Effect of Post -Operative Rehabilitation Nursing Protocol on Physical Functioning among Patients with Hip Fracture Surgery

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Abstract

Background: Improving physical functioning and mobility outcomes after hip fracture through strategies include hip fracture and muscle strength exercises, hip fracture: is one the most frequent fracture presenting in the trauma emergency orthopedic departments and term hip fracture or head of femur fracture are used synonymously.. **Aim:** Evaluate the effect of exercises on Physical functioning among patients with hip Fracture surgery. **Sample:** A purposive sample of 60 patients of both sex who are post-operative hip fracture surgery. **Tools:** Four tools were used; **First Tool:** patient interview structured questionnaire,. **Second Tool:** self-care practice of patient with hip fracture Checklist **(HFAC)**, **Third tool**: cumulated ambulation scale **(CAS). Fourth tool**: Oxford muscle strength scale. **Results:** there are a statistical significant differences P ≤ 0.01) (between the study and control group regarding all items of self-care practices after implementing the exercise program The intervention group , improves ambulation score due to strengthening the muscles through exercises. compared to the control group. **Conclusion**: Nursing intervention like exercises performance, improve the physical functioning of hip fractured patient after surgery. **Recommendation:** Designing standardized nursing rehabilitation protocol regarding hip fracture in the post-operative to upgrade nurses' knowledge and practice, and further research studies are needed on larger study samples.

Keywords: Hip Fracture Surgery, Physical Functioning, Post-Operative, Rehabilitation

Introduction

Bone fracture is a crack or break in bone fracture result from a high force impact or stress and it's full or partial break in the continuity of bone tissue it can occur at any bone in the body ,there are several different ways in which bone can fracture for example ,closed fracture or compound f0racture ,fracture range from simple fracture such as closed fracture to compound fracture which is more serious due to risk of infection (Emmerson et al ., 2023) and (Allen & Burr., 2019). Incidence of fracture between 9.0 to 22.8/1000/ year of adult population fractures are reported to occur globally (Gimigliano et al., 2020)

The number of Hip fracture is expected to increase to about 4.5 million per year worldwide by 2050 with successful surgery. Mortality and risk of permanent disability and dependence remain high in patients with Hip fractures (HF).As a result medical costs associated with the treatment of these patients are increasing. For these reasons, hip fractures are an increasingly important global public health issue. **Lee et al., (2020).** Hip fractures in individuals aged 40 years or more in Egypt in 2022,2023 was 123,34 per 100.000 in women and 55.19 per 100.000 in men . It is higher in south Egypt (113.62) versus north Egypt (64.8) this were consistent for both gender , bone mineral density (BMD) was significant (0.01) lower in south Egypt at both the spine ,distal forearm as well as trochanters etc **EL Miedaney y et al ., 2023)**

A fracture of the hip refers to a fracture of the proximal (upper) third of the femur, which extends to 5 cm or 2.5 inch below the lesser trochanter. Fractures that occur within the hip joint capsule are called Intracapsular fractures. Intracapsular fractures (femoral neck) are further identified by their specific locations: (capital): fracture of the head of the femur (subcapital): fracture just below the head of the femur,

and transcervical: fracture of the neck of the femur). (**Lucinda et al ., 2024) .**Hip fracture , this is common in older adult and usually result from Direct trauma or fall **(Wgner., 2022)**.

Regular exercises are performed to restore strength and mobility to the patients with hip fracture and gradual return to everyday activities are important to the patient full recovery after hip fracture, and the orthopedic surgeon and physical therapist may recommended that the patient exercises for 20-30 minutes or 2-3 times or sessions/daily during early recovery ,many hip fracture patients can drive again after surgery and return to activities like golf and cycling within 12 weeks recovery. **Crighton., (2024) & Sheth et al (2022).**

Mobility treatment undertaken after discharge from hospital after a fractured hip improves mobility, probably increases walking speed, improves functioning slightly and reduce falls. Proper rehabilitation and exercises after surgery has been shown to shorten hospital stays ,improve physical function ,and help patients maintain independent daily life outcomes which in turn reduce the medical and care giver **Fairhall et al ., (2022).**

