

Elderly awareness and perception of neck femur fracture in Saudi Arabia

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ABSTRACT

Background: Femoral neck fractures are prevalent and make up the highest per cent of proximal femur fractures. The femoral neck is the most common location for a hip fracture. This study aims to assess elderly awareness and perception of neck femur fracture in Saudi Arabia. **Methods:** A descriptive cross-sectional web-based study was conducted targeting all persons aged 60 years or above. An online questionnaire was developed by the study researchers based on literature review and after consultation of the field experts. The anonymous questionnaire was published using the social media platforms from October 2022 to January 2023 by the researchers and their families. **Results:** A total of 410 elderly completed the study questionnaire. Elderly age ranged from 60 to 89 years with mean age of 68.2 ± 10.9 years old. A total of 44 (10.7%) of the study elderly had an overall good awareness regarding NFF. The most reported sources were physician (61.7%), social media (41.2%), mass media (33.4%) and books and magazines reading (20.5%). **Conclusion:** In conclusion, elderly awareness regarding femur neck fracture was very low especially among male elderly and those with no history of trauma. Poor awareness for clinical presentation and complications of NFF was reported.

Keywords: Awareness, elderly, femoral neck fracture, perception, Saudi Arabia, trauma

Introduction

Femoral neck fractures (FFN) are a specific type of intracapsular hip fracture. The femoral neck connects the femoral shaft with the femoral head. The hip joint is the articulation of the femoral head with the acetabulum.^[1] The junctional location makes the femoral neck prone to fracture.^[2] The blood supply of the femoral head runs along the femoral neck and is an essential consideration in displaced fractures and patients in the younger population.

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There are approximately 1.6 million hip fractures annually. 70% of all hip fractures occur in women. Hip fracture risk increases exponentially with age and is more common in white females.^[2,3]

Femoral neck fractures are associated with low-energy falls in the elderly. On the other hand, they are associated with secondary to high-energy trauma such as a substantial height or motor vehicle accidents in younger patients.^[2,4] Risk factors for femoral neck fractures include female gender, decreased mobility, and low bone density.^[5,6]

In most cases, the patient mostly has had recent trauma. In cases of dementia or cognitive impairment, the history may be negligible without the report of any trauma. The patient mostly

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complaints of pain with a decreased range of motion of the hip. In non-displaced fractures, there may be no deformity. However, displaced fractures may present with a shortened and externally rotated lower limb.^[7,8] Complications of the femoral neck fractures are avascular necrosis increased risk factor with increased initial displacement and failure to obtain an anatomical reduction.^[9] Non-union and dislocation increased with total hip arthroplasty surgery. After a femoral neck fracture, there is a 6% in-house mortality rate. There is a 1-year mortality rate between 20 and 30%, with the highest risk within the first six months.^[10,11] Overall with hip fractures, 51% will resume independent ambulation, while 22% will remain non-ambulatory.^[12]

The effort to improve adults' awareness regarding hip fracture may be one of the primary healthcare staff roles which delivers a more comprehensive approach to the assessment of health. Recognising the awareness gaps with the unmet needs and focusing on the QOL will aid healthcare providers and policy makers to propose targeted interventions to improve the QOL and health outcomes among elderly with fracture neck of femur.

The aim of this study is to assess awareness and perception among elderly people about a vital issue which is the fracture of the femoral neck. In addition, this article highlights that early diagnosis and management of the femoral neck may save the femoral head from avascular necrosis and lives from life-threatening pulmonary embolism.

