

Research Article

**A RETROSPECTIVE CROSS SECTIONAL STUDY OF FUNCTIONAL OUTCOMES
AND FACTORS ASSOCIATED WITH FUNCTIONAL RECOVERY AMONG
OLDER ADULTS WHO HAD HIP FRACTURE TREATMENT**

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Abstract

Introduction: Most common cause of shift to nursing homes, hip fracture produces huge strain both personally and financially. As india is facing a rise of geriatric population, geriatric syndromes like falls, incontinence are on the rise. One of the most devastating complication of falls is hip fracture. Hip fragility fractures are very common in the elderly. Their prevalence is expected to rise in our country due to increasing elderly population.

Materials and Methods: A retrospective cross sectional study. All patients of age 65 years and above admitted with hip fracture to ortho ward from February 2020 to February 2022 were recruited for the study via telephone calls were included in the study. Pathological fractures, malignancy, terminally ill, bed ridden elderly were excluded. The Katz Index of Independence in Activities of Daily Living, commonly referred to as the Katz ADL, is the most appropriate instrument to assess functional status as a measurement of the client's ability to perform activities of daily living independently. Clinicians typically use the tool to detect problems in performing activities of daily living and to plan care accordingly. The Index ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions. A score of 6 indicates full function, 4 indicates moderate impairment, and 2 or less indicates severe functional impairment

Results: Amongst demographic variables, Male sex was significantly associated with a greater propensity for poor functional outcomes, with 16 out of 29 males showing poor outcomes (55.2% of male patients had poor outcome and 41.0% of poor outcomes were male) with an odds ratio (OR) of 2.3 (95% CI: 0.9–5.6), which became significant after removing the confounding effects of other variables - Adjusted OR: 3.9, 95% CI: 1.3–11.5). Age (≥ 80 years) also had significantly poorer outcome with 24 out of 45 such patients had OR of 2.7, with 95% CI: 1.1–6.2. This demonstrates that Male sex is an independent predictor of poor functional outcome.

Conclusion: Our study showed that age, chronic kidney disease, infection and delirium during hospital stay were inversely connected with recovery.

Key Words: Hip fracture, chronic kidney disease, infection and delirium.

INTRODUCTION

Most common cause of shift to nursing homes. Hip fracture produces huge strain both personally and financially. As India is facing a rise of geriatric population, geriatric syndromes like falls, incontinence are on the rise. One of the most devastating complication of falls is hip fracture. Hip fragility fractures are very common in the elderly. Their prevalence is expected to rise in our country due to increasing elderly population.

Hip fractures produce huge strain on the patient and healthcare system. It is usually associated with significant morbidity and mortality. Moreover adverse effects of hip fracture range from loss of independence, frailty, and pressure sores. One of the most important risk factor for shift to nursing homes is hip fractures. Many of the survived patients could not reach the baseline ADL.

Risk factors for adverse outcome include increased age, reduced ADL, multiple drugs, cognitive impairment, increased comorbidity status. Even though many studies are done in western countries, the number of studies analysing the factors affecting hip fracture recovery is meagre in India. The awareness of early mobilization, therapeutic exercises for mobility and immediate surgery is needed to make a good recovery is poor in India where this problem is on the rise.

Hence this study was undertaken to enable to understand the factors which help in recovery and the factors which negatively impact recovery.

This study will shed light on most important factors affecting the recovery of hip fracture patients. The need for orthogeriatrics is also crucial for the overall well being of elderly patients admitted with hip fracture. With an ageing population, the number of hip fractures is expected to rise, even though the trends suggest a stabilization in age-adjusted rates [1, 2]. This condition in older adult patients is often associated with adverse outcomes, such as increased mortality and morbidity [3], increased dependency in Activities of Daily Living (ADL) [4–6], reduced mobility [7], and a negative effect on cognitive function [8, 9]. In addition to the individual negative outcomes, the increased dependency will also place a high demand on health care systems in the years to come. Thus, hip fractures constitute a major socioeconomic and public

health burden worldwide [10, 11], and it is of value to investigate the best method for treating these patients.

