

# Prevalence and Risk Factors of Hip Fracture at Tertiary Hospital in Mogadishu, Somalia

Abdirazak Ahmed Adan<sup>1</sup>, Mohamed Abdullahi Awale<sup>1</sup>, Hassan Salad Ibrahim<sup>2</sup>,  
 Mohamed Abdullahi Omar<sup>1</sup>, Ahmed Abdi Hassan<sup>1</sup>, Abdikadir Muhumed Jinow<sup>1</sup>,  
 Faiza Ibrahim Mohamud<sup>1</sup>

<sup>1</sup>Faculty of Medicine and Surgery, Somali National University, Mogadishu, Somalia; <sup>2</sup>Orthopedic Department, Mogadishu Somalia Turkey Training and Research Hospital, Mogadishu, Somalia

Correspondence: Abdirazak Ahmed Adan, Email raazik.adammd@gmail.com

**Purpose:** This study aims to determine the frequency of hip fractures and associated risk factors among patients receiving care at the Somalia Turkish Training and Research Hospital in Mogadishu.

**Patients and Methods:** A retrospective study of patients treated at the Somalia Turkish Training and Research Hospital in Mogadishu was carried out. 96 of the 108 patients who were admitted met the inclusion criteria. Analyzing the medical records of individuals diagnosed with hip fractures between January and December 2023 allowed for the collection of data on demographics, hip fracture type, and medical history and also conducted follow-ups to identify other potential contributing factors that may not be available in medical records. The main conclusions have been established using descriptive statistical analysis.

**Results:** About 8.67% of all fracture cases were hip fractures, Elderly people (60+) represented the largest group at 64.6%, followed by younger people (17–39) and Middle-aged people (40–59) at 15.6%, and children (3–16) at 4.2%. Females comprised 56.3% of cases, while males made up 43.8%. Most patients (78.1%) had low physical activity. Falls were the primary cause of fractures (83.3%), followed by other traumas (13.5%), and pathological fractures (7.3%). 32.3% of patients had comorbidities, 8.3% had a family history, and 22.9% had prior fractures. The most prevalent hip fractures (81.3%) were those of the femur neck, followed by subtrochanteric and intertrochanteric fractures (10.4% and 8.3%, respectively).

**Conclusion:** This study emphasizes the frequency of hip fractures in Mogadishu, Somalia, as well as the significance of fall prevention, age, gender, and comorbidity treatment. We suggest comprehensive risk assessments, gender-specific bone health programs, fall prevention programs, focused prevention for the elderly, and public education campaigns to reduce the burden of hip fractures and encourage healthier people in our community by putting these measures into practice.

**Keywords:** hip, fracture, demographics, prevalence, risk factors, falls

## Introduction

Hip fractures are the most prevalent significant traumatic fracture suffered by older persons. After a hip fracture, patients frequently suffer significant impairments in life quality, independence and functional movement.<sup>1</sup>

Femur fractures of the femoral neck, intertrochanteric, sub-trochanteric, and femoral head can all be referred to as hip fractures. The possible course of treatment depends on where the fracture is located within one of these anatomical areas.<sup>2</sup>

Hip fractures are the most frequent cause of mortality (about 22% of patients pass away within a year) and morbidity (30–50% of patients lose their ability to function independently). Around the world, there is a wide range in the incidence of hip fractures in persons over the age of 50. Denmark, for example, has an age-standardized prevalence of over 500 occurrences per 100,000 adults, while South Africa has less than 100 cases per 100,000 adults.<sup>3</sup>

Hip fractures have significant societal and humanitarian implications. Hip fractures are predicted to become as common as acute myocardial infarction in individuals over the age of 80 or in women over the age of 65, owing to an aging population.<sup>4</sup>

It is predicted that 17 out of 100 males will experience a hip fracture at some point in their lives beyond the age of 60. In actuality, this risk is similar to the chance of receiving a prostate cancer diagnosis. Since hip fractures can lead to a number of major problems, such as pain, disability, and premature mortality, they are often acknowledged as the most serious effect of osteoporosis.<sup>5</sup>