Methods

A descriptive cross-sectional web-based study was conducted to assess elderly awareness, perception and attitude regarding femur neck fracture in Saudi Arabia. All persons aged 60 years or above who consented to participate in the study were enrolled in the study's final analysis. Persons who declined to consent were aged below 60 years, or spoke a language other than Arabic were excluded from the study. An online questionnaire was developed by the study researchers based on literature review and after consultation of the field experts. Questionnaire validity, applicability and clearness were assessed by three expert staff independently with all modifications which were done till achieving the last version of used questionnaire. The anonymous questionnaire was published using social media platforms from October 2022 to January 2023 by the researchers and their families till no more responses were obtained. Respondents were encouraged to participate in this study by clarifying the extent of confidentiality of participation and the importance of this research to the society health. The questionnaire of this study included elderly demographic data (age, gender, geographic location, education, occupation, monthly household income, marital status and living status, and home environment), morbidities, and history of trauma. Elderly awareness regarding femur neck fracture was assessed nine questions with single or multiple correct answers. Part 3 covered source of elderly information for femur neck fracture. Last section covered elderly attitude and perception regarding femur neck fracture using five

items; each item was scored on a three-point Likert scale from disagree (1) to agree (3).

Data analysis

After the data were extracted, they were processed, coded, and fed into IBM SPSS Version 22 statistical software (SPSS, Inc. Chicago, IL). All statistical methods used were two tailed with alpha level of 0.05 considering significance if *P* value is less than or equal to 0.05. Regarding elderly awareness, each correct answer was given one-point score. Overall awareness level regarding NFF was assessed through summing up discrete scores for different correct knowledge items. If the total score was 60% or more of the total possible score, the level of awareness was considered to be good and scores less than 60% were considered poor. Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including elderly personal data, medical data, and trauma history. Also, participants awareness and attitude about NFF were tabulated, while overall awareness level was graphed with their source of information. Cross-tabulation for showing distribution of elderly overall awareness level by their personal data and other factors using Pearson Chi-square test for significance and exact probability test if there were small frequency distributions.

Results

A total of 410 elderly completed the study questionnaire. Elderly age ranged from 60 to 89 years with mean age of 68.2 ± 10.9 years old. A total of 243 (59.3%) elders were males and 229 (55.95) had low level of education (below secondary), while 74 (18%) had university level of education. Monthly income less than 5000 SR was reported among 214 (52.2%), and only 83 (20.2%) had monthly income exceeding 10000 SR. A total of 372 (90.2%) of the study elderly lived with their families, and 66 (16.1%) had support aids for walking in their homes. A total of 282 (68.8%) had chronic health problem, 125 (30.5%) had balance disorder, 143 (34.9%) had previous trauma, and only 43 (10.5%) had previous femur fracture [Table 1].

Table 2. Elderly awareness and knowledge regarding neck femur fracture, Saudi Arabia. A total of 60.7% of the study elderly reported that they were informed about elderly trauma, and 42.7% heard about NFF. As for definition of NFF, it was known for 31.7% of the study elderly who told that "A neck of femur fracture is a particular type of hip fracture that occurs at the femoral neck." A total of 15.9% reported that incidence of NFF about 2–4%. Regarding risk factors of NFF, the most known were osteoporosis (77.1%), DM (43.3%), smoking (32%), and HTN (28%), while only 11.5% told about chronic strokes. The most reported symptoms by the elderly included swelling on side of hip (28.8%), back pain (24.6%), radiating pain in the knee (24.1%), and inability to bear weights (19.8%). Considering preventive methods for NFF, 62.2% of the elderly told about exercises like walking, 41% know about commitment to physician instruction, and 26.1% told about stopping

smoking. About complications of NFF, the most reported were non-union (28.5%), followed by dislocation (24.1%), and avascular necrosis (18.5%). Exact of 25.1% of the study elderly know about total hip arthroplasty as a management method for NFF, while 21.2% reported for casting.

