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Association of Frailty Comorbidity with Incidence of Fractures among Elderly at Assiut Trauma University Hospital

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Abstract
Background: Frailty is a growing public health concern, impacts clinical care significantly. As the elderly population expands, frailty rates are expected to increase. Bone fractures are a public health issue especially in elderly people that lead to disability, impaired quality of life, and high health-care costs. **Aim:** To assess the association of frailty comorbidity with incidence of fractures among elderly. **Research design:** A descriptive cross-sectional research design. **Setting:** inpatient ward and outpatients' clinics in Trauma Hospital at Assiut University. **Sample:** A convenience sample of 321 older adult patients who had Fractures. **Study tools:** Three tools were selected **I:** Structured interviewing questionnaire **II:** Reported Edmonton Frail Scale to assess frailty for elderly patients with fractures and **II:** Charlson Comorbidity Index scale to assess level of comorbidity. **Results:** The proportions of falls as a cause of fracture were 81.7% for all fractures and 76.0% of the studied elderly patients fall in their home. The most common fractures in the total population was the hip fracture (48.6%), and femur fracture (22.4%). Most of studied elderly patients have severe frailty (52.7%), moderate frailty (17.4%). This study found statistical significant difference between patient's comorbidities and frailty at p-value <0.000. **Conclusion:** The study highlights the association of frailty and incidence of fractures among elderly patients and level of comorbidities. **Recommendation:** Implement evidence-based rehabilitation programs to improve mobility and reduce complications after fractures.

Keywords: Elderly, Fracture & Frailty

Introduction
The global population aged 60 and over is set to experience dramatic growth, surging from 605 million in 2000 to a projected 2 billion by 2050. This substantial increase is attributed to advancements in public health that have extended life expectancy. Notably, the number of individuals aged 80 or older is anticipated to triple during this period, from 143 million in 2019 to 426 million in 2050 **(Meratwal et al., 2023).**

Longitudinal research has shown that frailty is associated with a range of negative consequences, such as increased risk of falls, reduced mobility, injuries, hospitalizations, and death. The global prevalence of frailty among older adults varies widely, from 4% to 59.1%, depending on how frailty is defined and the specific population studied. In Egypt, studies have reported significantly higher frailty rates, reaching 66.3% **(Alqahtani et al., 2022).** Frailty is a complex condition in older adults marked by a reduced ability to handle stress, leading to weakened bodily systems and decreased reserves. This results in a fragile state, making individuals more susceptible to hospitalizations, functional decline, and death **(Cristofori et al., 2023).**

Frailty is not a fixed condition and can improve with early intervention and proper care, challenging the idea that it's a natural part of aging. Multiple factors contribute to frailty, leading to faster decline, increased illness, and death. Screening tools, comprehensive assessments, and multidisciplinary teams are essential for evaluating and managing frail individuals, focusing on personalized physical and nutritional therapies while addressing underlying causes **(Darvall, 2023).**

Comorbidities significantly increase the risk of fractures, especially in older individuals. Studies have shown that having several health conditions can make fractures more likely and recovery more difficult, often leading to higher death rates. Conditions like heart disease and diabetes are particularly linked to a higher risk of fractures from minor injuries. **(Tran et al., 2024).**

Fragility fractures, common in older adults, are a major cause of illness and rising healthcare costs, often resulting from falls or minor injuries. These fractures, like pelvic fractures, can be difficult to diagnose and treat due to patients' age, multiple health problems, and related complications **(Snitkjær et al., 2024).**

Gerontological nursing assumes a pivotal function in the prevention of fractures among geriatric patients through thorough assessments, particularly for individuals identified as being at elevated risk for fractures. This discipline the dissemination of educational resources aimed at the elderly population to mitigate the occurrence of fractures by instructing them on the proper utilization of assistive devices, encouraging adherence to a structured physical activity regimen through daily engagement. Additionally, it is imperative to educate patients regarding the significance of sufficient consumption of calcium and vitamin D **(Tiago, 2024).**

Significance of the study

The global incidence of frailty has been quantified at 43.4 new cases per 1000 person-years, exhibiting a markedly elevated incidence among females compared to males. The anticipated prevalence is projected to escalate in the forthcoming years, considering that the demographic proportion of the global population aged over 60 years is anticipated to nearly double from 12% to 22% between the years 2015 and 2050 **(Iolascon et al., 2021).**

Longitudinal studies have found numerous negative outcomes linked to frailty, which could have a direct effect on the quality of human lives and society in general. These involve falling, mobility deterioration, injury, hospitalization, and increase mortality risk **(Alqahtani et al., 2022).**

A fragility fracture in the elderly represents a significant problem precisely in relation to the fragile nature of the patient, a subject with numerous comorbidities who would need to be treated in the entirety of their critical clinical picture by a specialized team **(Migliorini et al., 2021).**

Aim of the Study:

The aim of the present study was to assess association of frailty comorbidity with incidence of fractures among elderly.

Research question:

Is there association of frailty comorbidity with incidence of fractures among elderly?