Hip fractures in older persons are typically low-energy fractures caused by osteoporosis. Hip fractures therefore occur more frequently in women. Hip fractures in younger patients are uncommon. When they do happen, pathologic fractures due to a bone tumor or high-energy trauma are the most common causes.<sup>2</sup>

Several pre-fracture conditions contribute to the higher rate of morbidity and mortality in patients with low energy hip fractures: older age, male sex, pre-fracture comorbidities, poor preoperative walking capacity and activities of daily living, fracture type, low body mass index (BMI), high ASA class, and non-multidisciplinary postoperative rehabilitation. Alcohol intake is associated with a higher risk of hip fracture and postoperative complications.<sup>6</sup>

Globally, one of the most prevalent physical injuries among the elderly is hip fractures. Hip fractures were estimated to have affected 1.3 million people worldwide in 1990; by 2050, this number is expected to rise to nearly 6 million cases annually.<sup>7</sup>

Hip fractures are expected to affect about 18% of women and 6% of men globally, despite epidemiological data varying by countries.<sup>8</sup>

Brazil had the lowest incidence rate (95.1), followed by Thailand (95.2) and the United Kingdom. Denmark had the highest age- and sex-standardized incidence rate per 100,000 inhabitants (315.9), followed by Singapore (314.2) and Taiwan (253.4).<sup>9</sup>

In 2016, 177 trauma units in England, Wales, and Northern Ireland received 65,645 new hip fracture cases. Hip fractures occur at a higher rate in developed countries than developing countries. Northern Europe and the United States have the greatest rates of hip fractures, Africa and Latin America have the lowest, however. Research conducted in Europe suggests that the north experiences a greater frequency of hip fractures than the south, and the United States also shows a similar pattern.<sup>10</sup> It is predicted that the number of hip fractures in Middle Eastern nations will double, or even triple.<sup>11</sup>

Furthermore, Hip fractures are expected to be more common in developing countries, where there is also likely to be a marked increase in their incidence.<sup>12</sup>

Hip fractures represent a significant health concern in Somalia, yet there is a lack of comprehensive data on their prevalence and associated risk factors. This gap in knowledge hinders the ability to plan effective healthcare strategies, develop targeted prevention programs, and implement focused interventions. Without accurate data, addressing the growing burden of hip fractures becomes increasingly challenging.

The purpose of this study is to determine the frequency and identify the risk factors associated with hip fractures among patients treated at Mogadishu Somalia Turkey Training and Research Hospital. By analyzing the demographic, hip fracture type, potential risk factors, and lifestyle characteristics of these patients, we aim to provide insights that could inform targeted prevention and intervention strategies to reduce the burden of hip fractures in this study population.

## Materials and Methods

A retrospective study design using a quantitative approach was employed to determine the prevalence and risk factors associated with hip fractures among the population at Mogadishu Somalia Turkey Training and Research Hospital, chosen for its ability to assess historical data and identify potential contributing factors. The study conducted a retrospective review of medical records for all eligible patients who met the inclusion criteria during the defined study period, irrespective of age. Data were collected from hospital medical records, and researchers conducted follow-ups to gather additional data on comorbidities, physical activity levels (average hours of physical activity per week e.g Low=less than 2.5 hours per week, Moderate=between 2.5 and 5 hours per week, and High=More than 5 hours per week, and type of physical activities engaged like Casual walking, Running and High intensity aerobic exercises) and other potential risk factors may not be available in medical records.

Our orthopedic specialists categorize fractures as intracapsular (Femoral head, neck) and extracapsular (intertrochanteric, subtrochanteric) after reviewed the radiographs.

All patients diagnosed with hip fractures and treated at Mogadishu Somalia Turkey Training and Research Hospital's Orthopedic Department from January to December 2023 were included in this study. The Orthopedic Department confirmed that there were 108 total admissions during this period; 96 patients met the inclusion criteria, while 12

were excluded. The inclusion criteria were all patients admitted with a confirmed hip fracture case within the specified period and accepted to do operation. Exclusion criteria encompassed cases not confirmed as hip fractures, cases outside the January to December 2023 timeframe, patients who refused to participate, those with incomplete medical records (eg contact information, comorbidities), patients who passed away with incomplete records, and individuals with mental illness. The actual sample size accessible for data collection was 96 patients.

