٠.٢ ٢	٠.٨٩
	Left sided	٩	٢٢.٥	٨	٢٠.٠		
	Bilateral	٢٠	٥٠.٠	١٩	٤٧.٥		
Effect of pain on ambulation	Yes	٤٠	١٠٠.٠	٣٩	٩٧.٥	١.٠١٣	٠.٣١
	No	٠	٠.٠	١	٢.٥		

- Some patients choose more than one answer.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x٢=chi-square test**

Figure (١): Distribution of patients (both groups) regarding their total knowledge score pre and post program implementation (n=٨٠).

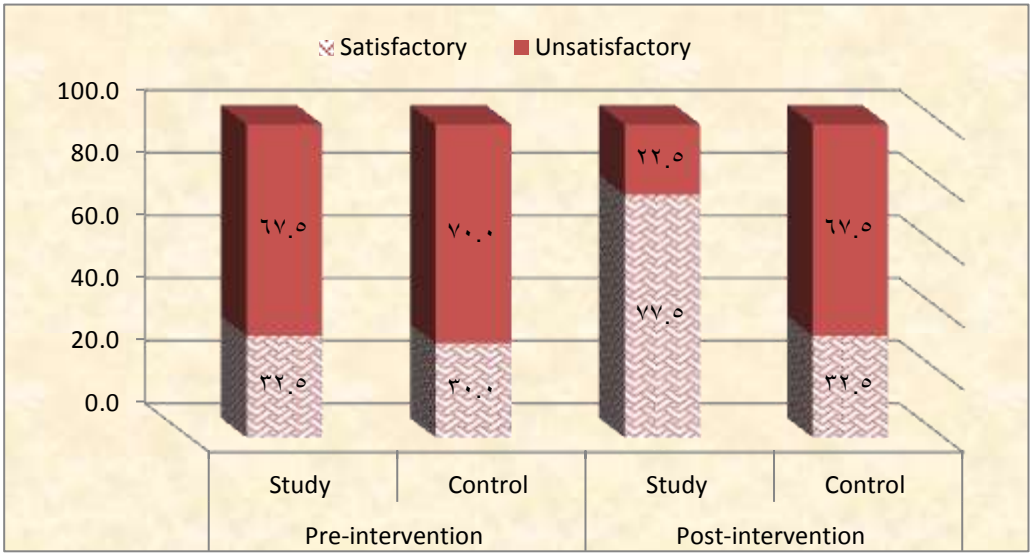

Table (٥): Distribution of patients (both groups) regarding their pain severity pre and post program (n=٨٠).

pain severity	Pre- preprogram				Post- preprogram				X^{2} ١	p-value	X^{2} ٢	P-value
	Study group ٤٠		Control group ٤٠		Study group ٤٠		Control group ٤٠					
	N	%	N	%	N	%	N	%				
Mild	٣	٧.٥	٤	١٠.٠	٣٥	٨٧.٥	٥	١٢.٥	٠.٨٢١	.٦٦٣	٣٩.٤٦	.٠٠٠**
Moderate	٢١	٥٢.٥	١٧	٤٢.٥	٥	١٢.٥	١٦	٤٠.٠				
Severe	١٦	٤٠.٠	١٩	٤٧.٥	٠	٠.٠	١٩	٤٧.٥				
Mean ±SD	٦.١٧±١.٨١		٦.١٢±١.٩٧		٢.١٥±١.١٦		٦.٠٥±٢.٠١					

X^{2} ١between study group control group pre-program X^{2} ٢ between study control group post program

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x^{2}=chi-square test**

Figure (٢): Distribution of patients (both groups) regarding their total barthel index of daily activities pre and post program (n=٨٠).