Significance of the Study

Hip fracture are the most common fracture leading to hospitalization and are associated with high costs, mortality rates, and functional decline, multicomponent intervention and physical exercises using rehabilitation could play important role in the management of hip fracture recovery., **Abdel Cedeno et al., (2023)**. The number of hip fracture is expected to increase about 4.5 million per year worldwide even with successful surgery, the mortality and the risk of permanent disability and dependence remain high in patient with hip fracture as a result medical costs associated with the treatment of these patients are increasing .For these reasons hip fractures

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are increasingly important global public health issue. (**Lee ., (2020).**

The aim of care after surgery for hip fracture is to get people safely back on their feet, moving , walking again. And various strategies to improve mobility, including walking retaining, exercises program used during hospitals stay and often discharge from hospital. (**Schene ., 2023**),so the present study can be utilized to improve physical functioning after hip fracture surgery

Patients and Methods
Aim of the Study
The present study aimed to evaluate the effect of post -operative rehabilitation protocol on physical functioning among patients with hip fracture surgery

Operational Definition
Rehabilitation interventions designed to optimize functioning and reduce disability in individuals with health condition in interaction with their environment .Rehabilitation include physical exercise training to improve muscle strength, voluntary movement and balance. **WHO., (2024).**

Physical functioning according to WHO having the capabilities that enable all people to do regular physical activity **WHO, (2019).**

Post-operative care for hip fracture surgery such as immediate or delayed weight bearing after surgery, any other mobilization strategies such as exercises , physical training and muscle stimulation ,used at various stages in rehabilitation ,which aim to improve walking and minimize functioning impairment **Fairhall et al ., (2022).**

Several exercises are highly suggested during the acute care phase following surgery, after surgery patient can begin exercises such as (ankle pump exercises) dorsal and planter flexion of ankle joint ,when the exercises performed in the acute phase it strengthen the quadriceps and enhance knee strength at the fractures extremities .To strengthen the quadriceps (isometric exercises and knee extension ,and gluteal muscle exercises result in greater muscular strength and limb control such as (isometric exercises of the gluteal in the supine position and pelvic lift) **(Koudouna et al .,2023)**

Research Hypothesis
The study group who received nursing intervention and exercises will improved in physical functioning among the study group compared with the control group

Research Design
A quasi-experimental research design was utilized in the current study.

Setting
The current study was carried out and conducted in Orthopedic department at Minia University Hospital, it is located on the 2nd and 3rd floor, Building (A) that consists of (6) rooms that contain (20-22 beds) three rooms for male patients that contain (13 beds) and three for female patients that contain (7-9 beds) ,that rooms for preoperative and postoperative patients

Research sample
A purposive sample of 60 adult post hip fracture surgery (males and females). Both groups in the current study were selected according to the following inclusion and exclusion criteria:

Inclusion Criteria
Adult patient aged 18 to 65 years with hip fracture surgery in the post-operative period willing to participate and able to communicate with others.

Exclusion Criteria
Patients who were not willing to participate, had pathological hip fracture surgery, had osteoporosis or hip deformity, and had vascular or paralysis and muscle atrophy.

Sample Size
The sample size was estimated by using the (Mohapatra & Chamola, 2020) formula which is computed as $(n = z2 \times p\ (1- p)\ /\ d2)$. Where n = sample size, Z= Z statistic for a level of confidence, P= expected prevalence or proportion (in proportion of one; if 20%, P= 0.02 and d= precision (in proportion of one; if 5%, d= 0.05). N= (1.96) 2 × 0.04 (1-0.04) / (0.05)2 = 60 patients.

Study Duration
Data collection started from July 2021 to March 2022

Tools of Data Collection
The researchers developed four tools that were used in the current study. They were established after an extensive literature review and revised for validity.

A- **First Tool: Patient Interview Structured Questionnaire:**
First Part: Demographic Data: such as age, sex, level of education, marital status, and residence.
Second Part: Medical Data: It included the date of admission, medical diagnosis, and type of medication

Second Tool: Self Care Practice Observational Checklist
This checklist was developed by the researchers based on review of relevant literature as (**Grafton., 2020).**

To assess the patient verbalized and performed then evaluated the patient's adherence and compliance to perform self-care and rehabilitative activities or skills after hip fracture repair surgery such as (changing position every 2-3 hours breathing and coughing exercise), (Skin and wound care) , (neurovascular assessment to affected site) , (range of motion to hip joint),….etc.

Third Tool: Cumulated ambulatory scale
This scale adopted by (**Melgaard et al., 2018**). It used to assess and measure the patients' independency in three activities, this scale composed of :(1) getting in and out of bed, (2) sitting down and standing up from a chair, 3) walking ability with an appropriate walking aid.

