

Sex Differences in Loneliness among Elderly in Rural Bangladesh: Exploring Socio-Demographic Influences

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Abstract

The problem of elderly loneliness is serious and has wide-ranging effects on the ageing population. Although the influence of socio-demographic characteristics on sex-specific loneliness has been acknowledged, this problem has received less attention, especially when it comes to the elderly population living in rural Bangladesh. The experience and prevalence of loneliness in the elderly population are examined in relation to sex in this study. The findings show that older males are significantly less likely than females to experience loneliness. The results also imply that a number of socio-demographic variables may have an impact on these variations. With a mixed-method approach, this study surveyed people in the rural Bangladeshi district of Naogaon who were 60 years of age or older through a cross-sectional survey. This study, in contrast to earlier research, provides evidence in favour of the claim that socio-demographic characteristics have a major impact on loneliness in elderly population according to their sex. To effectively minimize loneliness in older adults and ultimately improve their quality of life, it is imperative to comprehend these sex-specific tendencies when creating interventions.

Keywords: Loneliness, Socio-Demographic, Elderly, Rural, Bangladesh.

Introduction

Millions of older persons worldwide are impacted by elderly loneliness (Wu, 2020), which is a developing phenomenon that has serious consequences for both their mental and physical health. There is evidence to suggest that loneliness is more likely to strike elderly persons (Courtin & Knapp, 2017; Hwang et al., 2020). Loneliness usually has to do with how individuals evaluate their total level of social interaction. However, the widely recognized definition provided by Peplau and Perlman (1982) is that it is an adverse feeling resulting from the belief that a person's social needs are not in line with the quantity or quality of their current social ties (Peplau & Perlman, 1982). Human discomfort is significantly exacerbated by loneliness, especially in the elderly population, where prevalence rates may be higher (Ekwall et al., 2005). Any age can experience loneliness, which is a negative emotional response characterized by subjective sentiments. However, because to variables such a higher prevalence of chronic illnesses, deteriorating physical capabilities, losing a spouse, and retirement, it tends to be more common among elderly (Cohen-Mansfield et al., 2016; Ong et al., 2016). A growing number of research has shown how loneliness negatively impacts people's quality of life (Gerino et al.,

2017), overall well-being (DiJulio et al., 2018; Poscia et al., 2018), personal connections (DiJulio et al., 2018), and health (Cudjoe et al., 2020; Menec et al., 2020; Paul et al., 2021). While loneliness can affect everyone in the population (DiJulio et al., 2018), it is thought to have more severe impacts on elderly population (Shiovitz-Ezra et al., 2018).

But recent studies show that loneliness in later life is not universal and can be strongly impacted by sex orientation (Jylhä, 2004; Solmi et al., 2020; Srivastava et al., 2021). The experience of loneliness can differ between men and women due to varied socio-demographic characteristics. Bangladesh has a rich religious and cultural history that emphasizes honouring and valuing the elderly. Elderly care has traditionally been the responsibility of families and communities. Nevertheless, the traditional system of intergenerational and community-based care has been severely disrupted by the rapid changes in socio-economic and demographic characteristics, pervasive poverty, changing social and religious norms, the influence of Western culture, and numerous other issues. As a result, an ageing population is seeing a decline in their quality of life (Rahman et al., 2010). According to a number of studies (Kamiya et al., 2013; Pinqart, 2003; Solmi et al., 2020), socio-demographic parameters are important variables associated with loneliness. Even with a number of advancements in socio-demographic areas, the nation's population is not equally benefiting from these outputs, with women still falling well behind. In elderly age, it is increasingly important.

To successfully address this issue and design tailored therapies, it is important to understand how loneliness differs by sex. The association between socio-demographic characteristics and loneliness among the elderly population living in rural areas based on their sex is mostly studied in developed countries; Bangladesh is not given as much attention in this regard. Considering these gaps in research, it is imperative to look into how much gender-based socio-demographic traits contribute to the loneliness that elderly in rural areas suffer. This article sheds light on the distinct requirements and challenges faced by both men and women as they age by examining the complex relationship between loneliness and sex in older persons by taking into account their socio-demographic status.