Subjects and Method

Research design

Descriptive cross-sectional research design was used.

Setting:

The study was carried out at inpatient ward and outpatients' clinics in Trauma Hospital at Assiut University.

Sample:

A convenient sample for 321 elderly patients with fractures male/female was included. The total number of elderly patients suffering from fractures and coming to the orthopedic clinics were around 1212 every year. The estimated sample size was 292 elderly patients aged >65-year-old. To compensate for the drop outs, 10% was added to the initially calculated sample size. The final sample size were 321 patients.

The sample size was calculated according to the following equation:

$$n = \frac{P(1-P)}{(SE \div t) + [P(1-P) \div N]}$$

N (population)= 1212 elderly patients suffering from fractures and coming to the orthopedic clinics in the last year.

P= The property availability ratio and neutral = 0.50

SE = error rate = 0.05

T= the standard score corresponding to the level of significance= 1.96

n= sample size= 292

Inclusion criteria:

- Elderly patients aged 60 years and above.
- Able to communicate and willing to participate in the study.

Tools of the study:

Data collected using three tools:

Tool (1): structured interviewing questionnaire: it consists of three parts

Part one: **personal data** of geriatric patients such as (age, gender, residence, marital status, current occupation, level of education, pre-retirement occupation, and living status).

Part two: It includes patient's knowledge about fracture such as types of fractures, signs and symptoms, causes and management of fracture, and complications of fractures.

Part three: life style factors such as smoking and alcohol intake, physical activity, taking vaccination, sleeping and eating habits.

Tool (II): Reported Edmonton Frail Scale (EFS) (Roopsawang.et al 2020): consisted of 9 items that includes (cognition, general health status, functional independence, social support, medication use, nutrition, mood, continence, and self-reported performance) The EFS score range from zero to 18 points. Not frail (0-5) Apparently vulnerable (6-7), Mildly frail (8-9), Moderate frailty (10-11), and Severe frailty (12- 18).

Tool (III): Charlson Comorbidity Index (CCI) (Charlson et al 2022): consisted of 19 items corresponding to medical different comorbid conditions. The total score of the CCI consists in the simple sum of the weights, with higher scores indicating not only a greater mortality risk but also more severe comorbid conditions.

Scoring system: For EFS consist of 9 items the grade for each item range from zero to 18 points. The score

Not frail (0-5) apparently vulnerable (6-7), mildly frail (8-9), Moderate frailty (10-11), and Severe frailty (12- 18) **(Roopsawang.et al 2020).**

For CCI consist of 19 item yes was given (1point) and no was given (0 point), the total score ranged from 0-19, the high score indicates severe comorbidity **(Charlson et al 2022).**

The level of comorbidity was

- No comorbidity (0) score
- Mild comorbidity (1-5) score
- Moderate comorbidity (6-12)
- Sever comorbidity (7 or more)

Tools validity:

The content validity of the tool was assured by (3) expertise in gerontological nursing. Every member was contacted and asked to review the tool content and its structural design to ascertain completeness, and clarity of the question items. All comments and suggestions were considered and reworded and the sequence of some statements was carried out accordingly.

Tools reliability:

Reliability of tool was carried out using the Cronbach alpha test to confirm its consistency It was found to be:

For tool 1demographic, medical and physical (.729)

For tool II Reported Edmonton Frail Scale (EFS) (.828)

For tool III Charlson Comorbidity Index (.721)

Methods

Administrative phase:

Official letter of endorsement was accomplished from the nursing faculty dean to director of Trauma Hospital at Assiut University. The letter incorporated an endorsement to do the study, the nature and reason for the study.

Pilot study:

A pilot study was carried out prior to the starting of data collection on 32(10%) elderly patients, who were excluded from the study. To test the tools' clarity and to assess the needed time for fulfilling them, the necessary modifications based on the result of the pilot study and the questionnaire was reconstructed for readiness to use **(Teresi et al., 2021).**

Ethical Consideration:

- Research proposal was approved from Ethical Committee in the Faculty of Nursing.
- There is no risk for study patients during application of the research.
- The study was followed common ethical principles in clinical research.
- Informed consent was obtained from patient or guidance that is willing to participate in the study, after explaining the nature and purpose of the study.
- Confidentiality and anonymity were assured.
- Study patients have the right to refuse to participate and or withdraw from the study without any rational any time.
- Study patient's privacy was considered during collection of data.

Field work:

The elderly were met by the researcher; an explanation of the purpose of the research was done to participate in the study. Face to face individual interview with elderly was begun, questionnaire was completed for all elderly patients. The researcher started to collect data in that period. Data collection was carried out at Trauma Hospital at Assiut University, from the 1st of February 2024 and ended on the 30th of July 2024; data were collected from the previous mentioned setting for six months. The approximate time spent during the filling of sheet was around 20-30 minutes, 2 days per week (Sunday and Wednesday) and the number which was interviewed was 6-7 elderly patients per day over six months.

