

Effect of Nursing Guidelines on Patients Undergoing Inguinal Hernia Repair Outcomes.

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Abstract

Inguinal hernia is a common type of hernia in which a loop of the intestine protrudes directly through a weak area of the abdominal wall in the groin region. This study aimed to assess the effect of nursing guidelines on patients undergoing inguinal hernia repair outcomes. A study was conducted in the general surgical departments at Assiut University Hospital. A consecutive sample of (60) patients was obtained. This sample was divided into study and control group (30) each. Tools utilized for data collection were interview questionnaire sheet and patients' evaluation sheet. Results showed that all the studied patients were male, aged above (30) years, married, manual workers and smokers. The level of patients' knowledge in study and control group preoperative was unsatisfactory (100%) while before discharge level of knowledge for study group was satisfactory (67.7%), also the level of complications decreased in study group than in control group. **Conclusion:** level of knowledge for patients who take designed nursing guidelines was higher than who didn't take any designed nursing guidelines also level of complications was lower in study group. **Recommendation:** each patient is given booklet include designed nursing guidelines about inguinal hernia disease and surgery .

Key words: Designed Nursing Guidelines; Inguinal Hernia Repair & Patient's Outcomes.

Introduction

Inguinal hernia is a common type of hernia in which a loop of the intestine protrudes directly through a weak area of the abdominal wall in the groin region. (The groin is the area between abdomen and thigh). (Lunanske, 2016).

There are two types of inguinal hernia: indirect inguinal hernia, which are caused by a defect in the abdominal wall that is congenital, or acquired and direct inguinal hernia which usually occur only in male adults and are caused by a weakness in the muscles of the abdominal wall that develops over time. (Nicks, 2014).

Although the incidence and prevalence worldwide is unknown, it is estimated that over 20 million procedures for inguinal hernia are performed each year. In USA there are about 500,000 new cases of inguinal hernia each year. (Fitzgibbons, 2007) In USA 15 per 1000 population have inguinal hernia and 800,000 procedures are performed annually to repair it. Richard Burnley (2012) In the Middle East it is difficult to estimate incidence and prevalence of inguinal hernia. In 2008, it was estimated that in Egypt about 240,000 patients have inguinal hernia. (Menon, 2008) In Assiut University hospital through the year 2014, it was found that there were 400 patients performed surgical hernia repair. (Assiut University Hospital Records, 2014).

There is a number of factors that contribute to inguinal hernia formation which include aging, gender (male more than female), obesity, pregnancy, heavy lifting, smoking, chronic cough, frequent constipation, straining with defecation or urination, ascites, peritoneal dialysis, chronic obstructive pulmonary disease (COPD), cardiac disease and family history of hernias. (Akbulut et al., 2010).

The first sign of an inguinal hernia is a small bulge on one or, rarely, on both sides of the groin. The bulge may increase in size over time and usually disappears when lying down. There is also other signs and symptoms may appear including discomfort or pain in the groin especially when straining, lifting, coughing, or exercising that improves when resting, feelings such as weakness, heaviness, burning, or aching in the groin, a swollen or an enlarged scrotum in men or boys. (Simons et al., 2009).

If inguinal hernia is not treated well, complications may occur. It may be turned to irreducible inguinal hernia which means failure of returning contents of the sac back into the abdomen, inflammation of the hernia contents, hydrocele of the hernia sac, incarceration, intestinal obstruction, strangulation (When an incarcerated hernia is not treated, the blood supply to the contents may become obstructed, causing "strangulation" of the contents). This is an

emergency situation that is if not treated it can cause death. (Jeyarajah & Harford 2010).

The diagnosis of inguinal hernia is usually based on patient medical history, family history and a physical exam. Diagnostic investigations such as ultrasound and CT scans are not usually needed to diagnose an inguinal hernia unless if there is strangulation or incarceration. Other investigations may be needed to evaluate the status of any current health problems such as lung, heart or bleeding problems. A urine test may be done to rule out a urinary tract infection. A urinary tract infection or kidney stone may cause pain in the groin that can be mistaken for hernia pain. Surgery is the only treatment for inguinal hernia. (Sherman, 2010) and (Galal et al, 2016).