Methods

Data

Information gathered from people 60 years of age and older that lived in rural Manda Upazila in Naogaon district of Bangladesh—typically located in the country's north—was used in the study. September 25, 2023, to November 5, 2023, was when the data was collected. With a margin of error of 5% (i.e., $e = 0.05$), a 50% prevalence among the older individuals ($p = 0.50$), and a 95% confidence level ($Z = 1.96$), a minimum sample size of 384 was required. But this study took a 5% non-response rate into account to address any problems with selection bias and non-response. As a result of using a multi-stage sampling strategy, the study's final sample size consisted of 404 respondents. A Union inside that Upazila was first chosen, and then five particular wards were randomly selected. Data were subsequently gathered from 404 elderly living in these chosen wards using probability proportion to size (PPS) sampling. The 404 older adults were interviewed face-to-face by skilled interviewers using a well-structured questionnaire in Bangla, the official language of Bangladesh. The questionnaire covered socio-demographic aspects like age, sex, marital status, education, occupation, monthly income, family size, living arrangements, etc. The approval statement was given to respondents before the survey started, and their verbal consent was requested.

Dependent Variable

The dependent variable in this study is elderly loneliness. The University of California, Los Angeles Loneliness Scale item-3 i.e. 3-item UCLA Loneliness Scale (Hughes et al., 2004), is used in this study. The following questions make up the scale: "How often do you feel excluded?" and "How frequently do you experience a lack of companionship?" and "How often do you feel excluded from other people?" Using a 3-point rating system (1 being seldom, 2 being occasionally, and 3 being frequently), participants are requested to express their responses for each topic. A possible score range of 3 to 9 can be obtained by adding the total points earned for all of the questions. A higher score denotes a higher likelihood of experiencing loneliness. According to results from a previous study (Stephoe et al., 2013), participants were classified as "not lonely" with scores between 3 and 5 or as "lonely" with scores between 6 and 9 to create binary variables during the analysis.

Independent Variables

The current study included a number of socio-demographic variables that have been connected to loneliness in earlier studies (Cohen-Mansfield et al., 2016; Kamiya et al., 2013; Pinqart, 2003; Savikko et al., 2005; Solmi et al., 2020) as independent variables. The socio-demographic characteristics of the respondents include their age (categorized as 60-69, 70-79, or ≥ 80 years old), their marital status (categorized as married or widow/widower), their education (categorized as no formal education, 1 to 5 years of schooling as primary, 6 to above years of schooling as secondary and higher), their occupation (categorized as not involved in any work,

involved in paid work, or housewife), their monthly income (categorized as no income, ≤ 3000 Bangladesh currency Taka [BDT], or >3000 BDT), their family's monthly income (categorized as <5000 BDT, $5000-9999$ BDT, or ≥ 10000 BDT), their level of economic dependency (independent, partially dependent, or fully dependent), their living arrangement (alone, only with spouse, with children, or with others), and their condition (healthy, fairly healthy or unhealthy).

Statistical Analysis

For the study sample, descriptive statistics were first looked at. Chi-square tests were then used to find differences in loneliness percentages based on the explanatory variables that were previously indicated. By carefully examining the standard errors linked to the regression coefficients, multicollinearity in logistic regression analysis was evaluated. Numerical problems, like multicollinearity (defined as standard errors more than 2.0), were detected in accordance with Chan (2004); however, this investigation did not reveal any multicollinearity. A binary logistic regression model was then used to clarify how socio-demographic characteristics affected the assessment of loneliness in the elderly population. At a cutoff of $p < 0.01$, all analyses were deemed statistically significant. The data were not taken into account in the analysis since they did not have sample weights. SPSS version 16.0 for Windows (SPSS Inc., Chicago, IL, USA) was used to carry out the statistical operations.

Ethical Considerations

An agreement was made at the outset of the survey to protect respondent privacy and guarantee that the information would only be utilized for research. A consent statement clarifying that participation in the study on loneliness among elderly population is optional was used to convey this commitment. Respondents were asked for verbal consent after carefully reading the consent statement. In order to address potential difficulties with reading and/or writing that some participants might have, the decision was made to forego seeking written consent. The use of thumb impressions, a traditional formal technique in voting and property transfer, was also left out of fear that people might not be aware of its informal use. This preventive step was put in place to make sure that respondents wouldn't be reluctant to participate in the interview, protecting the integrity of the data collection process. It is crucial to emphasize that the dataset used in this study purposefully omitted any personally identifiable information.