Statistical analysis:

The collected data was organized, categorized, coded, tabulated and analyzed using the Statistical Package for Social Sciences (SPSS) version 26. Data was presented in tables and figures using numbers, percentages, means, standard deviation and Chi-square and Pearson test was used in order to find an association between variables. Statistical significant was considered at P-value < 0.05.

Results

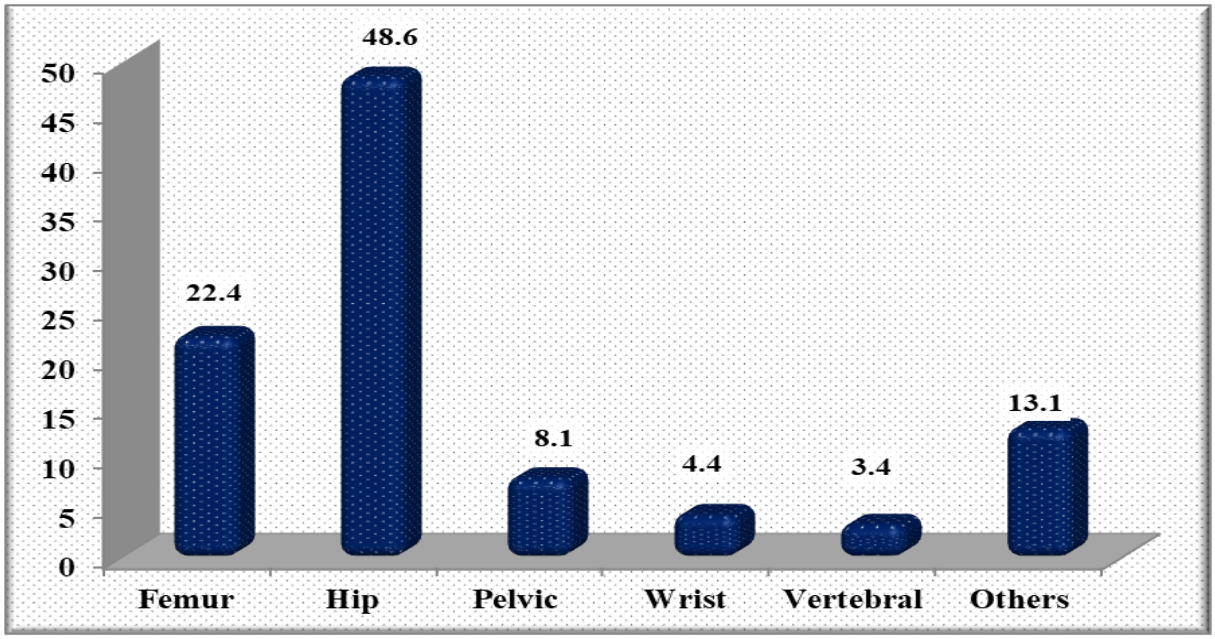


Figure (1): Distribution of the studied elderly patients according to their current site of fracture (n=321)

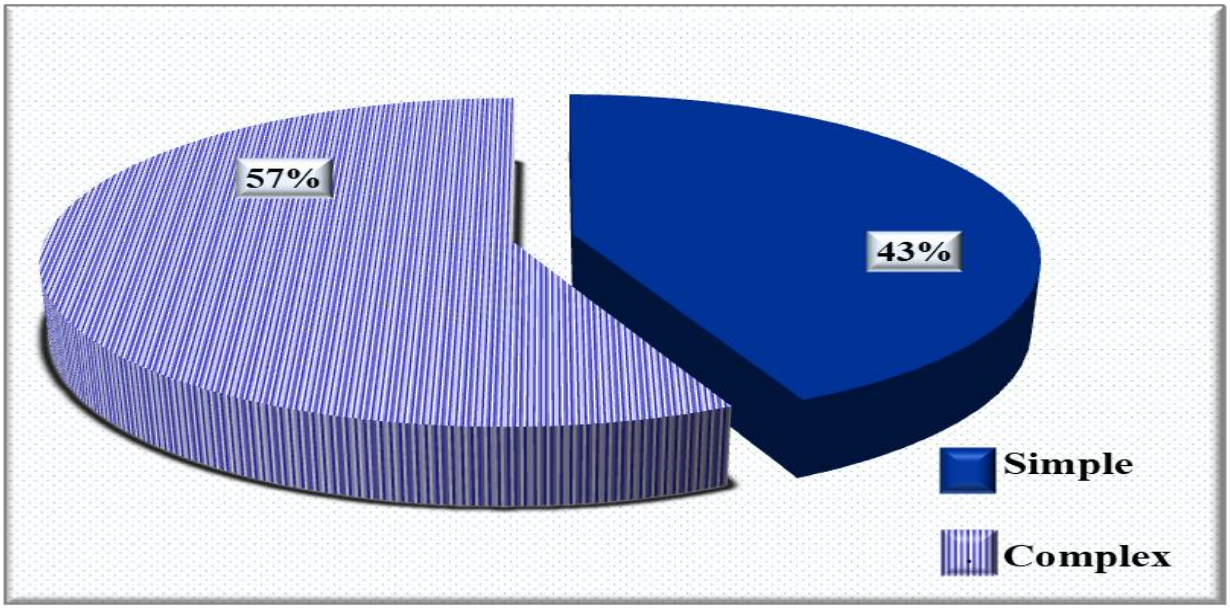


Figure (2): Distribution of the studied elderly patients according to their current type of fracture (n=321)

