

Effect of Discharge Plan on Satisfaction of Patients with Lumbar Disc Herniation Surgery

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Abstract

Background: Discharge planning for patients undergoing lumbar disc herniation surgery is considered as a strategy for promoting their satisfaction at home and in the community. **Aim:** This study aimed to evaluate the effect of discharge plan on satisfaction of patients with lumbar disc herniation surgery through the following: 1) Assessment of needs of patients with lumbar disc herniation surgery. 2) Developing and implementing discharge plan for patients with lumbar disc herniation surgery based on needs assessments 3) Assess the effect of discharge plan on satisfaction of patients with lumbar disc herniation surgery. **Study design:** a quasi-experimental design was utilized to conduct this study. **Setting:** The study was conducted in neurosurgical ward at El-Demerdash hospital and outpatient clinic at Ain Shams University Hospital which affiliated to Ain Shams University. **Subject:** A purposive sample of 60 patients with lumbar disc herniation surgery were selected according to certain inclusion criteria. The sample size was determined statistically by power analysis considering the total number of patients with lumbar disc herniation surgery in El Demerdash hospital during the year (2016). **Data collection:** 1) Patients' Interviewing questionnaire. and 2) Patient Satisfaction tool. **Results:** the present study revealed that, mean age of the patients under study was 39.58 ± 8.69 and 60% of them were female and There were a highly statistically significant difference among patients under study throughout discharge planning phases regarding their knowledge, There were statistical significant relations between patients' total satisfactory level of knowledge and their satisfaction level three months after implementing discharge plan. **Conclusion:** Application of discharge planning regarding lumbar disc herniation surgery has a positive improving effect on patients' satisfaction level. **Recommendations:** The discharge plan should be available in the neurosurgical department and clinic for all patients who will be undergoing lumbar disc herniation surgery and should be updated periodically.

Key words: Discharge planning, satisfaction, lumbar disc herniation surgery.

Introduction

Degeneration of inter vertebral discs is the most frequently known cause of lower back pain all over the world. In the developed countries low back pain is somewhat common. It is the most common reason of disability

above the age of forty and the most frequent cause for seeking medical advice. Occupational back pain affects functional capacity and quality of life and leads to limitations of the physical daily activities among construction workers (Salama, et al., 2017).

Lumbar disc herniation (LDH) is a common spinal disorder that usually favorably responds to conservative treatment. In those cases with refractory complaints, surgical intervention may become obligatory. The rate of spinal surgery for the treatment of symptomatic degenerative disc disease (DDD) has increased dramatically in recent decades; it can be associated with catastrophic complications and long-term disability. Appropriate patient selection with proper surgical planning can play the most important role in improving surgical outcome and avoiding complications (Omidi-Kashani, et al., 2016).

Before the patient with lumbar spine surgery prepares to leave the acute care setting, the nurse provides a thorough discharge planning to promote continuity of therapeutic regimen and active participation in the rehabilitation process. Thus the unique role of the nurses is to help patients and their families learn new behaviors that to have a positive impact on their health and their lives. 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 (Marchand, et al., 2016).

Discharge plan has been applied to clinical nursing care. The major idea of the intervention is to improve the efficacy of clinical nursing care, shorten hospital stay, reduce the incidence of complications, minimize physical dysfunction, improve social, psychological wellbeing and accelerate the recovery of patients by optimizing surgical and peri operative management (Guo., et al 2019).

Discharge planning is a process in which patients' needs are identified

and plans are written to facilitate continuity of health care. Discharge planning is therefore an integral component of patients' care in hospital. The provision of accurate and appropriate discharge information to patients undergoing lumbar disc herniation surgery, and carers, play a vital role in patients' care after discharge from hospital. Appropriate and effective discharge planning can maintain patients' quality and continuity of care from hospital to home, also reducing their length of hospital stay and readmission rates. To achieve anticipated physical, social and psychological patient outcomes (Mabire, et al., 2019).

Patient level of satisfaction is the most important indicator of high-quality health care and also used for the assessment and planning of health care activities. Nursing care is one of the major health care services that contribute significantly to the patient healing process. Nurses have 24 hour contact with patients as well as being near to them. Patient satisfaction is often determined by the quality nursing care offer in any health setup (Majid and Plummer, 2015).