Results

Socio-Demographic Characteristics of the Respondents by Sex

Socio-demographic status by sex often reveals significant disparities in various aspects such as income, education, health, and employment opportunities. Men and women tend to experience different social and economic conditions, influenced by gender roles and expectations. Understanding these differences is crucial for developing policies and interventions that promote gender equity and improve socio-demographic outcomes for all. Table 1 presents the socio-demographic characteristics of the respondents by sex. It shows that the mean age of male elderly is 68.99 years, while for female elderly it is 70.10 years. Approximately 95% of male elderly are married, whereas the majority of female elderly are widowed (54.8%). Differences in education status are also observed, with the majority of female elderly (59.1%) lacking formal education, while most male elderly have completed primary education (46.9%). These disparities are reflected in the mean years of schooling, which are 4.05 years for male elderly and only 1.05 years for female elderly.

The majority of male elderly (62.8%) are involved in paid work, while almost all female elderly (96.6%) are engaged in unpaid work, predominantly as housewives, which is an unpaid role in Bangladesh. Disparities by sex are also evident in their monthly income, with male elderly earning an average of BDT 4710, compared to only BDT 949 for female elderly. Similarly, there is a variation in the monthly income of their families, with the average income for families of male respondents being BDT 10840, while for families of female elderly, it is BDT 8201. About seven out of every ten female elderly individuals are fully economically dependent on others, commonly their families, while the majority of male elderly individuals are economically independent. The percentage of respondents living with children and others is almost similar across sexes. However, there is a significant difference in the percentage of those living alone, which is 5.1% for male elderly and 21.6% for female elderly. Health status also varies by sex, with more than half of the male elderly (54.6%) being healthy, compared to only 35.1% of female elderly (Table 1).

Table 1. Socio-Demographic Characteristics of the Respondents by Sex

Variables	Male		Female	
	Frequency	Percent	Frequency	Percent
Age (in years)				
60-69	117	59.7	124	59.6
70-79	62	31.6	50	24.1
80 and above	17	8.7	34	16.3
Mean age	68.99		70.10	
Marital status				
Married	185	94.4	94	45.2
Widow/widower	11	5.6	114	54.8
Education status				
No formal education	45	23.0	123	59.1
Primary level	92	46.9	75	36.1
Secondary and higher level	59	30.1	10	4.8
Mean years of schooling	4.05		1.05	
Occupation				
Involve in unpaid work	73	37.2	201	96.6
Involve in paid work	123	62.8	7	3.4
Respondents' monthly income (BDT)				
No income	12	6.1	31	14.9
≤ 3000	93	47.5	170	81.7
> 3000	91	46.4	7	3.4
Mean income (BDT)	4710.2		949.5	
Family's monthly income (BDT)				
< 5000	31	15.8	73	35.1
5000-9999	74	37.8	60	28.8
≥ 10000	91	46.4	75	36.1
Mean income (BDT)	10840		8201	
Status of economic dependency				
Independent	82	41.8	22	10.6
Partially dependent	57	29.1	40	19.2
Fully dependent	57	29.1	146	70.2
Living arrangement				
Alone	10	5.1	45	21.6
Only with spouse	72	36.7	44	21.2
With children and others	114	58.2	119	57.2
Current health status				
Healthy	107	54.6	73	35.1
Fairly healthy	57	29.1	74	35.6
Unhealthy	32	16.3	61	29.3

Notes: BDT: Bangladesh currency – Taka

Loneliness Status of the Respondents by Sex

Loneliness often differs significantly by sex, with notable variations in experiences and impacts. [Figure 1](#) shows the status of loneliness among respondents based on their sex. There is a noticeable variation in the percentage of individuals experiencing loneliness according to sex. Approximately 60% of elderly men and 70% of elderly women report feeling lonely. Conversely, only 39.3% of elderly men and 29.3% of elderly women do not feel lonely ([Figure 1](#)).

