Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.7, No.5, 2016

Effect of Implementing a Discharge Plan on Functional Abilities of Geriatric Patients with Hip Fractures

Hatem AL Khayyal[1]* Moshera El Geneidy[2] Hanaa Ibrahim[3] Mohamed Kassem[4]
1. Master of gerontological nursing, Faculty of Nursing, Alexandria University(doctorate candidate)
2. Professor of Gerontological Nursing, Faculty of Nursing, Alexandria University
3. Assistant professor of Gerontological Nursing, Faculty of Nursing, Alexandria University
4. Lecturer of Orthopedic and Traumatology, Faculty of Medicine, Alexandria University

Abstract
Hip fracture is considered one of the most fatal fractures for elderly people, resulting in increased morbidity and mortality and impaired functional capacity, particularly for basic and instrumental activities of daily living. **The aim of this study** was to determine the effect of implementing a discharge plan on functional abilities of geriatric patients with hip fractures. **Design:** A quasi experimental research design was used in this study. **Subjects:** The study subjects comprised 60 elders with hip fractures divided into two equal groups (study and control) where each group consists of 30 elders. The experimental group received the discharge plan beside routine care in hospital, whereas, control group received only the routine hospital care. **Conclusion:** Applying the discharge plan on geriatric patients with hip fracture was effective in enhancing recovery rate for performing ADLs. Positive but insignificant recovery rate was found in some IADLs.
Keywords: hip fracture, functional abilities, older adults, discharge plan.

Introduction

Hip fracture is any fracture occurring in the proximal femur anywhere between the edge of the femoral head and 5 cm below the lesser trochanter (Halter et al 2009). Hip fracture is a serious and costly public health problem that can drastically affects elders' independence and quality of life (Lönnroos et al 2006). The most dominant causes of hip fracture among elderly people are osteoporosis and falls (Kangau 2011). Both conditions are considered as indicators of frailty which have multiple accompanying risk factors such as sensory deprivations, muscle atrophy, and loss of neuromuscular coordination. These risk factors interact with each other and put elders at specific risk for hip fractures. (El Maghraoui et al 2005, Prince et al 2010). Worldwide, the number of hip fractures is predicted to increase from 1.7 million in 1990 to 6.26 million by the year 2050 in conjunction with rising costs of treatment from 34,800 billion to 131,500 billion dollars respectively (Johnell 1997, Nikitovic 2010).The average age of hip fracture' patients is 80 years, and nearly 80% are women (Panula 2010). The increasing number of hip fracture among elderly people leads to increasing financial burden and exhaustion of health care resources. This is because it requires long hospital stay and rehabilitation period, as well as, the costs of dependency and institutionalization (Fiatarone 2009). Restoring functional abilities is the ultimate goal of any health care plan for geriatric patients with hip fractures. Functional abilities are commonly measured by ability of elderly to perform basic and instrumental activities of daily living which are considered the cornerstone of maintaining independence and quality of life (Sanguineti 2010, Nosbusch 2011). Recovering from hip fracture and restoring functional abilities as well as possible is a gradual and multifaceted task which takes time and requires steady effective rehabilitative strategy (Prince et al 2011).

Discharge planning is the process by which the patients are assisted to develop a plan of care for ongoing maintenance and improvement of health conditions, even after their discharge from the acute care hospital. In other words, it is referred to as continuity of care. Discharge planning seeks to provide services that enable patient to enhance or restore independency (Felong 2008). It may include cognitive screening, functional assessment, provision of counseling and education, coordination of an interdisciplinary team, activation of community services, follow-up and evaluation (Sibai 2011, Gregersen 2012). The discharge planning concerning geriatric patients with hip fracture could significantly improve the treatment' outcome, reduce readmission, and achieve a successful rehabilitation. This will lead to prevent deteriorating in functional status and accelerate restoring of independence of older persons (CrottyM 2010, Nosbusch 2011, Al-Maqbali 2014). Therefore, this study aims to determine the effect of implementing a discharge plan on functional abilities of geriatric patients with hip fractures.

MATERIALS AND METHOD

Design: A quasi experimental research design was used in this study.
Setting: The study was carried out at Al-Hadara Orthopedic and Traumatology University Hospital in Alexandria - Egypt. It is the only hospital specialized in the field of orthopedic surgery in the city of Alexandria.
Subjects: The study subjects comprised 60 elders with hip fractures attending the previous setting. The subjects were divided into two equal groups (study and control) where each group consists of 30 elders. Selection of the

subjects was based on the following eligible criteria:

1. Age 60 years and older.
2. Diagnosed with hip fractures due to non-pathological cause.
3. Elderly with hip fractures not admitted to the ICU. This is because those who are admitted to ICU are usually fragile and frail, treated under specialized protocols, and may stay long period unconscious. All these factors hinder the application of the discharge plan.
4. Elderly not planned for hip replacement surgeries, because patients with total or hemi hip replacement can start weight bearing much earlier than those who had a surgery of internal fixation with metal screws, dynamic hip screw, or intramedullary nail. This would make discrepancy between subjects and results of the study.
5. Elderly with normal cognitive functions or mild cognitive impairment i.e. scoring of (0-2) and (3-4) respectively by using the Short Portable Mental Status Questionnaire. Elders with moderate or severe cognitive impairment are excluded from the study because they are usually disoriented to time, place, and persons, have lost their learning ability due to severe memory deficit, and have difficulty following directions. Therefore, those elderly might require different protocols for the rehabilitation intervention after hip fracture.

Sample size:

The sample size was calculated using Epi info7 program, the output numbers was 54, then 10% of the number was added in order to overcome issues of mortality and withdrawal from the study, the total subjects' amounted 60.

