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Socio-demographic correlates of psychological morbidity: A community based cross-sectional study among the rural elderly of North 24 Parganas

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KEYWORDS

GHQ 28, mental health, socioeconomic class

ABSTRACT

Psychological and physical health are influenced by a battery of socioeconomic, behavioural and psychosocial determinants. The purpose of this study was to look into the sociodemographic factors that influence psychological health among the rural elderly aged 60 years and above residing under the jurisdiction of Charghat and Machlandapur II Gram Panchayat in North 24 Parganas, West Bengal. All the elderly were approached for voluntary participation. Finally, 408 people agreed to participate in this study, of which 193 were males and 215 were females. A pretested questionnaire, containing information on age, sex, religion, marital status, education, occupation, monthly household income and living arrangement was used to obtain socio-demographic data. Uday-pareek socioeconomic status scale was used to determine socioeconomic class. Age (80 years and above), sex (female over male), financial dependency and socioeconomic class significantly predicted the occurrence of somatic symptoms, anxiety and insomnia, social dysfunction and severe depression among the studied elderly. Sociodemographic factors, like, age, sex, occupational status and socio-economic class, played a substantial role in psychiatric morbidity among the older persons in the rural study area of West Bengal.

Introduction

In India, a demographic shift was triggered by a sustained change in fertility and mortality rates. The population of the country is ageing four to five times quicker than that of western European countries. (Kalache 2000:34; UNDESA 2017). The population of elderly here is increased from 32.7 million in 1971 to 103.8 million in 2011. This is equivalent to 8% of India's entire population. Elderly people make up 8.1 percent of the population in rural areas, while 7.9 % live in urban areas. (Population Composition 2011). According to the census report 2011, in West Bengal, 10.1% of the elderly are living in urban areas whereas, only 7.5% of the elderly are living in the rural areas. According to MOSPI report (2016), better education and development in the health-care sector are the driving forces behind the increase in the older population, which is expected to grow by 12.4 % by 2026.

According to previous studies, a high percentage of older people in developing nations like India are suffering from chronic illness, rising impairment, and reduced functionality (Chatterji 2008:6; Basu 2013:1624; Arokiasamy 2015:6). This poor health conditions are also associated with poor mental health (Bhandari 2021:36). Grover and Malhotra (2015:4-15), in their clinic-based study revealed a very high prevalence of chronic depression among the elderly. Depression is found to be directly correlated with impairment or disability and also socioeconomic status of elderly (Kumar 2003:67-

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83). Anxiety and insomnia were reported in 3.4 % of the aged, followed by somatic symptoms, social dysfunction, and severe depression, according to a study conducted by Boralingaiah, Bettappa, and Kashyap in Mysore city in 2012 (pp 363). Other researches have also shown comparable findings (Datta 2013:96; Sinha 2016:220). Zimmer *et al*. (2001:1304) revealed that each health outcome is significantly associated with each socioeconomic status indicator. Another study by Lee and Jeon (2015:154) showed that low socioeconomic status leads to poorer health status, in terms of experiencing acute diseases, higher disability and higher cognitive impairment.

Inequalities in socioeconomic status have a significant impact on the health of older persons. According to some studies, having a greater level of household income, wealth, education, or higher occupational status lowers the risk of death and illness (Po and Subramanian 2011: 4-6; Glymour 2014: 17-63). Lower socioeconomic status also rises the chance of developing mental illness, like, depressive symptoms, anxiety and insomnia (Suda 2007:471-472; Back and Lee 2011:e142). Financial troubles of India's elderly were exacerbated by an unreliable and insufficient pension system, a lack of job possibilities, and a poor income (Ramachandran 2006:288-290). Owing to the fact that financial resources are increasingly proportionate to health state, older people are burdened by a high-priced healthcare system. (McMaughan 2020:5).

Gender disparities in health status and health-care systems have also been documented in studies of elderly. Compared to women, elderly men reported better self-rated health, a lower prevalence of disability, a greater prevalence of chronic disease, and more healthcare utilization (Roy 2008:1959). A recent study revealed that due to poorer educational attainment, employment status, and economic dependency, older women have a higher level of poor self-assessed health. (Pandey 2015:888).

The health of the elderly is influenced by their living arrangements, as well. Elderly who live alone are more likely to suffer from mental illness like depression and anxiety, chronic ailments like asthma and TB, as well as acute illnesses like malaria and jaundice, than those who live with their families. (Agrawal 2012:94; Behera 2016:129).

The area of residence, in addition to living arrangements, has a considerable impact on the health of the elderly. The elderly in rural areas are observed to be more health impaired than those in urban areas. People with a lower socioeconomic status are more likely to develop cognitive impairment, and most elderly people in rural areas have a lower socioeconomic status than those in urban areas (Behanova 2015:83; Shahar 2019:11). Again, elderly living in the rural area have lower utilization of healthcare services than their urban counterparts due to insufficient medical facilities.