## Statistical Analysis

Data analysis will be carried out using the software package IBM SPSS version 27 and will present our data using Univariate analysis and descriptive statistical tools such as Tables, charts, graphs, and Logistic Regression (Binary Logistic) performed to evaluate the association between the variables.

## Ethics Statement

This study was conducted in full accordance with the ethical standards of the Declaration of Helsinki and approved by the ethical research board committee of Mogadishu Somalia Turkish Training and Research Hospital (REF. MSTH/16338) approved the research to access and analyze patient records. Following informed consent was obtained from all study participants before the commencement of the study, Participants were fully informed about the study's purpose, procedures, risks, and benefits. Also, maintain strict confidentiality of patient information and adhere to data protection guidelines.

## Results

During the study period, a total of 108 patients were diagnosed with hip fractures and received treatment in the orthopedic departments of Mogadishu Somalia Turkey Training and Research Hospital. 96 patients meet our inclusion criteria while 12 patients meet our exclusion criteria. Approximately 8.67% of all fracture cases admitted to the hospital during the study period were hip fractures. [Table 1](#) provides an overview of the sociodemographic and other risk factors identified among participants, The elderly group (60+) makes up the greatest proportion, accounting for 64.6% of the total studied. Furthermore, young people (17–39) and middle adults (40–59) account for approximately 15.6% of the total, indicating an approximately balanced distribution throughout these age groups. Children (3–16) make up the smallest proportion, at 4.2%, showing that hip fractures are less common in these age groups.

Females account for a greater proportion of total cases (56.3%), while males account for 43.8%. The majority of hip fracture patients, accounting for 78.1% of cases, have a low level of physical activity. This suggests that a significant

**Table 1** Sociodemographic Factors and Other Risk Factors

Sociodemographic Factors	
<b>Age</b>	
Elderly 60+	62 (64.6%)
Middle adults (40–59)	15 (15.6%)
Young adults (17–39)	15 (15.6%)
Child (3–16)	4 (4.2%)
<b>Sex</b>	
Male	42 (43.8%)
Female	54 (56.3%)
<b>Smoking Status</b>	
Non-Smoker	90 (93.8%)
Current Smoker	6 (6.3%)
<b>Physical Activity Level</b>	
Low	75 (78.1%)
Moderate	10 (10.4%)
High	11 (11.5%)

(Continued)

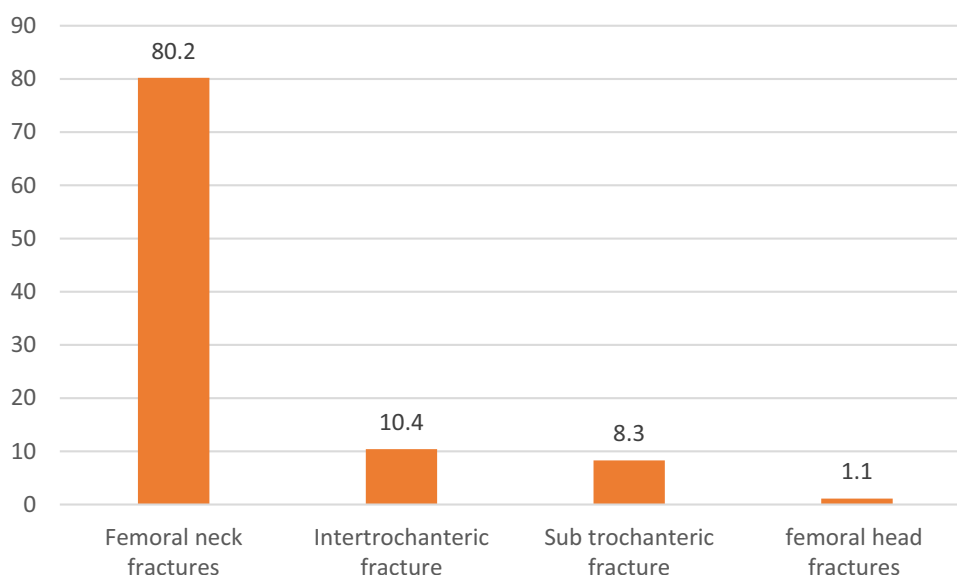
**Table 1** (Continued).