The CAS scoring system: as follow each function is assessed on a 3-point ordinal scale 2 = independent of human assistance, 1 = requiring human assistance to perform function, 0 = unable to perform function despite human assistance). The score for each function is cumulated to provide a daily score between 0 and 6 (one-day CAS), with 6 indicating independent ambulation on that particular day. In addition, the cumulated scores from the first three days post-

surgery can be added to give a value from 0 to 18 (three-day CAS).

Fourth Tool: Oxford Muscle Strength Scale

This scale adopted from **(Stangl-Correa et al., 2020), and (MRC ., 2023)** The Oxford Scale is used to quantify the power or strength produced by the contraction of muscle , The Oxford Scale is composed of numerical rating , it scored on a 0 to 5 ,with 5

The scoring system of Oxford Scale is as follow:

Scale score	Explanation
0/5	No muscle contraction
1/5	Visible/palpable muscle contraction but no movement
2/5	Movement with gravity eliminated
3/5	Movement against gravity only
4/5	Movement against gravity with some resistance
5/5	Movement against gravity with full resistance

Tools Validity

Five experts in the field of medical-surgical nursing in the Nursing Faculty at Minia University served as the jury committee that examined the research tools' validity and content to verify the clarity, completeness, and relevance of the items to the aim of the study.

Tools Reliability

The tools were modified somewhat after being examined by specialists who ensured their clarity, relevance, comprehensiveness, and simplicity. The proposed tools underwent statistical testing for reliability using the Cronbach alpha (0.897).

Pilot Study

A pilot study was carried out on 10% (n = 6) of the total sample of patients admitted to the previously mentioned orthopedic surgery department, meeting inclusion criteria to test the applicability, clarity, and objectivity of the study tools and estimate the time required for fulfilling it.

Ethical Considerations

Official permission to conduct the study was obtained from the ethical committee of research (REC), Nursing Faculty and Minia University and second permission was obtained from the director of the Orthopedic Surgery Department for approval to gather data for research. Written informed consent from patients was obtained to participate in the study after explaining the aim, purpose, procedure, nature of the study and had the right to refuse to participate or withdraw from the study independently at any time without any rationale and ensuring that data collection was used only for the purpose of the study.

Study Procedure

The study field work is composed of preparatory, implementation, and evaluation phase Preparatory Phase

The present study began by preparing the study tools after reviewing the literature by viewing textbooks, journals and internet to build a clear picture of all parts of study the patient who met the inclusion criteria and had a hip fracture was informed by the researchers individually about the purpose and nature of the study. A pilot study or research was also conducted and oral consent was obtained from participants, the researchers was given permission to carry out the study by the director of the orthopedic department at Minia University, and the study was approved by the dean of the nursing faculty and the ethics committee. A jury committee examined the created tools and performed validity and reliability tests on the tools.

Implementation Phase

The Researchers collect the control group first then the study group .The control group was received the routine nursing care and intervention.

- 1st session will be done in the 1st day through the first contact and meeting to the patient in the preoperative periods ,to take the socio-demographic and medical data using tool 1
- 2nd session the patient was assessed by using of tool 2 the (CAS) , and researchers demonstrate to the patient skills and performance through the role playing of these skills and demonstration the Range of motion and strengthens exercises on the patient the performance by using of tool 3 ,and patient muscle strength is assessed using tool 4 by Oxford muscle strength scale , in order to improve the mobility of the patient , Every patient was given the opportunity to ask any question in order to clear up any misunderstandings. This session was performed on the study group for about 15 to 45 minutes duration in the post-surgery depending on the patients' tolerance. On average, there were around 1:2 patients every day. While The study group receive an booklet which designed in Arabic language which having pictures to ensure there understanding and competency for demonstration of procedure at home once daily for 10 weeks after discharge. After a thorough examination of relevant literature, the investigator s designed it (Perry et al., 2018). It consisted of some educational procedures illustrated such as ROM and muscle strength exercises, breathing and coughing exercise, positioning importance and its technique, assessment of neurovascular condition. The researchers was stated the procedures and the included performance skills simply for the study group also it was taught for care giver for study group to apply it at home for their patient the researchers ensure that care giver was became competence application these procedures before patient discharge to improve the mobility of the patient and decrease the complication and negative consequences of the hip fracture the researchers give control group the rehabilitation booklet at the end of the study .
- 4th session : evaluation after 5 weeks post-operative using tool 2,3,4
- 5th session : evaluation after 10 weeks post-operative using tool 2,3,4

Evaluation Phase

This phase was started from the preoperative period to collect base data from both groups. All tools measured postoperatively after (5weeks) as the first patients evaluation and 2 nd follow applied after 10 weeks postoperative.

