

## Efficacy of Implementing Nursing Care Protocol on Total Hip Replacement Patient's Outcome in Orthopedic Department At Tanta University Hospital

Monera. B.A. El Shemey<sup>1</sup>, and Om Ebrahiem A. E. Elsaay<sup>2</sup>

<sup>1</sup>Medical Surgical Nursing, Faculty of Nursing, Tanta University.

<sup>2</sup>Medical Surgical Nursing, Faculty of Nursing, Tanta University.

**Abstract:** Hip surgeries such as total joint replacement require the surgeon to open the hip joint capsule and cut some of the ligaments around the hip joint. Until these ligaments heal, the hip is at risk of dislocating. You need to follow special precautions about hip positions and movements to avoid after surgery in order to keep the hip safe.

**This study aimed to** evaluate the efficacy of implementing nursing care protocol on total hip replacement patients outcome in Orthopedic Department At Tanta University Hospital. The sample comprised from Patients and nurses .A) convenience sample of 60 Adults ,hip replacement patients divided into three groups .Group I: 20 Adults , this group was managed by the routine hospital care. Group II: 20 Adults total, hip replacement patients was managed by the protocol of care. Group III: 20 Adults total, hip replacement patients was observed as a follows up group .B) Nurses :All available (40) nurses who are working in orthopedic department and caring with those hip replacement patients **Tools:** five tools were used for data collection: Tool (1) Structured Interview questionnaires sheet .Tool (2) :Nurse Observational Checklist. Tool (3) Patient structured interview questionnaire sheet .Tool (4) Patient Observation Checklist. Tool (5) lower extremity functional scale (LEFS). Data were collected over a period of 6 months from August 2014 to the end of January 2015.

**Result** revealed that There was a significant difference between nursing performance and knowledge throughout the period of the study. Circulatory, neurological, musculoskeletal and local complications were significant differences and improvement between patients control group , study group 1 and study group 2.

**Conclusion& Recommendations** revealed that Protocol of care education was effective and successfully enhancing orthopedic nurses `knowledge and clinical practices for total joint replacement. Educational unit regarding new intervention for caring with total hip replacement patients.

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**Key words:** Nursing Care Protocol , Total Hip Replacement.

### I. Introduction

Total hip replacement (THR) became one of the most popular procedure in orthopedic surgery and the number of patients requiring THR continuously increase due to demographic changes and life style trends <sup>(1,2)</sup>. The hip is a ball and socket joint formed by the head of the femur or thigh bone sitting into the acetabulum or socket in the side of the pelvis. Normally the surfaces are covered by a smooth substance known as articular cartilage or gristle. Due to arthritis, part or all of this cartilage may wear away exposing the underlying bone, thus causing roughening of the joint surfaces, stiffness and painful movement <sup>(3,4)</sup>.

A limp will usually develop and the leg may become shorter and also thinner due to muscle wasting, replacing the painful, arthritic joint with an artificial joint gives the joint a new surface that moves smoothly without causing pain. The goal is to help people return to many of their activities with less pain and with greater freedom of movement <sup>(5, 6)</sup>. According to , Jacob M ( 2013)<sup>(7)</sup> the incidence of Total hip replacement is increasing and is often associated with additional complications , Currently, more than 250,000 cases are performed per year in the US, the figure is expected to double in the next 20 years . In Tanta university Hospital during the period of 2013- 2014, 250 patients were admitted for Total hip replacement (THR) in the Orthopedic Department <sup>(8)</sup>.

Singh and Lewallen (2009) <sup>(9)</sup> Stated that ,the most common reason for hip replacement surgery is the wearing down of the hip joint that results from osteoarthritis. Other conditions, such as rheumatoid arthritis (a chronic inflammatory disease that causes joint pain, stiffness and swelling), a vascular necrosis (loss of bone caused by insufficient blood supply), injury and bone tumors also may lead to breakdown of the hip joint and

the need for hip replacement surgery. Other causes are long-term steroid use, congenital dislocation of the hip and ankylosing spondylitis, an inflammatory joint disease. Also THR is a very successful procedure to solve the effects of degenerative pathologies of the human hip joint<sup>(10)</sup>.

Meulen and Lewsey (2007)<sup>(11)</sup> Reporting that, the arthritic conditions induce an increased request for total joint replacement, being the second reason for female disabilities and the fourth in males, mainly in economically developed countries. While people over 50 years will double their number in the next 10 years, so will increase the incidence for the osteoarticular pathology. Dowsey et al (2010)<sup>(12)</sup> pointed that, the hip replacement surgery can be performed safely on early adults and over 65 years old, providing excellent pain relief and improved functional outcome. Nurses are well placed to undertake patient assessment so that significant issues can be addressed, such as the need to patient expectations are realistic and that any self-efficacy deficits regarding postoperative rehabilitation can be remedied through education. Preparation for discharge after surgery should be before admission and one study suggests that age, gender, walking ability, previous community support and social circumstance are predictors of extended inpatient rehabilitation after THR<sup>(13)</sup>.

Rotter et al (2010)<sup>(14)</sup> stated that, the Successful recovery from total hip replacement requires not only proper surgical technique but also appropriate nursing care during the pre and immediate recovery period. Sullivan and Savage (2008) considered that, the nursing priorities for patients recovering from hip replacement surgery are the management of pain and discomfort, impaired mobility and anxiety relating to knowledge deficit of the rehabilitation process<sup>(15)</sup>.

Gandhi, et al (2010)<sup>(16)</sup> pointed out that, the previous research has been focused on the experiences of the patients in relation to the physical elements such as pain management and comfort promotion and interpersonal elements such as professional characteristics and relational capacity. A third category comprised a combination of the above, relating to nurses' competencies patient monitoring, patient safety, holistic care and ward environment. Nurses contribute to meeting such needs through pain management comfort promotion, professional interpersonal relations, competent and holistic practice, patient monitoring and safety promotion.

Total hip replacement complications can be catastrophic and life threatening, the complications of total hip replacement can be divided into early complication as, Nerve Injury or damage, Blood or Pulmonary Embolism (PE), vascular Injury or damage, Pain, blood clot formation, bleeding, deep Vein Thrombosis (DVT), intra-operative or Post-operative Fracture and late as discrepancy in Leg Length, dislocation of Hip (dislocation) Loosening or Wear of the Prosthesis, early infection or late Infection, heterotopic ossification, Stroke, Sudden death<sup>(17-24)</sup>.