Other Risk Factors	YES	NO
Fall History	80 (83.3%)	16 (16.7%)
Other traumatic incidents	13 (13.5%)	83 (86.5%)
Gunshot	7 (7.3%)	89 (92.7%)
Explosion	4 (4.1%)	92 (95.9%)
Traffic accident	2 (2.1%)	94 (97.9%)
Bone-Related Conditions or Pathological	7 (7.3%)	89 (92.7%)
Previous Fractures	22 (22.9%)	74 (77.1%)
Family History	8 (8.3%)	88 (91.7%)
Comorbidities	31 (32.3%)	65 (67.7%)
Medications Affecting Bone Health	0 (0%)	96 (100%)

proportion of hip fracture patients may have limited mobility or reduced engagement in physical activities prior to experiencing the fracture. A smaller proportion of patients (10.4%) have a moderate level of physical activity, indicating some degree of regular physical activity or mobility. Similarly, 11.5% of patients have a high level of physical activity, suggesting a more active lifestyle or engagement in regular exercise before the hip fracture. This shows that hip fractures are more prevalent in females than in males in the studied population. Additionally, 93.8% of the patients are non-smokers, indicating that smoking is not a predominant risk factor in this population.

Falls are the leading cause of hip fractures, accounting for 83.3% of cases, underscoring the need for fall prevention programs. Other traumatic incidents (Gunshot 7.3%, Explosion 4.1%, and Traffic accident 2.1%) are less common (13.5%), and 7.3% of patients had pathological fractures or diseases related to the bones. A history of previous fractures is seen in 22.9% of the patients. In addition, only 8.3% of patients have a family history of hip fractures or bone-related disorders, and 32.3% of patients have comorbidities, underscoring the significance of treating these problems to prevent hip fractures. None of the patients reported taking medications affecting bone health.

Figure 1 illustrates the distribution of hip fracture types among participants, highlighting variations in fracture patterns that may be unique to this population. Femoral neck fractures are the most common, accounting for 80.2% of all cases examined. Intertrochanteric fractures account for 10.4% of all cases, with sub-trochanteric fractures accounting for 8.3% and only 1.1% of cases of femoral head fractures recorded in the study population.

**Figure 1** Types of Hip Fracture Frequency.

There is a statistically significant difference ( $p\text{-value} < 0.001$ ) between males and females in the sex distribution across age groups. Among the elderly (60+ years), there are significantly more females (46.9%) than males (17.7%), while in the young adult group (17–39 years), there are no females, with 15.6% males being recorded, indicating a notable gender disparity in these age groups.

In terms of fall history, the elderly group (60+ years) had the greatest number of individuals with a fall history (63.5%), which is indicative of the higher risk of falls with advancing age. By contrast, just one child had a history of falls, and only 13.5% of middle adults people (ages 40–59) and 5.2% of young adults reported a history of falls. The relationship between age and fall history is statistically significant ( $p\text{-value} < 0.001$ ).

Young adults (17–39 years old) reported the highest number of hip-related traumatic cases 10.4%, followed by middle adults 2%, and children 1%. It's interesting to note that no traumatic events were documented in the elderly, despite the fact that they experience the most falls. This indicates that traumatic hip injuries are more common in younger age groups, with a statistically significant difference across age groups ( $p\text{-value} < 0.001$ ), whereas falls are more common in the elderly.

## Discussion

The results of the study provide insight into our population's demographics, hip fracture type, risk factors related to hip fractures, lifestyle, and prevalence.

Hip fractures are more prevalent in the elderly (60+), which is consistent with research by Mei et al that found a correlation between age-related declines in physiological functions, including reduced physical activity, muscle strength, and balance, and an increased risk of hip fractures.<sup>13</sup> But the mean age of the patients seems relatively young compared to what is typically observed in Western populations, where hip fractures are most common in the elderly population, often those aged 70 and above. In comparison, Somalia has a younger population on average, with a large proportion of individuals under the age of 70 compared to Western countries. This demographic difference may contribute to our study population's relatively younger mean age.