Limitations of the Study

Limited national studies have been conducted regarding the correlation between the application of nursing intervention and performance of exercises and improving the physical functioning of patients post Hip fracture surgery .

Statistical Analysis of Data

A statistical package for the social science (SPSS), version (22) was used for statistical analysis of the data. Data were summarized, tabulated, and presented using descriptive statistics in the form of frequency distribution, percentages, means and standarddeviations (SD) as a measure of dispersion. Numerical data were presented in mean andSD. Qualitative data were presented in form of frequency and percentage (%). To compare frequencies between the study variables Chi-square was utilized while t test was used to compare means. The Friedman test was utilized to determine significant differences among three or more variables. Probability (P-value) is the level of significance of the results was considered: (P-value ≤ 0.05) was considered significant (S) and the (p-value ≤ 0.01) was taken in to account as highly significant

Results`

Table (1): Distribution of Both Study and Control Groups Regarding to Their Demographic data (n=60)

Demographic data	Study (n=30)		Control (n=30)		Sig. test	P-value
	No.	%	No.	%		
Age						
18 - 39 years	10	33.3	11	36.7	$X^2 = 1.32$	0.517
40 - 59 years	8	26.7	11	36.7		
60- 65 years	12	40	8	26.6		
Mean ± SD	43.2 ± 18.5		49.1 ± 13.6		t=1.39	0.168
Gender						
Male	22	73.3	21	70	$X^2 = 0.082$	0.774
Female	8	26.7	9	30		
Education						
Illiterate	2	6.7	4	13.3	$X^2 = 7.39$	0.117
Read and write	11	36.7	5	16.7		
Elementary	3	10	0	0		
Secondary	6	20	10	33.3		
University	8	26.6	11	36.7		
Residence						
Urban	13	43.3	12	40	$X^2 = 0.069$	0.793
Rural	17	56.7	18	60		
Occupation						
House wife	6	20	6	20	$X^2 = 3.88$	0.422
Employee	6	20	9	30		
Farmer	2	6.7	5	16.7		
Un employed	15	50	10	33.3		
Retired	1	3.3	0	0		
Marital Status						
Single	10	33.3	3	10	$X^2 = 4.90$	0.086
Married	18	60	25	83.3		
Divorced	0	0	0	0		
Widow	2	6.7	2	6.7		
Living Condition						
Living with family	30	100	30	100	…..	……
Living alone	0	0	0	0		

* Statistical Significant Difference (P ≤ 0.05)   )

Table (1): Shows sociodemographic data of the studied group regarding age, it was found that the mean age of study and control groups   was 43.2 ± 18.5 & 49.1 ± 13.6 respectively, in relation to gender, it was cleared that 73.3% & 70% of the studied group were males, for education, 36.7% of the study group were read and write compared to 36.7% of the control group were graduated from university and 56.7% & 6٠% of them lived in rural areas. Regarding occupation, the results found cleared   that 50% & 33.3% of study and control respectively were unemployed. Also, 60% & 83.3% of the study and control group respectively were married. As regard to living condition, it was found that 100% of the study and control group were lived with their families. Finally, there were none statistical significant difference between study and control group regarding socio-demographic data

Table (2): Distribution of Both Study and Control Groups Regarding to Their Cumulated Ambulation Scale (CAS) (n=60)

Cumulated Ambulation Scale	Study (n=30)			Control (n=30)			X^2 (P-value)
	Getting in and out of bed	Sit –to –stand to sit in a armchair	Waking with or without walking an aid	Getting in and out of bed	Sit –to – stand to sit in a armchair	Waking with or without walking an aid	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
Preoperative							
- Independent	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2.06 (0.150)
- Able with assistance	2 (6.7)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
- Not able	28 (93.3)	30 (100)	30 (100)	30 (100)	30 (100)	30 (100)	
5th Week Postoperative							
- Independent	26 (86.7)	3 (10)	0 (0)	2 (6.7)	0 (0)	0 (0)	39.2 (0.001**)
- Able with assistance	3 (10)	26 (86.7)	28 (93.3)	26 (86.7)	28 (93.3)	29 (96.7)	
- Not able	1 (3.3)	1 (3.3)	2 (6.7)	2 (6.7)	2 (6.7)	1 (3.3	
10th Week Postoperative							