Tools:

Tool I: Short Portable Mental Status Questionnaire (SPMSQ)

The short portable mental status questionnaire was developed by Pfeiffer (1975). The scale is widely used to detect the presence of mental impairment and to determine its degree. It is quick and easy to administer. It consists of 10 items. Scoring is based on 10 total points. Elders scoring from 0-2 are considered to have NO cognitive impairment; the scoring 3-4 indicates mild cognitive impairment, from 5-7 moderate cognitive impairment and from 8-10 severe cognitive impairment. This scale was translated into Arabic language and tested for its validity and reliability by Mahrous 2012, reliability value was (r = 0.89).

Tool II: Socio demographic and Clinical Data Structured Interview Schedule:

The tool was developed by the researcher and includes the following:

a) Socio demographic characteristics of the elderly such as age, sex, social status and level of education.
b) Health profile: pre-fracture comorbidities, sensory status, and use of any assistive devices.
c) Current falling: place, time and cause of current falling, and type of hip fractures.

Tool III: Barthel Index of Activities of Daily Living:

This scale was developed by Barthel (1965) and consists of 10 items that measure the ability of elderly to perform basic activities of daily living. The items include feeding, moving from chair to bed and return, grooming, transferring to and from a toilet, bathing, walking on level surface, going up and down stairs, dressing, and continence of bowels and bladder. The responses of each item are two to four with corresponding values (0, 5, 10, 15) depending on the item, an increased value indicates more independency in performing related tasks. These responses are then summed to a total score that ranges between 0 and 100 with higher scores indicating better functioning in performing ADLs, The Arabic version of this scale was used in this study, it was translated by Hallaj 2007, and tested for validity and reliability (r = 0.97).

Tool IV: Lawton and Brody Instrumental Activities of Daily Living Scale:

This Scale was developed by Lawton and Brody in 1969 to assess the ability of elders to perform instrumental activities of daily living. The scale includes eight items: telephoning, shopping, food preparation, housekeeping, laundering, use of transportation, use of medicine, and financial behavior. The eight different functions are measured and scored according to the self-report of individual actual performance of these activities. Women are scored on all 8 areas of function, but, for men, the areas of food preparation, housekeeping, laundering are excluded. Each item was scored from one to three values indicating levels of dependency, where three indicates performing the activity independently "without any assistance". Two indicates activity performed with some help "with partial assistance", and one indicates that patient cannot perform the activity at all. A sum score ranges from 8 (totally dependent) to 24 (totally independent) for women and from 5 to 15 for men. It was translated into Arabic language and validated on Egyptian population by Shehatta 1997 and tested for reliability in a study carried out at Alexandria by Elsayyed 2007, reliability was 0.83.

Tool (V): Selfcare practices of geriatric patients with hip fracture checklist:

This checklist was developed by the researcher based on thorough review of relevant literature, it comprised statements to evaluate subjects' adherence to self-care and rehabilitative activities after hip fracture repair surgery. These include activities related to nutritional habits, preventing complication of immobility, recommended exercise, and proper use of assistive devices. Every activity adopted by the elderly was scored one

point.

Method:

1) Official approval for conducting the study was obtained from the responsible authorities.
2) Preparing the tools for the study
3) The proposed discharge plan was developed by the researcher after thorough review of literature. The discharge plan covered the following topics:
   - Instructions related to preoperative period such as position in bed and performing deep breathing exercise.
   - Measures to avoid post-operative complications such as deep vein thrombosis, immobility and constipation.
   - Rehabilitative interventions which aim to improve functional abilities such as, safe exercise, adaptive techniques for performing activities of daily living, and nutritional recommendations.
4) The activities of the discharge plan were written in two separate printed booklets. The first one was a detailed version that illustrates the aim of the program, the objectives of every session, teaching method, and detailed content that guide the researcher during conducting the sessions. The second was a summarized booklet that contains concise and precise instruction given to patients to guide them during in-home rehabilitation. Both documents were written in Arabic language, and entails mainly pictures for more clarity and to overcome prevalence of illiteracy among elderly population.
5) Tool I, tool V, as well as discharge plan booklets were reviewed by a jury of 5 experts in the related fields.
6) Informed consent was obtained from each participant fulfilling the study criteria after they were informed about the purpose and methods of the study and that they were free to withdraw from study any time without penalties.
7) A pilot study was carried out on 6 elderly patients diagnosed with hip fractures at the study setting. Those elders were excluded from the study subjects.
8) Baseline assessment was conducted in the preoperative period. Every subject meeting the eligible criteria was interviewed in order to complete the baseline information using tool II. The telephone number and address of every patient was taken. Clinical data such as type of fracture, planned operative procedure was obtained from patient's file. The pre-fracture' functional abilities that concerning basic and instrumental activities of daily living were assessed using tools III and IV.
9) The period of implementing the discharge plan extended from hospital admission through three months after the operation.
   a. Experimental group: This group received the discharge plan beside the routine care followed in the hospital. The discharge plan was delivered by the researcher through individual sessions with the patient and their relatives at orthopedic ward in the study setting. Two sessions were conducted preoperatively, and other three sessions were held post operatively till patient discharge from the hospital. Each session took 15- 30 minutes and at the end of each session.
   b. Control group: Patients in the control group received the routine hospital care provided for all patients with hip fractures regardless of their age or type of hip fractures.
10) Three to seven days after patients' discharge, the researcher made one home visit for every patient. This visit aims to ensure the continuity of care for patients after being discharged from the hospital.
11) The researcher met the patients during the follow up appointments in the outpatient clinic, the number of these appointments was usually three, but some patients were given additional appointments especially in case of delayed wound healing. Telephone calls were conducted regularly (every two weeks) with subjects from both experimental and control groups and the researcher was available for patients by telephone seven days a week.
12) After 3 months from the operation date, the researcher interviewed geriatric patients in the experimental and control groups to evaluate their functional abilities by using the study tools III and IV. The data collection covered a period of 6 months from the beginning of February 2015 to the end of July 2015.