Complications that may occur after the surgery include wound seroma/hematoma, urinary retention, bladder injury, and superficial wound infection. While complications that occur later following hernia repair include persistent groin pain and post-herniorrhaphy neuralgia, testicular complications, deep wound/mesh infection, recurrent hernia, and mesh migration and erosion. (Matthews 2007).

People cannot prevent the weakness in the abdominal wall that causes inguinal hernias. However, people may be able to prevent inguinal hernias by maintaining a healthy weight and stop smoking. People can keep inguinal hernias from getting worse or keep inguinal hernias from recurring after surgery by avoiding heavy lifting, using the legs not the back when lifting objects, preventing constipation and straining during bowel movements, maintaining a healthy weight and stop smoking. (Simons et al., 2009).

So the nurse have a role to reduce occurring of these complications. The nurse should provide care to the patient preoperatively by preparing patient to surgery, providing him with all information about this condition, the surgical procedure and its complications also she should provide care to the patient, postoperative care beginning with deep breathing exercise, using ice packs to reduce swelling of the scrotum. The operation is a day case surgery so the most important role of the nurse is in providing guidelines to the patient to follow at home in caring of the wound and how to change dressing and to report any symptoms of infection including itching, swelling, fever or having difficulty in urination. Also the nurse should advise the patient when to return to their normal daily life activities. (Rothrock & Clark, 2010).

Significance of the study

From the researcher's clinical experience it has been observed that patients undergoing inguinal hernia

repair need knowledge about surgery and also need to know how to deal postoperatively with the surgery.

In the Middle East it is difficult to estimate incidence and prevalence of inguinal hernia. In 2005, it was estimated that in Egypt about 240,000 patients have inguinal hernia. In Assiut University hospital through year 2014, it was found that there were 400 patients performed inguinal hernia repair and that is according to Assiut University hospital records.

The aim of the study

The aim of this study was to assess the effect of nursing guidelines on patients undergoing inguinal hernia repair through;

- Assessing patient's knowledge about inguinal hernia repair.
- Developing nursing guidelines for patients undergoing inguinal hernia repair based on need assessment.
- Evaluating effect of nursing guidelines on patient's outcomes.

Hypothesis

Nursing guidelines will have a positive effect on patients undergoing inguinal hernia repair regarding their knowledge and postoperative complications.

Subjects & Method

Research design

Quasi-experimental design was utilized in this study.

Setting of the study

The study was conducted in the general surgical departments at Assiut University hospital.

Study variables

The independent variable in this study was the developed nursing guidelines for patients undergoing inguinal hernia repair, while the dependent variables were the patients' knowledge as well as the outcomes of patients undergoing inguinal hernia repair.

Study subjects

Sample

A purposive sample of (60) adult male patients who are admitted in general surgical departments was obtained. Those patients were divided equally into two groups, study and control group (30) patient for each. Those patients were fulfilling the following criteria:

Inclusive criteria

- Adult conscious patients.
- Male patients.
- Patients free from chronic illness.

Study tools

There are three tools were utilized to collect data for this study:

Tool I: "Interview questionnaire sheet" for patients:

Interview questionnaire sheet was developed by the researcher, after extensive review of the relevant literature and consulting expertise in this area, it was designed in Arabic language.(Annex I)

The interview questionnaire sheet was consisted of four parts as the following:

Part I: It includes the demographic characteristics (e.g., age, occupation, marital status, level of education, residence, smoking and passive smokers).

Part II: It is used to assess patient's knowledge about inguinal hernia (definition, cause, contributing factors, symptoms, methods of treatment, and complications of inguinal hernia) and about inguinal hernia repair (definition of inguinal hernia repair, diagnostic study, types of anesthesia, and complications of inguinal hernia repair). The second part was assessed twice pre and post the operation and after given the patient the developed guidelines in the study group.