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Cumulated Ambulation Scale	Study (n=30)			Control (n=30)			X^2 (P-value)
	Getting in and out of bed	Sit –to –stand to sit in a armchair	Waking with or without walking an aid	Getting in and out of bed	Sit –to – stand to sit in a armchair	Waking with or without walking an aid	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
- Independent	30 (100)	25 (83.3)	16 (53.5)	7 (23.3)	2 (6.7)	1 (3.3)	
- Able with assistance	0 (0)	5 (16.7)	14 (46.7)	23 (76.7)	28 (93.3)	29 (96.7)	42.6 (0.001**)
- Not able	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0	
Friedman test	109.4 (0.001**)						
Mean Total Score	9.30 ± 1.44			6.20 ± 1.21			t = 9.05 (0.001**)

* Statistical Significant Difference (P ≤ 0.05) ** Highly Statistical Significant Difference (P ≤ 0.01)

Table (2): Revealed that 93.3% & 100 0f the study and control groups was not able to get in and out of bed and 100% of them were not able to sit to stand to sit in a armchair, also, 100% of them were not able to walk with or without walking aid at the preoperative evaluation, while, 100% & 23.3% of study and control group were independent when getting in and out of bed, and 83.3% & 6.7% of them were independent to sit to stand to sit in a armchair. Also, 53.5% & 3.3% of them were independent to walk with or without walking aid at the 10th week postoperatively after implementing the rehabilitation protocol with highly statistical significant difference between the two groups

Table (3): Distribution of Both Study and Control Groups Regarding to Their Total Score of Cumulated Ambulation Scale (CAS) (n=60)

Cumulated Ambulation Scale	Preoperative		5th Week Postoperative		10th Week Postoperative		Friedman test
	Study (n=30)	Control (n=30)	Study (n=30)	Control (n=30)	Study (n=30)	Control (n=30)	
	No (%)	No (%)	No (%)	No (%)	No (%)	No (%)	
- Independent	0 (0)	0 (0)	3 (10)	2 (6.7)	25 (83.3)	2 (6.7)	109.4 (0.001**)
- Able with assistance	2 (6.7)	0 (0)	26 (86.7)	26 (86.7)	5 (16.7)	28 (93.3	
- Not able	28 (93.3)	30 (100)	1 (3.3)	2 (6.7)	0 (0)	0 (0)	
X^2 (P-value)	2.06 (0.150)		0.533 (0.766)		35.6 (0.001**)		

* Statistical significant difference (P ≤ 0.05) ** highly Statistical significant difference (P ≤ 0.01)

Table (3): showed the mobility status related to CAS scale are 93.3% , 100% of study and control group respectively not able the preoperative evaluation while 83.3% and 6.7% of study , with highly statistical significant difference between the two groups at the 10th week postoperatively after implementing the rehabilitation protocol

Table (4): Distribution of Both Study and Control Groups Regarding to Their Self-care practices (n=60)

	Preoperative		5th Week Postoperative		10th Week Postoperative		X^2 (P-value)
	Study (n=30)	Control (n=30)	Study (n=30)	Control (n=30)	Study (n=30)	Control (n=30)	
1. Change position / Three hours at least							
	0 (0)	0 (0)	25 (83.3)	4 (13.3)	26 (86.7)	6 (20)	48.8 (0.001**)
2. Breathing and coughing exercise							
	0 (0)	1 (3.3)	25 (83.3)	3 (10)	26 (86.7)	7 (23.3)	41.6 (0.001**)
3. Prevent the incidence of bed sores by know all bony prominences areas at lower limbs areas.							
	3 (10)	2 (6.7)	23 (76.7)	1 (3.3)	27 (90)	5 (16.7)	32.6 (0.001**)
4. Check skin integrity/color change at all bony prominence's areas							
	7 (23.3)	2 (6.7)	27 (90)	4 (13.3)	28 (93.3)	6 (20)	32.8 (0.001**)
5. Check surgery sit							
	11 (36.7)	7 (23.3)	26 (86.7)	4 (13.3)	27 (90)	4 (13.3)	8.48 (0.014*)
6. Check warning signs of infection (fever, redness, edema, inflammation, local bad odor, discharges from pin-site)							
	9 (30)	4 (13.3)	25 (83.3)	5 (16.7)	26 (86.7)	4 (13.3)	18.1 (0.001**)
7. Check sensation at periphery							
	8 (26.7)	3 (10)	26 (86.7)	3 (10)	26 (86.7)	4 (13.3)	21.4 (0.001**)
8. Check blood delivery (pulse palpation) at periphery							
	8 (26.7)	5 (16.7)	26 (86.7)	3 (10)	27 (90)	3 (10)	18.5 (0.001**)
9. Exercise joints of the lower limbs at scheduled time							
	0 (0)	0 (0)	22 (73.3)	2 (6.7)	27 (90)	2 (6.7)	45.1 (0.000**)