Statistical analysis:

Data was analyzed using PC with statistical package for social science (SPSS) version 15. The 0.05 level was used as the cutoff value for statistical significance.

Results:

Table (I): Distribution of geriatric patients with hip fracture among the study and control groups according to their Sociodemographic characteristics:

Items	Study group		Control group		Test of significance
	n (30)	%	n (30)	%	
Age (in years)					
60-	19	63.3	21	70.0	
75-	6	20.0	5	20.0	
85-96	5	16.7	3	10.0	
Mean ± SD	71.70±10.01		72.17±7.896		t = -0.200 p=0.842
Sex					
Male	12	40.0	13	43.3	χ^2= 0.69 p=0.793
Female	18	60.0	17	56.7	
Educational level					
Illiterate	23	76.7	25	83.3	
Read &write	5	16.7	4	13.3	χ^2= 1.581 p=0.664
Secondary	1	3.3	1	3.3	
University	1	3.3	0	0.0	

Table I shows the distribution of geriatric patients with hip fracture among the study and control groups according to their Sociodemographic characteristics. The age of the study group ranged from 61 to 96 years, with a mean age of 71.70±10.01 years, for the control group the age ranged from 61 to 90 years, with a mean of 72.17±7.896. Females were dominant among the studied subjects and constituted 60.0% of the study group and 56.7% of the control group. The majority of the subjects in both study and control groups (76.7% and 83.3% respectively) were illiterate. No statistical significant difference was found between both groups in relation to sociodemographic characteristics.

Table (II): Distribution of geriatric patients with hip fracture among the study and control groups according to their pre-fracture cognitive and physical status:

Items	Study group		Control group		Test of significance
	n (30)	%	n (30)	%	
Cognitive status					
Intact cognitive functions	11	37.9	14	46.7	χ^2=0.617 p=0.432
Mild cognitive impairment	19	63.3	16	53.3	
Visual status					
No visual problem	18	60.0	16	53.3	
Use eye glasses	4	13.3	9	30.0	χ^2= 2.733 p=0.255
Visual problem and not using eye glasses	8	26.7	5	16.7	
Hearing status					
No hearing problem	22	73.3	26	86.7	
Use a hearing aid	1	3.3	0	0.0	χ^2= 2.549 p=0.280
Hearing problem and not using hearing aid	7	23.3	4	13.8	
Ambulation capacity					
Independent	24	80.0	26	86.7	
Use cane	4	13.3	3	10.0	χ^2= 2.405 p=0.301
Use walker	2	6.7	1	3.3	

Table II shows the distribution of geriatric patients with hip fracture among the study and control groups according to their pre-fracture cognitive and physical status. Based on the eligible criteria, only patients with intact cognitive functions or mild cognitive impairment were included in this study. Those with mild cognitive impairment were more prevalent in both study and control groups, 63.3% and 53.3% respectively. Regarding visual status, the majority of elderly in both study and control groups reported no visual problems (60.0% and 53.3% respectively). In relation to hearing status, about three quarters of the study subjects (73.3%) and majority of the control group (86.7%) reported having no hearing problems. Concerning the ambulation status of the subjects before the occurrence of fracture, the majority of the elders in the study and control groups were able to ambulate independently (80.0% and 86.7 % respectively). No statistical significant difference was found between both groups in relation to cognitive, visual, hearing or ambulation capacity

Table (III): Comparison between geriatric patients with hip fracture among the study and control groups according to the recovering of their prefracture level of ADLs 3 months postoperatively.

ADLs	Study group (n=29)				Control group (n=27)				χ^2-test
	Recover to the pre-fracture level				Recover to the pre-fracture level				
	Yes		No		Yes		No		
	N	(%)	N	(%)	N	(%)	N	(%)	
Feeding	29	100	0	0.0	27	100	0	0.0	-
Bowels continence	29	100	0	0.0	27	100	0	0.0	-
Bladder continence	28	96.6	1	3.4	27	100	0	0.0	FET p=1.000
Grooming	27	93.1	2	6.9	20	74.1	7	25.9	χ^2=3.754 p=0.053
Dressing	24	82.8	5	17.2	16	59.3	11	40.7	χ^2= 3.783 p=0.052
Transferring Chair/bed	24	82.8	5	17.2	13	48.1	14	51.9	χ^2=7.472 p=0.006*
Toileting	22	75.9	7	24.1	14	51.9	13	49.1	χ^2= 3.511 p=0.061
Walking	20	69.0	9	31.0	10	37.0	17	53.0	χ^2= 5.731 p=0.017*
Bathing	19	65.5	10	34.5	11	40.7	16	59.3	χ^2=3.451 p=0.063
Climbing stairs	17	58.6	12	41.4	10	37.0	17	63.0	χ^2= 2.690 p=0.106
Total ADL	14	48.3	15	51.7	6	22.2	21	77.8	χ^2= 4.134 p=0.042*