Table 1: Bio-demographic data of study elderly, Saudi Arabia

Bio-demographic data	No	%
Age in years		
60–70	256	62.4%
71–80	108	26.3%
>80	46	11.2%
Gender		
Male	243	59.3%
Female	167	40.7%
Education		
Below secondary	229	55.9%
Secondary	107	26.1%
University/above	74	18.0%
Monthly income		
<5000 SR	214	52.2%
5000–10000 SR	113	27.6%
>10000 SR	83	20.2%
Living condition		
With family	372	90.7%
Alone	38	9.3%
Home environment condition		
Support aids for walking	66	16.1%
Carpets	183	44.6%
Sliding floor	161	39.3%
Do you have chronic health problem?		
Yes	282	68.8%
No	128	31.2%
Do you have previous trauma?	143	34.9%
Do you have previous femur fracture?	43	10.5%
Do you have balance disorder?	125	30.5%
Does any of your family or your friends suffer from an elderly femur fracture?	213	52.0%

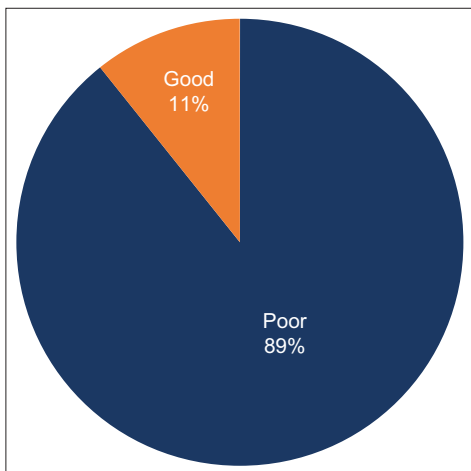


Figure 1: Overall elderly awareness level regarding neck femur fracture, Saudi Arabia

Figure 1. Overall elderly awareness level regarding neck femur fracture, Saudi Arabia. A total of 44 (10.7%) of the study elderly had an overall good awareness regarding NFF compared to 366 (89.3%) who had poor awareness level.

Figure 2. Source of elderly information about neck femur fracture, Saudi Arabia. The most reported sources were physician (61.7%), social media (41.2%), mass media (33.4%) and books and magazines reading (20.5%).

Table 3. Elderly attitude and perception towards neck femur fracture, Saudi Arabia. Exact of 63.2% of the study elderly agreed that fracture of the neck of the femur is a serious health problem, 55.4% thin that fracture of the neck of the femur is an avoidable problem, 35.9% told that femoral neck fracture more in females. Only 20% agreed that patients return to their normal condition after femur neck fracture treatment and 28% think that NFF can lead to death in the elderly.

Table 4. Factors associated with elderly awareness level regarding femur fracture, Saudi Arabia. A total of 15% of female elderly had an overall good awareness level regarding FNN compared to 7.8% of males with recorded statistical significance ($P = .022$). Also, 26.3% of elderly who live alone had a good awareness level versus 9.1% of others who live with their families ($P = .001$). Good awareness was detected among 17.8% of those with family history of femur fracture in comparison with 3% of others ($P = .001$). Additionally, 15.5% of those who gain their information from books and magazines had good awareness compared to 9.5% of social media ($P = .048$).

Discussion

Globally, about 4.5 million people are affected by hip fractures annually, with a predictable upsurge to 21 million persons living with a disability by 2040.^[13,14] Nearly half of all hip fractures are intracapsular fractures of the femoral neck.^[2,15] These can be treated by non-operative treatment, internal fixation or arthroplasty. Recently, femoral neck fractures are a weighty health

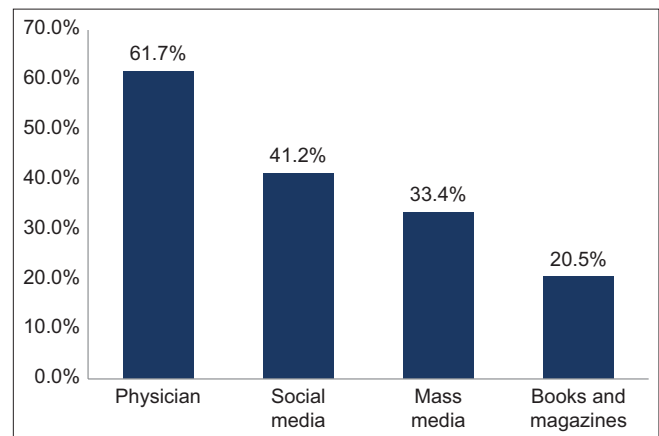


Figure 2: Source of elderly information about neck femur fracture, Saudi Arabia

Table 2: Elderly awareness and knowledge regarding neck femur fracture, Saudi Arabia

