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Gender Disparities in Frailty and Health Outcomes in Elderly Bangladeshis

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Abstract: ***Background:*** The global population is ageing rapidly, with a growing proportion of individuals aged 60 years and above. This demographic transition presents significant challenges for health systems, particularly in low- and middle-income countries like Bangladesh, where resources for elderly care remain limited. Frailty, a common geriatric syndrome characterized by decreased physiological reserve and increased vulnerability to adverse health outcomes. ***Methods:*** This cross-sectional observational study was conducted among elderly individuals aged 60 years and above in both urban and rural areas of Dhaka district, including the outpatient at Medical College for Women's and Hospital, Dhaka, Bangladesh. The study period was from January 2023 to December 2023. A total of 100 participants were selected using purposive sampling. Data were analyzed using SPSS version 26. ***Result:*** In this study of 100 elderly participants, frailty was significantly more prevalent among females (43.8%) compared to males (23.1%). Frailty was strongly associated with increased risk of falls, hospitalizations, and dependency in daily activities, with these outcomes being more common among women. Logistic regression analysis identified female gender as an independent predictor of frailty. ***Conclusion:*** This study highlights significant gender disparities in frailty and related health outcomes among elderly individuals in Bangladesh, with older women experiencing a higher prevalence of frailty and a greater risk of adverse outcomes such as falls, hospitalizations, and functional dependency compared to men. Female gender emerged as an independent predictor of frailty, underscoring the need for targeted, gender-sensitive interventions to address frailty and promote healthy ageing.

Keywords: Gender Disparities, Frailty, Health Outcomes, Elderly.

Original Researcher Article

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Article at a glance:

Study Purpose: *To investigate the prevalence of frailty and its health impacts among elderly individuals in Dhaka district, Bangladesh.*
Key findings: *Frailty was more prevalent among women (43.8%) than men (23.1%), with women facing higher risks of falls, hospitalization, and dependency.*
Newer findings: *The study identifies female gender as an independent predictor of frailty, highlighting the need for gender-specific interventions in elderly care.*
Abbreviations: *CI - Confidence Interval, BMI - Body Mass Index, OR - Odds Ratio.*

INTRODUCTION

The global population is undergoing a demographic shift marked by an unprecedented increase in the proportion of older adults. In low- and middle-income countries (LMICs), including Bangladesh, this ageing trend is particularly concerning due to fragile healthcare systems and limited resources to cater to the complex health needs of the elderly population.[1, 2] Among these concerns, frailty has emerged as a key geriatric syndrome that significantly impacts health outcomes, quality of life, and mortality in older adults.[3] Frailty is a multidimensional clinical condition characterized by diminished physiological reserve and increased vulnerability to adverse health outcomes, such as falls, hospitalization, disability, and death.[4] While frailty is a known public health challenge worldwide,

evidence suggests that its prevalence and consequences differ by gender, with older women consistently exhibiting higher rates of frailty compared to men.[5, 6] Understanding these gender disparities is critical for designing effective, culturally appropriate interventions, particularly in resource-constrained settings like Bangladesh. In Bangladesh, the elderly population is growing rapidly. According to recent estimates, individuals aged 60 years and above constitute approximately 8% of the total population, and this figure is projected to double by 2050.[7] Despite this demographic shift, research on geriatric health, particularly frailty and its gender-specific implications, remains limited in the country. Socio-cultural dynamics, economic dependency, and healthcare access barriers disproportionately affect elderly women in Bangladesh, which may partly explain their higher vulnerability to frailty and adverse health outcome.[8] Several international studies have highlighted that biological, social, and behavioural factors contribute to gender differences in frailty. Women tend to live longer than men but often experience higher morbidity, disability, and dependency in old age.[9] In Bangladesh, gender-based disparities are further exacerbated by socio-economic inequalities, patriarchal norms, and limited healthcare accessibility for women, especially in rural areas.[10] Existing evidence indicates that frailty among elderly women in Bangladesh is not only more prevalent but also associated with worse health outcomes, including higher rates of falls, functional disability, chronic illnesses, and poor self-rated health.[11] Moreover, elderly women often face compounded disadvantages due to widowhood, economic dependency, low educational attainment, and limited decision-making power within households, all of which contribute to their heightened risk of frailty and its consequences.[8, 12] Despite these concerning trends, frailty among the elderly in Bangladesh remains an under-researched area. Most available studies on frailty are concentrated in high-income countries, with limited generalizability to LMICs due to differing socio-cultural and healthcare contexts.[5, 11]