** Significance at p≤ 0.050*

Table (III) shows the comparison between geriatric patients with hip fracture among the study and control groups according to the recovering of their prefracture level of ADLs 3 months postoperatively. All elderly (100%) in the study and control groups recovered their prefracture level in feeding and bowel continence. 96.7% of the study group compared to 100% of the control group recover prefracture level in bladder continence with no statistically significant difference. All except two elders in the study group recover prefracture level in grooming. Whereas, three quarters in the control group recover prefracture level in grooming, the difference is not statistically significant p=0.053. Concerning ability to dressing, 82.8% of the study group compared to 59.3% of the control group recovers their prefracture level, with no statistical significant difference p=0.052. Recovering the ability to transfer from bed to chair and return was reported by 82.8% of the study group compared to less than half of the control group (48.1%), with statistical significant difference p=0.006. Three quarters from study group (75.9%) recover prefracture ability of toileting. However, among control group 51.9% recovers prefracture ability. The difference isn't statistically significant p=0.061.Two thirds of the study group (69.0%) recovers their prefracture ability of walking compared to 37.0% of the control group with statistically significant difference p=0.017. In relation to bathing 65.5% of the study group recovers the prefracture level. Among control group, 40.7% recover prefracture ability, the difference is not statistically significant p=0.063. The most difficult task was climbing stairs. 58.6 % of the study group recovers their prefracture level and 41.4% became more dependent. 37.0 % of the control group recovers their prefracture level and 63.0% became more dependent, yet the difference is not statistically significant p=0.106. Consequently, a half of the study group (48.3%) recover their prefracture ability of performing ADLs and other half (51.7%) became more dependent. On the other hand, 22.2% of the control group recovers their prefracture level of ADLs and 77.8% became more dependent, the difference is statistically significant p=0.042.

Table (IV): Comparison between study and control groups of geriatric patients with hip fracture according to the recovering of their prefracture level of IADLs 3 months postoperatively.

IADLs	Study group (n=29) Male=11 Female=18				Control group (n=27) Male=11 Female=16				χ^2-test
	Recover to the pre-fracture level				Recover to the pre-fracture level				
	Yes		No		Yes		No		
	n	(%)	n	(%)	n	(%)	n	(%)	
Telephoning	29	100	0	0.0	27	100	0	0.0	-
Handling finance	26	89.7	3	11.3	18	66.7	9	33.3	χ^2= 4.389 p=0.036*
Medication	23	79.3	6	20.7	18	66.7	9	33.3	χ^2= 1.140 p=0.286
Laundry (Female only)	12	66.7	6	33.3	6	37.5	10	62.5	χ^2= 2.892 p=0.089
Shopping	12	41.4	17	58.6	12	44.4	15	55.6	χ^2=0.054 p=0.817
Food preparation (Female only)	11	61.1	7	38.9	4	25.0	12	75.0	χ^2= 4.480 p=0.034*
Housekeeping (Female only)	7	38.9	11	61.1	5	31.2	11	68.8	χ^2=0.216 p=0.642
Transportation	10	34.5	19	66.5	12	44.4	15	55.6	χ^2=0.582 p=0.446
Total IADL	6	20.7	23	79.3	1	3.7	26	96.3	FET P=0.062

** Significance at p≤ 0.050*

Table (IV) shows the comparison between study and control groups of geriatric patients with hip fracture according to the recovering of their prefracture level of IADLs 3 months postoperatively. Ability to use telephone was recovered among all subjects (100%) in both study and control groups. The second recovered task was handling finance, followed by taking medications, laundry, shopping, with no statistical significant difference between both groups in relation to these tasks. concerning food preparation, 61.1% compared to 25.0% of the females in the study and control groups respectively recover prefracture level with statistical significant difference p=0.034. This was followed by housekeeping, and transportation, but no detected statistical significant difference between study and control group. Overall 20.7% of the study group recovers their prefracture level of the study group and 79.3% became more dependent. Whereas 3.7% recover their prefracture level of independence and the majority (96.3%) became more dependent, yet the difference isn't statistically significant p=0.062.

Table (V): Relations between Sociodemographic characteristics of geriatric patients with hip fracture among the study and control groups and ADLs score 3 months postoperatively.

Sociodemographic characteristics	Study group (n=29)	Control group (n=27)
	ADLs score (*After 3 months*)	**ADLs score** (*After 3 months*)
	Mean±SD	**Mean±SD**
Age (in years)		
60-	87.89±17.26	70.7 ±24.45
75-	70.83±24.78	63.00±28.41
85-96	62.50±20.61	61.67±30.13
ANOVA test	F= 3.871 p=0.034*	F=0.296 p=0.746
Sex		
Male	85.00±16.12	78.89±24.04
Female	63.18±27.95	71.88±22.94
t-test	t=2.242 p=0.039*	t=0.867 p=0.391
Living status (residency)		
Alone	100.00	85.00±0.00
With relatives	92.50±10.60	-
With spouse	83.33±12.24	72.50±27.64
With children	77.06±25.43	64.41±24.86
ANOVA test	F=0.670 p=0.578	F=0.752 p=0.482

** Significance at p≤ 0.050*

Table (V): shows the relations between Sociodemographic characteristics of geriatric patients with hip fracture among the study and control groups of and ADLs score 3 months of the operation. There is a gradual decline in ADLs with increasing age of the subjects in both the study and control groups, these differences are statistically significant in the study group only p=0.034. Both male and female patients reported higher mean in ADLs among the study group than the control group. This difference in ADLs mean score between males and females is statistically significant in the study group p=0.039 and NOT statistically significant in the control group p=0.391.Concerning living status, patients living alone reported the highest ADLs mean score in the study and control groups followed by those living with relatives, then those who living with a spouse whereas those who live with their children reported the lowest ADLs mean score, no statistical significant difference found in either study or control group according to social status p=0.578 and p=0.482 respectively.