Significance of the study:

Lumbar disc herniation is rapidly emerging as a Global health problem among population and a major cause of medical expenses. It is a frequent complain among the individuals in the society. It significantly affects the daily activities and the social and psychological life aspects leading to an economic health burden. The prevalence rate of this disease remains unclear in our country due to lack of systematic data. otherwise through a period of three months cases were admitted to the orthopedic

department and outpatient spine clinic at Assiut University Hospital for lumbar discectomy were 22 cases (Abd-El Mohsen, et al, 2019)

However, in Egypt there is no national statistics available about lumbar disc herniation surgery, meanwhile the medical records of neurosurgical ward at El Demerdash Hospital revealed that the number of patients who had undergone lumbar disc herniation surgery in year (2019) were 400 patients from 1300 patients admitted to neurosurgical department, it represent 30.7 % from the total cases diagnosed with neurosurgical problems. (Medical record of neurosurgical ward at El-Demerdash hospital, 2019).

Aim of the study:

This study aimed to assess the effect of discharge plan on satisfaction of patients with lumbar disc herniation surgery through the following:

- 1- Assessment of needs of patients with lumbar disc herniation surgery.
- 2- Developing and implementing discharge plan for patients with lumbar disc herniation surgery based on needs assessments.
- 3- Assess the effect of discharge plan on satisfaction of patients with lumbar disc herniation surgery.

Research Hypothesis

The current study hypothesized that:

The implementation of discharge plan will affect positively on the satisfaction level of patients exposed to lumbar disc herniation surgery

Subjects and Methods

Research design:

A quasi experimental design one group pre/ post and follow up test was utilized to meet the aim of this study.

Research Setting:

The study was conducted in neurosurgical ward at El-Demerdash hospital and outpatient clinic at Ain Shams University Hospital which affiliated to Ain Shams University.

Subjects:

A purposive sample of 60 patients with lumbar disc herniation surgery were selected according to certain inclusion criteria. The sample size was determined statistically by power analysis considering the total number of patients with lumbar disc herniation surgery in El Demerdash hospital during the year (2016) (Statistical records of El- Demerdash Surgical Hospital, neurosurgical Departments, 2016).

Sample size:

Sample size calculated by using **Epicalc 2000** software with the following inputs:

- **The sample size is 60 patients**
 - Type I error (α) =5% with confidence level 95%
 - Study power 90 % (power of test) with type error II 10% (Beta)
 - The significance level (α) at 0.05

Patients were selected according to the following criteria:

Inclusion Criteria:

Adult patients, from both genders, conscious, had first-time lumbar disc surgery, with chronic low back and lower extremity pain of at least 6 months with pain intensity limiting function. Patients with different types of surgical techniques for lumbar disc herniation (e.g. standard discectomy, microdiscectomy, laser discectomy, spinal fusion) were included. With no critically or psychotic disorders, able to comprehend instructions, and agree to participate in the study.

Tools for data collection:

The study data was collected through the following tools:

Tool (I) Patients' interviewing questionnaire

It was developed by the researcher based on review of relevant recent literature, **Weheida, et al., 2016** and **(Lewis, et al., 2014)**, it was translated into Arabic, validity and reliability were tested. it included two parts as follows:-

- **First part:** is concerned with patient's personal data which included age, gender, marital status, educational level, and occupation, ...etc).

- **Second part:** It was used to assess patients' knowledge related to lumbar disc herniation, and included 38 MCQs, which were grouped to 7 sub groups as the following: anatomy and function of the disc (4 questions), lumbar disc herniation (5 questions) lumbar disc herniation surgery (3 question) instruction and precautions to be followed after surgery (7 questions) correct body position and physical exercise (5 questions) nutritional allowed related to his condition (8 questions) medication and follow up compliant to plan (6 questions)

Scoring system

The scoring system for this part was as following:

- One grade was given for the correct answer and zero for the incorrect answer, with total mark = 38 mark

The total level of patient's knowledge was categorized as following:

- $\geq 60\%$ was considered satisfactory (it equal 23 grades).

- $< 60\%$ was considered unsatisfactory.