Montin, et al (2002)<sup>(17)</sup> found that patients reported of post-operative pain following hip replacement surgery more intense than expected, yet they were happy with pain management. While pain made mobility difficult, patients considered it important to do the exercises in accordance with the physiotherapy regime. Adequate pain control following joint replacement surgery is considered crucial for early mobility and for the prevention of complications. Judge et al (2010)<sup>(19)</sup> pointed out that, the client who learns and practices moving techniques before surgery can use them more effectively in the postoperative period. Provide or reinforce teaching of postoperative exercises specific to the joint on which surgery is to be performed. Exercises are prescribed postoperatively to strengthen muscles providing joint stability and support, prevent muscle atrophy and joint contractures; and prevent venous stasis and possible thromboembolism. Teach or reinforce post discharge exercises and activity restrictions. Emphasize the importance of scheduled follow-up physician visits. Exercises are prescribed and activities are resumed gradually to protect the integrity of the joint replacement and prevent contractures<sup>(19,20)</sup>.

Hip surgeries such as total joint replacement require the surgeon to open the hip joint capsule and cut some of the ligaments around the hip joint. Until these ligaments heal, the hip is at risk of dislocating. You need to follow special precautions about hip positions and movements to avoid after surgery in order to keep the hip safe<sup>(16, 21)</sup>. The presence of an 'engaged' nurse was portrayed as a positive experience by the patients recovering after hip replacement surgery in a phenomenological study by Kralik et al., (1997)<sup>(22)</sup>. The qualities characteristics of an 'engaged' nurse are acknowledgement of the physical, emotional, spiritual and environmental dimensions of the individual; uses confident, firm and supportive physical touch; displays an understanding of the patients' situation and preserves patients' dignity. Consulting with patients about the planned nursing care provided the patient with a sense of control<sup>(17, 22, 23)</sup>. Informing the patients of the plan of care for the day was important because they were eager to understand what was expected of them. Female patients felt particularly vulnerable when feeling unwell and unsafe when mobilizing alone. Close monitoring by nurses therefore comforted patients<sup>(18, 25)</sup>.

Accurate assessment of patient outcome is critical in the evaluation of responsiveness to treatment interventions. Lieberman et al. reported large differences between patients' and physicians' evaluations of outcomes after THR, a disparity that was greatest when patients reported pain or poor satisfaction. This evidence highlights the need for outcome tools that reflect patients' goals<sup>(26, 27)</sup>.

## **II. Aim of the study:**

To evaluate the efficacy of implementing nursing care protocol on total hip replacement patient's outcome in orthopedic department at Tanta University Hospital

### **Research hypothesis**

- 1-The application of nursing care protocol will have an impact on reducing incidence rate of total hip replacement complications
- 2-The Orthopedic department nurses will have higher knowledge and performance score related to total hip replacement.

### **Research design:**

The present study utilized A quasi- experimental research design.

### **Setting:**

This study conducted in the Orthopedic Departments at Tanta University Hospitals

### **Subjects**

The sample comprised from patients and nurses.

#### **A) – Patients:**

A convenience sample of 60 Adults, hip replacement patients divided into three groups fulfilling the inclusive criteria of both sexes, was taken .The subjects of this study were selected according to the following criteria.

#### **Inclusions Criteria:-**

-Adult patient, both sexes, one or both hip,

#### **Exclusions Criteria:**

- Any cognitive impairment of the patient by history or during explanation of consent procedure.
- Previous history of stroke affecting the legs.
- Very obese patient

**Group I:** 20 Adults, total hip replacement patients fulfilling the inclusive criteria of both sexes, was taken and this group was managed by the routine hospital care.

**Group II:** 20 Adults total, hip replacement patients fulfilling the inclusive criteria of both sexes, was taken and this group was managed by the protocol of care.

**Group III:** 20 Adults total, hip replacement patients fulfilling the inclusive criteria of both sexes, was taken and this group was observed as a follows up group.

#### **B) Nurses:**

A (40) nurses who are working in orthopedic department and directly contact and caring with those hip replacement patients regardless of their age, years of experience , and level education were included in the study

## **III. Data collection tools:**

Five tools were used for data collection they accomplished after reviewing the recent literature<sup>(26)</sup> .

**Tool (1) Structured Interview questionnaires sheet:** It was comprise two parts as follows:

**Part I: Socio-demographic data as** ( Personal data): code, age, marital status, level of education, years of experience outside orthopedic department, years of experience in orthopedic department, previous formal or informal education as (in-service training program) related to hip replacement patient care .

**Part II:** It comprises (54) questions about nurses knowledge related to hip replacement patients and their protocol of care. Nurses knowledge related to definition of hip replacement ,types, causes , preoperative care , immediate postoperative care ,immediate and late complication, time of early ambulation, neurovascular assessment , types of exercise, long term plan and discharge plan .

**Tool (2): Nurse Observational Checklist:** Observational checklist for nurses practicing hip replacement protocol of care .This tool was developed by the researcher as a monitoring and an evaluative tool for nurse's performance related to protocol of care application. This protocol was including the following strategies :

- 1- Preoperative educational care that includes :assess the patient's knowledge and understanding of the planned operative , obtain a nursing history ,physical assessment, ROM, explain necessary postoperative restrictions, teach how use the overhead trapeze for changing position ,teach respiratory hygiene ,discuss postoperative pain

control ,and provide preoperative preparation such as shower ,skin scrub with antibacterial solution ,administer intravenous antibiotic as order , assess vital signs , arrangement of all lab investigation .

II-Educational immediate postoperative Care that include check vital signs, level of consciousness , assessment the site of operation , assessment of neurovascular status , assessment pain level 0-----10,managing the pain as prescribed after surgery foot pumps or leg compression devices ,to prevent blood clot formation , keep the patient legs separated by wedge ,monitor, incision bleeding ,recording intake and output ,help the patient shift position at least every 2 hrs, help the patient to cough and to breathe deeply, help the patient get out of bed as soon as allowed, pivot turning and toe –touch , Initiate physical therapy and exercise as prescribed for specific joint replaced as :Quadriceps setting ,leg raising ,active and passive exercise, range of motion exercises , prevent hip flexion of greater than 90 degree ,prevent hip adduction of the affected leg , assess the patient for signs of affected joint dislocation,, internal rotation of the affected limb pain, shortening

-Postoperative day one :Early morning blood work and possible blood transfusion, a clear liquid diet will be advanced as tolerated, physical therapy twice a day at your bedside, sit in a chair with the help of the nursing staff or physical therapist ,use the bedside commode or walk to the bathroom with assistance, as needed.