Scoring system

The interview questionnaire sheet (part II) was administered by the researcher to the patients for answering all its components, the total number of questions was (25). The total number of score was (62). Each right answer was given one score and zero for wrong answer, definition given two score because it is divided into two parts. Those who obtained less than 60% were considered unsatisfactory level while those who obtained more than 60% were considered satisfactory level.

Nursing guidelines for patients undergoing inguinal hernia repair:

The content of nursing guidelines were developed by the researcher based on reviewing the current national and international literature to maintain health of patients and reduce postoperative complications as well as the patient's needs which were identified after assessing their knowledge. Nursing guidelines included: preoperative care, postoperative care and home instructions.

Tool II:- "Patients' evaluation sheet"

This tool was designed by the researcher to assess the outcomes of patients undergoing inguinal hernia repair including postoperative complications that might develop related to the inguinal hernia repair (e.g. pain, bleeding, infection at the wound site, swelling of the scrotum, groin numbness, bruising, hematoma, seroma formation at the surgery site, orchitis and difficulty during urination. The evaluation sheet applied by the researcher before patient's discharge. (Annex II).

Methods of data collection

Ethical approval

- An official permission to conduct the study was obtained by the researcher from the responsible hospital authorities of the general surgical departments at Assiut University Hospital. At initial interview, each patient was informed with the purpose of the study. The investigator emphasized that the participation is voluntary and confidentiality and anonymity of subjects will be assured through coding of all data.
- This study approved by research ethical committee of faculty of nursing at Assiut University.

Data Collection

- A review of current and past, local and international related literature in the various aspects of the problems using books, articles, periodicals, and magazines was done. The purposed study setting was assessed for the numbers of patients in the general surgical departments at Assiut University Hospital.
- A pilot study was implemented on 10% of the sample. The purpose of this pilot study was of 2 folds: first to ensure the clarity of designated study tools. Second, to examine the utility of the designed tools and identify any difficulties or problems needed to be handled before receiving it.
- Confidentiality of the data was asserted. The aim of the study was explained to patients by the researcher. The right to refuse to participate in the study was emphasized to the patients.
- The researcher collected the data from patients by receiving tool (I & II).
- Length of time was not exactly detectable, because patients are different in their conditions and ability of understanding. One of the family members was present in the session.

Content validity of the data collection tools

Panel of five experts to test the content validity of the tools was including 3 lecturer of Medical-Surgical Nursing, Adult Nursing Department from Assiut University and 2 physicians in General Surgery Department at Assiut University Hospital, they reviewed the tools for relevance, comprehensiveness, understanding and applicability for its purpose. Minor modifications were required. Then final form of the tool was designed and tested for reliability by using internal consistency for the tools. Experts in fields of medicine and nursing checked the content validity and reliability of the tools and corrections were carried out accordingly

Procedure

An official letter was issued from the Dean of the Faculty of Nursing to the Head of the General

Surgical departments soliciting the necessary approval to conduct the present research.

Once permission was granted to proceed with the proposed study, the investigator initiated data collection.

Data were collected from general surgical departments at Assiut University Hospital during the period from May /2015 to February/2016. The tools filled through interviewing. This study was carried out at morning and afternoon shifts.

Names of patients who are admitted to general surgical departments in Assiut University Hospital were obtained from the head nurses of the departments who helped the researcher work both during data collection and during patients care. As well an official permission from the patients was granted. Then patients were divided into both control and study group.

The study and control groups were visited by investigator to initiate line of communication, explain the nature and purpose of the study and fill out the

first tool (pre-test). The control group were exposed to routine nursing care, while the study group were exposed to the developed nursing guidelines. Then demonstration and return demonstration were done about preoperative care, postoperative care and home instructions.

Post-test was done for the patients in the study group using the same tool I while tool

II (patient's evaluation sheet) was applied to the both study and control group before discharge.

Statistical analysis

A data entry file, using EXCEL 2007 program, was prepared. Data was analyzed using SPSS (version 19). The frequencies, percentages, mean and standard deviation were computed. Chi-square test was used to compare quantitative variables between groups. Mann-Whitney test was used as the test of significance to compare quantitative data between groups. Spearman correlation was done to measure correlation between quantitative variables.