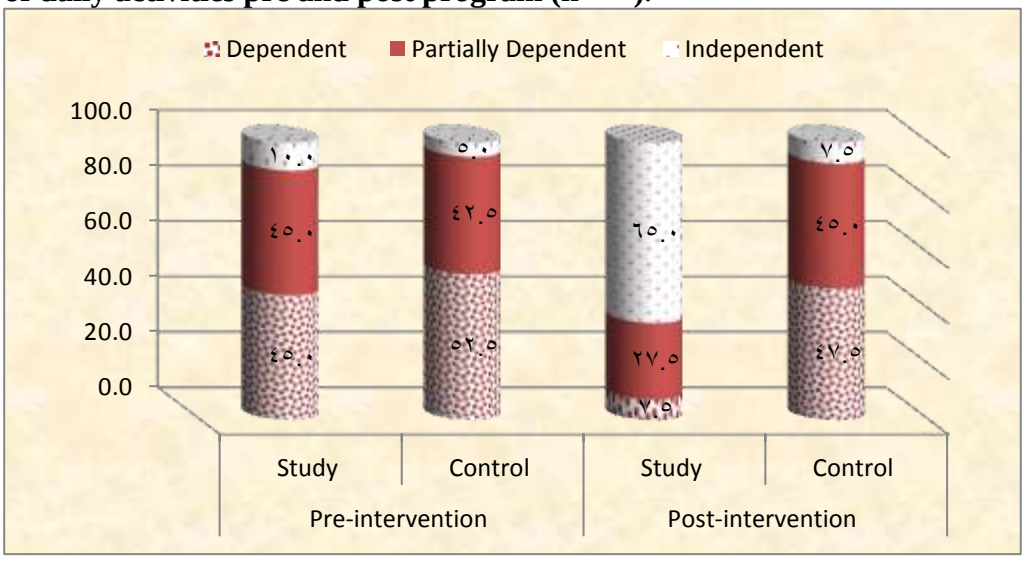

Table (٦): Relation between pain severity of both groups and their age & occupation preprogram implementation.

Item	Patient data	Pain												X^{2}١	p-value	X^{2}٢	P-value
		Study						Control									
		Mild ٣		Moderate٢١		Severe ١٦		Mild ٤		Moderate ١٧		Severe ١					
		N	%	N	%	N	%	N	%	N	%	N	%				
Age	< ٣٠	٠	٠.٠	٣	١٤.٣	٢	١٢.٥	٢	٥٠.٠	٤	٢٣.٥	٣	١٥.٨	٤.٠٢	.٦٧٤	٧.٦٠	.٢٦٩
	٣٠-٥٠	٣	١٠٠	١٢	٥٧.١	٩	٥٦.٣	٠	٠٠.٠	٩	٥٢.٩	١٢	٦٣.٢				
	> ٥٠	٠	٠.٠	٦	٢٨.٦	٥	٣١.٣	٢	٥٠.٠	٤	٢٣.٥	٤	٢١.١				
Occupation	Desk work	١	٣٣.٣	٦	٢٨.٦	٣	١٨.٨	٢	٥٠.٠	٤	٢٣.٥	٢	١٠.٥	٣.٨٨	.٨٦٨	١٠.٣٦	.٢٤٠
	Technical work	٢	٦٦.٧	٦	٢٨.٦	٥	٣١.٣	٠	٠.٠	٥	٢٩.٤	٤	٢١.١				
	No work	٠	٠.٠	٢	٩.٥	١	٦.٣	٠	٠.٠	٣	١٧.٦	١	٥.٣				
	House wife	٠	٠.٠	٦	٢٨.٦	٥	٣١.٣	٢	٥٠.٠	٤	٢٣.٥	١٢	٦٣.٢				
	Retired	٠	٠.٠	١	٤.٨	٢	١٢.٥	٠	٠.٠	١	٥.٩	٠	٠.٠				

X^{2}١between pain score of study group and their age and occupation. X^{2}٢ between pain score of control group and their age and occupation.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x٢=chi-square test**

Table (٦): shows that, there was no significant statistical relation between pain severity of both groups and their age as well occupation preprogram implementation.

Table (٧) : Relation between pain severity of both groups and their age & occupation post program.

Items	Patient data	Pain												X^{2}_{1}	p-value	X^{2}_{2}	P- value
		Study						Control									
		Mild ٣٥		Moderate ٥		Severe ٠		Mild ٥		Moderate ١٦		Severe ١٩					
		N	%	N	%	N	%	N	%	N	%	N	%				
Age	< ٣٠	٤	١١.٤	١	٢٠.٠	٠	٠.٠	٤	٨٠.٠	٢	١٢.٥	٣	١٥.٨	٠.٧٥	.٨٦٠	١٢.٤٩	. ٥٢
	٣٠-٥٠	٢١	٦٠	٣	٦٠	٠	٠.٠	١	٢٠.٠	٩	٥٦.٣	١١	٥٧.٩				
	> ٥٠	١٠	٢٨.٦	١	٢٠.٠	٠	٠.٠	٠	٠.٠	٥	٣١.٣	٥	٢٦.٣				
Occupation	Desk work	٩	٢٥.٧	١	٢٠.٠	٠	٠.٠	٢	٤٠.٠	٣	١٨.٨	٣	١٥.٨	١.٨٩	.٧٥٦	١١.٩٧	.١٥٢
	Technical work	١١	٣١.٤	٢	٤٠.٠	٠	٠.٠	١	٢٠.٠	٢	١٢.٥	٦	٣١.٦				
	No work	٢	٥.٧	١	٢٠.٠	٠	٠.٠	٢	٤٠.٠	١	٦.٣	١	٥.٣				
	House wife	١٠	٢٨.٦	١	٢٠.٠	٠	٠.٠	٠	٠.٠	٩	٥٦.٣	٩	٢٥.٧				
	Retired	٣	٨.٦	٠	٠.٠	٠	٠.٠	٠	٠.٠	١	٦.٣	٠	٠.٠				

X^{2}_{1} between pain score of study group and their age and occupation. X^{2}_{2} between pain score of control group and their age and occupation.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x^{2}=chi-square test**

Table (٧): shows that, there was no significant statistical relation between pain severity of both groups and their age as well occupation preprogram implementation.