- Postoperative Day two: Early-morning blood work and possible blood transfusion, Foley catheter, IVs, drain and ice bag will be discontinued, Physical therapy twice a day in the rehabilitation, gym, where you will learn to walk with a walker and other techniques to improve your mobility, an occupational therapist will visit once a day to teach you how to use any equipment needed to perform, Continue to sit in the chair twice a day and increase your walking distance daily Medication before your pain level becomes too severe

- Postoperative Day 3: routine care and physical therapy will be given, physical therapy will add car and bathroom transfers to your routine therapy, family members are expected to attend therapy sessions, learn the patient how to assist with transfers and walking, as well as postoperative safety, precautions ,(discharge plans) for when you leave the hospital and complete explanation.

**Tool (3) :Patient structured interview questionnaire sheet:** It comprised two parts as follows:

**Part I:** Socio-Demographic data as: name, age, sex, date of admission , date of operation, occupation, marital status, medical history ,smoker ,body weight ,height, BMI, smoking history , deformity , any other surgery on legs , limiting walking , biggest problem , use assistance devises , previous health teaching program for hip replacement from orthopedic department nurses , media, other.

**Part II:** Socioeconomic level as level of education, family size, family income, crowding index, current medical history.

#### **Tool (4): Patient Observation Checklist**

**Part I:** It comprises (6) items about general complication as circulatory, neurological, respiratory, signs of pulmonary embolism, GIT, urinary and musculoskeletal complications.

**Part II:** It comprises (12) items about local complication related to site of operation as pain ,leg appears , tenderness , skin temperature, drainage from incision , bleeding , signs of blood clots in legs ,signs of infection , signs of dislocation , vascular complication , nerve complications,

#### **Tool (5) lower extremity functional scale (LEFS)<sup>28</sup>**

The LEFS is composed of 20 items each scored on a 5 point adjectival scale with '0' extreme difficulty or unable to perform the activity and '4' no difficulty.<sup>12</sup> The items are summed to produce a total LEFS score, which can vary from 0 to 80. The LEFS has the opposite orientation to the WOMAC with higher total LEFS' scores signifying better lower extremity functional status.

#### **Method**

##### **- Ethical& administration considerations:-**

1-An official permission to carry out the study was obtained from responsible authorities at Faculty of Nursing at Tanta University. Then, the permission was obtained from the hospital administrative authority.

2-The purpose of the study was explained to the nurses and their oral consent to participate was received and those who were willing to participate were given a questionnaire to answer it. They were also assured of their anonymity and the confidentiality of their responses. Data collection extended from August 2014 to the end of January 2015.

3- The purpose of the study was explained to the patients and their consent to participate was received and those who were willing to participate were given a questionnaire to answer it. They were also assured of their anonymity and the confidentiality of their responses

-Field work -:

4- The questionnaire's validity were checked by 5 experts from the Faculty members in Nursing Colleges,

5-Pilot study was conducted on 10% of sample; this number was excluded from the studied sample to identify the obstacles and problems that may be encountered in data collection.

6-Internal consistency reliability (coefficient alpha) was applied = 0.987)

**Data collection**

The questionnaires were distributed to patients. Before the protocol was administered, the patients were thoroughly briefed about the purpose of the study and the data collection process. They were also assured of their anonymity and the confidentiality of their responses

7-The tools filled through interviewing. The study was carried out at morning shift. Each patient was observed directly while performed routine hip replacement care.

8-The questionnaires were distributed to nurses. Before the questionnaire was administered, the nurses were thoroughly briefed about the purpose of the study and the data collection process. They were also assured of their anonymity and the confidentiality of their responses.

9-The tools filled through interviewing. The study was carried out at morning shift. Each nurse was observed directly while performed routine hip replacement care.

10- The LEFS was used to evaluate the functional impairment of a patient with a disorder of one or both lower extremities. It used to monitor the patient over time and to evaluate the effectiveness of an intervention.

10-The application of designed nursing protocol was performed by the researchers, researcher prepared the training places, teaching aids and media (computer, picture, handouts, This was followed by arranging for the teaching schedule based on the contents of the, protocol of care, number of staff involved, time availability,. Also scheduled with them the teaching sessions for both theoretical and practical and the nurses were divided into small groups, each group contains 4 to 5 nurses. Each group of nurses chooses the optimal time for receiving the teaching sessions whenever they have minimal workload. Each group needed 4 sessions. Each nurse obtained a copy of the designed nursing teaching protocol of care; the implementation of the program was done for each group separately. The total duration of the program was 30 hours. Booklet that included all the training contents

Immediately after implementation of the designed protocol of care.

11- The nurses` knowledge and practice had been evaluated by the researcher through filling the tool I part II and tool II. Also, immediately after implementation of the designed protocol of care

**12-Evaluation of the program**

Three assessments were done to the nurses and patients in order to test their Knowledge and practice for nurses and outcomes on the patients. Therefore , tool I part II , tool II ,tool III part I ,II , tool 4 par I and part II and tool 5 were used three times ,before , immediate and two months after program implementation.

**Scoring system of nurse's performance** related to hip replacement protocol of care .

**The nurse's performance ranked as follows:**

Category	Description	Score
Not done	= the step or task not performed	Scored (zero)
Needs improvement	=the step is performed incorrectly or out of sequence or sequence is completely omitted	Scored (1)
Competently performed	= the step or task is performed correctly and in proper sequence but participant does not progress from step to step efficiently.	Scored (2)
proficient	the step or task is performed correctly and in proper sequence the participant progress from step to step efficiently .	Scored (3)

It was considered Not or bad (<30%), Need improvement (≥30% - >65%), Competent (≥65%- <80% ) and proficient (≥80%)<sup>29</sup>

Scoring system for knowledge was 0 for incorrect answer and, 1 for correct but incomplete answer, scoring 2 for correct and complete answers. The total score less than 50% consider poor level of knowledge, The total score from 50%to less than 75% consider fair level of knowledge and the score from 75% to 100%considered good level of knowledge.