Hip fragility fractures are a common occurrence in the elderly [1]. Their prevalence is increasing globally as life expectancy rises, with an incidence rate of 350/100,000 people per year in developed countries [1]. Despite medical advances and increasingly sophisticated therapeutic interventions, hip fractures continue to have a significant impact on elderly patients (reduced mobility and functionality) [2]. They are associated with significant social [3] and economic consequences (increased hospitalization costs and nursing home rates, high mortality and morbidity) [4,5]. Many patients who have had a hip fracture are unable to return to their pre-fracture level of autonomy [5]. Age, presence of comorbidities, lack of autonomy prior to the fracture, and prolonged bed rest (frequent use of an air pressure mattress, an increase in the number of days spent disoriented, inability to recover, long-term urinary catheter, and short-term care provision) are all risk factors [6]. Prolonged immobility can decrease functionality and raise the risk of hospital-related problems like falls and pressure ulcers. In contrast, early movement tends to decrease functional decline and bed rest comorbidities.

Various studies have been done to know the factors which adversely affect the prognosis of recovery in hip fracture patients undergoing surgery.

Having a hip fracture is considered one of the most fatal fractures for elderly people, resulting in impaired function, and increased morbidity and mortality. Functional capacity, specifically related to activities of daily living, is restricted in all hip fractures, and according to published data elderly individuals with hip fracture do not reach their pre-fracture levels of functioning one year post-fracture in 29 to 50% of cases [10, 11]. Hip fractures are associated with a pronounced decline in physical functioning at 2 years, independent of the effects of increasing age, pre-existing medical conditions and disabilities [12].

In india , as the elderly population are increasing, the proportions of elderly with hip fracture will rise.

Identifying elements that favor a return to health and functional recovery are very useful for developing appropriate and efficient prevention, intervention and rehabilitation programs.⁸ Due to these reason the following study is undertaken

AIM

To examine the functional outcomes and factors associated with functional recovery among older adults who had hip fracture treatment

OBJECTIVES

1. To assess the functional ability among older adults, 6 months after hip fracture treatment
2. To determine the clinical factors associated with functional ability 6 months after hip fracture treatment in the study group

METHODOLOGY

Study design: retrospective cross sectional study

Study population: Older adults 65 years and above who had hip fracture and underwent treatment in orthopedic ward of tertiary care hospital were recruited for the study from February 2020 to 2022 were included after getting informed consent.

Inclusion criteria:

All patients of age 65 years and above admitted with hip fracture to ortho ward from February 2020 to February 2022 were recruited for the study via telephone calls

Exclusion criteria:

Pathological fractures, malignancy, terminally ill, bed ridden elderly were excluded

Study tools:

A questionnaire containing following questions will be drawn up for data collection

Clinical data – AGE, sex

Comorbidity status

Duration of hospital stay

Number of medications

ASA classification (American society of Anaesthesiology)

Delay in surgery >48 hours

Intercurrent infections during hospital stay

Delirium during hospital stay

Mortality

Socio economic status – modified kuppuswamy scale

Activities of daily living was assessed by katz scale

The Katz Index of Independence in Activities of Daily Living, commonly referred to as the Katz ADL, is the most appropriate instrument to assess functional status as a measurement of the client's ability to perform activities of daily living independently. Clinicians typically use the tool to detect problems in performing activities of daily living and to plan care accordingly. The Index ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions. A score of 6 indicates full function, 4 indicates moderate impairment, and 2 or less indicates severe functional impairment

Socioeconomic status was studied using modified kuppuswamy scale which is usually used for assessing status of urban household. Ambulation category was assessed by functional ambulatory catirt.

The Functional Ambulation Categories (FAC) is a 6-point functional walking test that evaluates ambulation ability, determining how much human support the patient requires when walking, regardless of whether or not they use a personal assistive device

- A score of 0 indicates that the patient is a non-functional ambulator (cannot walk);
- A score of 1, 2 or 3 denotes a dependent ambulator who requires assistance from another person in the form of continuous manual contact (1), continuous or intermittent manual contact (2), or verbal supervision/guarding (3)
- A score of 4 or 5 describes an independent ambulator who can walk freely on: level surfaces only (4) or any surface (5=maximum score)

Data collection procedure: data was collected from medical records department and via telephone calls after obtaining consent from the patient. If patients were not able to participate, a proxy respondent, family member or care giver were interviewed. Questionnaire was prepared including all the data mentioned in the study tools and telephonic interview were conducted, questions asked and data entered in the study. Clinical data was collected from the case sheets from the medical records department.