Results

Table (1): Comparison between the study and control groups as regard demographic variables.

Variables	Study(n= 30)		Control(n= 30)		P-value
	No.	%	No.	%	
Age: (years)					
< 30 years	11	36.7	5	16.7	0.080
≥ 30 years	19	63.3	25	83.3	
Occupational status					
Office work	5	16.7	10	33.3	0.136
Manual worker	25	83.3	20	66.7	
Marital status					
Single	7	23.3	3	10.0	0.099
Married	23	76.7	24	80.0	
Widow	0	0.0	3	10.0	
Level of education					
Illiterate	9	30.0	18	60.0	0.077
Read and write	9	30.0	5	16.7	
Primary school	3	10.0	1	3.3	
Secondary school	8	26.7	3	10.0	
High school	1	3.3	3	10.0	
Residence					
Urban	9	30.0	5	16.7	0.222
Rural	21	70.0	25	83.3	
Smoking					
Smoker	20	66.7	17	56.7	0.426
Non-smoker	10	33.3	13	43.3	
Sitting with smokers in home or work: (passive smokers)					
Yes	27	90.0	20	66.7	0.028*
No	3	10.0	10	33.3	

Statistical significant difference (P< 0.05)

Table (2): Comparison between the mean knowledge scores obtained by study and control group about inguinal hernia as a disease and its surgical management.

Variables	Study		Control (n= 30)	P-value ¹	P-value ²
	Preoperative (n= 30)	Before discharge (n= 30)			
	Mean ± SD	Mean ± SD	Mean ± SD		
Meaning of inguinal hernia	0.07 ± 0.25	1.30 ± 0.60	0.13 ± 0.35	0.000*	0.393
Cause of inguinal hernia	0.00 ± 0.00	0.43 ± 0.50	0.03 ± 0.18	0.000*	0.317
Factors or habits can lead to inguinal hernia	0.47 ± 0.73	2.20 ± 1.06	0.87 ± 0.78	0.000*	0.122
Symptoms of inguinal hernia	1.70 ± 0.65	2.17 ± 0.46	1.77 ± 0.68	0.002*	0.713
Methods of treating inguinal hernia	0.70 ± 0.47	1.00 ± 0.00	0.83 ± 0.38	0.001*	0.226
Complications that may occur if inguinal hernia is not repaired	0.30 ± 0.53	1.80 ± 0.61	0.33 ± 0.55	0.000*	0.785
Tests should be done before the operation	3.13 ± 0.51	3.70 ± 0.47	3.33 ± 0.61	0.000*	0.143
Types of anesthesia	0.50 ± 0.82	1.87 ± 0.43	0.40 ± 0.67	0.000*	0.805
Complications may occur after inguinal hernia repair surgery	0.40 ± 0.67	2.10 ± 0.76	0.30 ± 0.47	0.000*	0.721

P-value 1 : The relationship between pre-operative + before discharge tests in the study group.

P-value 2: The relationship between the both groups in the preoperative test.

Table (3):- Comparison between level of knowledge of the study and control group about inguinal hernia disease and its surgery using true and false questions.

Variables	Study				Control (n= 30)		P-value ¹	P-value ²
	Preoperative (n= 30)		Before discharge (n=30)		No.	%		
	No.	%	No.	%				
It is necessary that the patient trying to reduce the weight before the operation								
False	13	43.3	1	3.3	19	63.3	0.000*	0.121
True	17	56.7	29	96.7	11	36.7		
Inguinal hernia is a disease transmitted genetically								
False	10	33.3	8	26.7	4	13.3	0.573	0.067
True	20	66.7	22	73.3	26	86.7		
It is possible for patient to disregard the hernia and lives without treating it								
False	6	20.0	0	0.0	1	3.3	0.031*	0.108
True	24	80.0	30	100.0	29	96.7		
The only solution for the treatment of inguinal hernia is the surgery								
False	1	3.3	0	0.0	0	0.0	0.313	0.313
True	29	96.7	30	100.0	30	100.0		
Inguinal hernia may be recurrent								
False	2	6.7	0	0.0	6	20.0	0.472	0.255
True	28	93.3	30	100.0	24	80.0		
It is important for the patient to maintain his body weight after surgery								
False	7	23.3	2	6.7	11	36.7	0.148	0.260
True	23	76.7	28	93.3	19	63.3		
Patient can return to hard work two weeks after surgery								
False	10	33.3	0	0.0	8	26.7	0.001*	0.573
True	20	66.7	30	100.0	22	73.3		
You must stop smoking at least 8 hours before the surgery								
False	13	43.3	5	16.7	18	60.0	0.024*	0.196
True	17	56.7	25	83.3	12	40.0		