**IV. Statistical analysis:**

The analysis was performed using statistical software SPSS version 18.- For quantitative data, the range, mean and standard deviation. For qualitative data, a comparison between one group before and after intervention were calculated was done by using Chi-square test ( $\chi^2$ ). For a comparison between more than two means, the F-value of ANOVA was calculated. Significance was adopted at P<0.05 for interpretation of results of tests of significance. Correlation was done by using person correlation test.

**V. Result**

**Table (1): Distribution of the studied nurses according to their sociodemographic data:**

sociodemographic characteristics		Studied sample (n = 40)	
		N	%
Age (years)	From 20-29	2	5.0
	From 30-39	18	45.0
	From 40-49	18	45.0
	50 and more	2	5.0
Level of education	Diploma of nursing	14	35.0
	Technical institute	10	25.0
	Baccalorated	16	40.0
Job	Nurse	32	80.0
	Supervisor	8	20.0
Years of experience	5-10 years	16	40.0
	More than 10 years	24	60.0
Years of experience in orthopedic	5-10 years	38	95.0
	More than 10 years	2	5.0
Training program in past	Yes	2	5.0
	No	38	95.0

Table (1) Shows distribution of the studied group according to socio-demographic characteristics. Regarding the age distribution of the studied group, the majority of the studied group (90%) aged from( 30-39 (45.0 %) and 40-49 (45.0%) ). Regarding the level of education more than one third of the studied group 16 (40%) has Baccalaureate degree. As regarding years of experience 95% have 5-10 years of experience in orthopedic department, and haven't any past training program.

**Table (2): Mean scores of nurses' knowledge regarding hip joint replacement throughout period of study.**

Items	Mean ± SD			F	P
	Pre-test	Immediate	Follow up		
1. Definition of hip joint.	0.45±0.504	1.90±0.304	1.70±0.464	<b>131.959</b>	<b>&lt; 0.05</b>
2. types of hip joint replacement operation	0.70±0.464	1.90±0.304	1.80±0.405	<b>112.761</b>	<b>&lt; 0.05</b>
3. Causes of hip joint replacement	0.85±0.483	1.90±0.304	1.80±0.405	<b>82.288</b>	<b>&lt; 0.05</b>
4. Nurses roles before operation	0.90±0.304	1.95±0.221	1.80±0.405	<b>126.832</b>	<b>&lt; 0.05</b>
5. Suitable time for patient get out of bed	0.50±0.506	1.95±0.221	1.80±0.405	<b>162.607</b>	<b>&lt; 0.05</b>
6. Immediate nursing care after hip joint replacement	0.90±0.304	1.90±0.304	1.80±0.405	<b>104.382</b>	<b>&lt; 0.05</b>
7. Early complication of hip replacement	0.85±0.362	1.90±0.304	1.80±0.405	<b>104.086</b>	<b>&lt; 0.05</b>
8. Signs of infection in the operation wound	1.00±0.000	1.90±0.304	1.75±0.439	<b>98.027</b>	<b>&lt; 0.05</b>
9. Signs of joint dislocation	0.25±0.439	1.85±0.362	1.80±0.405	<b>203.826</b>	<b>&lt; 0.05</b>

Significant at level  $P < 0.05$

Table (2) Illustrated Mean scores of nurses' knowledge regarding hip joint replacement throughout period of study. There were significant differences and improvement between studied nurses, pre, Immediately and follow up  $P = < 0.05$

**Table (3): comparison of mean scores of nurses' knowledge regarding post operative nursing intervention after hip joint replacement surgery throughout period of study.**

Items	Mean ± SD			F	P
	Pre-test	Immediate	Follow up		
1. Nursing intervention 1 <sup>st</sup> postoperative day	1.00±0.000	1.85±0.362	1.70±0.464	<b>71.356</b>	< 0.05
2. Nursing intervention 2 <sup>nd</sup> postoperative day	1.00±0.000	1.85±0.362	1.65±0.483	<b>65.092</b>	< 0.05
3. Nursing intervention 3 <sup>rd</sup> postoperative day	1.00±0.000	1.90±0.304	1.80±0.405	<b>113.880</b>	< 0.05
4. Nurse role for patient in day of discharge.	0.75±0.439	1.85±0.362	1.75±0.439	<b>86.149</b>	< 0.05
5. Important of exercises for body joint and muscles	0.85±0.362	1.95±0.221	1.80±0.405	<b>124.276</b>	< 0.05
6. Steps of patient ankle exercise and its time	0.70±0.464	1.90±0.304	1.80±0.405	<b>112.761</b>	< 0.05
7. Steps of patient quadriceps exercise and its time	0.25±0.439	1.85±0.362	1.70±0.464	<b>174.014</b>	< 0.05
8. Steps of gluteal muscles exercise	0.35±0.483	1.90±0.304	1.85±0.362	<b>203.983</b>	< 0.05
9. Change patient position in the bed.	0.80±0.405	1.90±0.304	1.80±0.405	<b>105.585</b>	< 0.05
10. Steps of getting out patient from bed	0.85±0.362	1.95±0.221	1.80±0.405	<b>124.276</b>	< 0.05
11. Method of use patient walker	1.00±0.000	2.00±0.000	1.90±0.304	<b>394.333</b>	< 0.05
12. How to use the walker in elevated the stapes	0.45±0.504	1.90±0.304	1.80±0.405	<b>154.236</b>	< 0.05
13. How to use the walker in up down the stapes	0.75±0.439	2.00±0.000	1.75±0.439	<b>136.500</b>	< 0.05
14. Equipment's need in safe walking.	1.10±0.304	2.00±0.000	1.80±0.405	<b>104.520</b>	< 0.05
15. Instructions before discharge	1.00±0.000	1.95±0.221	1.75±0.543	<b>87.604</b>	< 0.05
16. Instructions to relatives before discharge	0.85±0.362	1.95±0.221	1.85±0.483	<b>107.553</b>	< 0.05
17. Signs of success operation	1.05±0.221	1.95±0.221	1.75±0.439	<b>92.496</b>	< 0.05