As main outcome functional status was measured (Barthel Index and Lawton Instrumental Activities of Daily Living Scale). Data were collected during the first week after fracture occurrence and after 6 months of follow-up. Patients were considered to have deteriorated if there was worsening in their functional status as measured by katz Index and functional ambulation score. Factors associated with the outcome were studied via logistic regression analysis.

RESULTS

After Removing Deaths

Total Patients = 95

Variable	Total (n = 95)	Katz Index		Odds ratio	Adjusted Odds ratio
		Poor (n = 39)	Good (n = 56)		
Sex (Male)	29 (30.5%)	16 (41.0%)	13 (23.2%)	2.3 (0.9, 5.6) *	3.9 (1.3, 11.5)
Age (≥ 80)	45 (47.4%)	24 (61.5%)	21 (37.5%)	2.7 (1.1, 6.2) **	
TYPE OF FRACTURE					
IT Fracture	52 (54.7%)	21 (53.8%)	31 (55.4%)	0.9 (0.4, 2.1)	
NOF Fracture	42 (44.2%)	16 (41.0%)	26 (46.4%)	0.8 (0.4, 1.8)	
Subtrochanteric	1 (50.0%)	1 (50.0%)	0		
COMORBIDITY STATUS					
T2DM	55 (57.9%)	22 (56.4%)	33 (58.9%)	0.9 (0.4, 2.1)	
Hypertension	69 (72.6%)	32 (82.0%)	37 (66.0%)	2.3 (0.9, 6.3)*	
Coronary Artery Disease	16 (16.8%)	6 (15.4%)	10 (17.8%)	0.8 (0.3, 2.5)	
Chronic Kidney Disease	4 (4.2%)	4 (10.2%)	0	**	
COPD / BA	20 (21.0%)	11 (28.2%)	9 (16.0%)	2.1 (0.8, 5.6)	
Cerebrovascular Accident	8 (8.4%)	4 (10.3%)	4 (7.1%)	1.5 (0.3, 6.3)	
Dyslipidemia	28 (29.5%)	10 (25.6%)	18 (32.1%)	0.7 (0.3, 1.8)	
Parkinson's	5 (5.3%)	4 (10.3%)	1 (1.8%)	6.3 (0.7, 58.6)*	
Chronic Liver Disease	2 (2.1%)	0	2 (3.6%)		
PROCEDURE DONE					
Open reduction and internal fixation (ORIF)	8 (8.4%)	3 (7.7%)	5 (8.9%)	0.9 (0.2, 3.8)	
Closed reduction and internal fixation (CRIF)	44 (46.3%)	18 (46.1%)	26 (46.4%)	0.9 (0.4, 2.2)	
Hemiarthroplasty	34 (35.8%)	17 (43.6%)	17 (30.4%)	1.8 (0.8, 4.2)	
Total hip replacement	7 (7.4%)	1 (2.6%)	6 (10.7%)	0.2 (0.02, 1.9)	
IN HOSPITAL STATUS					
Delay in surgery	41 (43.2%)	19 (48.7%)	22 (39.3%)	1.5 (0.6, 3.3)	
Infections during hospital stay	17 (17.9%)	11 (28.2%)	6 (10.7%)	3.3 (1.1, 9.8)**	
Delirium during hospital stay	22 (23.2%)	16 (41.0%)	6 (10.7%)	5.8 (2.0, 16.7)**	4.7 (1.5, 14.9)
Duration of hospital stay (>10)	30 (31.6%)	18 (46.2%)	12 (21.4%)	3.1 (1.3, 7.7)**	2.9 (1.1, 8.4)

Number of days physiotherapy after (> 10)	5 (5.3%)	3 (7.7%)	2 (3.6%)	2.3 (0.4, 14.1)	
PRE HOSPITAL STATUS					
Prefunctional Status (≤ 5)	59 (62.1%)	30 (76.9%)	29 (51.8%)	3.1 (1.2, 7.7)**	3.3 (1.1, 9.8)
No. of comorbidity (> 3)	12 (12.6%)	6 (15.4%)	6 (10.7%)	1.5 (0.5, 5.1)	
Number of drugs taken (> 10)	28 (29.5%)	16 (41.0%)	12 (21.4%)	2.5 (1.0, 6.3)**	