Awareness items	No	%
Have you been informed about elderly trauma?		
Yes	249	60.7%
No	161	39.3%
Have you heard about NFF?		
Yes	175	42.7%
No	235	57.3%
Definition of NFF is?		
A neck of femur fracture is a particular type of hip fracture that occurs at the femoral neck	130	31.7%
A neck of femur fracture is a particular type of hip fracture that occurs at the femoral shaft	61	14.9%
Do not know	219	53.4%
What is the Incidence percentage of NFF among elderly?		
2–4%	65	15.9%
20–30%	26	6.3%
70–80%	68	16.6%
Don't know	251	61.2%
Risk factors or causes of neck of femur fracture?		
Osteoporosis	316	77.1%
DM	178	43.4%
Smoking	131	32.0%
HTN	115	28.0%
Thyroid diseases	68	16.6%
Cerebrovascular strokes	47	11.5%
Do not know	89	21.7%
Symptoms and signs of femur neck fracture?		
Swelling on side of hip	118	28.8%
Back pain	101	24.6%
Radiating pain in the knee	99	24.1%
Inability to bear weight	81	19.8%
Do not know	224	54.6%
What are the preventive methods of neck of femur fracture?		
Exercises	255	62.2%
Taking medication as prescribed by your physician	168	41.0%
Stop smoking	107	26.1%
Do not know	141	34.4%
Complications of NFF		
Non-union	117	28.5%
Dislocation	99	24.1%
Avascular necrosis	76	18.5%
Do not know	235	57.3%
What are the management methods of neck of femur fracture?		
Total hip arthroplasty	103	25.1%
Treat it with casting	87	21.2%
Do not know	220	53.7%

problem with massive impact on health insurance costs mainly among elderly. So, the awareness of the disorder, preventable measures and appropriate treatment is mandatory.^[16]

The current study aimed to assess awareness and perception among elderly people about a vital issue which is the fracture of the femoral neck in Saudi Arabia. The study showed that elderly awareness regarding FFN was very low as nearly one-tenth of

Table 3: Elderly attitude and perception towards neck femur fracture, Saudi Arabia

Attitude items	Disagree		Not sure		Agree	
	No	%	No	%	No	%
Fracture of the neck of the femur is a serious health problem?	25	6.1%	126	30.7%	259	63.2%
Fracture of the neck of the femur is an avoidable problem?	24	5.9%	159	38.8%	227	55.4%
Femoral neck fracture more in females?	35	8.5%	228	55.6%	147	35.9%
Patients return to their normal condition after femur neck fracture treatment?	65	15.9%	263	64.1%	82	20.0%
Fracture of the neck of the femur can lead to death in the elderly?	82	20.0%	213	52.0%	115	28.0%