Religion appears to improve life satisfaction and reduce psychological distress in older persons in India in some studies (Tarakeshwar 2003:328; Maheshwari 2009:289; Chokkanathan 2013:880). Singh, *et al*. (2019:16) in their study on religious practice and health status among the older women found that religious practice have significant effect on the overall health of the rural women. Another study on elderly rural women found that Muslim and other religious groups show higher prevalence of communicable and non-communicable diseases than their Hindu counterparts (Agrawal and Keshri 2014:3).

Previous studies have shown that socioeconomic determinants such as education, income, and employment, behavioural determinants such as smoking, obesity, and physical inactivity, and psychosocial determinants such as critical life events, chronic stressors, and psychological

resources all have an impact on health (Denton 2004: 2597). In view of the above, the present study is aimed at examining the sociodemographic determinants of psychological health among the rural elderly of North 24 Parganas, West Bengal.

Material and methods

Study design: The present study was a cross sectional one. Data were collected from 1st November, 2019 to 16th March, 2020.

Study area and participants: The study was conducted in two community development blocks, Swarupnagar and Habra I. Charghat Gram Panchayat (elected village level local self-government), among the 10 Gram Panchayats in Swarupnagar community development block, and Machlandapur II Gram Panchayat, among the 7 Gram Panchayats in Habra I, were purposively chosen for the present study. The justification for selecting this location is because it is primarily a rural area with two religious communities, Hindu and Muslim, living in close proximity. Agriculturists account for 80 percent of the population. The Charghat Panchayat is made up of eight villages, out of which villages, namely Charghat, Pantua, and Tipi-Molladanga are chosen for the study. The village Simulpur was selected from among eight villages within the Machlandapur II Gram Panchayat's jurisdiction. The purpose and objectives of the study were explained to all Panchayat functionaries. The study was initiated following a Panchayat level discussion meeting was organized with the village level panchayat members for their permission to work in the selected villages.

For the study, all the villagers aged 60 and over were contacted. Finally, 408 people agreed to participate in this study, of which193 were males and 215 were females. The age of study elderly was verified using an electoral roll vis-a-vis other family sources. The elderly who were bedridden or mentally ill were not included in the study.

Data types: A pretested questionnaire was used to obtain socio-demographic data. It contains information such as the participants' age, sex, religion, marital status, education, occupation, monthly household income and living arrangement. The Uday-pareek socioeconomic status scale was used to determine socioeconomic class.

The psychological health was assessed using GHQ or General Health questionnaire which is a self-administered screening questionnaire for detecting sub-clinical disturbance among apparently normal individuals (Goldberg 1979:139-145). The Bengali version of the GHQ-28 was used in this study. This translated version of GHQ was devised by Bangur Institute of Neurosciences, Kolkata. Each of the 28 questions was coded as 0-0-1-1, with a total coding range of 0-28. A total score of 17 or more were regarded as psychological distress. Somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression are the four subscales of this scale. The coding range of this scale is 0-7. Scores of four or more were regarded sub clinically disturbed. Though the GHQ is ideally a self-administered questionnaire, in the present study it has been used as interviewer-administered one owing to the fact that a substantial proportion of the participants were non-literates. Under the circumstance, a single investigator (the author) administered the GHQ.

The Table1 provides the list of dependent and independent variables considered in the study.

Ethical consideration: The study was approved by the Ethics Committee of the Indian Statistical Institute, Kolkata. Each study participant provided consent either by signing or through thumb

impression after having been informed of the purpose and data collection plan for the study.

Statistical analysis: The distribution of the socio-demographic parameters and psychological health of the rural elderly were determined using frequency distribution and percentage calculations. The Chi square test was used to examine association between socio-demographic factors and psychological wellbeing. To assess the effect of socio-demographic factors on psychological health, a binary logistic regression analysis was used. The value of the Odds Ratio indicated the likelihood of being more psychologically distressed than the reference group. IBM SPSS 18.0 was used to calculate all descriptive and inferential statistics.

Results

The sociodemographic characteristics of the study elderly are shown in Table 2. The majority of the participants in the study were between the ages of 60 and 69 years, followed by those between the ages of 70 and 79 years, and those aged 80 years and over. Males made up 47.3% of the study participants, while females made up 52.7%. Hindus made up 46.8% of the study participants, while Muslims made up 53.2%. Only 32.4% of the elderly were not in wedlock (widow or widower or divorced), compared to 67.6% who were married or in wedlock. They lacked formal schooling in 56.9% of the cases. Only 40.7% of the elderly were financially reliant on family members; nevertheless, 38.0% of the elderly were involved in financial activities such as agricultural labourer, engaged in agri-horticulture, business, and service. Only 21.3% of the elderly got government pensions being beneficiary of the Indira Gandhi National Old Age Pension Scheme (IGNOAPS) or the Old Age Pension Scheme (OAPS) or the Indira Gandhi National Widow Pension Scheme (IGNWPS) or their pensions as retirement benefit. A higher number of the elderly (41.9%) had a monthly household income of less than Rupees 5000. According to the Uday-Pareek socioeconomic status scale, 72.1% of the elderly are from the lower-middle socioeconomic level. None of the study elderly are from the upper middle or upper classes. Only 12.3% of the elderly were living alone, and only 25.0% were living with their spouse(s). The majority of the elderly (62.7%) lived in the extended families.