*p Value < 0.1

**p Value < 0.05

This retrospective cross sectional study evaluated the prognostic indicators of poor functional recovery via logistic regression analysis in 95 elderly patients, who underwent hip fracture surgery from 2020 to 2022 at a tertiary care center. Exempting postoperative deaths, this analysis mainly focused on survivors and their subsequent clinical trajectories, as assessed by the Katz Index of Independence in Activities of Daily Living(Katz ADL).

Amongst demographic variables, Male sex was significantly associated with a greater propensity for poor functional outcomes, with 16 out of 29 males showing poor outcomes (55.2% of male patients had poor outcome and 41.0% of poor outcomes were male) with an odds ratio (OR) of 2.3 (95% CI: 0.9–5.6), which became significant after removing the confounding effects of other variables - Adjusted OR: 3.9, 95% CI: 1.3–11.5). Age (≥ 80 years) also had significantly poorer outcome with 24 out of 45 such patients had OR of 2.7, with 95% CI: 1.1–6.2. This demonstrates that Male sex is an independent predictor of poor functional outcome.

Fracture types included Intertrochanteric fracture, neck of femur and subtrochanteric fractures. Intertrochanteric fractures were the most common, observed in 52 out of 95 patients(54.7%), of whom 21 had poor outcomes (40.4%- IT fracture patients with poor outcome) and 31(55.4%) had good recovery; Neck of femur fractures were the second most common type, seen in 42 patients (44.2%), with 16 experiencing poor outcomes (38.1% of patients with neck of femur fracture had poor functional outcome)and 26 had good prognosis. Only 1 patient had a subtrochanteric fracture (1.1%) which resulted in poor outcome. Although Intertrochanteric fractures were the most prevalent, their association with adverse functional outcomes were comparable to that of neck of femur fractures. Odds ratio analysis revealed weak inverse trends with no statistically significant differences between fracture types: intertrochanteric fracture had an OR of 0.9 (95% CI: 0.3–2.5) and neck of femur had an OR of 0.8 (95% CI: 0.3–2.3). The single subtrochanteric fracture (1 patient) was excluded from further statistical analysis due to insufficient sample size. Overall, fracture type showed no significant association with recovery.

Amongst comorbidities Hypertension was most common and observed in 69 out of 95 patients (72.6%). Of which 32 patients had poor recovery, but analysis did not reveal a significant association (OR: 2.3; 95% CI: 0.9–6.30). Diabetes mellitus was present in 55 out of 95 (57.9%) with 22 showing adverse outcomes (56.4%) having OR of 0.9; 95% CI 0.4–2.1, also indicating no significant association. Coronary artery disease (CAD) was found in 16 patients (16.8%), of whom 6 (37.5%) had poor recovery (OR: 0.8; 95% CI: 0.3–2.5). Chronic kidney disease (CKD) was reported in 4 patients (4.2%), and all experienced poor functional outcomes. The absence of OR reflects statistical limitation due to small sample size and skewed distribution. Chronic obstructive pulmonary disease (COPD) or bronchial asthma was noted in 20 patients (21.0%), with 11 (55%) having poor outcomes (OR: 2.1; 95% CI: 0.8–5.6). Cerebrovascular accidents (CVA) were documented in 8 patients (8.4%), with 4 (50%) poor outcomes (OR: 1.5; 95% CI: 0.3–6.3). Parkinson's disease, though affecting only 5 patients (5.3%), showed the highest odds ratio (OR: 6.3, 95% CI: 0.7–58.5) suggesting a potentially strong association, though not statistically significant due to small sample size. Dyslipidemia was seen in 28 patients (29.5%), with 10 poor outcomes (35.7%) (OR: 0.7; 95% CI: 0.3–1.8), while chronic liver disease was rare (2 patients, 2.1%) and not statistically analyzable. Overall, while comorbidities were highly prevalent, none demonstrated statistically significant independent associations with adverse outcomes, though Parkinson's disease and CKD indicated strong nonsignificant trends.