Significant at level P< 0.05

Table (3): Illustrated the comparison of mean scores of nurses' knowledge regarding post operative nursing intervention after hip joint replacement surgery throughout period of study There were significant differences and improvement between studied nurses, pre, Immediately and follow up P = <0.05

**Table (4): comparison of mean scores of nurses' knowledge regarding post operative complications after hip joint replacement surgery throughout period of study.**

Items	Mean ± SD			F	P
	Pre-test	Immediate	Follow up		
1-Signs of operation failure	0.70±0.464	1.90±0.304	1.80±0.405	<b>112.761</b>	< 0.05
1. Signs of circulatory deficiency perfusion.	0.80±0.405	1.95±0.221	1.75±0.543	<b>89.227</b>	< 0.05
2. Signs of neurological deficiency.	0.45±0.504	1.95±0.221	1.70±0.648	<b>107.181</b>	< 0.05
3. Early complication of operation	0.85±0.362	1.90±0.304	1.80±0.516	<b>82.288</b>	< 0.05
4. Nursing intervention to prevent early complication	0.90±0.304	2.00±0.000	1.85±0.362	<b>191.414</b>	< 0.05
5. Late complication	0.90±0.304	1.95±0.221	1.85±0.362	<b>148.274</b>	< 0.05
6. Nursing intervention to prevent Late complication	1.00±0.000	2.00±0.000	1.80±0.516	<b>126.000</b>	< 0.05
<b>Total Knowledge Score</b>	<b>29.00±4.718</b>	<b>79.50±5.008</b>	<b>73.90±7.916</b>	<b>836.009</b>	< 0.05

Significant at level P< 0.05

Table (4): Shows comparison of mean scores of nurses' knowledge regarding post operative complications after hip joint replacement surgery throughout period of study. There were significant differences and improvement between studied nurses, pre, immediately and follow up P <0.05

**Table (5): comparison between the studied nurses according to pre and post operative performance checklist throughout period of study.**

Items	Pre (n=40)		Immediately (n=40)		Follow up (n=40)		$\chi^2$ P	
	N	%	N	%	N	%		
1. Preoperative care performance checklist:	Not done	4	10	0	0	0	<b>1.275</b> <b>&lt;0.05</b>	
	Need improvement	36	90	0	0	0		
	Competently performed	0	0	28	70	36		90
	Proficiently performed	0	0	12	30	4		10
2. Immediate operative care performance checklist:	Not done	4	10	0	0	0	<b>1.075</b> <b>&lt;0.05</b>	
	Need improvement	36	90	2	5	3		7.5
	Competently performed	0	0	26	65	33		82.5
	Proficiently performed	0	0	12	30	4		10
3. 1 <sup>st</sup> , 2 <sup>nd</sup> and 3 <sup>rd</sup> Post operative care performance checklist	Not done	4	10	0	0	0	<b>1.211</b> <b>&lt;0.05</b>	
	Need improvement	36	90	1	2.5	0		0
	Competently performed	0	0	26	65	34		85
	Proficiently performed	0	0	13	32.5	6		15

Significant at level P< 0.05

Table (5): Reflect comparison between the studied nurses according to pre and post-operative performance checklist throughout period of study .There was a significant difference between nursing performance throughout the period of the study regarding the three phases of the operative care.

**Table (6): Total scores for nurses' knowledge and practice about hip replacement throughout period of study:**

Items	Pre (n=40)		Immediately (n=40)		Follow up (n=40)		$\chi^2$ P	
	N	%	N	%	N	%		
Total nurses' knowledge score	Unsatisfactory	40	100	0	0	0	<b>1.262</b> <b>&lt;0.05</b>	
	Satisfactory	0	0	2	5	8		20
	Good	0	0	38	95	32		80
Total nurses' practice score	Poor	40	100	0	0	0	<b>1.274</b> <b>&lt;0.05</b>	
	Fair	0	0	28	70	36		90
	Good	0	0	12	30	4		10

Significant at level P< 0.05

Table (6) shows the total scores for nurses' knowledge and practice about hip replacement throughout period of study it was observed that there is a significance difference among nurses knowledge and practice throughout the period of the study.

**Table (7): Correlation between Total scores for nurses' knowledge and practice regarding socio-demographic data throughout period of study:**

Nurses' characteristics	Total knowledge score						Total practice score					
	Pre		Immediately		Follow up		Pre		Immediately		Follow up	
	R	P	R	P	R	P	R	P	R	P	R	P
Age	-	-	-0.171	0.291	0.000	1.000	--	--	<b>-0.488</b>	<b>0.001**</b>	-0.248	0.122
Level of education	-	-	0.013	0.935	0.173	0.284	--	--	<b>0.467</b>	<b>0.002**</b>	<b>0.366</b>	<b>0.020*</b>
Job	-	-	0.115	0.481	0.250	0.120	--	--	<b>-0.327</b>	<b>0.039*</b>	-0.167	0.304
Years of experience	-	-	0.281	0.079	<b>0.357</b>	<b>0.024*</b>	--	--	0.312	0.050	0.272	0.089
Years of experience in orthopedic	-	-	0.053	0.747	<b>0.459</b>	<b>0.003**</b>	--	--	0.150	0.355	0.076	0.639
Training program in past	-	-	0.053	0.747	<b>0.449</b>	<b>0.002**</b>	--	--	0.150	0.355	0.076	0.639

\* Significant

\*\* highly significant

Table (7): Reflect Correlation between Total scores for nurses' knowledge and practice regarding socio-demographic data throughout period of study it was found that there is highly significant positive correlation between years of experience in orthopedic department and training program in past with total



knowledge score in follow up group R= 0.459 and 0.449 respectively . As regarding **total practice score** it was found that the highly significant negative correlation between age of nurses in immediately study group R= - 0.488 and highly significant positive correlation between this group and level of education R = 0.467