Patient satisfaction tool

It was adapted from **He et al., (2018)**, **Kleefstra, (2015)**, **Soliman et al., (2015)**, **Tang et al., (2013)**, **Custer, (2012)** to assess satisfaction level for patients with lumbar disc herniation surgery. It included 32 statements which were grouped into 4 subtitles knowledge (9 items), discharge plan process (8 items), self management (8 items) and patient's autonomy (7 items). It was translated into Arabic and retranslated, validity and reliability were tested.

Scoring system:

- The responses for the items were as the following:

- Not satisfied = 1, Somewhat Satisfied = 2, very satisfied = 3

The total item 32 and score was from 32-96 grades the higher score means higher satisfaction level.

Score % = $\left(\frac{\text{the observed score}}{\text{the maximum score}} \right) \times 100$

It was categorized as following:

- Unsatisfactory $\leq 50\%$ = [\leq 48 Grade]
- Average $>50-75\%$ = [$>$ 48-72 Grade]
- Satisfactory $>75\%$ = [$>$ 72-96 Grade]

II. Operational design:

The Operational design includes preparatory phase, validity and reliability of the study tools, pilot study, ethical consideration and fieldwork.

Preparatory phase:

It included reviewing of the current and more recent relevant national and international literature reviews concerning outcomes and satisfaction of patients undergoing lumbar disc herniation surgery of the various aspects of this issue in order to prepare the tools of data collection.

- Some of the tools were translated from English into Arabic then back translation was done.

Validity and reliability:

The validity of proposed tools done by using face & content validity aimed to inspect the items to determine whether the tools measure what suppose to measure and conducted to determine whether the tools cover the aim. Validity was tested through a jury of 7 expertise from medical surgical nursing department, Ain Shams university (3 professors, 3 assistant professors and one lecturer). The expertises revised the tools for clarity, relevancy, comprehensiveness, simplicity and applicability, minor modifications were done based on the expertise's opinion.

Reliability, The reliability was done by alpha cronbach test which used to

examine whether the tools had internal consistency. The test reached to 0.924.

Pilot study

A pilot study was carried out on a group of 6 patients (10%) to test the applicability of the study and clarity of the designed questionnaires, as well as to estimate the time needed to answer the study tools. Some modifications were done for the study tools then the final form was developed. Patients of the pilot study were not included in the study sample and another 6 patients were selected based on the sample criteria to be included in the study subject. Instead of the excluded group.

Field work:

Field work included two phases: implementation phase & evaluation phase.

A. Assessing phase:

- This phase started pre operatively at the neurosurgical department by interviewing studied patients with lumbar disc herniation and following the inclusion criteria in order to explain the aim and nature of the study as well as taking their approval to participate in the study prior to data collection. Data collection was started and completed within a year; from June 2018 to June 2019.

- the patients' telephone numbers were obtained at the first time for contacting them to determine the other appointments in order to complete data collection process.

- The study tools were filled in and completed by the researcher on 3 phases (pre, immediately after the operation and post 3 months period).

- The patients' assessment sheet was used to determine the patients' needs regarding lumbar disc at discharge as the following:

- Using Patients' Interviewing questionnaire to assess patients' level of knowledge it was filled in by the

researcher or by the patients according to their level of education. It took about 30:45 minutes to fill in for every patient. Total time needed to fill in the study tools was from 30 to 45 minute hours.

- Data collection was done 3 days / week (Monday, Tuesday and Wednesday) at the previously mentioned settings in morning and afternoon shifts. As Wednesday was the outpatient clinic day and Monday and Tuesday were the pre and postoperative days for patients with lumbar disc herniation surgery .

- Based on patients' needs, the researcher developed the discharge plan and designed it as a booklet in Arabic language including the following items: lumbar disc herniation surgery (definition, indication, types, preparation) pain management strategies , method to protect back and spine while practicing every day activities , physical exercise, nutrition, weight management strategies, follow up and medication, stress management strategies aiming at improving the physical, psychological and social outcomes.

The content of discharge plan for patients with lumbar disc herniation surgery was adapted from **Elkwood, et al., (2017); Lall, (2017); Wang, et al., (2017); Linton, (2016); Bajwa, & Haldar, (2015) ; Dewit, & Kumagai, (2014) and Tarnanen, et al., (2014).**

B. Implementation phase:

- Discharge plan was distributed to all patients immediately post assessing patients' needs in June 2018 after explaining its content and how to go through the discharge plan for the educated patients and or one of the care givers for the illiterate patients.