Table (1): Distribution of the studied elderly patients according to their demographic characteristics (n=321)

Demographic characteristics	N	%
Age by years		
65- < 70 years		42.4
70 years or more	185	57.6
Age (mean±SD)	**73.11±7.722**	
Gender:		
Male	121	37.7
Female	200	62.3
Marital status:		
Single	23	7.2
Married	132	41.1
Divorced	18	5.6
Widow	148	46.1
Residence:		
Urban	119	37.1
Rural	202	62.9
Educational level:		
Illiterate	139	43.3
Read and write	62	19.3
Basic education	64	19.9
Secondary education	23	7.2
University	33	10.3
Pre-retirement occupation:		
House wife	164	51.1
Farmer	57	17.8
Employer	54	16.8
Others job (not work, private work)	46	14.3

Others job (not work, private work)

Table (2): Distribution of the studied elderly patients according to their current medical data (n=321)

Current medical data	N	%
Side of fracture:		
Right	127	39.6
Mid between right and left	52	16.2
Left	142	44.2
Causes of fracture:		
Accident	47	14.6
Fall	262	81.7
Others (heavy object)	12	3.7
Type of treatment:		
Surgical	278	86.6
Medical	7	2.2
Cast	36	11.2
Frequencies of fall before admission:		
This is the first fall	51	19.5
Less than 2 per year	69	26.3
2-4 falls per year	119	45.4
More than 4 fall per year	23	8.8
Place of fall:		
Home	199	76.0
Work place/ office	10	3.8
Passage (street)	49	18.7
Unknown	4	1.5

Current medical data	N	%
Causes of falls (More than one choice) =262		
Environmental factors as slipped, furniture	152	58.0
Medication effect as antihypertensive	46	17.6
Problem with assistive devices as cane, walker	66	25.2
Loss or impaired vision	100	38.2
Feel of faint / dizzy	67	25.6
Gait problem	11	4.2
Unknown	9	3.4

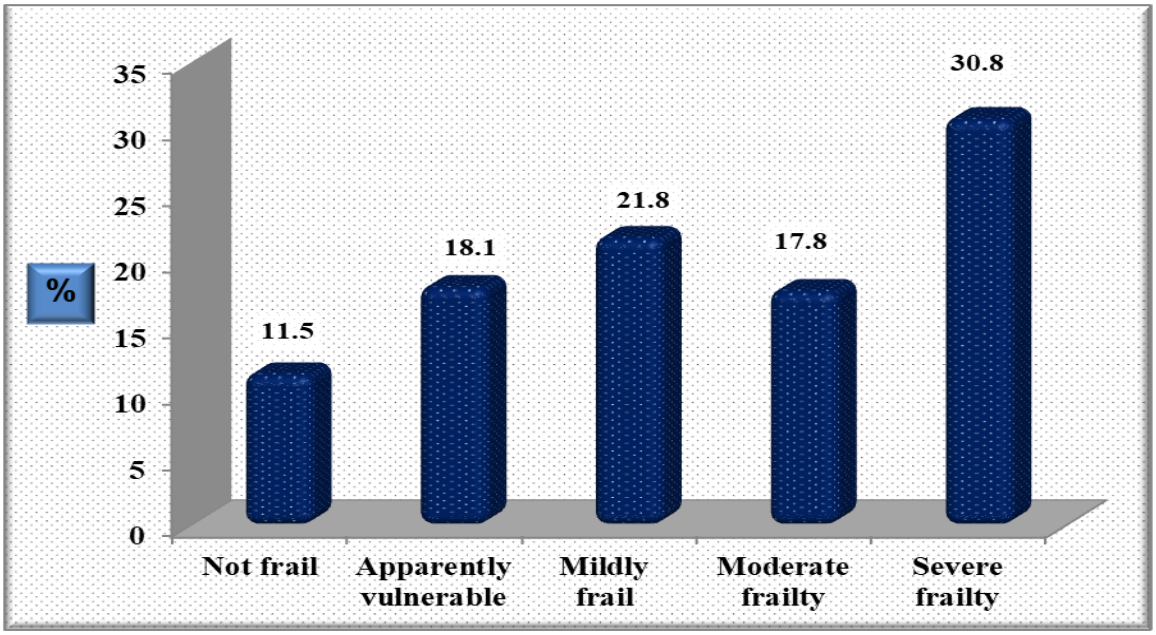


Figure (3): Total level scores of assessment association of frailty (n=321)