**Table (8): Distribution of the studied patients according to their socio-demographic data**

Socio-demographic Data		Control group (n=20)		Study group 1 (n=20)		Study group 2 (n=20)	
		N	%	N	%	N	%
Age (years)	From 40-49	3	15	0	0	0	0
	From 50-59	3	15	0	0	3	15
	More than 60	14	70	20	100	17	85
Sex	Male	2	10	2	10	2	10
	Female	18	90	18	90	18	90
Marital status	Married	14	70	16	80	15	75
	Widow	3	15	2	10	2	10
	Divorced	3	15	2	10	3	15
Occupation	Yes	3	15	0	0	3	15
	No	17	85	20	100	17	85
Level of education	Illiterate	17	85	20	100	17	85
	Secondary school	0	0	0	0	3	15
	University	3	15	0	0	0	0
Family income	1000-<1500	10	50	12	60	1	5
	1500- <2000	10	50	8	40	19	95
Smoking	Smoker	2	10	2	10	2	10
	Non smoker	18	90	18	90	18	90
Family size	3-4	4	20	1	5	2	10
	5	7	35	13	65	18	90
	6	9	45	6	30	0	0
Number of rooms	4	0	0	4	20	0	0
	2	20	100	16	80	20	100
Past surgery on legs	Yes	8	40	5	25	2	10
	No	12	60	15	75	18	90

Table (8): Illustrated the distribution of the studied patients according to their socio-demographic data : Regarding the age distribution of the studied group, it was found that near three quarter (70%) of control group ,(100%) of group 1 and more than three quarter (85%) of group 2 were 60 year and more. Regarding the sex, it was found that females sex in control group, study group1and study group 2 (90%). As regarding marital status it was found that the majority of control group , study group1 and study group2 were married , (70%), (80%) and (75%) respectively .While regarding the level of education it was found that the majority of control group , study group1 and study group2 were Illiterate, (75%), (100%) and (85%) respectively . As regarding the income it was found that the 50% of control group, study group1 (60%) respectively have income less than 1500 pound and study group2 (95%) have income more than 2000 pound. Regarding smoking it was found that the majority of control group, study group1 and study group2 were nonsmoker's (90%). As regarding family size it was found that (45%) of control group have 6 number in family size while study group 1 and study group 2 (65%) , (90%) respectively have 5 number of family size .Regarding past surgery on legs, it was found that control group ,study group1 and study group 2 haven't past surgery (60%), (75%) and (90%) respectively.

**Table (9): Distribution of the studied patients according to their medical history:**

Current Medical history		Control group (n=20)		Study group 1 (n=20)		Study group 2 (n=20)	
		N	%	N	%	N	%
<b>BMI</b>	<b>Mean±SD</b>	<b>38.25±0.786</b>		<b>37.80±0.616</b>		<b>37.60±1.273</b>	
<b>Cardiovascular disorder</b>	Yes	5	25	3	15	5	25
	No	15	75	17	85	15	75
<b>Respiratory disorder</b>	Yes	6	30	7	35	5	25
	No	14	70	13	65	15	75
<b>Neurological disorder</b>	Yes	0	0	3	15	3	15
	No	20	100	17	85	17	85
<b>Renal system insufficiency</b>	Yes	6	30	0	0	5	25
	No	14	70	20	100	15	75
<b>Diabetes mellitus</b>	Yes	7	35	5	25	5	25
	No	13	65	15	75	15	75
<b>Hypertension</b>	Yes	5	25	5	25	0	0
	No	15	75	15	75	20	100
<b>Problems limiting walking</b>	Other hip or knee pain	20	100	20	100	20	100
<b>Biggest problem</b>	Pain	20	100	12	60	16	80
	Stiffness	4	20	1	5	0	0
	Problem with walking	0	0	7	35	0	0
<b>Deformity</b>	Walking	20	100	20	100	20	100
<b>Ability to walk outdoors</b>	Yes	0	0	3	15	0	0
	No	20	100	17	85	20	100
<b>Walking need to use</b>	Cane	12	60	5	15	3	15
	Walker	17	85	15	75	8	40

Table (9): Illustrate distribution of the studied patients according to their medical history: regarding BMI it was found that the Mean±SD of the control group, study group1 and study group2 were 38.25±0.786 , 37.80±0.616 and 37.60±1.273 respectively. Regarding the cardiovascular, respiratory, neurological disorders, renal system insufficiency , diabetes mellitus and hypertension , it was found that control group (75%), (70%) ,(100%),(70%) ,(65%) ,(75%) respectively ,were haven't any of this medical disorder, also it was found that the study group 1 (85%) , (65%) ,(85%),(100%) ,(75%) ,(75%) respectively ,were haven't any of this medical disorder ,regarding study group 2 it was found that (75%) , (75%) ,(85%),(75%) ,(75%) ,(100%) respectively ,were haven't any of this medical disorder. As regarding problems limiting walking it was found that the pain in all (100%) study groups was cause of limited walk. Also the pain was the biggest problem of control group , study group1 and study group2 represent of (100%) , (60%) and (80%) respectively . As regarding ,deformity it was found that the all (100%) study groups .Regarding ability to walk outdoors it was found that the majority of control group study group1 and study group 2 not able to walk out doors (100%) , (85%) ,(100%) respectively .As regarding Walking need to use , it was found that the control group (60%) use cane during walking ,while study group 1 and study group 2 were use walker (75%) and (85%) respectively.

**Table (10): Comparison between different groups of studied patients regarding to their general complications of hip replacement:**

Items		Control group (n=20)		Study group 1 (n=20)		Study group 2 (n=20)		χ <sup>2</sup> P
		N	%	N	%	N	%	
1. Circulatory complications.	Yes	5	25	0	0	2	10	6.146 0.046*
	No	15	75	20	100	18	90	
2. Neurological complications.	Yes	6	30	1	5	2	10	8.705 0.036*
	No	14	70	19	95	18	90	
3. Respiratory complications.	Yes	2	10	1	5	2	10	2.781 0.175
	No	18	90	19	95	18	90	
4. GIT complications	Yes	9	45	1	5	3	15	12.512 0.051
	No	11	55	19	95	17	85	
5. Urinary complications	Yes	5	25	3	15	2	10	6.986 0.142
	No	15	75	17	85	18	90	
6. Musculoskeletal complications	Yes	6	30	1	5	2	10	8.705 0.036*
	No	14	70	19	95	18	90	
7. pressure sore	Yes	1	5	0	0	0	0	2.034 0.362
	No	19	95	20	100	20	100	

Control group= pre test group, study group1= immediately post test, study group2= follow up group