Table (٨): Relation between total knowledge of both groups and their educational level preprogram implementation.

Educational level	Total knowledge								X^{2}١	p-value	X^{2}٢	P- value
	Study				Control							
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory					
	N	%	N	%	N	%	N	%				
Illiterate	٤	١٤.٨	٠	٠.٠	٣	١٠.٧	١	٨.٣	.٨٨٦	.٠٢٩*	.٧٧٤	.٥٥٦
Read and write	١٥	٥٥.٦	٢	١٥.٤	١٤	٥٠.٠	٥	٤١.٧				
Secondary	٥	١٨.٥	٥	٣٨.٥	٧	٢٥.٠	٢	١٦.٧				
University	٣	١١.١	٦	٤٦.٢	٤	١٤.٣	٤	٣٣.٣				

X^{2}١ between total knowledge and educational level of study group. X^{2}٢ between total knowledge and educational level of control group.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x٢=chi-square test**

Table (٨): shows that, there was significant statistical relation between total knowledge of study group and their educational level regarding preprogram implementation. While, there was no significant statistical relation among control group.

Table (٩): Relation between total knowledge of both groups and their educational level post program implementation.

Educational level	Total knowledge								X^{2}١	p-value	X^{2}٢	P-value
	Study				Control							
	Unsatisfactory		Satisfactory		Unsatisfactory		Satisfactory					
	N	%	N	%	N	%	N	%				
Illiterate	١	١١.١	٣	٩.٧	٢	٧.٤	٢	١٥.٤	١١.٤٤	.٠١٠*	١.٩٥٣	.٥٨٢
Read and write	٣	٣٣.٣	١٤	٤٥.٢	١٣	٤٨.١	٦	٤٦.٢				
Secondary	٢	٢٢.٢	٨	٢٥.٨	٦	٢٢.٢	٣	٢٣.١				
University	٣	٣٣.٣	٦	١٩.٤	٦	٢٢.٢	٢	١٥.٤				

X^{2}١ between total knowledge and educational level of study group. X^{2}٢ between total knowledge and educational level of control group.

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x²=chi-square test**

Table (٩): shows that, there was significant statistical relation between total knowledge of study group and their educational level regarding post program implementation. While, there was no significant statistical relation among control group.

Table (١٠): Correlation between total pain score and total barthel index of daily activities among study and control groups pre and post program implementation.

	Pain							
	Study				Control			
	Pre		Post		Pre		Post	
	r	p-value	R	p-value	r	p-value	R	p-value
Barthel index	-٠.٥٢	٠.٠٠٠**	-٠.٦١	٠.٠٣*	-٠.٥٦	٠.٠٠٠**	-٠.٥٨	٠.٠٠٠**

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance (p<٠.٠٠١) x٢=chi-square test**

Table (١٠): shows that, there were a negative correlations 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 them pre and post program implementation.

Table (١١): Correlation between total knowledge score and total barthel index among study and control groups pre and post program.

	Knowledge							
	Study				Control			
	Pre		Post		Pre		Post	
	r	p-value	R	p-value	r	p-value	r	p-value
Barthel index	٠.١٩	٠.٢٣	٠.٣٣	٠.٠٣*	٠.٤١	٠.٧٣	٠.٢٩	٠.٠٦

In-significance (p>٠.٠٥) significance*(p≤٠.٠٥) highly significance** (p<٠.٠٠١) x٢=chi-square test

Table (١١): shows that, there was a positive statistically significant correlation between total knowledge score and total barthel index scale among study group post program implementation.

Discussion

Table (١): Distribution of patients regarding their socio-demographic characteristics (n=٨٠).

Regarding socio-demographics characteristics, the current study findings showed that no statistical significant differences were existed between both groups in relation to all socio- demographic characteristics except occupational change which means the harmony of both groups. This result was supported by ***Zhang, Wan and Wang, (٢٠١٤),*** in their study entitled "the effect of health education in patients with chronic low back pain" who found that there were no statistically significant differences between groups in any baseline data.

Also, ***Weheida, Shabaan and Fehr, (٢٠١٨),*** in their study "effect of pre-discharge instructions on patients' activities and functional ability post spinal cord surgery" found that no statistically significant difference was found between study and control groups regarding their socio-demographics.