- Sessions of the discharge plan (5 sessions) were conducted in a classroom in the inpatient department. The classroom was quite, well ventilated, well furnished, had adequate lightening, adequate spacing and supplies for implementation of the discharge planning.

- Sessions of the discharge plan were included three theoretical sessions and two practical sessions, starting with

greeting and assuring patients' privacy then assessing the patients' motivation for learning. Orientation about the discharge plan purpose, time and content were done by the researcher using simple words and a tone of voice that shows interest and concern .

- Each session of the discharge plan took about 45-60 minutes per day for 2 days per week. Sometimes the sessions were conducted individual or for small groups; each group did not exceed three patients.

- The sessions were carried out for every patient according to their level of education and understanding. The teaching methods including demonstration, small group discussion and role play, supported by posters and booklet.

- Patient satisfaction tool was filled in by the researcher or by patients according to their level of education, took about 20-25 minutes to fill it in for every patient.

- Patients were allowed to ask questions in case of miss- understanding while listening and expressing interest for them. At the end of the sessions the researcher emphasized the importance of follow up visits.

- The patients were instructed to come after 3 months period for follow up test.

C. Evaluation phase:

Written assessment tools (patients' interviewing questionnaire, , patient satisfaction tool) were used again post 3 months after implementation of the discharge plan. Test were done to evaluate the effect discharge planning on satisfaction of the studied patients.

Administrative Design:

An official letter was issued from the Faculty of Nursing, Ain Shams University to the director of inpatient neurosurgery department and neurosurgery outpatient clinics at which the study was conducted, explaining the purpose of the study to obtain their permission to conduct this study.

Statistical Design:

The data were collected, coded and entered into a suitable excel sheet. Data were transferred into SPSS. Quantitative data were presented as mean, standard deviation; comparison was done using X² test. Qualitative data were presented as percentages. The observed differences and association were considered as follows:

- Non significant at $P > 0.05$
- Significant at $P \leq 0.05$
- Highly significant at $P < 0.001$

Results

Table (1) this table shows that the mean age of the studied patients was 39.58 ± 8.69 . Also, 60% of them were female, and 85% of them were married respectively. Regarding education level 30% of them were illiterate or have diploma, 43.3% of them were having heavy work. 58.3% from urban and 66.7% overweight.

Table (2) This table shows that, there were highly statistically significant difference of immediate and follow up compared to pre according to their level of knowledge, at p-value (<0.001) in pre vs. immediate; while immediate vs. follow up (p-value >0.05).

Table (3) This table illustrated that, there were a highly statistically significant difference of patients satisfaction regarding knowledge ,discharge process, self care management and patient autonomy of immediate and follow up compared to pre according to total score of patients satisfaction, at p-value (<0.001) in pre vs. immediate; while immediate vs. follow up (p-value >0.05).

Fig. (1) This figure shows that, the total level of patient's satisfaction for the studied patients were 85% and 93.3% immediately and three months after implementing the discharge plan respectively compared to pre that was 6.7%.

Table (4) This table illustrated that there were statistical significant relations between patients' total satisfactory level of knowledge and their total level of satisfaction pre implementing discharge plan at p-value 0.002^* and a highly statistically significant immediate and three months after implementing discharge plan regarding their level of patient's satisfaction at p-value $<0.001^{**}$.

Table (1): Number and percentage distribution of patients with lumbar disc herniation surgery according to their demographic data (N=60).

Socio-Demographic data	No.	%
Age (years)		
20-≤35 years	19	31.7
35-≤50 years	30	50.0
≥50 years	11	18.3
Mean±SD	39.58±8.69	
Gender		
Male	24	40.0
Female	36	60.0
Marital status		
Married	51	85.0
Not Married	9	15.0
Education		

Cannot read and write	18	30.0
Read and write	15	25.0
Secondary school	18	30.0
University Education	9	15.0
Occupation		
Not working	25	41.7
Sedentary work	9	15.0
Heavy work	26	43.3
Residence		
Urban	35	58.3
Rural	25	41.7
Weight (kg)	75.36±10.34	
Height (cm)	165.35±9.27	
BMI [wt/(ht)^2]		
Under weight	0	0.0
Normal weight	13	21.7
Over weight	40	66.7
Obese	7	11.6
Mean±SD	27.67±3.78	

Table (2): Patients' satisfactory level of knowledge regarding lumbar disc herniation surgery during the three phases of the study (n=60).