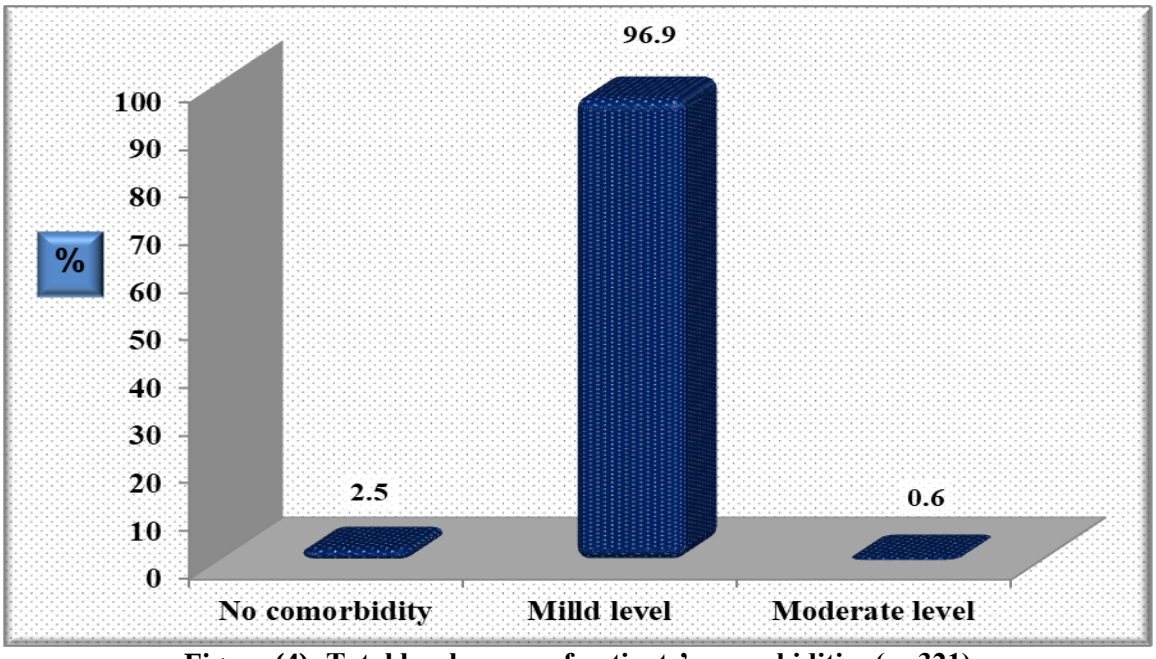


Figure (4): Total level scores of patients' comorbidities (n=321)

Table (3): Relations between patients' marital status, educational level, type of fracture and level of assessment association of frailty (n=321)

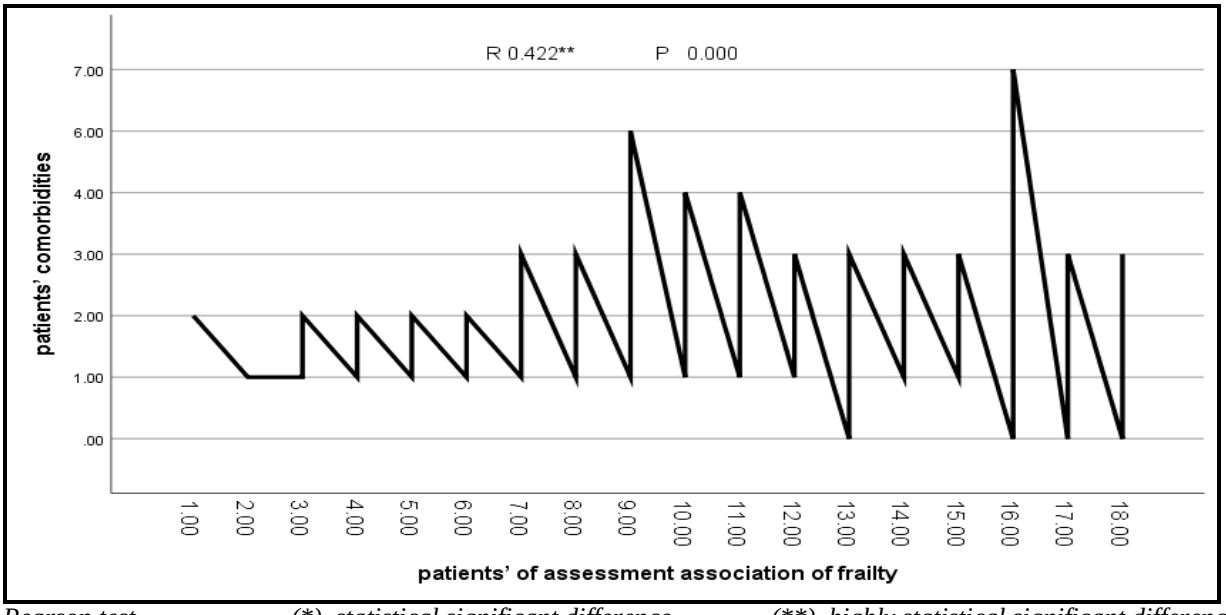
Item	Level of assessment association of frailty					P-value
	Not frail	Apparently vulnerable	Mildly frail	Moderate frailty	Severe frailty	
	N (%)	N (%)	N (%)	N (%)	N (%)	
Marital status:						
Single	6 (16.2)	3(5.2)	6(8.6)	5(8.8)	3(3.0)	**0.001****
Married	16(43.2)	34(58.6)	39(55.7)	23(40.4)	20(20.2)	
Divorced	4(10.8)	3(5.2)	7(10.0)	3(5.3)	1(1.0)	
Widow	11(29.7)	18(31.0)	18(25.7)	26(45.6)	75(75.8)	
Educational level:						
Illiterate	5(13.5)	21(36.2)	28(40.0)	20(35.1)	65(65.7)	**0.001****
Read and write	12(32.4)	16(27.6)	16(22.9)	5(8.8)	13(13.1)	
Basic education	9(24.3)	12(20.7)	16(22.9)	17(29.8)	10(10.1)	
Secondary education	5(13.5)	6(10.3)	4(5.7)	6(10.5)	2(2.0)	
University	6(16.2)	3(5.2)	6(8.6)	9(15.8)	9(9.1)	
Types of fracture						
Simple	27(73.0)	27(46.6)	42(60.0)	17(29.8)	25(25.3)	**0.018***
Complex	10(27.0)	31(53.4)	28(40.0)	40(70.2)	74(74.7)	