Concerning the age, the current study findings showed that more than half of both study and control groups were in age ٣٠-٥٠ years old. This might be due to this age represent working-age population. This result was agreed with ***Sabreen, et al., (٢٠١٨),*** in study entitled "a study on laminectomy, discectomy and conservative management for prolapsed intervertebral disc and assessment of recurrent disc herniation" who mentioned that more than one third of the studied patients were in age ٣١-٥٠ years old.

In addition, ***Aghajanloo, et al., (٢٠١٩),*** in their study entitled "quality of life evaluation of patients undergoing lumbar surgery: a cross‐sectional study in west of Iran" who found that two thirds of study subjects were from the age ranged between ٣٠ to ٥٠ years old.

This result was on the contrary with ***Yang, et al., (٢٠١٣),*** in the study entitled "minimum ٣-year outcomes in patients with lumbar spinal stenosis after bilateral microdecompression by unilateral or bilateral laminotomy" who mentioned that all of the studied patients aged ٥٣-٨٢ years old. Also, ***Bydon, et al., (٢٠١٥),*** in the study entitled "clinical and surgical outcomes after lumbar laminectomy" mentioned that studied patients were in age ٥٥-٨٤ years old.

Owing to the sex; the result of the present study revealed that more than half of both study and control groups were males. Gender differences may be a result of differences in lifting patterns and work methods between males and females. This result was consistent with ***Shetty, et al., (٢٠١٥),*** in a study entitled "a study of functional outcome of laminectomy and discectomy in lumbar intervertebral disc prolapse" who mentioned that, more than three quarter of the study group were males and more than two thirds of control group were males.

Furthermore, ***Tohidi, et al., (٢٠١٨),*** in their study about "routine perioperative practices and postoperative outcomes for elective lumbar laminectomies" found that more than half of their patients were males. Moreover, this result was supported by ***Boakye, et al., (٢٠١٨),*** they conducted a study in "post-decompressive neuropathy, new-onset post-laminectomy lower extremity neuropathic pain different from the preoperative complaint" who mentioned that, more than half of patients were males. **Also**, ***Järvimäki, (٢٠١٨),*** in the study entitled "lumbar spine surgery, results and factors predicting outcome in working

aged patients" who mentioned that, males were more than females in decompressions surgeries.

This result was on the contrary with***, Williams, Wafai and Podmore, (٢٠١٧),*** in the study entitled "functional outcomes of laminectomy and laminotomy for the surgical management lumbar spine stenosis" who documented that more than half of patients were females. Also, ***Morris, et al., (٢٠١٩),*** in the study entitled "an analysis of the cost-effectiveness of spinal versus general anesthesia for lumbar spine surgery in various hospital settings" who reported that, more than half of patients were females.

Regarding the marital status, the results of the present study revealed that most of the study group and about three quarters of the control group 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., (٢٠١٤),*** in the study entitled "predicting discharge placement and health care needs after lumbar spine laminectomy" who reported that, more than two thirds of the patients were married. Also, ***Nerland, et al., (٢٠١٥)***, in the study entitled " the risk of getting worse: predictors of deterioration after decompressive surgery for lumbar spinal stenosis" documented that about three quarters of their patients were married.

Pertaining the residence, the current study findings showed that about three quarters of both study and control groups lived in rural areas. The researcher views that patients may have difficulties in attaining the health care services. This result was supported by ***Mohamed, et al., (٢٠١٨),*** in the study entitled "impact of exercise program on functional status among post- lumbar laminectomy patients" who found that more than half of their patients lived in rural areas.

Furthermore, ***Al Shurbaji, et al., (٢٠١٧)***, in the study entitled "surgery for lumbar disc herniation, demographic data and analysis of complications at King Hussein medical city" found that about three quarters of both groups lived in rural areas. While, this result was in contrast to ***Zygourakis, et al., (٢٠١٧)***, in the study entitled "geographic and hospital variation in cost of lumbar laminectomy and lumbar fusion for degenerative conditions" who found that about two thirds of patients lived in urban areas.

Concerning the educational level, the result of the present study revealed that most of both groups could read and write and had different educational levels. This result was consistent with, ***Garcia, et al., (٢٠١٥)***, in their study entitled "clinical evaluation of the post-laminectomy syndrome in public hospitals" who illustrated that near to three quarters had up to a primary education (could read and write). As well, ***Louw, et al., (٢٠١٥),*** in their study entitled "preoperative education for lumbar surgery for radiculopathy" found that most of studied patients had different educational levels as high school, graduate degree and postgraduate degree.