Moreover, data on gender-specific patterns of frailty and health outcomes among Bangladeshi older adults are scarce, creating significant gaps in policy development and healthcare planning for this vulnerable population. Given the rapidly ageing population, the gendered nature of frailty, and the socio-economic challenges faced by elderly women in Bangladesh, there is a pressing need for empirical research focusing on gender disparities in frailty and associated health outcomes. Such research is essential to inform gender-sensitive health interventions, promote healthy ageing, and reduce the disproportionate burden of frailty-related morbidity and mortality among elderly women in the country. Therefore, this study aims to explore gender disparities in frailty and related health outcomes among elderly individuals in Bangladesh. By identifying the magnitude of frailty, understanding its gender-specific patterns, and examining the health consequences in men and women, this research seeks to contribute to evidence-based policy making and targeted geriatric health interventions. Ultimately, addressing these disparities is crucial to achieving equitable health for Bangladesh's ageing population and aligning with global healthy ageing agendas.

METHODS

This cross-sectional observational study was conducted among elderly individuals aged 60 years and above in both urban and rural areas of Dhaka district, including the outpatient at Medical College for Women's and Hospital, Dhaka, Bangladesh. The study period was from January 2023 to December 2023. A total of 100 participants were selected using purposive sampling. Inclusion criteria were individuals aged 60 years or older, of both genders, who were ambulatory and provided informed consent. Those who were severely ill, bedridden, cognitively impaired, or unwilling to participate were excluded. Data was collected using a pretested structured questionnaire, and frailty was assessed using the Fried Frailty Phenotype criteria. Relevant health outcomes, including falls, hospitalizations, dependency in activities of daily living (ADLs), and presence of chronic illnesses, were recorded. Data were analyzed using SPSS version 26, and statistical significance was set at $p < 0.05$.

RESULTS

Table 1: Socio-Demographic Characteristics of Study Participants (n=100)

Variable	Male (n=52)	Female (n=48)	Total (n=100)	p-value
Age (Mean ± SD)	68.1 ± 6.5	68.8 ± 6.9	68.4 ± 6.7	0.524
Age Group (years)				
60–69	28 (53.8%)	23 (47.9%)	51 (51.0%)	0.517
70–79	18 (34.6%)	17 (35.4%)	35 (35.0%)	
≥ 80	6 (11.5%)	8 (16.7%)	14 (14.0%)	
Education (Primary or below)	35 (67.3%)	39 (81.3%)	74 (74.0%)	0.108

The majority of the participants (51.0%) belonged to the 60–69 years age group, followed by 35.0% in the 70–79 years age group. Females had a slightly higher representation in the ≥80 years group (16.7%) compared to males (11.5%), but this difference was not statistically significant. A high proportion of participants had primary or no formal education, with no significant difference between genders.

Table 2: Prevalence of Frailty by Gender (n=100)

Frailty Status	Male (n=52)	Female (n=48)	Total (n=100)	p-value
Non-Frail	22 (42.3%)	12 (25.0%)	34 (34.0%)	0.048*
Pre-Frail	18 (34.6%)	15 (31.3%)	33 (33.0%)	
Frail	12 (23.1%)	21 (43.8%)	33 (33.0%)	

*Statistically significant at p<0.05

The overall prevalence of frailty was 33.0%, with a significantly higher prevalence among females (43.8%) compared to males (23.1%, *p=0.048*). Non-frail status was more common in males, while a larger proportion of females were categorized as frail.

Table 3: Association Between Frailty and Health Outcomes (n=100)

Health Outcome	Non-Frail (n=34)	Pre-Frail (n=33)	Frail (n=33)	p-value
Falls in the past year	4 (11.8%)	9 (27.3%)	19 (57.6%)	<0.001*
Hospitalization in the past year	3 (8.8%)	7 (21.2%)	15 (45.5%)	<0.001*
Dependency in ADLs	2 (5.9%)	6 (18.2%)	20 (60.6%)	<0.001*

*Statistically significant

Frailty status was significantly associated with adverse health outcomes. The proportion of participants experiencing falls, hospitalizations, and dependency in activities of daily living (ADLs) increased progressively from non-frail to frail groups, with all associations being statistically significant (*p<0.001*).

Table 4: Gender-wise Distribution of Specific Health Outcomes (n=100)

Health Outcome	Male (n=52)	Female (n=48)	Total (n=100)	p-value
Falls in the past year	11 (21.2%)	21 (43.8%)	32 (32.0%)	0.013*
Hospitalization in the past year	8 (15.4%)	17 (35.4%)	25 (25.0%)	0.022*
Dependency in ADLs	9 (17.3%)	19 (39.6%)	28 (28.0%)	0.011*
Chronic Illness (≥1)	35 (67.3%)	38 (79.2%)	73 (73.0%)	0.161

*Statistically significant

Older women reported significantly higher rates of falls, hospitalizations, and dependency in ADLs compared to men. Although chronic illness was more common among females, the difference was not statistically significant.