Chi-square test *(*) statistical significant difference* *(**) highly statistical significant difference*

Table (4): Correlations between patients' current physical status and total level scores of patients' frailty and patients' comorbidities (n=321)

Current physical status		Patients' of assessment association of frailty	Patients' comorbidities
Physical mobility	Pearson Correlation	**.419****	**.159***
	Sig. (2-tailed)	**.000**	**.025**
Vision	Pearson Correlation	**.446****	**.209****
	Sig. (2-tailed)	**.000**	**.003**
Hearing	Pearson Correlation	**.545****	**.144***
	Sig. (2-tailed)	**.000**	**.041**

Pearson test *(*) statistical significant difference* *(**) highly statistical significant difference*



Pearson test *(*) statistical significant difference* *(**) highly statistical significant difference*

Figure (5): Correlations between patients' comorbidities and total level scores of patients' frailty (n=321)

Figure (1): This figure illustrates that the hip fractures was the most prevalent, constituting 48.6% of all fractures.

Figure (2): This figure illustrates that complex fractures were the most common, accounting for 57% of all cases studied.

Table (1): This table illustrated that 57.6% of the studied elderly patients aged ≥70 years with mean age ± SD 73.11 ± 7.722. Regarding gender, it was observed that 62.3% of the studied elderly were female. Concerning marital status, nearly half of studied elderly (46.1%) were widows. Concerning their educational level (43.3%) of them were illiterate.

Table (2): This table show that 44.2% of the studied elderly patients were experienced fractures on the left side. Falls were the most common cause of fractures, accounting for 81.7% of cases. Regarding the surgical treatment was the most prevalent, with 86.6% of patients.

Figure (3): This figure illustrates that severe frailty were the most common, percent accounting for 30.8% of all elderly patients.

Figure (4): This figure illustrates that the vast majority of patients (96.9%) had a mild level of comorbidities.

Table (3): present that there was highly positive relation between frailty, widow and illiterate p-value <0.001. Also there was positive relation between frailty and complex fracture p-value <0.018.

Table (4): Illustrated that there was highly positive correlation between frailty and physical mobility, vision and hearing with (r=.419, r=.446, r=.545) respectively. Also there was positive correlation between comorbidities and vision, physical mobility and hearing (r=.159, r=.209, r=.144) respectively.

Figure (5): This figure shows that there was highly statistical correlation between patients' comorbidities and frailty at p-value <0.000.

Discussion

Regarding current site of fracture, the current study revealed that nearly half of the fractures in the examined patients occurred in the hip. This finding aligns with the research by **Groff et al. (2020),** who study causes of in-hospital mortality after hip fractures in the elderly and found hip fractures as one of the most common injuries among the elderly. Regarding current type of fracture, the current study discovered that the more than half of the patients examined had complex fractures. This finding was in agreement with **Yilmaz et al., (2023),** who study towards fracture risk assessment by deep-learning-based classification of prevalent vertebral fractures and mentioned that complex fractures as a common occurrence in elderly individuals.

As a result of an aging population, there is a notable increase in the prevalence of older individuals suffering from chronic musculoskeletal disorders, with osteoporosis being particularly prominent. The incidence of fractures associated with osteoporosis, referred to as fragility fractures, and is experiencing a significant escalation on a global scale. Fragility fractures typically arise from low-energy trauma, such as falls from a standing position or lower. Elderly individuals with fragility fracture face a heightened risk of adverse outcomes. This amplified risk of negative health outcomes is frequently attributable to the presence of co-morbid conditions **Dent et al., (2023)**.

This research examined a cohort of three hundred twenty-one patients. The demographic attributes indicated an average age of 73.11 years. This observation is consistent with earlier investigations conducted by **Corbi et al. (2019),** who study inter-relationships between gender, frailty and 10-year survival in older Italian adults and found which documented an average participant age of 74.19 years.