Also, ***Mirzashahi, et al., (٢٠١٨),*** in the study entitled "surgical outcomes for lumbar spinal canal stenosis in ٥٨ patients" who reported that half of their patients had elementary education. On the other hand, ***Abd Elwahhab, Shehata and Abd Elghaffar, (٢٠١٩)***, in the study entitled "effect of rehabilitative nursing program on functional status among patients with discectomy" found that more than one third of study group & control group had secondary education.

Owning to the occupation, the current study findings showed that one third of study group were technical work and about half of control group were house wives. This

result may be explained that technical workers and house wives were more prone to prolapsed lumbar disc due to heavy workload and continuous bending and working This result was supported by ***Gupta, et al., (٢٠١٧)***, in the study entitled "an epidemiological study of low back pain in a tertiary care hospital of Jammu" Who stated that more than one third of their patients were non-sedentary workers.

While, this result was contradicted with ***Sabreen, et al., (٢٠١٨),*** who mentioned that, two thirds of patients were strenuous work as weight-bearing works and more than one quarter were housewives. In addition, ***Abd Elwahhab, Shehata and Abd Elghaffar, (٢٠١٩),*** found that about half of study group and control group worked manually (technical work).

As regarding to occupational change, the current study findings showed that all patients of study group and most of control group did not have occupational change. This result was in accordance with ***Garcia, et al., (٢٠١٥),*** who reported that majority of their patients did not change their jobs because of the pain. This result was in contrast with ***Garczyk, et al., (٢٠١٣),*** in the study "patient satisfaction with nursing after surgery due to cervical or lumbar discopathy" emphasized that about one quarter of their lumbar surgery patients had changed their quality of work because of pain. Also, ***Ólafsson, (٢٠١٨),*** in the study entitled " cost of low back pain: results from a national register study in Sweden " who documented that Pain effect on work in more than two thirds related to sick leave and early retirement.

Table (٢): Distribution of patients regarding their past medical health history (n=٨٠).

Regarding to the Conservative measures the current study findings showed that all patients of both groups underwent different types of conservative measures where majority of study group and about three quarters of control group took analgesics. This result was in the same line with ***Mancuso, Reid and Girardi, (٢٠١٧)***, in their study entitled "improvement in pain after lumbar spine surgery" who found that majority of patients had received non-surgical treatment for their condition**.** Also, ***Ólafsson, (٢٠١٨),*** documented that non-surgical treatment is the preferred first-line treatment, including activity modification, oral analgesics, and physical therapy.

This result was in contrast with ***Gelalis, et al., (٢٠١٠),*** in the study entitled "prospective analysis of surgical outcomes in patients undergoing decompressive laminectomy and posterior instrumentation for degener- ative lumbar spinal stenosis" who mentioned that more than half of studied patients did not use any analgesics. Also, ***Garczyk, et al., (٢٠١٣),*** they reported that about one third of their lumbar surgery patients didn't have physiotherapy preoperatively.

Regarding chronic illness, the current study findings showed that about half of both study and control groups had chronic disease where diabetes mellitus was the common comorbidities. This result was consistent with ***Yang, et al., (٢٠١٣)***, who mentioned that about half of studied patients had diabetes mellitus. Also, ***Lee and Srikantha, (٢٠١٥),*** in the study entitled "spinous process splitting laminectomy: clinical outcome and radiological analysis of extent of decompression" who mentioned that, more than half of patients had diabetes mellitus.

In addition, ***Pietrantonio, et al., (٢٠١٩),*** in the study entitled "long-term clinical outcomes after bilateral laminotomy or total laminectomy for lumbar spinal stenosis" who

found that the comorbidity rate was high and more than half of their studied patients had diabetes mellitus. On the other hand ***Zhang, et al., (٢٠١٧),*** in the study entitled "risk of same-level recurrent stenosis requiring surgery after laminectomy for lumbar spinal stenosis" who mentioned that about one quarter of study group had diabetes mellitus and minority of control group had diabetes mellitus.

Owing to previous surgical vertebral operations, the current study findings showed that about one third of both groups had previous surgical vertebral operation. This result was in agree with ***Mancuso, Reid and Girardi, (٢٠١٧),*** who documented that more than one third of their patients had under-gone previous decompressive surgery in the lumbar spine.

Also, ***Kesanen, et al., (٢٠١٦),*** in their study entitled "increased preoperative knowledge reduces surgery-related anxiety; a randomized clinical trial in ١٠٠ spinal stenosis patients" found that one third of study and control groups had previous spine surgeries. In addition, ***Aghajanloo, et al., (٢٠١٩)***, who documented that majority of their patients had no previous or recurrent of lumbar surgery.