Table 5: Logistic Regression for Predictors of Frailty

Predictor	Adjusted OR	95% CI	p-value
Female gender	2.34	1.05 – 5.23	0.038*
Age ≥ 70 years	1.89	0.85 – 4.23	0.118
Chronic illness (≥1)	1.56	0.68 – 3.56	0.290

*Statistically significant

Multivariate logistic regression analysis showed that female gender was an independent predictor of frailty, with women having more than twice the odds of being frail compared to men (*OR=2.34, p=0.038*). Age and presence of chronic illness were not significant predictors after adjustment.

DISCUSSION

The overall frailty prevalence in this study was 33%, aligning closely with recent studies conducted in similar South Asian settings. For instance, Khan *et al.* reported a frailty prevalence of 31.5% among community-dwelling elderly individuals in Bangladesh, with significantly higher rates among women compared to men.[13] Similarly, a multi-country systematic review by O'Caoimh *et al.* found that frailty prevalence in community-dwelling older adults across Europe ranged from 11% to 38%, with higher rates consistently observed among females.[14] The slightly higher frailty prevalence observed in our study may be attributed to the inclusion of both community and hospital-based participants, as well as socio-economic and health status variations within the Bangladeshi elderly population. The significantly higher prevalence of frailty among elderly women observed in our study reflects a consistent trend reported across multiple international studies. Gordon *et al.* conducted a systematic review and meta-analysis, highlighting that older women exhibit higher frailty rates globally, largely due to biological differences, longer life expectancy, and socio-economic disadvantages.[15] More recently, Nguyen TN *et al.* reinforced this gender disparity, emphasizing that elderly women experience greater frailty burden due to cumulative disadvantages such as widowhood, lower educational attainment, and healthcare access barriers.[16] These factors are particularly relevant in the Bangladeshi context, where elderly women often face social and economic dependency, limited decision-making power, and inadequate access to healthcare, which may contribute to their increased vulnerability. Our study also demonstrated that frailty was significantly associated with adverse health outcomes, including falls, hospitalizations, and dependency in ADLs, with these outcomes occurring more frequently among frail females. This is consistent with findings from Hoogendijk *et al.*, who reported that frail older adults experience increased risk of falls, disability, hospitalization, and mortality, with women being disproportionately affected.[17] Similar observations were made by Alshanberi *et al.*, who found that frailty was a strong predictor of falls and functional decline among Saudi older adults, with female gender identified as an independent risk factor for frailty.[18] The logistic regression analysis in this study identified female gender as an independent predictor of frailty, even after adjusting for age and chronic illness. This finding is in line with previous studies from diverse populations. For example, Tavares JP *et al.* in Brazil reported that female gender remained a significant predictor of frailty after accounting for socio-demographic and health-related factors.[19] Likewise, Lin YC *et al.* highlighted the role of female gender as a determinant of frailty among older adults in Taiwan, underscoring the universality of this gender disparity.[20] While chronic illness was more prevalent among females in this study, it did not emerge as a significant independent predictor of frailty in the multivariate analysis. This could be explained by the complex interplay between biological, social, and environmental factors influencing frailty beyond the mere presence of chronic conditions. Similar observations have been reported by Woo *et al.*, who emphasized the multifactorial nature of frailty and its stronger association with functional limitations

and social vulnerability than with specific chronic diseases.[21]

Limitations of The Study

This study was limited by its cross-sectional design, small sample size, and purposive sampling, which may affect the generalizability of the findings. Important factors like nutrition and physical activity were not assessed, and self-reported data may be subject to recall bias.

CONCLUSION

This study highlights significant gender disparities in frailty and related health outcomes among elderly individuals in Bangladesh, with older women experiencing a higher prevalence of frailty and a greater risk of adverse outcomes such as falls, hospitalizations, and functional dependency compared to men. Female gender emerged as an independent predictor of frailty, underscoring the need for targeted, gender-sensitive interventions to address frailty and promote healthy ageing.

Recommendation

Targeted frailty screening programs should be integrated into primary healthcare services in Bangladesh, with special emphasis on identifying and managing frailty among elderly women. Community-based interventions focusing on physical activity, nutritional support, and fall prevention are essential to reduce the burden of frailty and its adverse outcomes. Additionally, public health policies should prioritize gender-sensitive approaches to promote healthy ageing and improve the overall well-being of the elderly population.

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