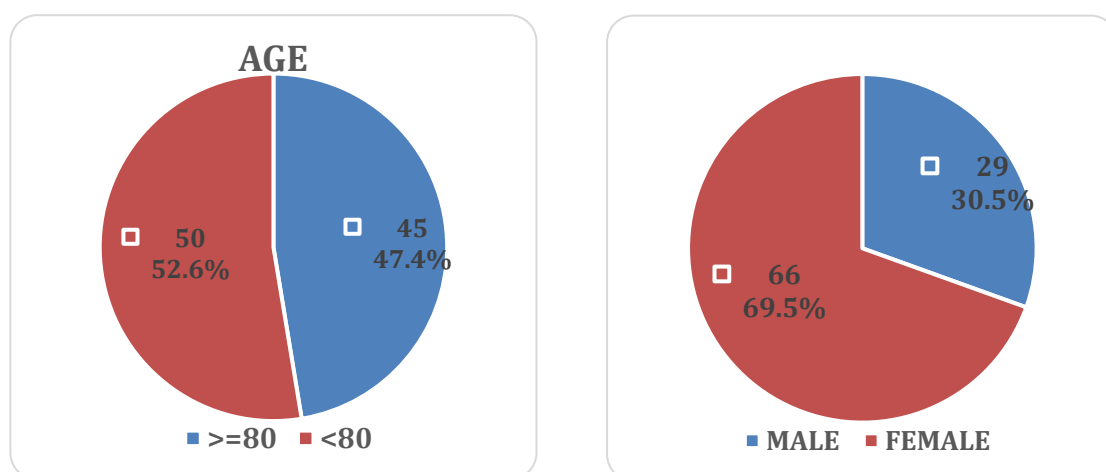
Surgical intervention types included Closed and Open reduction internal fixation (CRIF/ORIF), Hemiarthroplasty, Total hip replacement. CRIF was performed in 44 (46.3%) of patients, hemiarthroplasty in 34 (35.8%), open reduction internal fixation (ORIF) in 8 (8.4%), and total hip replacement (THR) in 7 (7.4%). Hemiarthroplasty had the highest absolute percentage of poor outcomes, odds ratio of 1.8 (95% CI: 0.8–4.2). Total hip replacement showed a trend towards better recovery (OR: 0.2, 95% CI: 0.02–1.9). Though none of these procedures were statistically significant.

In Hospital Status includes Delay in surgery, Infections, delirium, duration of hospital stay and extended physiotherapy of > 10 days. Delirium during hospital stay occurred in 22 patients out of which 16 had poor outcomes, yielding an OR of 5.8 (95% CI: 2.0–16.7), with an adjusted OR of 4.7 (95% CI: 1.5–14.9) implies, delirium independently predicts poor recovery. Infections seen in 17 patients of which 11 (28.2%) had poor recovery, with a significant association (OR: 3.3, 95% CI: 1.1–9.8). Hospitalization for more than 10 days also significantly increased the likelihood of poor outcomes in 46.2% (OR: 3.1; 95% CI: 1.3–7.7; AOR: 2.9, 95% CI: 1.1–8.4). Like delirium, hospitalization > 10 days is also an independent predictable factor. Conclusively, delirium, infection and prolonged hospital stay had significant association for poor outcome. This emphasizes the importance of delirium prevention, infection control and duration of hospital stay in recovery. Delay in surgery for > 48 hours shows 48.7% poor outcomes but statistically not significant, OR = 1.5 (0.6–3.3). Similarly physiotherapy for > 10 days is also not statistically significant (3 out of 5 patients showed poor outcome) and shows wider CI, OR = 2.3 (0.4–14.1).

Pre-fracture functional status as calculated using Katz ADL, was a strong determinant of recovery. Patients with a Katz score ≤ 5 was observed in 59 patients (62.1%), of which 30 (76.9%) had significant poor functional recovery shown by OR: 3.1, 95% CI: 1.2–7.7 and

AOR: 3.3, 95% CI: 1.1–9.9 suggests it as an independent predictor. Burden of comorbidities prior to hospitalization also influences the recovery. 6 out of 12 patients who had >3 comorbidities experienced suboptimal recovery outcomes, but was not significant statistically (OR 1.5; 95% CI 0.5-5.1) Medication burden was also evaluated and use of 10 or more drugs, was prevalent in 28.4% and also showed a statistically significant association with poor recovery (OR: 2.5, 95% CI: 1.0–6.3).