Pertaining to family history of lumbar disease the current study findings showed that majority of both groups had no family history of lumbar disease. This result was supported by ***Alhowaiti, et al., (٢٠١٨)***, in their study entitled "socio-demographic and clinical characteristics of patients with lumber disc disease in Riyadh, Saudi Arabia" who documented that about two thirds of their patients had no first-degree relative affected by lumber spine disease. On the other hand, ***Patel, et al., (٢٠١١),*** in the study entitled "evidence for an inherited predisposition to lumbar disc disease" observed a heritable predisposition to lumbar disc disease and showed an excess relatedness of patients, and substantially elevated relative risks for close and distant relatives.

Owing to family history of lumbar surgery, the current study findings showed that majority of both groups had no family history of lumbar surgery. This result may show that patients had little exposure to information about these types of spinal surgery. This result was supported by ***Alhowaiti, et al., (٢٠١٨)***, who documented that majority of their patients had no family history of back surgery.

Table (٣): Distribution of patients regarding their current medical health history (n=٨٠).

Concerning medication, the current study findings showed that more than two thirds of the study and control groups were on continuous medication which was neurological medications. This result may be attributed to these medications was the prescribed medications to alleviate symptoms of lumbar spine disease before the operation. This result was consistent with ***The American Association of Neuroscience Nurses (٢٠١٤),*** 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 to main complain, Regarding main complain, the current study findings showed that low back pain was presented in majority of both study and control groups. In the same line with ***Hey, et al., (٢٠١٢),*** in study entitled "post-laminectomy spondylolisthesis; a review of the posterior elements and their contribution to the stability of the lumbar spine" who documented that the majority of their participants were presented by low back pain.

Also, ***Gunzburg and Szpalski (٢٠١٣),*** in study entitled "the conservative surgical treatment of lumbar spinal stenosis" who documented that most patients complained of low back pain. Moreover, ***Mancuso, Reid and Girardi, (٢٠١٧),***reported that most studied patients had low back pain. This result was in consistent with ***Pietrantonio, et al., (٢٠١٩),*** who found that the most common clinical symptom was neurogenic claudication which was presented in majority of patients.

Pertaining to current medical diagnosis (surgical indication), the current study findings showed that lumbar disc prolapse was the main indication in more than one third of both the study and control groups. This result was consistent with ***Bouloussa, et al., (٢٠١٧),*** in the study entitled "is it safe to perform lumbar spine surgery on patients with other medical comorbidities?" who found that the main indication for surgery was lumbar disc prolapse in half of patients. This result was in consistent with ***Guha, Heary and Shamji, (٢٠١٥),*** in the study entitled "iatrogenic spondylolisthesis following laminectomy for degenerative lumbar stenosis: systematic review and current concepts" who reported that more than one third of the cases had lumbar stenosis

Regarding level of operated vertebra, the current study findings showed that the most affected vertebra was L٤/٥ in more than two thirds of both the study and control groups. This result was supported by ***Mobbs, et al., (٢٠١٤),*** in the study entitled "outcomes after decompressive laminectomy for lumbar spinal stenosis: comparison between minimally invasive unilateral laminectomy for bilateral decompression and open laminectomy" who found that more than three quarter of their patients had operated level L٤-L٥.

In addition, ***Williams, Wafai and Podmore, (٢٠١٧),*** documented that the most frequent level of pathology was L٤/٥. Also, ***Song, et al., (٢٠١٨),*** in study entitled "the clinical results after posterior ligaments preserving fenestration in lumbar spinal stenosis: the port-hole decompression" who reported that the majority of studied patients had operated level L٤-L٥ laminectomy. The result was in compatible with ***Faraj, et al., (٢٠١٨),*** in study entitled "laminectomy versus interlaminar approach for lumbar disc herniation" who reported that more than half of their laminectomy patients had operated at level L٥-S١.

Table (٤): frequency distribution of studied patient regarding Characteristics of pre-operative pain (n=٨٠).

Concerning onset, frequency and type of pain, the results of the current study revealed that three quarters of study group and more than half of control group had gradual onset of pain. Moreover, more than three quarters of study group and three quarters of control group had continuous pain. Furthermore, more than three quarters of study group and more than half of control group had chronic pain.

This result was in agreement with ***Mohamed, et al., (٢٠١٨),*** who documented that the majority of study patients had gradual onset and continuous pain and more than half of them reported chronic low back pain on admission. As well, ***Garcia, et al., (٢٠١٥),*** observed the gradual onset of pain in more than three quarters of patients. Pain was continuous in about two thirds of patients and all of patients experienced chronic pain.