* Statistical Significant Difference (P ≤ 0.05) ** Highly Statistical Significant Difference (P ≤ 0.01)

Table (4): Documented that there are a statistical significant differences between the study and control group regarding all items of Self Care Practice self-care practices after implementing the rehabilitation protocol.
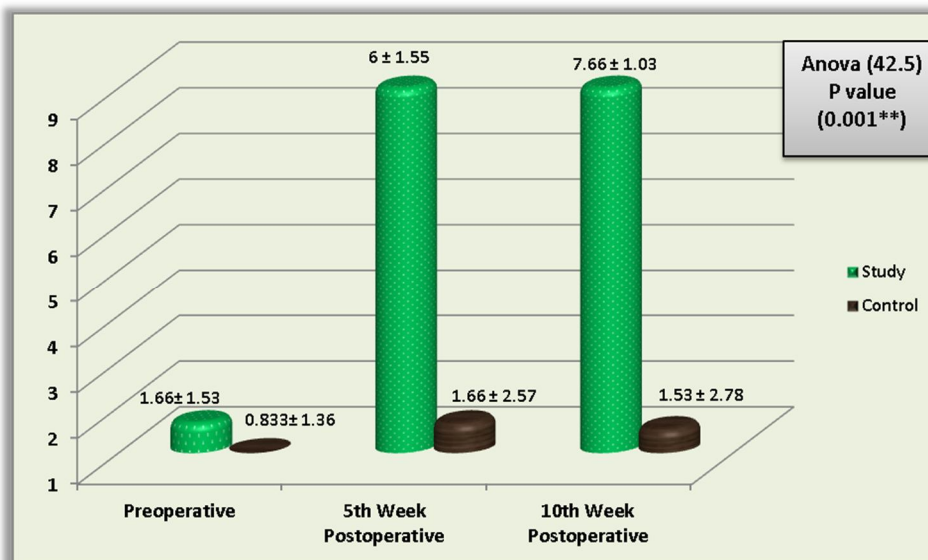
Figure (1): Mean Score of Both Study and Control Groups Regarding to Their Self-care Practices Preoperative, Post 5th Weeks and at 10th Weeks (n=60)

Figure (1): Showed that the mean score of self-care practices of study and control group were 1.66 ± 1.53 & 0.833 ± 1.36 preoperatively compared to 7.66 ± 1.03 and 1.53 ± 2.78 for study and control group respectively after implementing the rehabilitation protocol.

Table (5): Relationship between Demographic Data and Cumulated Ambulation Scale among Study and Control Groups (n=60)