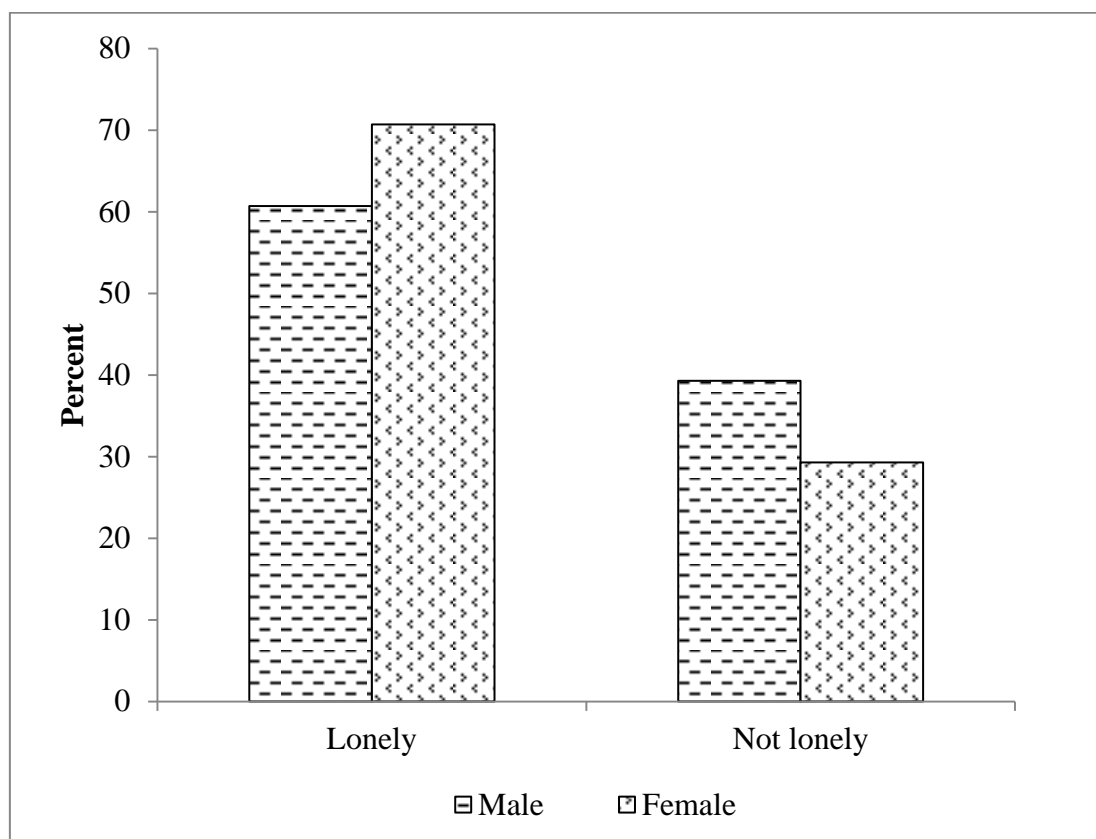


Figure 1. Loneliness Status of the Respondents by Sex

Relation of Socio-Demographic Variables with Loneliness Status of the Respondents by Sex

The relationship between socio-demographic variables and loneliness status among respondents reveals distinct patterns when analyzed by sex. Table 2 represents the relation of elderly loneliness with their selected socio-demographic characteristics by sex. It is observed that there is a relationship between age and loneliness among respondents, with a higher percentage of lonely elderly aged 80 years and above for both male and female. Marital status is also associated with the feelings of loneliness among the elderly and varies by sex. Notably, the percentage of loneliness is higher among married elderly male, while for elderly female, it is highest among widows. The educational status of respondents is strongly linked to their loneliness, with higher levels of education corresponding to lower levels of loneliness for both elderly men and women. Additionally, occupation impacts loneliness differently based on sex. Male paid workers experience less loneliness compared to those who are unpaid, while elderly women show higher and similar levels of loneliness regardless of their occupation. The monthly income of respondents and their families is also connected to their loneliness status. Table 2 shows that elderly men with higher individual and family incomes experience less loneliness compared to those with lower incomes. A similar trend is observed among elderly women. Economic dependency also impacts feelings of loneliness, with variations between sexes. Specifically, elderly men who are economically independent report lower levels of loneliness, while elderly women who are fully economically dependent experience lower loneliness.

A significant relationship exists between the loneliness status of elderly respondents and their living arrangements, affecting both male and female differently. For elderly men, the incidence of loneliness is lower among those living alone, whereas for elderly women, loneliness is more common among those residing alone. Additionally, the health status of respondents is closely related to their loneliness levels. Both male and female elderly respondents who are in poor health report higher levels of loneliness (Table 2).