Owing to pain severity, the result of the current study revealed that more than two thirds of study group and more than half of control group had severe pain. This result was congruent with ***Mannion, et al., (٢٠١٤)***, in their study "the influence of

comorbidity on the risks and benefits of spine surgery for degenerative lumbar disorders" who represented that the mean pain severity was ٧.٣ ± ٢.٠ on scale (٠-١٠) in more than half of patients. As well ***Garcia, et al., (٢٠١٥),*** found that the pain was intense at its severe point (٨.٦٧ ± ٢.٠٠) in majority of patients.

Pertaining to causes of pain, aggravating factors and alleviating measures of pain, the results of the current study revealed that three quarters of study group and about half of control group had pain because of lifting heavy objects. As well, more than three quarters of both groups their pain was aggravated by excessive twisting. Furthermore, most of study group and more than two thirds of control group relieved their Pain by analgesics.

This result was supported by ***Mohamed, et al., (٢٠١٨),*** who presented that pain is caused by lifting heavy objects in more than two thirds of patients and aggravated by excessive twisting for a long time in more than one quarter while, half of the patients used a combination of pharmacological and non-pharmacological measures to alleviate their pain. Moreover, ***Abd Elwahhab, Shehata and Abd Elghaffar, (٢٠١٩),*** reported that lifting heavy objects was considered as the main cause of low back pain in more than half of subjects. On the other hand, ***Gupta, et al., (٢٠١٧),*** documented that pain was aggravated by walking in about two thirds of patients.

Regarding radiation of pain, the results of the current study revealed that half of study group and nearly half of control group had bilateral lower limb pain**.** This result was in line with ***Farrokhi, Yadollahikhales and Gholami (٢٠١٧),*** in the study entitled "treatment of ٤٤ cases with lumbar spine stenosis and degenerative instability: outcomes of surgical intervention" who noted that more than two thirds of patients had bilateral pain radiation. Moreover, ***Aghajanloo, et al., (٢٠١٩),*** who documented that more than two thirds of patients had bilateral pain radiation.

This result was in constrast with ***Garcia, et al., (٢٠١٥),*** who found that the radiation of the pain was predominantly asymmetric (one side) in about three quarters of patients. Also, ***Lee and Srikantha, (٢٠١٥),*** reported that two thirds of their patients had symptoms predominantly localized to one side.

Concerning pain effect on ambulation, the result of the current study revealed that the movement was affected by pain in nearly all of patients of both groups. This result was consistent with ***Gelalis, et al., (٢٠١٠),*** who showed that all patients had limited functional activities due to leg or back pain. As well ***Garcia, et al., (٢٠١٥),*** found that majority of patients reported difficulties with their movements due to the pain.

Figure (١): Distribution of patients (both groups) regarding their total knowledge score pre and post program (n=٤٠).

Regarding total knowledge level, there was significant statistical improvement in level of knowledge among study group post program implementation as compared to control group. From the researcher point of view, this is may be related to the knowledge that acquired from the provided educational program about lumbar laminectomy and self-

care activities which supported by illustrative colored booklet. These results also supported by the fact that most of the studied group was educated which help them to comprehend and acquire knowledge and self-care activities related to lumbar laminectomy.

This result was consistent with ***McGregor, et al., (٢٠١٢),*** in the study entitled "patient's views on an education booklet following spinal surgery" who stated that more than three quarters of their patients learned new and helpful facts post explaining the education booklet.

Also, ***Abd-El Mohsen, Ammar and Mohammed, (٢٠١٩),*** found that patients had satisfactory level of knowledge post program compared to pre application. While, the result was in contrast with ***Bidstrup, et al., (٢٠١٨),*** in their study "does information become actual knowledge in surgical spine patients" they found that knowledge and behavior change are emergent processes in patients and not a linear outcome of information.

Table (٥): Distribution of patients (both groups) regarding their pain severity pre and post program (n=٨٠).

Concerning pain severity pre and post program, the current study findings showed that there were no significant statistical differences between study and control groups related to pain levels preprogram implementation. While, there were significant statistical differences between both groups post program implementation. As well, there was significant statistical improvement in pain severity among the study group post program implementation.

The results were supported by ***Shabat, et al., (٢٠٠٨)***, who conducted a study in "long-term outcome of decompressive surgery for lumbar spinal stenosis in octogenarians" they mentioned that a significant improvement in overall pain perception was recorded following the program. In addition, ***Zhang, Wan and Wang, (٢٠١٤),*** found that educational intervention is effective for improving pain and disability in their patients.

Moreover, ***Guo, et al., (٢٠١٩),*** in their study about "rehabilitation nursing for patient rehabilitation after minimally invasive spine surgery" they reported that there was no significant difference in visual analogue pain score (VAS) before educational intervention between both groups. While, after intervention, a significant improvement of VAS scores was noted in the observational group than the control group. In the same context, ***Burgess, Arundel and Wainwright (٢٠١٩)***, in the study entitled "the effect of preoperative education on psychological, clinical and economic outcomes in elective spinal surgery" found that patients who received an educational intervention reported lower mean pain scores using VAS post-surgery.