the elderly had good awareness level. In more details, less than two-thirds of the study elderly were informed about elderly trauma, and less than half of them heard about the disorder of FFN. Only one-third of the study elderly correctly defined FFN. A very low per cent of the study elderly knows about the incidence of the trauma. Also, elderly awareness regarding the clinical presentation of FFN was unsatisfactory as swelling on side of hip, back pain, radiating pain in the knee, and inability to bear weights were known for one-fourth of the elderly or less. Also, elderly awareness for complications was below average where non-union, dislocation and avascular necrosis were reported in low percentages. On the other hand, their awareness regarding risk factors of NFF was good as osteoporosis was known for more than three-fourths of the study elderly, but 11.5% told about chronic strokes. Saw SM *et al.*^[17] found that 85% of the sample had heard of osteoporosis. Also, Melton III LJ *et al.*^[18] reported that hip fractures were infrequent among women with femoral bone density ≥ 1.0 g/cm², but their frequency increased as bone density was less than that level. Nikolaou VS *et al.*^[19] found that fracture healing of nailed femoral diaphyseal fractures is significantly delayed in older osteoporotic patients. Also, two-thirds of the elderly told about exercises like walking, and less than half of them know about commitment to physician instruction as a preventive measure. Literature showed that aerobics, weight bearing and resistance exercises were all effective on the BMD of the spine. Also, walking increased BMD with low incidence of osteoporosis and associated fracture.^[20-22] About one-fourth of the study elderly know about total hip arthroplasty as a management method for NFF. No previous studies were identified concerning with elderly awareness or perception towards NFF to be compared within Saudi Arabia or any other region. The current study is considered to be pioneer in this area.

Regarding source of information reported, the study revealed that about two-thirds of the study elderly gained their information from their physicians and from social media. Higher awareness level was reported among female elderly, who are living alone

Table 4: Factors associated with elderly awareness level regarding femur fracture, Saudi Arabia

Factors	Overall awareness level				P
	Poor		Good		
	No	%	No	%	
Age in years					0.175
60–70	223	87.1%	33	12.9%	
71–80	101	93.5%	7	6.5%	
>80	42	91.3%	4	8.7%	
Gender					0.022*
Male	224	92.2%	19	7.8%	
Female	142	85.0%	25	15.0%	
Education					0.629
Below secondary	207	90.4%	22	9.6%	
Secondary	95	88.8%	12	11.2%	
University/above	64	86.5%	10	13.5%	
Living condition					0.001 [§]
With family	338	90.9%	34	9.1%	
Alone	28	73.7%	10	26.3%	
Home environment condition					0.231
Support aids for walking	55	83.3%	11	16.7%	
Carpets	166	90.7%	17	9.3%	
Sliding floor	145	90.1%	16	9.9%	
Do you have chronic health problem?					0.800
Yes	251	89.0%	31	11.0%	
No	115	89.8%	13	10.2%	
Do you have previous trauma?					0.908
Yes	128	89.5%	15	10.5%	
No	238	89.1%	29	10.9%	
Do you have previous femur fracture?					0.214 [§]
Yes	36	83.7%	7	16.3%	
No	330	89.9%	37	10.1%	
Do you have balance disorder?					0.214
Yes	108	86.4%	17	13.6%	
No	258	90.5%	27	9.5%	
Does any of your family or your friends suffer from an elderly femur fracture?					0.001*
Yes	175	82.2%	38	17.8%	
No	191	97.0%	6	3.0%	
Source of data					0.048*
Physician	221	87.4%	32	12.6%	
Social media	153	90.5%	16	9.5%	
Books and magazines	71	84.5%	13	15.5%	
Mass media	117	85.4%	20	14.6%	

P: Pearson χ^2 test. [§]Exact probability test. *P<0.05 (significant)

as mostly those who may experience any trauma that improved their awareness level. Also, elderly with family history of trauma showed high awareness level and those who gained their information from mass media and physicians.

Conclusion and Recommendations

In conclusion, elderly awareness regarding femur neck fracture was very low especially among male elderly and those with no history of trauma. Higher awareness was reported for risk factors, preventive measures and management methods were observed, while poor awareness for clinical presentation and complications of NFF was reported. Health education sessions especially for high risk elderly and other who live in unsuitable environmental

conditions are mandatory to raise their awareness level mainly for preventive measures and risk factors. Also, large-scale studies are recommended to cover this issue comprehensively including role model for elderly simulation.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki, and the Ethics and Research Committee of the College of Medicine of King Khalid University approved the protocol. Approval number (ECM#2020-237) - (HAPO-06-B-001)

Institutional Review Board Statement: available.

Data Availability Statement: available.

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Conflicts of interest

There are no conflicts of interest.

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