P-value 1 : The relationship between pre-operative + before discharge tests in the study group.

P-value 2: The relationship between the both groups in the preoperative test.

Table (4): Comparison between the level of knowledge of the study and control group about pre, postoperative education and home guidelines.

Variables	Study				Control (n= 30)		P-value ¹	P-value ²
	Preoperative (n=30)		Before discharge (n=30)					
	No.	%	No.	%	No.	%		
Preparations that should be done before surgery								
Don't know	7	23.3	0	0.0	5	16.7	0.016*	0.519
Stop smoking at least 48 hours before the surgery	0	0.0	9	30.0	3	10.0	0.004*	0.236
Practice simple chest exercises before the surgery	0	0.0	23	76.7	0	0.0	0.000*	--
Taking all preoperative prescribed medications	0	0.0	11	36.7	6	20.0	0.000*	0.031*
Fasting 8 hours before the surgery	23	76.7	29	96.7	25	83.3	0.058	0.519
Needs to be done immediately after surgery								
Don't know	29	96.7	0	0.0	29	96.7	0.000*	--
Start moving the feet and legs on bed as soon as possible	0	0.0	20	66.7	0	0.0	0.000*	--
Sitting on the bed or chair most of the time	0	0.0	17	56.7	0	0.0	0.000*	--
Doing deep breathing exercise every hour	0	0.0	14	46.7	0	0.0	0.000*	--
Walking as soon as possible.	1	3.3	23	76.7	1	3.3	0.000*	--
Total smoking cessation.	0	0.0	3	10.0	0	0.0	0.236	--
Doing mild exercises such as bending the trunk over the legs in a standing position	0	0.0	3	10.0	0	0.0	0.236	--
Guidelines must be followed after discharge								
Don't know	24	80.0	0	0.0	22	73.3	0.000*	0.542
Follow up and wound care	3	10.0	24	80.0	5	16.7	0.000*	0.704
Regulating the day meals	1	3.3	4	13.3	1	3.3	0.350	--
Taking prescribed medications at the definite time	1	3.3	15	60.0	1	3.3	0.000*	--
Keep walking	0	0.0	8	26.7	0	0.0	0.008*	--
Doing progressive muscle relaxation and deep breathing exercises	0	0.0	1	3.3	0	0.0	0.313	--
Stop smoking	0	0.0	4	13.3	1	3.3	0.121	0.313
Increase intake of water daily and eating fruits and vegetables	0	0.0	20	66.7	1	3.3	0.000*	--
Avoid lifting heavy objects at least 6 months after the surgery	2	6.7	16	53.3	3	10.0	0.000*	0.640

P-value 1 : The relationship between pre-operative + before discharge tests in the study group.

P-value 2: The relationship between the both groups in the preoperative test.

Table (5): Correlation between patients' knowledge score in study and control group and their demographic characteristics.