Taken together, this retrospective study comprehensively identifies both modifiable and non-modifiable factors influencing postoperative functional outcomes in elderly patients following hip fracture surgery. Male sex, delirium during hospital stay, duration of hospitable stay and functional status before hospital stay are independant predictors of poor outcome. Parkinson's disease, delirium, infection, duration of stay, prefunctional status <5, age>80 years, multiple drug intake (>10) before admission, >10days after physiothrapy, male sex, Hypertension, COPD/BA, CVA, , hemiarthroplasty intervention, delay in surgery and burden of comorbidities before hospital admission shows adverse outcome of recovery. Of which Parkinsons disease, despite affecting only five patients, it showed the highest odds ratio for poor outcome (OR: 6.3), highlighting a potentially strong effect on adverse outcome.



As shown in table 1, potential risk factors that affect the Katz Index like demographic factors, type of fracture, comorbidity status, procedure done, in-hospital and pre-hospital status were studied. Among these factors the following were statistically significant: age (OR (95% CI): 2.7 (1.1- 6.2)), infections during hospital stay (OR (95% CI): 3.3 (1.1- 9.8)), Delirium during hospital stay (5.8 (2.0- 16.7)), duration of hospital stay (3.1 (1.3-7.7)), pre-functional status (OR (95% CI): 3.1 (1.2- 7.7)) and number of drugs taken (OR (95% CI): 2.5 (1.0- 6.3)).

There is a 2.7 times chance of poor Katz Index for patients aged 80 year or more, 2.3 times higher risk of poor outcome among men, patients who experience an infection during hospital stay have a 3.3 times chance of poor Katz Index, 5.8 times more risk of poor outcome among patients with Delirium during hospital stay, 3.1 times chance of poor Katz Index for patients with longer hospital stay, 3.1 times higher risk among patients with lower pre-functional status and patient taking more number of medications have a 2.5 times chance of poor Katz Index.

However, only four were independent risk factors of recovery based on Katz Index. They are sex (OR (95% CI): 3.9 (1.3, 11.5)), Delirium during hospital stay (OR (95% CI): 4.7 (1.5, 14.9)), duration of hospital stay (OR (95% CI): 2.9 (1.1, 8.4)) and pre-functional status (OR (95% CI): 3.3 (1.1, 9.8)).

Correlation between different values and Katz Index

VARIABLE (n = 114)		FREQUENCY	r value	p value
SEX	MALE	34 (29.8%)	0.20	0.06
	FEMALE	80 (70.2%)		
AGE	60 - 70	30 (26.3%)	- 0.37	0.0002
	71 - 80	32 (28.1%)		
	81 - 90	39 (34.2%)		
	91 - 100	13 (11.4%)		
IT FRACTURE	YES	61 (53.5%)	-0.01	0.95
	NO	53 (46.5%)		
NOF FRACTURE	YES	52 (45.6%)	-0.05	0.60
	NO	62 (54.4%)		
SUBTROCHANTERIC	YES	2 (1.8%)	0.12	0.23
	NO	112 (98.2%)		
T2DM	YES	62 (54.4%)	-0.02	0.80
	NO	52 (45.6%)		
HTN	YES	84 (73.7%)	0.2	0.08
	NO	30 (26.3%)		
CAD	YES	25 (21.9%)	-0.03	0.7
	NO	89 (78.1%)		
CKD	YES	8 (7.0%)	0.25	0.01
	NO	106 (93.0%)		
COPDBA	YES	22 (19.3%)	0.14	0.15
	NO	92 (80.7%)		
CVA	YES	9 (7.9%)	0.05	0.6
	NO	105 (92.1%)		
DLP	YES	32 (28.1%)	-0.07	0.5
	NO	82 (71.9%)		
PARKINSONS	YES	5 (4.4%)	0.2	0.07
	NO	109 (95.6%)		