Table (VI): Relations between chronic diseases, cognition status, and physical status of the geriatric patients with hip fracture among the study and control groups of and ADL score 3 months of operation

ITEM	Study group (n=29)	Control group (n=27)
	ADLs score (*After 3 months*)	**ADLs score** (*After 3 months*)
	Mean ±SD	**Mean ±SD**
Chronic diseases:		
No	88.00 ± 26.83	87.50 ± 8.66
1or 2	85.00 ± 12.50	66.05 ± 25.68
3-5	65.71 ± 29.07	60.00 ± 27.38
ANOVA test	F= 2.677 p=0.088	F= 1.543 p=0.234
Cognitive status		
Intact cognitive functions	92.27±11.69	77.27±26.11
Mild cognitive impairment	73.89±22.91	62.19±22.94
t-test	t = 2.850 p=0.008*	t = 1.587 p=0.125
Visual status		
No visual problem	82.94±19.28	69.33±26.31
Use eye glasses	81.25±37.50	80.00±17.72
Visual problem and not using eye glass	76.25±17.67	41.25±9.46
ANOVA test	F=0.257 p=0.775	F=3.984 p=0.032*
Hearing status		
No hearing problem	85.00±20.41	72.50±24.23
Hearing problem and not using hearing aid	65.83±20.59	50.00±21.21
t-test	t = 2.072 p=0.146	t = 3.647 p=0.068
Ambulation capacity		
Independent	89.13±11.74	71.09±23.35
Use cane	46.25±21.74	58.33±36.17
Use walker	55.00±21.21	35.00
ANOVA test	F=20.428 p=0.000*	F=1.302 p=0.291

** Significance at p≤ 0.050*

Table (VI) shows the relations between chronic diseases, cognition status, and physical status of geriatric patients among the study and control groups with hip fracture and ADL score after 3 months of operation. Although there was a gradual decrease in ADLs score with increasing number of suffered chronic diseases in both groups. Yet, this difference is not statistically significant in both groups p=0.088 and p=0.234 respectively. Concerning cognitive status, the table shows that patients with intact cognitive functions have higher ADLs score than those with mild cognitive impairment in the study and control groups, yet this difference is not statistically significant p=0.125.In relation to visual status, the table shows that having visual problems affect inversely recovering ADLs among patients from study and control groups but this effect is statistically significant among control groups only p=0.032. Hearing problems also leads to lower ADLs score in the study and control groups after 3 months but the difference is not statistically significant in neither study group p=0.146 nor control group p=0.068.With regard to the ambulation status, independent patient have higher ADLs score in both study and control group, followed by those who use cane, and then by those who use walker. The differences in ADLs score according to ambulation capacity is statistically significant in the study group p=0.000 but not statistically significant in the control group p=0.291.

DISCUSSION

Hip fractures are important causes for morbidity, mortality, and loss of functional abilities among elderly people. Discharge plan for geriatric patients with hip fracture is coordinated approach aiming to reduce disability and recover pre-fracture level of functional ability (Waddell 2011). Discharge plan coordinating patients' and caregivers' expectations into the care process which starts by patient assessment, development of an appropriate plan, provision of education to the patient and caregivers and follow-up and evaluation (Damiani et al 2009).

Sociodemographic characteristics of geriatric patients in this study deserve attention. The age of the subjects ranged from 61 to 96 years, with a mean age of 71.70±10.01 years for the study group and 72.17±7.89 years for those in the control group (table I). This is less than the mean age reported in other studies conducted in Taiwan by Lin et al (2009), Belgium by Deschodt et al (2011), and Spain by Moyano et al (2013) where the mean age ranged from 79±699to 82±703 years. This difference may be related to the increased risks of falling among studied subjects in the community due to increased environmental hazards whether in home or community. Prevalence of illiteracy among the study subjects was more than predicted, this may be related to the low social status of the subjects and the characteristics of the study setting as governmental non paid hospital

(table I).

The primary objective in this study is to determine how the implementation of the discharge plan affected functional recovery after hip fracture. In the present study, the total ADLs score were higher at three months following discharge from the hospital in the study group compared with those in the control group (***table III)***. Many previous studies conducted in Australia by Crotty et al (2002), Taiwan by Huang(2005), and Sweden by Stenvall et al(2007) demonstrated that discharge planning improved the ADLs of hospitalized older people with hip fracture. Zidén et al conducted two randomized controlled trials in Sweden in 2008 and 2010 to study the effect of rehabilitative intervention on functional abilities of older adult with hip fracture and found a significant increase in ADLs score of the study group compared to the control group. In a study carried out in Taiwan by Tseng (2012), the researcher examined the effect of a 3-month interdisciplinary program that included geriatric consultation services, a continuous rehabilitation program, and discharge-planning services, the researcher found that the probabilities of poor or moderate recovery for participants who received the intervention were only 5% or 17% of the probability for those who received routine care. In Sweden, Sipilä et al 2014 studied the effect of multi-component home-based rehabilitation program on functional abilities of geriatric patients with hip fractures over 3, 6 and 12 months. The program improved the mobility recovery of patients with hip fracture over routine care.

On the other hand, other studies conducted in USA by Tinetti et al (1999), Spain by Vidan et al (2005), Belgium by Deschodt et al(2011), and Sweden by Edgren et al(2012) reported that geriatric intervention and multi component rehabilitation program was no more effective in promoting recovery than usual care. Orwig et al. (2011) studied a six-month intervention, comprising an exercise module and a self-efficacy based motivational module, implemented by physiotherapists. None of these interventions had any significant advantage over standard care. It is difficult to compare studies from different countries because of the differences in healthcare organization and rehabilitation routines and differing interventions provided in these studies, observation times and outcomes measures. The improvement of the present study may come from the improved services given through proposed discharge plan compared to the hospital routine care, the participants in the study group received exercise module, counseling about proper nutrition preventive measures of possible complications as well as personal communication through telephone. Participants of the control group did not receive any of these activities. Also absence of routine physical therapy in the study settings may make the effect of applying the discharge plan much obvious than other studies which demonstrated no effect of applying discharge plan in settings where physical therapy was given as a routine care for all patients.