	Study group		Control group
	Preoperative	Before discharge	
	Mean ± SD	Mean ± SD	Mean ± SD
Age: (years)			
<30 years	12.55 ± 2.88	24.82 ± 2.27	15.60 ± 3.78
≥ 30 years	13.58 ± 3.01	23.58 ± 2.09	13.40 ± 2.36
P-value	0.365	0.141	0.097

	Study group		Control group
	Preoperative	Before discharge	
	Mean \pm SD	Mean \pm SD	Mean \pm SD
Occupational status			
Office work	14.80 \pm 2.68	24.00 \pm 1.58	15.80 \pm 3.01
Manual worker	12.88 \pm 2.95	24.04 \pm 2.34	12.75 \pm 1.89
<i>P-value</i>	0.189	0.971	0.002*
Marital status			
Single	12.29 \pm 2.69	24.43 \pm 2.30	15.00 \pm 2.65
Married	13.48 \pm 3.03	23.91 \pm 2.21	13.67 \pm 2.63
Widow	--	--	13.33 \pm 4.04
<i>P-value</i>	0.358	0.597	0.707
Level of education			
Illiterate	11.67 \pm 2.12	22.78 \pm 1.30	12.83 \pm 2.04
Literate	13.86 \pm 3.05	24.57 \pm 2.31	15.17 \pm 3.04
<i>P-value</i>	0.061	0.039*	0.018*
Residence			
Urban	14.11 \pm 3.33	23.22 \pm 1.72	15.80 \pm 2.86
Rural	12.81 \pm 2.77	24.38 \pm 2.33	13.36 \pm 2.53
<i>P-value</i>	0.276	0.192	0.064
Smoking			
Smoker	13.30 \pm 3.10	23.90 \pm 1.94	14.59 \pm 3.06
Non-smoker	13.00 \pm 2.79	24.30 \pm 2.75	12.69 \pm 1.70
<i>P-value</i>	0.798	0.648	0.055

Table (6): Comparison between study and control group regarding complications after surgery.

Variables	Study(n= 30)		Control(n= 30)	
	No.	%	No.	%
Pain	2	6.7	2	6.7
Bleeding				
Internal bleeding	0	0.0	0	0.0
External bleeding	0	0.0	0	0.0
Infection at the wound site				
Pain of the surgery site	1	3.3	2	6.7
Bad odor	0	0.0	1	3.3
Redness at the site	1	3.3	1	3.3
Pus at the site	0	0.0	2	6.7
Swelling of the scrotum				
	0	0.0	0	0.0
Groin numbness				
	0	0.0	0	0.0
Bruising				
Pain of the surgery site	0	0.0	0	0.0
Dark red color of the skin	1	3.3	0	0.0
Hematoma				
Pain of the surgery site	0	0.0	0	0.0
A red/ blue color of the skin	0	0.0	0	0.0
Seroma formation at the surgery site				
Swelling	1	3.3	1	3.3
A tumor like mass	0	0.0	0	0.0
Orchitis				
Pain	0	0.0	0	0.0
Swelling of one or both testicles	0	0.0	0	0.0
Fever	0	0.0	0	0.0
Sensation of heaviness in the affected area	0	0.0	0	0.0
Difficulty during urination	0	0.0	0	0.0

Table (1): This table shows that the majority of both study and control group were aged above 30 years old, married and manual workers. As regarding residence the majority of both study and control group were from rural areas and smokers with no statistical significant difference between the both group. The only statistical significant difference between both group was in the items related to sitting with smokers in home or work.

Table (2): This table shows that there was statistically significant difference between preoperative (pre-test) and before discharge (post-test) in the study group in all the items While both study and control group were symmetrical in preoperative with no statistical significant difference between them.

Table (3): This table shows that there was statistically significant difference between (preoperative) and (before discharge) knowledge in the following items (It is necessary that the patient is trying to reduce the weight before the operation, It is possible for the patient to disregard the hernia and lives without treating it, patient can return to hard work 2 weeks after surgery, you must stop smoking at least 8 hours before the surgery).

While both study and control group were symmetrical in preoperative with no statistical significant difference between them.

Table (4): This table shows that there was statistically significant difference between (preoperative) and before discharge in study group in most of the items. While there was only one statistical significant difference between the study and control group regard (Taking all preoperative medications).

Table (5): This table shows that there was statistical significant difference in two items (occupational status in control group, and level of education in both study and control group).

Table (6): This table shows that in the study group (6.7%) complain of pain and (3.3%) complain of infection at the wound site, bruising and seroma formation at the surgery site, while in control group (6.7%) complain of pain and infection at the wound site.