From the researcher perspective, fractures predominantly impact the geriatric population, attributable to diminished bone density, hormonal fluctuations, and the influence of specific pharmacological agents, such as corticosteroids, which may elevate the likelihood of osteoporosis and subsequent fractures, as well as pre-existing health conditions including arthritis, diabetes, and thyroid abnormalities. These medical conditions render bones increasingly fragile, leading to osseous weakness and heightened vulnerability to fractures.

Regarding gender, current study revealed that nearly two third of studied sample were females. This observation is corroborated by the results of a study conducted by **Rupp et al., (2021),** who study the incidence of fractures among the adult population of Germany and reported that nearly two third of the studied patients were females.

From the researcher perspective, females exhibit a greater propensity for fractures attributable to hormonal changes, particularly during the menopausal transition, which can adversely influence bone density, alongside variations in levels of physical activity, nutritional practices, and the inherent anatomical differences, as women typically possess smaller and more slender bones compared to their male counterparts, rendering them more vulnerable to fractures.

In relation to marital status, the present investigation elucidated that less than half of the studied sample were widowed. This assertion is supported by the results of an inquiry conducted by **Karahan & Sakçı, (2023),** who study social determinants of hip fractures

in elderly patients and found that, fewer than fifty percent of the studied patients were widowed.

From point of view, widows experience fracture related to a decline in physical activity due to factors like grief, or changes in lifestyle. This reduced physical activity can contribute to weaker bones and increase the risk of fractures. Additionally, widows may face financial difficulties that limit their access to healthcare, including bone health checks and preventive measures.

Regarding residence, current study revealed that more than half of the studied sample lived in rural area. This finding similar to the study undertaken by **Michalak et al., (2021),** who study fractures of the craniofacial skeleton in the elderly and found that more than half of the participants studied were inhabitants of rural regions or small towns. On the other hand the present study do not align with **MacDermid et al., (2021),** who study fracture profiles of a 4-year cohort of 266,324 first incident upper extremity fractures from population health data in Ontario and reported that the majority of the participants in their study resided in urban locales.

From point of view, as rural areas characterized by poverty may restrict access to essential services such as healthcare, secure housing, and nutritious food; these limitations can lead to an elevated risk of fractures. Furthermore, reduced levels of education may correlate with increased incidences of accidents and injuries.

As regards educational level, the current study illuminated that approximately one half of studied sample possessed illiteracy. This observation is congruent with research conducted by **Lee et al., (2021),** who study history of falls, dementia, lower education levels, mobility limitations, and aging are risk factors for falls among the Community-dwelling elderly and reported a high percentage of participants exhibiting lower levels of education.

From point of view, the experience of illiteracy manifests as a significant barrier due to the challenges associated with comprehending health-related information; individuals may encounter difficulties in interpreting medical directives, and cautionary advisories pertinent to falls and fractures. Furthermore, the inability to identify symptoms may lead to a failure to recognize the early indicators of osteoporosis or other medical conditions that elevate the risk of fractures.

In relation to current medical data, the current study found that over three-fourths of the patients examined experienced falls. This finding aligns with a previous study done by **Wang et al., (2020)**, who study effectiveness of exercise intervention on fall-related fractures in older adults and found falls as the primary cause of fractures.

According to researcher opinion, falls are a major cause of fractures in older adults due to age-related changes. As people age, their bones naturally become thinner and more fragile, making them more likely to break. Decreased muscle strength and balance can also increase the risk of falls. Age-related vision problems, hearing loss, and reduced sense of touch can contribute to falls as well.

As regards to type of treatment, the current study discovered that the majority of patients received surgical intervention. These findings are consistent with a previous study conducted by **Kim et al., (2020),** who study outcome of non-operative treatment for hip fractures in elderly patients and found that surgical treatment yields superior results in elderly patients with fragile fractures compared to non-surgical approaches.

From the researcher perspective, surgical treatment can guarantee that broken bones are correctly positioned, alleviating pain and discomfort. It can also help prevent nonunion, a situation where broken bones fail to mend. Surgical intervention can enhance stability and decrease the likelihood of future falls, which may result in further fractures.

Regarding frequencies of fall before admission and place of fall, the current study found that more than three quarter of studied patients fall within their homes, and approximately half of these patients fell between two and four times per year. These findings in line with a study done by **Moreland et al., (2020),** who study a descriptive analysis of location of older adult falls That resulted in emergency department visits in the United States, 2015 and found that, over three-fourths and half of their study participants as falling within their homes and at a rate of two to four times per year.

From the researcher perspective, the common notion that most falls occur within homes. Environmental factors such as poor lighting, insufficient handrails, and the presence of hazards like toys significantly increase the risk of falling. Furthermore, the absence of grab bars in bathrooms or near stairs can make it challenging to maintain balance. Wearing unsuitable footwear, such as slippers or loose-fitting shoes, can be slippery and increase the likelihood of falls.