Although applying the discharge plan lead to significant increase in postoperative ADLs score than those in the control group, yet more than half of the subjects in the study group could not recover their pre-fracture level of ADLs (***table III)***.Our findings are consistent with a previous study in Sweden by Zidén et al (2010)which showed that approximately half of the patients did not regain their independence in performing ADLs, and within the range reported by other studies in USA by Young(1997), Taiwan by Shyu (2004) where the percent of regaining pre-fracture level ranged from 44–60%.

The present study revealed that ADLs that recovered to the pre-fracture level three months post discharge were feeding, bowel and bladder continence where almost all subjects in both the study and the control groups reached the pre-fracture level of these tasks. Moderate increase in dependency than pre-fracture level was seen in activities like grooming, dressing, and transferring, with a significant difference between both groups in favor of the study group. These were followed by activities of toileting, walking, bathing, and climbing stairs that showed more difficulty in recovering pre-fracture level. (***table III)***. Difficulty of recovering activities like climbing stairs, walking and bathing is logic as these activities need more coordination in movement and high balance and self-confidence to be conducted. Also, these activities may trigger fear of falling more than other activities because of fear of slipping or tripping, which are the main causes of fall among subjects in this study. A study carried out in Taiwan by Lin et al (2009) reported similar results where about 90% of patients in intervention group had recovered the pre-fracture level in feeding, bowel and bladder continence, transferring, and grooming, whereas the rate of recovering pre-fracture level were more difficult in other tasks such as using toilet, dressing, bathing, and climbing stairs task. This is supported by a study carried out in Sweden by Stenvall et al (2007) who investigated the effect of intervention consisted of staff education, individualized care planning and rehabilitation, active prevention, detection and treatment of postoperative complications. They found a significant improvement in ADLs in the study group than the control group after 4 months of the operation, the most recovered tasks were feeding, following by transfer, toileting, continence, walking, dressing and bathing.

Concerning ability of performing IADLs, in this study the female patients were evaluated regarding eight activities, but for males the activities of laundry, food preparation, and housekeeping were excluded. This recommendation was put when designing the scale and used in many other studies in different areas, also it may be more suitable to eastern culture where it is uncommon to see geriatric males taking part in these activities especially when they are living with their spouses, relatives or siblings**.** After 3 months of the operation, the ability to use telephone was not affected by hip fracture where all subjects in both the study and control groups

had no problem in using the phone. This is understandable after the increase using of mobile telephone which do not need transferring or moving to the place of telephone to dial or answer calls. Handling finance and medication were the second most recovered tasks. The rate of increased dependency in activities of laundry, food preparation and housekeeping are less but not significant in the study group than the control group. The activities of shopping and transportation were the most difficult task where nobody either in the study or the control group was able to perform them during three months of follow up ***(table IV)***. These findings goes in line with other prospective cohort study of six months follow up carried out in Spain by Vergara et al (2014) on 557 geriatric patients with hip fracture due to a fall found that only 24.9% of elderly recover to the pre-fracture level of IADLs. On the other hand, a randomized controlled trial conducted in Taiwan by Li et al (2012) studied the effect of nutritional based intervention of functional recovery after hip fracture demonstrated better performance in IADLs among the study group than the control group. In present study, many people reported living with their sibling, spouse or relatives, which may rational the low mean score obtained in assessing the performance of IADLs even among female patients who are usually dependent on their relatives in helping in these tasks.

The positive relationship between better cognitive function and early functional recovery among geriatric patients after hip fracture has been reported in several studies (Montalbán et al 2012, Lee et al 2014, Penrod et al 2008). The present study showed that an impaired cognitive function is negatively associated with recovering functional recovery ***(table VI)***. This is supported by a recent large retrospective study on 5053 geriatric patients with hip fracture conducted in Korea (2014) to investigate the prognostic factors predicting the recovery of pre-fracture functional mobility; it was found that the early recovery of functional mobility was associated with pre-injury cognitive function. However, this doesn't mean that cognitively impaired patients do not benefit from rehabilitation programs. In another study, being cognitively impaired had only a little influence on functional regain comparing to normal patients (Morghen et al, 2011). But those subjects who reported functional regain among cognitively intact subjects had a significantly better pre-fracture functional abilities and less comorbidity than their counterparts.

In the present study, presence of comorbidity was negatively rather not significantly associated with recovering to the pre-fracture level of functional abilities (***table VI).***This is supported by a study carried out in Taiwan (2012) by Tseng where the number of comorbidity at admission was not associated with rate of recovering ADLs. Findings from other studies conducted in USA by Koval et al (1998) Sweden by Sipilä et al (2014), Spain by Vergara et al(2014), and are in contrast with findings of the present study and suggest that patients whose functional status worsened had higher degree of comorbidity. The different findings may be due to the different number of chronic diseases in the studies, where those who reported negative relation between comorbidity and functional regain reported higher number of chronic diseases among their subjects than studies which reported no relation. In our study, the mean number of chronic diseases in the study and control groups was 1.83±1.41 and 1.50±1.16 respectively which is near to other reported in Taiwan (2012) by Tseng et al which reported 1.49 chronic diseases, but less than other reported from contraindicated study where number of comorbidity in Sweden by Sipilä et al (2014) was 3 ± 2 and subjects who suffered more 2 and more chronic diseases amounted to78% of total subjects in Spain (2014) by Vergara et al.

CONCLUSION

Based on the findings of the present study, it can be concluded that the discharge plan that was implemented for the geriatric patients with hip fracture had a significant and positive effects on recovering elders to their prefracture level in most of the activities of daily living. Whereas, a positive rather not significant effect was found in recovering prefracture level of performing instrumental activities of daily living. Increasing age, being female, cognitively impaired, and lower of prefracture ambulation capacity, were negatively affected the rate of recovering functional ability after hip fracture.