Discussion

In agreement with the present study, **Quintas et al., (2000)** found that people of any age can develop inguinal hernias, indirect hernias can appear before age 30 but the direct hernias which are much more common appear in men older than age 40 because the muscles of the abdominal wall weaken with age and this agrees with our results in which (73.3%) of patients were aged above 30 years.

The present study found that most of the patients in the study group (83.3%) and control group (66.7%) are manual workers this results agreed with **Richardson, (2010)** a cohort analysis study which found that the risk of inguinal hernia repair increased with increasing cumulative exposures to daily lifting activities (total loads, frequent heavy lifting) and prolonged standing or walking at work.

In our study, it was observed that the incidence of inguinal hernia is highest among the group engaged in hard manual work and this agrees with **Fitzgibbons et al., (2005)** which suggested that inguinal hernias appears to occur more frequently in heavy laborers.

Jones et al., (2001) in his study "Return to work after inguinal hernia repair" found that (79%) of the patients were married males and this agree with our study in which married patients were (78%) of the patients.

Jones et al., (2001) the study reported that (77%) of the patients are college-educated patients and this disagree with our study in which only (6.67%) were college-educated patients.

Read et al., (2002) reported that there is an association between cigarette smoking and groin hernias and this agrees with the current study in which the majority of the patients in control group (56.7%) and study group (66.7%) are smokers.

Mohamed et al., (2012) in his study "Evaluation of patient's understanding and recall of the consent process after open inguinal hernia repairs" found that (67%) of the patients felt that the surgery is the only way for treating hernias while in our study (85%) of patients believe that the surgery is the only way for treating inguinal hernia.

A similar study conducted in outpatients clinics at El- Demerdash Surgical Hospital at Ain Shams University by **Hegazy et al., (2012)** reported that patients had unsatisfactory level of knowledge about disease pre guidelines, and significant improvement in patients' knowledge regarding post and follow up assessment.

Moore, (1995) asserted that providing patient with the information required concerned with their condition, the surgery and the recovery improving their level of knowledge about self-care to prevent and manage post-surgical discomfort and to decrease / reduce hospital readmission and morbidity and mortality rate and this agree with our study results which show that there was improvement in the level of knowledge about disease and care in the study group after given the nursing guidelines.

As for laboratory investigations and diagnostic procedures that are necessary for diagnosis and evaluating the patient's medical condition and his readiness for surgery, it was noticed that there were

no statistical significant difference between the study and control group. In addition, routine laboratory investigations was done for the majority of the patients in the both control and study groups and the necessary diagnostic procedures according to the patient's condition were performed.

As regard to patient's knowledge about, post-operative complications the present study showed that statistical significant difference between pre-test and post-test in study group. These results agreed with **Thomas, (2012)** who carried out a study to investigate the impact of a designed nursing teaching these study found a highly significant difference between levels of knowledge in pre-test and post-test.

In agreement with this, a study conducted by **Hussan & Mohamed, (2012)** in the outpatient medicine clinics in EL-nasr Health insurance and Zagazig University Hospitals reported that, the implementation of the nursing guidelines program led to significant improvements in patient knowledge at the post-test.

The present study showed that there was statistical significant difference between pre-test and post-test for study group regarding practices toward patient's activity. It included breathing and coughing exercise, early ambulation, leg exercise, pain control. This finding was supported by **Kilber, (2012)** who reported that all members of the health care team agree that consistent, early and frequent post-operative ambulation improves both patient and provider satisfaction and has decreased post-surgery paralytic ileus, improved patient progress and facilitated appropriate patient discharges.

According to **Debacker et al., (2003)** which recommended that nutritional information should be given to optimize wound healing, maintain ideal body weight and reduce cholesterol levels if elevated. They should also eat plenty of fresh fruit, vegetables and cereals and this agrees with our present study in which patients level of knowledge regarding nutrition pretest was none (0.00%) while in post-test it was satisfactory (66.6%).