CLD	YES	2 (1.8%)	-0.12	0.2
	NO	112 (98.2%)		
ORIF	YES	10 (8.8%)	-0.02	0.8
	NO	104 (91.2%)		
CRIF	YES	52 (45.6%)	-0.002	0.9
	NO	62 (54.4%)		
HEMIARTHROPLASTY	YES	43 (37.7%)	0.13	0.2
	NO	71 (62.3%)		
TOTAL HIP REPLACEMENT	YES	7 (6.1%)	-0.15	0.13
	NO	107 (93.9%)		
DELAY IN SURGERY	YES	51 (44.7%)	0.1	0.4
	NO	63 (55.3%)		
DURATION OF HOSPITAL STAY	0 - 10	78 (68.4%)	-0.18	0.06
	11 - 20	28 (24.6%)		
	21 – 30	4 (3.5%)		
	31 – 40	3 (2.6%)		
	41 – 50	1 (0.9%)		
INFECTIONS DURING HOSPITAL STAY	YES	25 (21.9%)	0.22	0.03
	NO	89 (78.1%)		
DELIRIUM DURING HOSPITAL STAY	YES	32 (28.1%)	0.35	0.0004
	NO	82 (71.9%)		
NUMBER OF DRUGS TAKEN	0 - 10	83 (72.8%)	-0.2	0.1
	11 - 20	30 (26.3%)		
	21 - 30	1 (0.9%)		
NUMBER OF DAYS PHYSIOTHERAPY AFTER SURGERY	0 - 10	108 (94.7%)	-0.04	0.7
	11 - 20	5 (4.4%)		
	21 - 30	1 (0.9%)		

VARIABLE (n = 95)		FREQUENCY	r value	p value
Katz Index	0 - 4	39 (41.0%)		
	6 - 5	56 (59.0%)		
Functional Ambulatory Score	0 - 4	62 (65.3%)	0.5	<0.0001
	5	33 (34.7%)		
Prefunctional Status	0 - 5	59 (62.1%)	0.2	0.01
	6	36 (37.9%)		

Positive Correlation:

The Katz index is positively correlated with CKD, Total Hip Replacement, infections during the hospital stay, delirium during the hospital stay, Functional Ambulatory Score and Prefunctional Status. This implies that the functional recovery increases in these cases.

- Higher prefunctional status correlates positively with higher Katz Index scores, suggests that patients with better initial functional status tend to recover better and maintain higher levels of independence.
- Effective management of CKD can contribute to better recovery and higher Katz Index scores, emphasizing the importance of chronic disease management.

Negative Correlation:

- The correlation coefficient of -0.39004 between age and the Katz Index suggests a moderate negative correlation, indicating a decline in functional ability with age. That is as patients get older, their recovery tends to decrease. Correlation between different values and Katz Index.

DISCUSSION

Four independent risk factors were identified based on a logistic regression model, where all those with a significant level of 0.1 or less were included.

Two of these factors are not modifiable, namely, sex (OR (95% CI): 3.9 (1.3, 11.5)) and pre-functional status (OR (95% CI): 3.3 (1.1, 9.8)). However, knowing that pre-functional status is associated with recovery, enables us to predict the recovery status even before operating, which can help the surgeons to make necessary changes at that stage itself. The other two factors, namely, Delirium during a hospital stay (OR (95% CI): 4.7 (1.5, 14.9)) and duration of hospital stay (OR (95% CI): 2.9 (1.1, 8.4)) are modifiable factors.

Apart from the above, one in-hospital condition, namely, infection (OR (95% CI): 3.3 (1.1, 9.8)), one pre-hospital status, namely, number of drugs taken (OR (95% CI): 2.5 (1.0, 6.3)) and age greater than 80 years (OR (95% CI): 2.7 (1.1, 6.2)) were significantly associated with poor recovery. Similarly Chronic Kidney Disease was also significantly associated with poor recovery, but its odds ratio could not be calculated as all the patients with Chronic Kidney Disease had poor Katz Index. However, they dropped out of the final model, as the same

patients having these conditions may also have conditions that were included in the model, making these variable highly correlated or multi-collinear.

CONCLUSION

Our study showed that age, chronic kidney disease, infection and delirium during hospital stay were inversely connected with recovery

LIMITATIONS: Small sample size

The authors report no conflict of interest

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