Level of knowledge	Pre intervention		Immediate		Follow Up		Pre Immediate vs. Immediate		Immediate Follow Up vs. Follow Up	
	No.	%	No.	%	No.	%	x2	p-value	x2	p-value
Satisfactory ≥60%	5	8.3	56	93.3	54	90.0				
Unsatisfactory <60%	55	91.7	4	6.7	6	10.0	83.3	<0.001**	0.109	0.741
Total	60	100.0	60	100.0	60	100.0				

p-value>0.05 NS; **p-value <0.001 HS

Table (3): Mean scores of patient satisfaction scale among studied patients (N=60).

Patient satisfaction scale	Pre Mean±SD	Immediate Mean±SD	Follo w Up Mean ±SD	Pre Immediate t-test	vs. p-value	Immediate Follow Up t-test	vs. p-value
Total First: Knowledge (max=27)	10.67±3.44	23.38±3.08	25.10±3.30	-21.336	<0.001**	-0.944	0.349
Total Second: Discharge plan process(max=24)	8.53±2.06	20.97±2.91	21.88±2.84	-26.997	<0.001**	-0.746	0.276
Total Third: Self care management (max=24)	8.87±2.31	21.00±2.54	22.13±2.01	-27.385	<0.001**	-0.710	0.263
Fourth: Patients autonomy(max=21)	7.70±2.36	19.32±2.04	20.12±1.76	-28.859	<0.001**	-0.303	0.112
Total Score of patient satisfaction (max=96)	35.67±8.28	84.67±8.54	89.48±7.93	-31.907	<0.001**	-0.201	0.074

p-value>0.05 NS; **p-value <0.001 HS

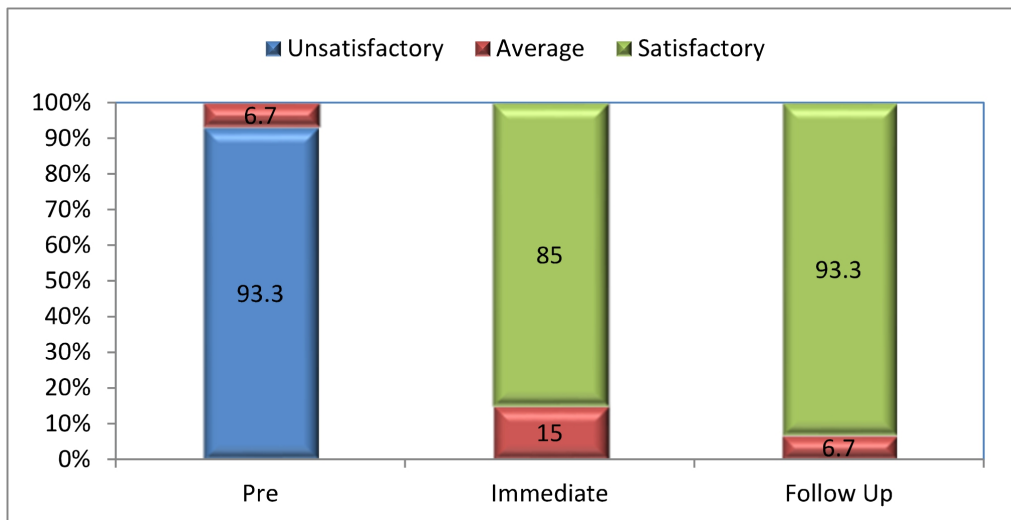


Fig. (1): Patients' total level of patients satisfaction during the three phases of the study.

Table (4): Relation between patients' total satisfactory level of Knowledge and their level of patients satisfaction pre, immediate and three months post implementing discharge planning (n=60).