Table 2. Relation of Socio-Demographic Variables with Loneliness Status of the Respondents by Sex

Variables	Male		Female	
	Lonely	Not lonely	Lonely	Not lonely
Age (in years)				
60-69	72 (61.5)	45 (38.5)	90 (72.6)	34 (24.7)
70-79	36 (58.1)	26 (41.9)	32 (64.0)	18 (36.0)
80 and above	11 (64.7)	6 (35.3)	25 (73.5)	9 (26.5)
	p-value = <0.84		p-value = <0.49	
Marital status				
Married	114 (61.6)	71 (38.4)	64 (68.1)	30 (31.9)
Widow/widower	5 (45.5)	6 (54.5)	83 (72.8)	31 (27.2)
	p-value = <0.28		p-value = <0.45	
Education status				
No formal education	28 (62.2)	17 (37.8)	83 (67.5)	40 (32.5)
Primary level	60 (65.2)	32 (34.8)	59 (78.7)	16 (21.3)
Secondary and higher level	31 (52.5)	28 (47.5)	5 (50.0)	5 (50.0)
	p-value = <0.30		p-value = <0.01	
Occupation				
Involve in unpaid work	46 (63.0)	27 (37.0)	142 (70.6)	59 (29.4)
Involve in paid work	73 (59.3)	50 (40.7)	5 (71.4)	2 (28.6)
	p-value = <0.61		p-value = <0.96	
Respondents' monthly income (BDT)				
No income	7 (58.3)	5 (41.7)	26 (83.9)	5 (16.1)
≤ 3000	59 (63.4)	34 (36.6)	117 (68.8)	53 (31.2)
> 3000	53 (58.2)	38 (41.8)	4 (57.1)	3 (42.9)
	p-value = <0.76		p-value = <0.17	
Family's monthly income (BDT)				
< 5000	23 (74.2)	8 (25.8)	59 (80.8)	14 (19.2)
5000-9999	47 (63.5)	27 (36.5)	50 (83.3)	10 (16.7)
≥ 10000	49 (53.8)	42 (46.2)	38 (50.7)	37 (49.3)
	p-value = <0.01		p-value = <0.001	
Status of economic dependency				
Independent	48 (58.5)	34 (41.5)	17 (77.3)	5 (22.7)
Partially dependent	35 (61.4)	22 (38.6)	28 (70.0)	12 (30.0)
Fully dependent	36 (63.2)	21 (36.8)	102 (69.9)	44 (30.1)
	p-value = <0.85		p-value = <0.77	
Living arrangement				
Alone	5 (50.0)	5 (50.0)	35 (77.8)	10 (22.2)
Only with spouse	49 (68.1)	23 (31.9)	32 (72.7)	12 (27.3)
With children and others	65 (57.0)	49 (43.0)	80 (67.2)	39 (32.8)
	p-value = <0.02		p-value = <0.02	
Current health status				
Healthy	68 (63.6)	39 (36.4)	51 (69.9)	22 (30.1)
Fairly healthy	29 (50.9)	28 (49.1)	51 (68.9)	23 (31.1)
Unhealthy	22 (68.8)	10 (31.2)	45 (73.8)	16 (26.2)
	p-value = <0.17		p-value = <0.18	

Notes: BDT: Bangladesh currency – Taka; Figures in parentheses indicate percentage; The p-values are of chi-square tests; P-values<0.20are in boldface.

Socio-Demographic Determinants of Elderly Loneliness by Sex

Socio-demographic determinants of elderly loneliness vary significantly by sex, reflecting different underlying factors that contribute to loneliness among older adults. Table 3 shows the more important variables that have an impact on how lonely older people are. Results show that respondents between the ages of 70 and 79 are more likely than their peers to report feeling lonely, with higher odds of loneliness for older men (OR: 1.58; CI: 0.74-3.39) and women (OR: 2.63; CI: 1.07-6.43), respectively. Compared to their contemporaries, widows and widowers are more likely to feel lonely. This is true for older men (OR: 2.33; CI: 0.57-3.62) and women (OR: 1.37; CI: 0.14-0.98), respectively. The level of education among the participants also affects their feelings of loneliness. Elderly who have completed secondary education or higher are, on average, 0.91 times (CI: 0.53-3.24) for male and 0.78 times (CI: 0.24-5.86) for female are less likely to feel lonely than their

counterparts. The probability of loneliness is lower (OR: 0.73; CI: 0.61-3.36) for old male workers in the paid occupation group, but higher (OR: 1.25; CI: 0.18-8.62) for elderly female workers in the same profession category. The respondents' monthly income and that of their families have an impact on how lonely they feel, with elderly both male and female who make more money—both individually and as a family—feeling less lonely than their peers.