In relation to level of frailty, the present investigation revealed that nearly one third of the participants analyzed exhibited severe levels of frailty. This observation corresponds with prior research conducted by **Dent et al., (2024),** who study frailty increases the long-term risk for fall and fracture-related hospitalizations and all-cause mortality in community-dwelling older women and indicated that about one third of the patients with any form of fracture demonstrated pronounced frailty.

According to researcher opinion, many older adults suffer from osteoporosis and chronic illnesses like heart disease, diabetes, and lung conditions. These health issues can negatively impact overall well-being and physical abilities, leading to frailty. Moreover, elderly individuals frequently consume multiple pharmacological agents, which can elevate the likelihood of adverse effects and drug interactions that may further exacerbate frailty.

With respect to the prevalence of comorbidities, the current study indicated that a significant proportion of the participants exhibited mild levels of comorbidity. This finding is consistent with earlier studies conducted by **Petrovic et al., (2022),** who study influence of comorbidity on postoperative course and mortality in patients with hip fracture and found that a majority of patients experiencing hip fractures exhibited a pronounced tendency towards mild comorbidities.

As regard to marital status and frailty, the current study indicated that there was a highly statistical significant difference between widow marital status and severe frailty. This finding in agreement with **Wang et al., (2021),** who study social engagement and physical frailty in later life and reported that unmarried individuals, including widows, are more likely to experience severe frailty compared to those who are married.

The present study represented that, there were highly statistical significant differences between illiterate educational level and severe frailty. This finding was in agreements with **Mousavi Sisi et al., (2019),** who study multidimensional approach to frailty among rural older people and stated that the lower educational attainment may contribute to higher frailty prevalence among rural older people. Regarding type of fracture, the current study indicated that there was a statistical significant difference between complex fracture and severe frailty. This finding was in line with **Middleton et al., (2021),** who study mortality, falls, and fracture risk are positively associated with frailty and reported that the severely frail individuals showed a significant risk of vertebral fractures and hip fractures.

Regarding physical mobility and frailty, the current study indicated that there was a highly statistically significant difference between physical mobility and frailty. This finding was in agreements with **Brown et al., (2020),** who study association between a deficit accumulation frailty index and mobility outcomes in older adults and found that the higher frailty scores are associated with increased risk of mobility impairment in older adults.

Regarding physical mobility and comorbidities, the results of present study showed that there were statistical significant differences between physical mobility and comorbidities. This aligns with previous research by **Hajduk et al., (2019),** who study association between mobility measured during hospitalization and functional outcomes in older adults with acute myocardial infarction and reported that participants with impaired mobility had higher rates of comorbidities.

Regarding vision and frailty, results of the present study showed that there were highly statistically significant differences between vision and frailty. These findings were in line with **Gonzales-Turín et al., (2021),** who study relationship between self-reported visual impairment and worsening frailty transition states in older people and indicated that visual impairment significantly worsens frailty, particularly in individuals at risk of frailty. This impact is particularly evident in mobility-related aspects of frailty, such as slowness, low energy, and low physical activity.

The current study indicated that there was a highly statistical significant difference between vision and comorbidities. This finding was in agreements with **Zheng et al., (2020),** who study patterns of chronic conditions and their association with visual impairment and health care use and indicated that individuals with comorbidities have a significantly higher risk of visual impairment compared to those without comorbidities.

In relation to hearing and frailty, the current study indicated that there was a highly statistically significant difference between hearing and frailty. This finding was in agreements with **Assi et al., (2023),** who study hearing loss and frailty among older adults and reported that moderate or severe hearing loss increases the likelihood of being pre-frail or frail among older adults.

The results of the present study showed that there were statistically significant differences between hearing and comorbidities. These findings were in line with **Williams et al., (2020),** who study a deterioration in hearing is associated with functional and cognitive impairments, difficulty with communication, and greater health instability and found that hearing deterioration is associated with greater health instability and comorbidities, as chronic conditions such as hypertension and diabetes increase the risk of hearing loss in older adults.

Regarding frailty and comorbidities, the results of present study showed that there were highly statistical significant differences between frailty and comorbidities. These findings were in line with **Damluji et al., (2021),** who study frailty and cardiovascular outcomes in the national health and aging trends study and reported that frailty is associated with a significantly higher prevalence of comorbidities, including hypertension, falls,

disability, anxiety/depression, and multimorbidity, compared to individuals who are not frail.

Conclusion

Based on the results of the present study, increasing frequency of fractures, particularly among the elderly, and common in female than male. In addition to elderly people had high level of frailty. The present study showed that there was an association between frailty and incidence of fracture among elderly.

Recommendations

- Standardize Comprehensive Geriatric Assessments (CGAs) for the elderly population aged 60 and above or those with risk factors.
- Provide education and support to patients and caregivers to facilitate effective management of chronic diseases.
- Monitor patients closely for post-operative complications and intervene promptly.
- Conduct further research on the implementation of evidence-based rehabilitation programs to enhance mobility and minimize complications following fractures.

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