Level of patients satisfaction	Pre				Immediate				Follow Up				x2	P-value
	Satisfied		Unsatisfied		Satisfied		Unsatisfied		Satisfied		Unsatisfied			
	N	%	No.	%	N	%	N	%	N	%	N	%		
Satisfactory	0	0.0	0	0.0	5	91.1	0	0.0	5	100.0	2	33.3	14.118	<0.001**
Average	4	80.0	0	0.0	5	89.0	4	100.0	0	0.0	4	66.7	12.476	<0.001**
Unsatisfactory	1	20.0	55	100.0	0	0.0	0	0.0	0	0.0	0	0.0		
Total	5	100.0	55	100.0	5	100.0	4	100.0	5	100.0	6	100.0		

*p-value <0.05 S; **p-value <0.001 HS

Discussion

Regarding patient's **demographic characteristics**, the result of the present study revealed that, the mean age of the studied patients was (39.58±8.69). This result can be explained by increase incidence of lumbar disc herniation and recurrent exposure to life stressors in younger adults in which this age group represent working-age population.

This finding is inconsistent with what was reported by **Ahmed et al.,**

(2019) entitled: "Effectiveness of Structured Nursing Teaching Program on Outcomes of Chronic Low Back Pain Patients Undergoing Radiofrequency Ablation " who found that more than half of studied patients have an age ranged from (18 to less than 55 years old and less than half of studied patients were older adults that their age from 55 and more.

Furthermore, a study done by **Hey et al., (2018)** entitled "The Predictive Value of Preoperative Health-Related Quality-of-Life Scores on Postoperative Patient-Reported

Outcome Scores in Lumbar Spine Surgery". Revealed that the mean age for patients with disc herniation was the youngest (40 years). On the other hand, **Hartvigsen et al., (2018)**. Reported that low back pain affects all age groups from children to the elderly population.

Regarding to **gender**, the present study result clarified that, more than half of the study sample were female; this may be due to that stresses of everyday life as females are more weak than males; Also this can be attributed to the accumulation of household chores and outside work, in addition to women's anatomical and functional characteristics. This finding supported by **Ahmed et al. (2019)**, who stated that highest percent of case and control group were females. otherwise, this was on the contrary with **Weheida et al., (2016)** entitled "The Effect of Implementing an Educational Program about Proper Body Mechanics on Low Back Pain and Activities of Daily Living among Patients with Disc Prolapse" who pointed that the prevalence of low back pain affects a large proportion of the male population.

Concerning **marital status**, the results showed that, more than three quarters of the patients were married. This may reflect that married people were liable to lumbar disc herniation more than singles because they always facing psychological stress of their social role. This finding is inconsistent with what was reported by **Abd-El Mohsen et al., (2019)** entitled: " Effect of Nursing Rehabilitation Guide on Outcomes of Patients Undergoing Lumbar Discectomy " who pointed that more than two third of the studied sample were married.

In relation to **educational level**, the current study illustrated that, one

quarter of the studied patients can read and write and more than one quarter of the studied patient were illiterate and diploma education. This may be due to conduct the study in a governmental hospital with a high percentage of low social standards for patients attending at Ain shams university hospital for getting medical treatment. Moreover, as evidenced by their report about their income that is not enough.

This result goes in the same way with **Mbizo et al., (2019)** entitled ") Integrative and Complementary Medicine Use in Adults With Chronic Lower Back Pain, Neck Pain, and Arthritis/Musculoskeletal Diseases" who pointed that; a low level of education is associated with various diseases and condition, including musculoskeletal disorders and more specifically low back pain.

As regards **occupations** and nature of work, the results of the present study showed that, more than one quarter of the patients under study were heavy work. The patient under study reported that their work requires physical effort; this may reflect that nature of the work which causes mechanical stress on the back and acts as a risk factor to develop lumbar disc herniation. This finding is in accordance with **Fareed et al., (2017)** entitled " Effect of Superficial Hot Versus Cold Application on Low Back Pain among Patients with Disc Prolapse" who concluded that type of work has a significant effect on low back pain occurrence. As well heavy manual work that demands lifting, bending, twisting, repetitive moments can be one of the reasons to cause back pain and increase risk of lumbar disc herniation.

Regarding **residence**, the current study showed that, more than half of the

studied patients were from urban areas. This could be attributed to the ability of them to find the advanced technology that may help them and decrease load during the performance of activities of daily living. Also the availability of the hospital for urban patients help them to attain and get medical treatments and complaint in their follow up.