The results of this study are in line with those of Alpantaki et al, who found that hip fractures occur more frequently in women than in men. Specifically, the incidence of hip fractures in women was greater (56.3%) than in men (43.8%).<sup>14</sup>

Femoral neck fractures accounted for 81.3% of all cases, making it the most prevalent form that was observed. According to Bäcker et al, over 90% of all proximal femur fractures are caused by femoral neck fractures, which is in line with these findings. The significance of emphasizing prevention and treatment approaches for femoral neck fractures is underscored by this consistency.<sup>15</sup>

Falls were identified as the leading cause of hip fractures in this study (83.3%), with other traumatic or pathological events accounting for a smaller proportion of cases (13.5%). These findings are consistent with those of Yang et al, who found that falls account for almost 95% of hip fractures in older people. This emphasizes how important fall prevention programs are, especially for the older population.<sup>16</sup>

In contrast to research by Gasparik et al that highlighted the hereditary variables influencing bone density and fracture risk, a study identified a low prevalence of family history of hip fractures and bone-related disorders (8.3%).<sup>17</sup> This discrepancy might be due to limited access advanced medical labs and genetic testing. While genetic predispositions to osteoporosis and fragility fractures are uncommon, traumatic events such as gunshot wounds, explosions, or road traffic accidents may have an impact on the occurrence of hip fractures, which may be more common due to local circumstances such as armed conflict or inadequate safety measures.

According to Llopis-Cardona et al, hypertension and diabetes were shown to be common comorbidities among hip fracture patients, and these findings were supported by the observation that 32.3% of patients had hip fractures. This suggests the need for comprehensive management of these conditions to prevent hip fractures.<sup>18</sup>

According to the study, patients with hip fractures had a history of fractures in 22.9% of them. This is in line with a meta-analysis conducted by Kanis et al, which found that those with a history of fractures are substantially more likely to experience hip fractures in the future.<sup>19</sup>

Notably, none of the patients reported using any drugs that affected their bone health. This could be a result of underreporting or restricted access to these drugs. To comprehend the drug profile and its effect on bone health in our population, this aspect necessitates more research.

Lastly, the low levels of physical activity reported by the majority of patients (78.1%) align with Lagerros et al, which found a higher risk of hip fractures among individuals with lower physical activity levels.<sup>20</sup>

This study's limited generalizability may be attributed to its single-center design at the Mogadishu Somalia Turkish Training and Research Hospital as well as possible center rejection. Generalizability might have been improved by working with multiple centers to produce a more diversified sample. The representativeness of our sample may have been impacted by selection bias introduced by our inclusion criteria. The reliability of our analysis may also have been impacted by different data quality and availability, especially with relation to medical history and lifestyle variables. Data depth and quality were further harmed by the short time allotted for data gathering up order to appropriately interpret the results and direct future research efforts to fill up knowledge gaps, it is imperative that these limitations be acknowledged. Larger sample sizes and a variety of approaches should be used in future research to improve generalizability.

## Conclusion

In conclusion, this study addresses the prevalence of hip fractures in Mogadishu, Somalia, and highlights the critical roles that age, gender, fall prevention, and comorbidity treatment play.

Unlike Western populations our study reveals a relatively younger mean age. This finding is likely reflective of the Somali population's demographic structure and the higher prevalence of trauma-related fractures. While falls are the leading cause of hip fractures globally, our study reveals a notable contribution of trauma (such as gunshots, explosions, and traffic accidents) to hip fractures, which is rare in Western studies. This highlights the need for region-specific prevention strategies, including trauma prevention programs in addition to fall-prevention interventions. We advise specialized preventive actions for the elderly, such as managing chronic conditions and promoting physical exercise, in addition to gender-specific programs like supporting women's bone health. Fall prevention initiatives, thorough risk assessments, and public education campaigns are critical to lowering the incidence of fractures and raising public awareness. With future research concentrating on improving bone health and fall prevention techniques, our goal is to lessen the burden of hip fractures and encourage healthier aging in our community by putting these measures into practice.

## Acknowledgments

We express our thanks to all healthcare professionals at Mogadishu Somalia-Turkish Training and Research Hospital, for their time and effort in data collection and patient follow-up. We also extend our gratitude to Somali National University for its support throughout this study.

## Disclosure

The authors declare no conflicts of interest in this work.

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