The main recommendations were:

1) Stress the importance of applying the discharge plan for patients with hip fracture in order to accelerate their recovery and prevent complications.
2) Handout of printed booklet to each patient with hip fracture admitted to the hospital. This will help in their understanding and follow the main instructions to avoid complications.
3) In service training for nurses about components of the discharge plan and encourage them to apply its content to patients with hip fractures on admission to the hospital.

References

Crotty M, Whitehead CH, Gray S, Finucane PM(2002). Early discharge and home rehabilitation after hip fracture achieves functional improvements: a randomized controlled trial. Clin Rehabil;16(4):406-13.

Damiani G, Federico B, Venditti A, Sicuro L, Rinaldi S, Cirio F, Pregno C, Ricciardi W(2009). Hospital discharge planning and continuity of care for aged people in an Italian local health unit: does the care-home model reduce hospital readmission and mortality rates?. BMC Health services research; 9(22).

doi: 10.1186/1472-6963-9-22.
Deschodt M, Braes T, Broos P, Sermon A, Boonem S, Flamaing J, Milisen K(2011). Effect of an inpatient geriatric consultation team on functional outcome, mortality, institutionalization and readmission rate in older adults with hip fracture: A controlled trial. JAGS;59(7):1299-1308. DOI: 10.1111/j.1532-5415.2011.03488.x.
Edgren J, Rantanen T, Heinonen A, Portegijs E, Alén M, Kiviranta I, Kallinen M, Sipilä S(2012). Effects of progressive resistance training on physical disability among older community-dwelling people with history of hip fracture. Aging Clin Exp Res;24(2):171-5.
El Maghraoui A, Koumba BA, Jroundi I, Achemlal L, Bezza A, Tazi MA (2005). Epidemiology of hip fractures in 2002 in Rabat, Morocco. Osteoporosis Int;16(6):597-602.
Felong B(2008). Guide to discharge planning. USA: Western Govenors university.
Fernández-Moyano A, Fernández-Ojeda R, Ruiz-Romero V, García-Benítez B, Palmero-Palmero C, Aparicio-Santos R(2014). Comprehensive care program for elderly patients over 65 years with hip fracture. Rev Clin Esp (Barc);214(1):17-23. doi: 10.1016/j.rce.2013.01.011.
Fiatarone Singh MA1, Singh NA, Hansen RD, Finnegan TP, Allen BJ, Diamond TH, Diwan AD, Lloyd BD, Williamson DA, Smith EU, Grady JN, Stavrinos TM, Thompson MW(2009). Methodology and baseline characteristics for the Sarcopenia and Hip Fracture study: a 5-year prospective study. J Gerontol A BiolSci Med Sci;64(5):568-74. doi: 10.1093/gerona/glp002.
Gregersen M, Mørch MM, Hougaard K, Damsgaard EM(2012). Geriatric intervention in elderly patients with hip fracture in an orthopedic ward. J Inj Violence Res; 4(2): 45-51.
Hallj F (2007). Activity pattern of resident in elderly homes. Unpublished Master thesis, Faculty of Nursing, Alexandria University.
Halter JB, Ouslander JG, Tinetti ME, Studenski S, High KP, Asthana S (2009). Hazard's geriatric medicine and gerantology. 6th ed. New York: McGraw-Hill; 1435-42.
Huang TT, Liang SH (2005). A randomized clinical trial of the effectiveness of a discharge planning intervention in hospitalized elders with hip fracture due to falling.Journal of clinical nursing; 14: 1193-1201.
Johnell O, Cooper C, Cummings S, Slemenda C, Seeman E (1997). The socioeconomic burden of fractures today and in the 21st century.American Journal of Medicine; 103(2):20-5.
Kangau H (2011). Coping with everyday life after hip fracture rehabilitation for the elderly living at home [Degree thesis]. Finland: Arcada University of applied science.
Koval KJ, Skovron ML, Aharonoff GB, Zuckerman JD (1998). Predictors of functional recovery after hip fracture in the elderly. Clin Orthop Relat Res;(348):22–8.
Lawton P, Brody M(1969). Assessment of older people Self-maintaining and instrumental activities of daily living. The Gerontologist; 9(3): 179-186.
Lee D, Jo JY, Jung JS, Kim SJ(2014). Prognostic Factors Predicting Early Recovery of Pre-fracture Functional Mobility in Elderly Patients With Hip Fracture. Annals of Rehabilitation Medicine;38(6):827-835. doi:10.5535/arm.2014.38.6.827.
Li HJ, Cheng HS, Liang J, Wu CC, Shyu YI (2013). Functional recovery of older people with hip fracture: does malnutrition make a difference?. J Adv Nurs;69(8):1691-703. doi: 10.1111/jan.12027.
Lin PC, Wang CH, Chen CS, Liao LP, Kao SF, Wu HF (2009). To evaluate the effectiveness of a discharge-planning programme for hip fracture patients. J Clin Nurs;18(11):1632-1639. doi: 10.1111/j.1365-2702.2008.02695.x.
Lönnroos E, Kautiainen H, Karppi P, Huusko T, Hartikainen S, Kiviranta I, Sulkava R. (2006). Increased incidence of hip fractures, A population based-study in Finland. Bone: 39 (3); 623-7.
Mahrouse R(2012). Effect of multi-sensory stimulation on cognitive and physical functions of institutionalized elderly. Unpublished doctoral thesis. Faculty of Nursing, Alexandria University.
Marks R, Allegrante JP, Ronald MacKenzie C, Lane JM(2003). Hip fractures among the elderly: causes, consequences and control. Ageing Res Rev;2(1):57-93.
Mohoney I ,Barthel D(1965). Functional evaluation: the barthel index Maryland state. Medical state journal;14:56-61
Montalbán-Quesada S, García-García I, Moreno-Lorenzo C(2012). Functional evolution in elderly individuals with hip fracture surgery. Rev Esc Enferm USP;46(5):1096-1101.
Morghen S, Gentile S, Ricci E, Guerini F, Bellelli G, Trabucchi M(2011). Rehabilitation of older adults with hip fracture: cognitive function and walking abilities. J Am Geriatr Soc;59(8):1497-1502. doi: 10.1111/j.1532-5415.2011.03496.x.
Nikitovic M(2011). Direct Costs Of Hip Fractures Among Seniors In Ontario [Master thesis].Canada: University of Toronto.
Nosbusch M, Weiss E, Bobay L(2011). An integrated review of the literature on challenges confronting the acute