\* Significant at level  $P < 0.05$

Table (10): Shows comparison between different groups of studied patients regarding to their general complications of hip replacement . Regarding, circulatory, neurological and musculoskeletal complications ,it was found that the significant differences and improvement between control group , study group 1 and study group 2.  $P = <0.05$

**Table (11): Comparison between different groups of studied patients regarding to their local complications related to site of operation:**

Items		Control group (n=20)		Study group 1 (n=20)		Study group 2 (n=20)		$\chi^2$ P
		N	%	N	%	N	%	
1. Increased pain in calf or thigh of either leg	Yes	5	25	1	5	2	10	<b>3.750</b> <b>0.153</b>
	No	15	75	19	95	18	90	
2. Increased pain in leg and leg appears shorter	Yes	7	35	0	0	4	20	<b>8.237</b> <b>0.016*</b>
	No	13	65	20	100	16	80	
3. Increased swelling, tenderness, or redness in either leg	Yes	8	40	0	0	2	10	<b>12.480</b> <b>0.002*</b>
	No	12	60	20	100	18	90	
4. Temperature above 38°C taken at least 30 minutes after eating or drinking	Yes	3	15	0	0	0	0	<b>6.316</b> <b>0.043*</b>
	No	17	85	20	100	20	100	
5. Increased drainage from the incision, redness, or opening of incision edges	Yes	5	25	0	0	2	10	<b>6.146</b> <b>0.046*</b>
	No	15	75	20	100	18	90	
6. Increased difficulty with walking.	Yes	17	85	1	5	3	15	<b>33.407</b> <b>0.00*</b>
	No	3	15	19	95	17	85	
7. Swelling in thigh, calf or ankle that does not go down with elevation	Yes	4	20	0	0	3	15	<b>4.205</b> <b>0.122</b>
	No	16	80	20	100	17	85	
8. Pain, heat and tenderness in calf, back of knee or groin area	Yes	4	20	0	0	4	20	<b>4.615</b> <b>0.099</b>
	No	16	80	20	100	16	80	

Table(11):Illustrate Comparison between different groups of studied patients regarding to their local complications in the site of the operation: , Increased pain in leg and leg appears shorter , Increased swelling, tenderness, or redness in either leg , Temperature above 38°C taken at least 30 minutes after eating or drinking , Increased drainage from the incision, redness, or opening of incision edges and Increased difficulty with walking , it was found that there is significant differences decrease in incidence between control group , study group 1 and study group 2.  $P = 0.016, 0.002, 0.043, 0.046$  and  $0.00$  respectively.

**Table (12): Comparison between different groups of studied patients regarding to their local complications related to signs of infection:**

Items		Control group (n=20)		Study group 1 (n=20)		Study group 2 (n=20)		$\chi^2$ P
		N	%	N	%	N	%	
1. Increasing pain around incision Increasing redness, swelling, or tenderness around your incision. Discharge from the incision	Yes	7	35	1	5	2	10	<b>7.44</b> <b>0.024*</b>
	No	13	65	19	95	18	90	
2. Fever over 38 degrees and increased difficulty with walking	Yes	8	40	1	5	2	10	<b>9.573</b> <b>0.008*</b>
	No	12	60	19	95	18	90	
3. Shortness of breath	Yes	2	10	0	0	1	5	<b>2.105</b> <b>0.349</b>
	No	18	90	20	100	19	95	
4. Signs of blood clot on the lung	Yes	3	15	0	0	2	10	<b>3.245</b> <b>0.098</b>
	No	17	85	20	100	18	90	
5. Signs of dislocation	Yes	4	20	0	0	2	10	<b>4.444</b> <b>0.108</b>
	No	16	80	20	100	18	90	
6. Vascular complications	Yes	4	20	0	0	2	10	<b>5.494</b> <b>0.08</b>
	No	16	80	20	100	18	90	

Table (12): Illustrate the comparison between different groups of studied patients regarding to their local complications related to signs of infection. Regarding Increasing pain around incision Increasing redness, swelling, or tenderness around your incision. discharge from the incision ,fever over 38 degrees and increased difficulty with walking and vascular complications ( pain in the leg) it was found that the significant differences between control group , study group 1 and study group 2.  $P = 0.024, 0.008,$  and  $0.029$  , respectively .

**Table (13): Comparison between different groups of studied patients regarding to their LEFS:**

Total LEFS score	Control group (n=20)		Study group 1 (n=20)		Study group 2 (n=20)		χ <sup>2</sup> P
	N	%	N	%	N	%	
Extreme difficulty	7	35	4	20	4	20	3.333 0.189
Quite difficulty	10	50	5	25	7	35	
Moderate difficulty	2	10	5	25	4	20	
Little bite of difficulty	1	5	4	20	3	15	
No difficulty	0	0	2	10	2	10	

Table (13): Comparison between different groups of studied patients regarding to their LEFS: It was found that there is differences and improvement between control group, study group 1 and study group 2. but it was not significant.

## VI. Discussion

Total joint replacement and especially total hip replacement represent one of the most successful surgical procedures regarding cost and effectiveness ratio (30, 31). While the mean age in general population is increasing, the total hip replacement is gaining importance not only for the patients but also for their social environment (32). In recent years, there has been an increase in the number of total hip replacement procedures performed, which is an effective treatment for severe degenerative joint disease of the hip. With increasing volume and experience of surgeons and hospitals performing this procedure, the authors were able to demonstrate that mortality has largely decreased for patients undergoing elective primary hip replacement. Variations in other outcomes such as hospital length of stay and readmissions rates over time were also seen (33). Thus, evaluation of parameters pre and postoperatively appears very important to improve rehabilitation programs.

The current study showed that, the majority of the study (95%) have no previous training program on total hip replacement while they are dealing with large numbers of cases in their department this indicate the importance of this educational program for them.

The study illustrated that the mean scores of nurses' knowledge regarding hip joint replacement throughout period of study have significant differences improvement between studied nurses, pre, Immediately and follow up this agree with **Hojatallah et al** (2012)(34) who emphasized that training significantly improved levels of knowledge and practice.

Regarding total knowledge score it was found that there is highly significant positive correlation between years of experience in orthopedic department and training program with total knowledge score in follow up group This agree with Matthew et al (2011)(35) emphasized that the composition of a hospital's staff, particularly the aggregate level of education, contributes to clinical nurse expertise.