Demographic Data	Study		Control	
	Independent (n=25)	Need assistance (n=5)	Independent (n=2)	Need assistance (n=28)
	No (%)	No (%)	No (%)	No (%)
Age				
18 - 39 years	10 (40)	0 (0)	0 (0)	11 (39.3)
40 - 59 years	7 (28)	1 (20)	1 (50)	10 (35.7)
60- 65 years	8 (32)	4 (80)	1 (50)	7 (25)
X^2 (P-value)	4.50 (0.105)		1.32 (0.722)	
Gender				
Male	19 (76)	3 (60)	2 (100)	19 (67.9)
Female	6 (24)	2 (40)	0 (0)	9 (32.1)
X^2 (P-value)	0.545 (0.460)		0.918 (0.338)	
Residence				
Urban	10 (40)	3 (60)	1 (50)	12 (40)
Rural	15 (60)	2 (40)	1 (50)	18 (60)
X^2 (P-value)	0.679 (0.410)		0.089 (1.000)	
Marital Status				
Single	9 (36)	1 (20)	0 (0)	3 (10.7)
Married	15 (60)	3 (60)	2 (100)	23 (82.1)
Widow	1 (4)	1 (20)	0 (0)	2 (7.1)
X^2 (P-value)	1.92 (0.383)		0.429 (0.807)	
Education				
Illiterate	2 (8)	0 (0)	0 (0)	4 (14.3)
Read and write	6 (24)	5 (100)	0 (0)	5 (17.9)
Elementary	3 (12)	0 (0)	0 (0)	0 (0)
Secondary	6 (24)	0 (0)	1 (50)	9 (32.1)
University	8 (32)	0 (0)	1 (50)	10 (35.7)
X^2 (P-value)	10.3 (0.035*)		0.925 (0.819)	
Occupation				
House wife	4 (16)	2 (40)	0 (0)	6 (21.4)
Employee	5 (20)	1 (20)	1 (50)	8 (28.6)
Farmer	2 (8)	0 (0)	1 (50)	4 (14.3)
Un employed	13 (52)	2 (40)	0 (0)	10 (35.7)
Retired	1 (4)	0 (0)	0 (0)	0 (0)
X^2 (P-value)	1.92 (0.750)		2.85 (0.414)	

* Statistical Significant Difference (P ≤ 0.05)   ** Highly Statistical Significant Difference (P ≤ 0.01)

Table (5): Showed a none statistical significant relation between demographic data and cumulated ambulation scale among study and control group

Discussion

Hip fracture is one of the most common and severe forms of injuries in adults, which could lead to disability, low quality of life, institutional care, and mortality. Although surgery is recommended as the first treatment, only one in three adults can recover to their previous independence level, half lose their mobility, and a quarter requires full-time nursing home care. Moreover, poor recovery of physical function and mobility after hip fracture is associated with future falls and fractures which will lead to worse health status and even higher medical expenses (**Zhang et a l., 2022)**

Regarding demographics, the current study revealed that the mean age among study and control groups in the young age , which could be explained in the light of the increased incidence of motor car accident that affects the young age, and the majority of both groups among them lived in rural areas and almost of both group were married respectively. These come in accordance with (**Ahmed et al. 2023**) whose study demonstrated that the mean age among study and control group most of studied participants were married and the majority of them were living in rural areas

Concerning to gender the current study showed that the highest percentage among study and control group were males, which agreed with (**Dong et al. 2023**) study in which more than half of study and control groups were males, this agreed with (**Dong et al. 2022**) who stated that hip fracture are common and economically burdensome to health care system globally with fall being the leading cause, the age standardized incidence rate has slightly increased in men.
In Egypt, the hip fracture incidence was higher in the south compared to the north, because bone mineral density **(BMD)** was significant lower in south Egypt at the spine, distal forearm, as well as hip trochanters. (**El Miedaney Y, 2023**).

Regarding to educational level, the current study clarified that nearly quarter of the study and control group had a university education and all of the study and control group lived with their families, from the investigator point of view the increased percentage of university education exposure risk of transportation could be regarded to the increased interest of education in the last years and, this findings come in the same line with **AdelEbada El Sayed et al. (2021**) whose study documented that of study and control group had a bachelor degree of education and the majority of them lived with their families.

The current study, the results showed none statistical significant differences between study and control groups regarding all features of personal characteristics; the investigator explained this result as it indicate that both study and control groups were compatible and any difference found between the two groups is a result of the applied rehabilitation protocol. This result is in arrangement with **Liu et al. (2021)**, who mentioned that there was no statistical difference in all aspects of demographic characteristics between the two groups

Regarding Self-care practices among study and control group, the study findings concluded that there were no statistical significant differences between the two groups regarding self-care practices at preoperative period. **In contrast** there were a highly statistical significant differences between the two groups was found at the end of the rehabilitation program. This finding could be regarded to the effect of the applied rehabilitation protocol on the study group

This finding consistent with AdelEbada et al. (2021) study reveals that there was no statistically significant difference between the patients' scores regarding total hip arthroplasty bundled care pre- application between study and control groups. In contrast, post one month and post three months of bundled care application, there was a high statistically significant difference between the patients' scores in study and control groups. Also, **Ahmed & Abd-El Mohsen ., (2018)** who mentioned that, highly percentage of the studied patients were non-compliance before intervention, **Mostafa Mahrous & Faheem Gendy (2020)** concluded that the discharge instructions that were implemented for the patients with hip fracture had a significant and positive effect on recovering patients to their pre fracture level in most of the activities of daily living. And the **Xu, (2023)** results showed that it further helps patients improve the overall prognosis compared to routine nursing