Partially economically dependent male elderly are 1.21 times (CI: 0.50-2.91) more likely to experience loneliness than their peers, whereas fully economically reliant elderly are 0.91 times (CI: 0.33-2.51) less likely to experience it. In contrast, elderly women who are partially dependent are 2.93 times (CI: 0.58-4.92) and fully dependent are 2.80 times (CI: 0.63-2.37) more likely than the reference category to feel lonely. Elderly who live alone, regardless of sex, are more likely than their colleagues to experience loneliness. Male elderly who are unhealthy have a higher likelihood of feeling lonely than their peers (OR: 1.79; CI: 0.34-1.85). In addition, unhealthy elderly women have a 1.82 times (CI: 0.39-1.76) higher likelihood of loneliness than those who are not ill (Table 3).

The likelihood of being lonely is higher for both male and female elderly living alone than their counterparts. Elderly male, who are unhealthy are more likely to feel lonely (OR: 1.79; CI: 0.34-1.85) than their counterparts. Also unhealthy female elderly are 1.82 times (CI: 0.39-1.76) more likely to experience loneliness than their counterparts (Table 3).

Table 3. Socio-Demographic Determinants of Elderly Loneliness by Sex

Variables	Male				Female			
	β	SE (β)	Odds ratio	95% CI	β	SE (β)	Odds ratio	95% CI
Age (in years)								
60-69 [®]	-	-	1.00	-	-	-	1.00	-
70-79	0.46	0.39	1.58	0.74-3.39	0.97	0.46	2.63**	1.07-6.43
80 and above	0.23	0.69	1.26	0.33-4.89	0.57	0.56	1.77	0.59-5.30
Marital status								
Married [®]	-	-	1.00	-	-	-	1.00	-
Widow/widower	0.85	0.72	2.33	0.57-3.62	-0.99	0.50	1.37**	0.14-0.98
Education status								
No formal education [®]	-	-	1.00	-	-	-	1.00	-
Primary	0.10	0.43	1.11	0.82-2.55	-0.77	0.43	0.46*	0.20-1.07
Secondary and higher	0.27	0.46	0.91	0.53-3.24	0.17	0.82	0.78	0.24-5.86
Occupation								
Involve in unpaid work [®]	-	-	1.00	-	-	-	1.00	-
Involve in paid work	0.36	0.44	0.73	0.61-3.36	0.22	0.99	1.25	0.18-8.62
Respondents' monthly income (BDT)								
No income [®]	-	-	1.00	-	-	-	1.00	-
≤ 3000	-0.31	0.75	0.73	0.17-3.18	0.82	0.57	0.87*	0.74-3.70
> 3000	-0.23	0.82	0.79	0.16-4.01	0.99	0.93	0.69	0.21-4.52
Family's monthly income (BDT)								
< 5000 [®]	-	-	1.00	-	-	-	1.00	-
5000-9999	0.15	0.45	0.96	0.48-2.80	0.65	0.52	0.92	0.69-5.32
≥ 10000	0.65	0.52	0.91	0.69-5.31	1.92	0.59	0.81**	2.15-9.55
Status of economic dependency								
Independent [®]	-	-	1.00	-	-	-	1.00	-
Partially dependent	0.91	0.45	1.21	0.50-2.91	1.07	0.83	2.93*	0.58-4.92
Fully dependent	-0.10	0.52	0.91	0.33-2.51	1.03	0.76	2.80*	0.63-2.37
Living arrangement								
Alone [®]	-	-	1.00	-	-	-	1.00	-
Only with spouse	-1.25	0.77	0.29*	0.06-1.29	-1.03	0.77	0.36*	0.08-1.62
Children and others	-1.15	0.76	0.32*	0.07-1.42	-1.20	0.67	0.30**	0.08-1.16
Current health status								
Healthy [®]	-	-	1.00	-	-	-	1.00	-
Fairly healthy	0.52	0.33	0.68*	0.88-3.23	0.04	0.36	1.05	0.52-2.11
Unhealthy	-0.23	0.43	1.79	0.34-1.85	-0.19	0.39	1.82	0.39-1.76

Notes: BDT: Bangladesh currency – Taka; β : regression coefficient; CI: Confidence interval; [®]: Reference category; SE: Standard error; Level of significance: ***: p<0.001; **: p<0.01; *: p<0.05.