As regarding **total practice score** it was found that the highly significant negative correlation between age of nurses in immediately study group ,this results agree with Taylor and Francis (2009)(36) who emphasized that older subjects tend to improve more slowly than younger in tasks that require the making of movements which are complex, unfamiliar, or not guided by a display whereas **Dowsey et al** (2010)(12) pointed that ,the hip replacement surgery can be performed safely on early adults and over 65 years old, providing excellent pain relief and improved functional outcome.

In relation to total practice score it was found that there is a highly significant positive correlation between the group and level of education this also was emphasized by Nelson (2002)(37) Who stated that, We've missed all the previous deadlines for resolving the entry into practice issue and allowed the 21<sup>st</sup> century to begin without agreement about the educational preparation needed for professional nursing practice the results agree also with, The American Association of Colleges of Nursing (AACN), the national voice for baccalaureate and graduate nursing programs, believes that education has a significant impact on the knowledge and competencies of the nurse clinician, as it does for all health care providers (38).

The current study showed that, the majority of the study sample were at age of 60 and more , this finding is compatible with **Smeltzer and Bare** (2004) (39) and not compatible with **Mohamed and Mecheser** (2012)(40) their represent the majority age of 25-35 year. Women who had hip replacement had majority in this study this agree with **Johanson et al** (2009)(22) **Shaw** who mention that arthritis is the leading cause of joint replacements. And because women have higher rates of arthritis than men, some 60% of joint replacement surgeries are performed on women. Regarding BMI it was found that the Mean±SD of the control group, study group1 and study group2 were 38.25±0.786, 37.80±0.616 and 37.60±1.273 respectively. "Up to 50 percent of hip replacements are performed in obese patients at some institutions," said **Emily Dodwell, MD**(2015) (41) an orthopedic surgeon at HSS and lead investigator. "Obesity is associated with longer hospital stays, higher overall costs and higher failure rates, necessitating costly revision surgery

As regarding problems limiting walking it was found that the pain in all (100%) study groups was cause of limited walk. Also the pain was the biggest problem of control group , study group1 and study group2 represent of (100%) , (60%) and (80%) respectively . this agree with the opinions **Ghomrawi et al (2011)**<sup>(42)</sup> who stated that Pain following total hip replacement has come a long way over the last 10-15 years with increased use of regional nerve blocks, spinal blocks, and various other modalities used for pain control. Total hip replacement is generally considered to be less painful than total knee replacement. Early range of motion and rapid rehabilitation protocols are also designed to reduce early stiffness and pain, making the procedure in general much less painful than in years past.

General complications of hip replacement, regarding, circulatory, neurological and musculoskeletal complications, it was found that the significant differences and improvement between control group, study group 1 and study group 2. These results agree with Bethesda who recommended that exercises like walking, stationary bicycling, swimming, and cross-country skiing. These exercises can increase muscle strength and cardiovascular fitness without injuring the new hip. It is important to get instructions before leaving the hospital and to follow them carefully once you get home. Doing so will you give you the greatest chance of a successful surgery<sup>(43)</sup> Also **Pelletier (2002)**<sup>(44)</sup> mention that many hospitals and clinics now have "preop" classes for patients scheduled for hip replacement surgery. These classes answer questions regarding preparation for the operation and what to expect during recovery, but in addition they provide opportunities for patients to share concerns and experiences. Studies indicate that patients who have attended preop classes are less anxious before surgery and generally recover more rapidly

Regarding local complications in the site of the operation:, Increased pain in leg and leg appears shorter , Increased swelling, tenderness, or redness in either leg , Temperature above 38°C taken at least 30 minutes after eating or drinking , Increased drainage from the incision, redness, or opening of incision edges and Increased difficulty with walking , it was found that there is significant differences decrease in incidence between control group , study group 1 and study group 2.this result agree with **Ibrahim et al (2005)**<sup>(45)</sup> who mention that Complications following hip replacement surgery are uncommon, and can usually be prevented with careful postoperative management. Physiotherapy treatment is vital to hasten the healing process and ensure an optimal outcome in all patients following a hip replacement. This should ideally begin prior to surgery

Regarding to their Lower Extremity Functional Scale(LEFS): This a functional tests and measures used in the acute care setting and during the home or outpatient phase of rehabilitation to assess locomotor and functional capacity of THR patients It was found that there is differences and improvement between control group , study group 1 and study group 2. but it was not significant ..Also **Deborah et al (2006)**<sup>(46)</sup> high light the benefit of using physical performance measures to assess recovery of physical function post arthroplasty as important information is gained about the patient's actual level of disability.

## **VII. Conclusions and Recommendations**

Based on the findings of the presented study, it can be concluded that, We have our total joint replacement educational program with great results. The results of this study demonstrate that the preoperative educational program for patients for total joint replacement and nurses had a positive effect on understanding postoperative expectations.

Protocol of care education was effective and successfully enhancing orthopedic nurses `knowledge and clinical practices for total joint replacement.

- The areas of greatest contribution from nurses to mobility rehabilitation of older adults following hip replacement surgery: Physical care: provision of pressure area care, management of patients' pain, meeting physical comfort needs, infection prevention. Combined: competent practice, monitoring patients, holistic approaches and information giving. Education: nurses perceive that they contribute to the restoration of mobility by effective communication, providing patient centered education relating to avoidance of physical exertion, knowledge of medications and information on community care and support.
- Nursing contributions are explicit in relation to physical, interpersonal and educational care.

### **Recommendations**

Based on the findings of the current study the following recommendations are derived and suggested:

1- Recommendations for staff nurse:

-Continuing education regarding total hip replacement surgery and encourage creativity to create programs that encourage nurses to seek knowledge and update their skills .Educational unit regarding: advanced and new technology, new intervention for caring with total hip replacement patients.

- Orientation and refreshment program in orthopedic department for new and nurses staff about new protocols regarding care of total hip replacement patients should be carried out as a routine care for those patients.

2- Recommendations for administration:

- Institutionalized written policies regarding application of protocol of care strategies in daily routine care for those patients.
  - Empowering nurses with provision of continuing education appropriate resources and advanced search of protocol of care regarding prevention of local and general complications.
  - Nursing contributions are explicit in relation to physical, interpersonal and educational care.
- 3- Recommendation for further research studies:
- Replication of the study using a larger probability sample.

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