The present study revealed that, before implementation of developed nursing guidelines, the patient did not have any background or information about preoperative, postoperative and discharge instructions about inguinal hernia repair. Post implementation there were significant improvement in patient's level of knowledge regarding inguinal hernia surgery preoperative, postoperative and discharge instructions.

Mohamed et al., (2012) reported that (67%) of the patients answered right about avoid lifting heavy objects, and this agrees with our study in which

(53%) of the patients answered right about avoid lifting heavy objects at least after six months.

Rosen et al., (2011) reported that the main results of his study revealed that patients who undergone a day case surgery may experience persistent symptoms and other discomfort, interfering with daily functions after surgery for up to three months so we should continue to develop new care plans and guidelines that may lead to less suffering for patients and this agree with our results which revealed that there was statistical significant difference between study and control group in the level of knowledge about disease and care needed

In a study by **Shikh et al., (2009)** 5% of the patients developed surgical site infection, while **Amid et al., (1996)** reported less than 2% wound infection **Gianeta et al., (1997)** reported that 0.7% of the patients developed wound infection. In our study there were (3.3%) of the study group developed infection at the wound site while (6.7%) among the control group.

The current study showed that a great effect of developed nursing guidelines on minimizing the occurrence of postoperative wound infection for the study group. This may be related to the instructions that was given to patients including importance of using sterile dressing, supporting the wound during cough, early ambulation, balanced nutrition and the use of prophylactic antibiotics according to prescription. These results in the same line with **(Van Dam, 2013)** that wound assessment and drainage under aseptic technique can enhance wound healing process.

Koninger et al., (2004) reported that the incidence of chronic pain that occurs after inguinal hernia repair is ranged from 0.03 to 31% and this large range maybe reflects heterogeneity of surgical approaches and techniques, duration of follow up and the experience of the surgeon. This agrees with our results which reported that (6.7%) of both groups complain of persistent pain after surgery.

In our study patients in study group have a higher level of postoperative recovery and this agrees with **Louise et al., (2007)** as in his study approved that the patients who received preoperative teaching have higher levels of recovery.

In this regard, **Abdel hammed et al., (2012)** supported these result when reporting that, a higher statistically significant difference between patient's knowledge score pre and post exposure to the nursing designed protocol conducted for myocardial infarction patients, and revealed that, there was significant statistical correlation between educational level and mean knowledge scores among both (control and study groups). Also this agree with my study results which show that there

was statistically significant difference between patients' knowledge score pre and post exposure to the designed nursing guidelines.

After implementing of the developed nursing guidelines, the study group had a highly significant improvement than those of the control group in relation to all items of knowledge. In this respect, **Jennifer (2002) & Charlson et al., (2006)** found that, applying nursing intervention postoperatively plays a major role in patients' improvement in relation to knowledge and recovery.

The current study answered the research hypothesis, where the mean knowledge score of patients who received instructions about disease (inguinal hernia) and inguinal hernia surgery was higher than the mean knowledge scores of a control group also the incidence of postoperative complications was lower in patients who receive the developed nursing guidelines than those who didn't receive it. So the developed nursing guidelines affect positively on the patient level of knowledge and complications.

So, it can be concluded that results from this study and other studies strongly suggest that teaching should be approached in organized manner, under pinned by sound principles of teaching and learning using teaching plans where appropriate to ensure that no vital aspects are omitted. Also, patient who undergo inguinal hernia repair surgery need extensive teaching and counseling to promote recovery and avoid complications.

Conclusions

Based on the results of the present study, it can be concluded that, level of Knowledge about the disease, surgery and care for patient's undergoing inguinal hernia repair was higher than who didn't take any nursing guidelines. Also level of complications in patients who get nursing guidelines was slightly lower than those who didn't take any developed nursing guidelines.

Recommendations

Surgical inguinal hernia repair is one of the most commonly performed operative procedures so great care should be given to those patients.

- Pamphlets and simple illustration booklet should be available for illiterate patients.
- Each patient is given booklet include nursing guidelines about inguinal hernia disease, preparations before surgery, after surgery and home instructions.
- Establishment of health education program in general surgery departments at Assiut University

Hospital to provide health teaching for patients about such operation.

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