care staff nurse in discharge planning.Journal of Clinical Nursing; 20 (5–6): 754–774.

Orwig DL, Hochberg M, Yu-Yahiro J, Resnick B, Hawkes WG, Shardell M, Hebel JR, Colvin P, Miller RR, Golden J, Zimmerman S, Magaziner J(2011). Delivery and outcomes of a yearlong home exercise program after hip fracture: a randomized controlled trial. Archives of Internal Medicine;171(4):323-31.

Panula J(2010). Surgically treated hip fracture in older people with special emphasis on mortality analysis [Published PhD thesis]. Finland: University of Turku.

Penrod JD, Litke A, Hawkes WG, Magaziner J, Doucette JT, Koval KJ, Silberzweig SB, Egol KA, Siu AL(2008). The association of race, gender, and comorbidity with mortality and function after hip fracture. J Gerontol A Biol Sci Med Sci;63(8):867-872.

Pfiffer E(1975). A short portable mental status questionnaire for the assessment of organic brain defect in elderly patients. J AM Geriatric Soc; 23(10):433-41.

Prince I, Lini JR, Taniform W, Azefor E(2010). Guidance through rehabilitation of hip fracture patients at Armila hospital via caring-TV [Published doctorate thesis]. Otaniemi: LaureaUniversity of Applied Sciences.

Ranhoff AH, Holvik K, Martinsen MI, Domaas K, Solheim LF (2010). Older hip fracture patients: three groups with different needs. BMC Geriatr;10(65). doi: 10.1186/1471-2318-10-65.

Sanguineti A(2010). Hip Fractures in Older Adults: Peri-Operative Considerations. Arizona Geriatric Education Center and Arizona Center on Aging.

Shyu YL, Chen M, Liang J, Wu C, Su J (2004). Predictors of functional recovery for hip fractured elders during 12 months following hospital discharge: a prospective study on a Taiwanese sample. Osteoporosis International;15(6): 475-82.

Sibai AM1, Nasser W, Ammar W, Khalife MJ, Harb H, Fuleihan Gel-H (2011). Hip fracture incidence in Lebanon: a national registry-based study with reference to standardized rates worldwide. Osteoporos Int;22(9):2499-506. doi: 10.1007/s00198-010-1468-y.

Sipilä S, Salpakoski A, Edgren J, Heinonen A, Kauppinen MA, Arkela-Kautiainen M, Sihvonen SE, Pesola M, Rantanen T, Kallinen M (2011). Promoting mobility after hip fracture (ProMo): study protocol and selected baseline results of a year-long randomized controlled trial among community-dwelling older people. BMC Musculoskeletal Disorders;12(277). DOI:10.1186/1471-2474-12-277.

Stenvall M, Olofsson B, Nyberg L, Lundström M, Gustafson Y (2007). Improved performance in activities of daily living and mobility after a multidisciplinary postoperative rehabilitation in older people with femoral neck fracture: a randomized controlled trial with 1-year follow-up. J Rehabil Med;39(3):232-8.

Tinetti ME, Baker DI, Gottschalk M, Williams CS, Pollack D, Garrett P, Gill TM, Marottoli RA, Acampora D(1999). Home-based multicomponent rehabilitation program for older persons after hip fracture: a randomized trial. Arch Phys Med Rehabil;80(8):916-22.

Vergara I, Vrotsou K, Orive M, Gonzalez N, Garcia S, Quintana JM(2014). Factors related to functional prognosis in elderly patients after accidental hip fractures: a prospective cohort study. BMC Geriatrics;14(124). doi:10.1186/1471-2318-114-24.

Vidán M, Serra JA, Moreno C, Riquelme G, Ortiz J(2005). Efficacy of a comprehensive geriatric intervention in older patients hospitalized for hip fracture: a randomized, controlled trial. J Am Geriatr Soc;53(9):1476-82.

Waddell J (Ed.). National Hip Fracture Tool Kit.Bone and Joint Decade Canada, Toronto, Ontario. 2011:35-36. Available from: http://boneandjointcanada.com/wp-content/uploads/2014/05/National-hip-fracture-toolkit-June-2011.pdf Retrieved on: 10/6/2014.

Young Y, Brant L, German P, Kenzora J, Magaziner J. A longitudinal examination of functional recovery among older people with subcapital hip fractures. J Am Geriatr Soc. 1997 Mar;45(3):288-94.

Zidén L, Frändin K, Kreuter M(2008). Home rehabilitation after hip fracture. A randomized controlled study on balance confidence, physical function and everyday activities. Clin Rehabil ;22(12):1019-33. doi: 10.1177/0269215508096183.

Zidén L, Kreuter M, Frändin K (2010). Long-term effects of home rehabilitation after hip fracture - 1-year follow-up of functioning, balance confidence, and health-related quality of life in elderly people. Disabil Rehabil;32(1):18-32. doi: 10.3109/09638280902980910.