Discussion

The goal of this study is to thoroughly document the impact of some selected socio-demographic variables on the loneliness that elderly men and women who live in rural areas experience. According to the study's findings, the majority of senior people—male and female—report feeling lonely. Sex differences in terms of socio-demographic status have a significant impact on the degree of loneliness experienced by the elderly.

Studies in the past (Pinquart & Sorensen, 2001; Savikko et al., 2005; Zhong et al., 2018) have indicated a connection between growing older and increased loneliness. Consistent with these conclusions, the study's result shows that age has an impact on the loneliness that elderly experience, with elderly women being far more likely than older men to experience loneliness. Male and female elderly without a spouse are more likely than their married counterparts to feel lonely, and the intensity of loneliness is higher in the former group. This study supports the finding of previous studies (Cohen-Mansfield et al., 2016; Phaswana-Mafuya & Peltzer, 2017) that older adults without a spouse feel more alone than older adults with spouses. This study confirmed previous research (Cohen-Mansfield et al., 2016; Dahlberg & McKee, 2014; Hansen & Slagsvold, 2016) by demonstrating that there are sex differences in loneliness among the elderly, with a lower degree of education being associated with higher levels of loneliness. There is, however, a difference based on sex; the results of this study indicate that elderly who do not work for pay, have a low or nonexistent monthly income, have a lower family income, and are financially dependent on others are more likely than their peers to experience loneliness. These findings are consistent with previous studies showing that those who are dependent on others (Vijg, 2007), unemployed (Srivastava et al., 2021; Vakili et al., 2017), and have lower incomes (Eckhard, 2018; Stewart et al., 2009; Zavaleta et al., 2017) are more likely than others to experience loneliness. The results of the current study verified that respondents who live alone are more likely to feel lonely, and that the chance of loneliness varies by sex. The present conclusion is consistent with previous research (Steed et al., 2007; Tomstad et al., 2017), highlighting the importance of this component in exacerbating loneliness in the elderly population. There are sex differences in the likelihood of being an elderly lonely person as well. The results of this study indicate that, in comparison to their healthier peers, elderly those are in poor health are more likely to experience emotions of loneliness. This finding is in accordance with earlier research that found poor health to be a risk factor for loneliness (Cattan et al., 2011; Fry & Debats, 2002; Victor et al., 2005).

The limitations of our research are mainly due to the small sample size, as the study was carried out in small rural areas in the northern region of Bangladesh and may not be representative of the entire country. However, it is recommended that this topic be investigated more thoroughly in future studies. Notwithstanding this drawback, it is crucial to remember that this research represents the first investigation into how socio-demographic characteristics affect elderly loneliness by sexual orientation in northern Bangladesh.

Conclusion

In rural Bangladesh, this study aimed to ascertain how different socio-demographic characteristics affect older persons' feelings of loneliness according to their sex. According to the study, loneliness affects the majority of elderly, with a higher frequency among women. The study also determined the socio-demographic factors that influence loneliness in elderly population and the ways in which these factors differ depending on the sex of the respondents. The need to develop policies by considering the sex of the population that allow elderly in the present and future generations to live autonomous lives and experience a high quality of life is becoming more pressing as the population ages. We suggest that intervention methods should concentrate on the following, based on the study's findings: 1) offering various services to meet fundamental needs, particularly as financial and health supports for the elderly, with a focus on female; 2) incorporating religious and moral precepts that encourage elder care and respect into schools and the media; 3) building closeness in interpersonal relationships for the elderly; and 4) special focus on social skills training—including the efficient use of communication instruments like the phone, cell phone, and online platforms—should be given to the elderly, especially the female elderly.

Disclosure

This research is a part of the PhD thesis "Loneliness of rural elderly in Bangladesh: does social capital matter?" that under the direction of MAIK and RI was carried out by the first author, KMMR. The decision to publish, the design of the study, the gathering and analysis of data, or the writing of the manuscript were all outside the purview of the funder.

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Conflict of interest

Regarding the research, authorship, and/or publication of this paper, the author(s) declare that there are no potential conflicts of interest.

Data availability

The data are available from the corresponding author on reasonable request.

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