On the other hand, ***Geneen, et al., (٢٠١٥),*** in the study entitled" effects of education to facilitate knowledge about chronic pain for adults" found no evidence for improvement in pain with different types of education. Also, ***Rolving, et al., (٢٠١٦),*** in the study entitled "peri operative cognitive-behavioral intervention improves in-hospital mobilization and

analgesic use for lumbar spinal fusion patients" found that no difference in pain severity scores between intervention and control groups following the education program.

Regarding relation between pain severity of both groups and their age as well occupation, the current study findings showed that there was no significant statistical relation between pain severity of both groups and their age as well occupation pre and post program implementation. This result was consistent with ***Almeida, et al, (٢٠٠٧),*** in the study entitled "is preoperative occupation related to long-term pain in patients operated for lumbar disc herniation" who found no statistically significant between occupation and pain.

As well, ***Moradi and Hajbaghery, (٢٠١٥***), showed that there was no relation between age and occupation and pain level. Moreover***, Zhang, et al, (٢٠١٧).,*** reported that there were no significant relations observed between the two groups in terms of age, sex, smoker and comorbidities and back and leg pain intensity. In addition, ***Boakye, et al., (٢٠١٨),*** in the study entitled "post-decompressive neuropathy; new-onset post-lamine`ctomy lower extremity neuropathic pain different from the preoperative complain" stated that there were no statistically significant differences in the age related to pain level. Also, ***Kesanen, et al., (٢٠١٧)***, found that age, did not demonstrate any significant effect on pain.

Owing to relation between total knowledge of both groups and their educational level, the current study findings showed that there was a significant statistical relation between total knowledge of study group and their educational level pre and post program implementation compared to control group. This result was supported by ***Alkatheri and Albekairy, (٢٠١٣)***, 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.

This result was contradicted with ***Weckbach, et al., (٢٠١٦),*** in the study "a survey on patients' knowledge and expectations during informed consent for spinal surgery" who found no positive correlation between educative background and patient's knowledge. Additionally, ***Weheida, Shabaan and Fehr (٢٠١٨)***, found no significant relation between educational levels of studied patients and their knowledge level. However, ***Abd-El Mohsen, Ammar and Mohammed, (٢٠١٩),*** found that there was no significant correlation between educational levels of studied patients and their knowledge level pre and post program application.

Pertaining to correlation between total pain score and total barthel index of daily activities, 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.

The results were supported by ***Manusov, (٢٠١٢)***, in the study "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 and Radaković, (٢٠١٥),*** in the study "the effectiveness of the functional magnetic stimulation therapy in treating sciatica syndrome" found a positive correlation between pain and physical activities.

Owing to correlation between total knowledge score and total barthel index of daily activities, the current study findings showed that**,** there was a positive statistically significant correlation between total knowledge score and total barthel index scale among study group post program implementation. These findings may be attributed to that the increased knowledge level among the study group affect on their daily activities post program.

The results were supported by ***Koekenbier, et al., (٢٠١٦),*** in the study of "empowering knowledge and its connection to health-related quality of life" reported that empowering knowledge was associated with high postoperative health-related quality of life. Moreover, ***Burgess, Arundel and Wainwright (٢٠١٩)***, reported that patients who gain sufficient knowledge can improve their coping ability and then engage in appropriate attitudes and behaviors.

Conclusion

This study concluded that:

Based on the findings of the current study, it can be concluded that:

- Providing an educational program to the patients has been shown to be effective for improving knowledge and self-care activities.
- Study group had marked improvement in satisfactory level of knowledge post program compared to control group.
- Study group had marked improvement regarding independency of activities of daily living post program implementation compared to control group.
- Statistical significant differences were found between study and control groups post program implementation regarding pain severity.
- Statistical significant differences were found between study and control groups post program implementation regarding all items of Barthel index.

Recommendations:

The results of this study projected the following recommendations:

- Replication of the study using a larger probability sample from different geographical regions for generalization of results.
- Similar studies are needed to assess the long-term effects of such educational programs.

- Further research is needed to assess the effects of preoperative education on surgical outcomes and self-care activities in patients with lumbar laminectomy.
- Establishment of in-services training program for nurses about knowledge and self-care activities for patients with lumbar laminectomy.
- Establishment of health care educational center in Benha University Hospital to educate patients about necessary instructions regarding their conditions and self-care activities using manual booklet with colored pictures and illustrated pamphlets for each patient especially those who cannot read and write.

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