This finding not agrees with a study done by **Abd-El Mohsen et al., (2019)** entitled " Effect of Nursing Rehabilitation Guide on Outcomes of Patients Undergoing Lumbar Discectomy " who reported that the majority of the studied patients were from rural areas. Furthermore, a study done by **Fareed, et al, (2017)** entitled "Effect of Superficial Hot Versus Cold Application on Low Back Pain among Patients with Disc Prolapse" which reported that, the incidence of lumbar disc prolapse was more common in people from rural area. That may be due to their work requirements which need more bending, twisting back and lifting heavy objects.

Concerning **body mass index** the results of the present study showed that, more than two third of the studied patients were overweight. This may be due to that the majority of the studied patients were female with a sedentary life style, not practice exercise and not eating healthy diet that maintain optimal weight.

This finding agrees with a study conducted by **Morcos et al., (2018)**. Entitled "Predictive Factors for Discharge Destination Following Posterior Lumbar Spinal Fusion: A Canadian Spine Outcome and Research Network (CSORN) "Study, which revealed that about two, third of the studied patients with a high body mass index. And also stated that obesity can

complicate postoperative recovery and delay rehabilitation.

The result showed that there were a highly statistically significant improvement among patients under study throughout discharge planning phases regarding their **knowledge** about the instillation and function of the disc, lumbar disc, lumbar disc herniation surgery, guide line to be followed after surgery, correct position and back exercise, nutrition, medication and follow up. This reflects the positive effect of discharge planning on modifying knowledge of those patients.

This finding is consistent with a study conducted by **Weheida et al., (2016)**, entitled: "The Effect of Implementing an Educational Program about Proper Body Mechanics on Low Back Pain and Activities of Daily Living among Patients with Disc Prolapse" which revealed that there were statistically significant difference between study and control group between mean of total knowledge score at post teaching .

The results showed that there were ahightly statistical significant differences among patients under study throughout discharge planning phases regarding **satisfaction level regarding to knowledge, discharge plan process, self care management and patients autonomy**. As more than four fifth of the patients under study had unsatisfactory level of satisfaction which improved in immediately and three months after implementing discharge plan.

This finding is consistent with **Eastwood et al., (2018)**, entitled" improving post-operative patient reported benefits and satisfaction following spinal fusion with a single

pre-operative education session." who reported that, the patient satisfaction was improved following participation in educational session prior surgery and had their expectations met (improved daily activity, walking capacity, and back pain). Compared to patients not participate.

Furthermore, this finding may be attributed to the effect of the provision of educational booklet with clear and simple written information which given to them. In addition to the curiosity of the study subjects to know how to deal and perform activity of daily living make them more satisfied with information given to them about their diagnosis.

As regards **the relation between patients' total satisfactory level of knowledge and their satisfaction level** three months after implementing discharge plan, this study revealed that there were statistical significant relations. This finding could be related to improving patients understanding is likely to improve health outcomes and avoid unnecessary health care utilization and cost.

This result is in agreement with a study done by **Menendez et al., (2019)**, entitled " Patient Satisfaction in Spine Surgery: A Systematic Review of the Literature, " who pointed that, patients who are more satisfied with their medical care are known to have better long-term outcomes and higher satisfaction. Satisfied patients are more compliant with treatment regimens; develop lasting relationships with their medical providers.

Conclusion

The results of this study concluded that:

Application of discharge planning regarding lumbar disc herniation surgery has a positive improving effect satisfaction level, and there were statistically significant relations between knowledge and satisfaction level three months after implementing discharge planning. The results of the study support the research hypothesis.

Recommendations

I – In research:

- Replication of the current study on a larger probability sample is recommended to achieve generalization of the results.

- Further researches are recommended periodically to be carried out using new approaches in the area of management of patients undergoing lumbar disc herniation surgery and evaluate its effect on patients' outcomes.

- Studying factors affecting patients' compliance with therapeutic regimen after lumbar disc herniation surgery.

II- In services:

- Providing copies of the discharge plan in the neurosurgical department and clinic to be readily available for all patients planned to undergoing lumbar disc herniation surgery and should be updated periodically.

- Follow up care for patients with lumbar disc herniation through phone calls, and clinical visits that would help to pinpoint post discharge patients' problems and solve it.

- Establish interdisciplinary approach in the management of patients undergoing lumbar disc herniation surgery.

III- In Community:

- Health education through mass media concerning lumbar disc herniation and proper use of body mechanics.

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