The current study clarified that there were no significant differences between demographic characteristics and cumulated ambulation scale and self-care practices among study and control groups, this could be due to the homogeneity of the two groups so the demographic characteristic didn't affect the result of the study and any effect found was regarded to the applied rehabilitation protocol, that was supported by **Ahmed et al. (2023**) a study revealed that there was no significant difference between socio-demographic data and ambulation scores in both groups

Concerning muscle strength, the current study found a significant improvement in muscle strength between the study and control group post implementing the rehabilitation protocol which support the positive effect of the implemented rehabilitation protocol on increasing muscle strength

This s agreed by **AdelEbada et al., (2021)** study illustrated that there were a significant improvement of the mean scores of all items of hip strengthening exercises performance among the study group. Also, **Segev-Jacubovski ., (2023) mentioned that** there is agreement in the literature that continuous rehabilitation regimes carried out in early or late phases after THR surgery can lead to significant improvement in muscle strength and function

As regard improving the muscle strength in relation to ROM exercises this is agreed by **Berg (2021)** who stated that implementing muscle strength training (MST) and ROM exercises in the early post-operative period improved lower extremities and maximal muscle strength more conventional physiotherapy and was accompanied by improvement the postural stability .so implementing (MST) and exercises after hip fracture should be considered as a relevant treatment to reduced risks , falls and excess mortality

The current study clarified that there were no significant differences between demographic characteristics and cumulated ambulation scale and self-care practices among study and control groups, this could be due to the homogeneity of the two groups so the demographic characteristic didn't affect the result of the study and any effect found was regarded to the applied rehabilitation protocol, that was supported by **Ahmed et al. (2023**) a study revealed that there was no significant difference between socio-demographic data and ambulation scores in both groups

The current study documented a statistical significant correlation between self-care practices and the patients' ability of ambulation and muscle strength. The investigator s' interpretation for this result is that application of the nursing rehabilitation protocol could encourage the patients to practice activity of daily living and ambulation.

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This study's results agreed with **Wu et al. (2018)** who declared that home-based rehabilitation significantly improve mobility, daily activity instrumental activity, and balance. This study is also supported by **Ellen et al. (2019)** who stressed that physical therapy also had significantly greater improvements than the control condition in measures of muscle strength, walking speed, balance, and perceived health. Moreover **Abd El-Naby et al., (2021)** who showed that there was a statistically significant difference between study and control groups regarding their functional status after implementing nursing instructions postoperatively

Conclusion

Based on the result of the present study we can concluded that :-

The present study reveals that, the majority of patients with hip fracture surgery who received educational rehabilitation protocol showing a progress of being more independent in mobilization activities after 10 weeks of operation than preoperative and 5 weeks post-operative.

There was significant improvement in muscle strength between the study and control group post implementing the rehabilitation protocol which support the positive effect of the implemented rehabilitation protocol on increasing muscle strength

Recommendations:

The researchers come up with the following recommendation for:-

For Nurses

- Designing educational training programs to upgrade nurses' knowledge and practice regarding post-operative care and rehabilitation for hip fractured patients
- Designing simplified booklet including basic information about improving post-operative outcomes of patients among hip fracture surgeries

For Patients:

- Periodic training and educational programs about exercises therapy or prevention mobility restriction should be developed for the health team members, especially the nursing staff.
- Preoperative teaching and training programs for patients about measures that can reduce postoperative hip fracture complication and care that can be done
- Continues self-care practice for hip fracture surgeries patients focusing on management behaviors especially complications prevention, and post hip fractures surgeries management.

Further Research:

Designed and structured educational physical therapy booklet includes nursing intervention.

For hospital

- Assess the cost-effectiveness of implementing self-care management program for hip fracture patients and explore potential strategies for resource allocation to support their implementation.
- Provide the hospitals or orthopedic departments' libraries with adequate advanced teaching aids regarding orthopedic nursing care in the form of textbooks or online 4 websites that assist nursing staff to perform high-quality nursing practices.
- Replication of the current study on a larger sample size to achieve generalizable results.

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