Table 3 shows the prevalence of psychological distress among the rural elderly. It reveals that 62.5% of the rural elderly have psychological distress. Elderly aged 80 years and above were mostly (80.6%) suffering from psychological distress. Chi square test shows significant association between age category and psychological distress (χ^2 =15.684). About 73.5% of the female elderly have psychological distress, which was higher than that of males. Chi square test shows significant association between sex and psychological distress (χ^2 =23.415). No significant association between religion and psychological distress was found. Higher proportion of elderly who were widow/widower or divorced, experienced psychological distress than their married counterparts. Chi square test also shows significant association between marital status and psychological distress (χ^2 =18.169). Psychological distress was significantly higher among the elderly, who did not have any formal education (χ^2 =7.205). Financially dependent elderly were more psychologically distressed than the elderly, engaged in financial activities. Elderly having monthly household income less than Rs. 5000 showed more psychologically distress than the other respective income categories. Elderly belonging to lower socio-economic class were more psychologically distressed compared to elderly belonging to other socio-economic categories. Elderly, living alone were more psychologically distressed than the elderly, living with spouse(s) or living in an extended family. Chi square test also showed significant association between psychological distress and monthly household income (χ^2 =8.976), socioeconomic class (χ^2 =32.125) and living arrangement (χ^2 =9.486).

Somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression are the four subscales of the GHQ-28. Table 4 shows the presence and absence of subclinical disturbances according

to these subscales. It reveals that the prevalence of somatic symptoms was higher in older people. Somatic symptoms occured among roughly 60% of the elderly aged 70-79 years, and about 58% of the elderly aged 80 years and above. Anxiety and insomnia were most common in people aged 80 years and above (71.1%). 92.1 percent of the elderly aged 80 years and above showed social dysfunction. Severe depression was quite evenly prevalent throughout all age categories. The Chi square value revealed a significant association between age and somatic symptoms (χ^2 =9.680) and social dysfunction (χ^2 =20.386).

In comparison to males, female elderly people had a higher prevalence of somatic symptoms (59.5%), anxiety and insomnia (72.1%), social dysfunction (76.3%), and severe depression (50.7%). The chi square values also show significant association between somatic symptoms (χ^2 =23.039), anxiety and insomnia (χ^2 =12.273), social dysfunction (χ^2 =11.630), severe depression (χ^2 =20.852) and sex of the participants.

Both the religions had a higher prevalence of somatic symptoms. In comparison to Hindus, Muslims had a higher incidence of anxiety and insomnia (68.7%) and a higher rate of severe depression (46.5%). The Hindu elderly, on the other hand, had a high rate of social dysfunction (73.8%). Chi square value shows that there are significant association of religion with anxiety and insomnia (χ^2 =3.991), social dysfunction (χ^2 =4.104) and severe depression (χ^2 =7.770).

The prevalence of all the four component of GHQ-28 was higher among the elderly who were not currently in wedlock. The chi square value also shows significant association of marital status with somatic symptoms (χ^2 =13.368), social dysfunction (χ^2 =21.080) and severe depression (χ^2 =4.604).

Elderly people who lacked formal education, were financially dependent, had a monthly household income of less than 5000 rupees, were from a lower socioeconomic class, and lived alone, had a higher prevalence of somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression than their counterparts. Chi square value also showed significant association of somatic symptoms with educational status (χ^2 =7.821), occupation of the elderly (χ^2 =21.980), socioeconomic class (χ^2 =12.722) and living arrangement (χ^2 =9.004) of the elderly. Anxiety and insomnia were significantly associated with education (χ^2 =7.371), occupation of the elderly (χ^2 =7.219), and socioeconomic class (χ^2 =13.837). Social dysfunction was significantly associated with occupation (χ^2 =55.478), socio-economic class (χ^2 =17.825) and living arrangement (χ^2 =13.735). Severe depression was significantly associated with education (χ^2 =10.305), occupation (χ^2 =18.981), monthly household income (χ^2 =18.890), socioeconomic class (χ^2 =19.948) and living arrangement (χ^2 =13.735).

Table 5 shows the results of a logistic regression analysis of psychological distress in relation to sociodemographic factors among the rural elderly. It demonstrates that older people from lower socioeconomic classes were three times more likely than middle-class people (OR=3.958) to experience psychological distress. In the lower middle class, the odd ratio was also higher (OR=2.391). Though other sociodemographic variables did not show significant relationship but the odds ratios were comparatively higher among the elderly aged 80 years and above (OR=0.760), Muslim elderly in comparison to Hindus (OR=1.065), among the widow, widower or divorced elderly (OR=1.409), financially dependent elderly (OR=1.730), elderly with monthly household income of less than rupees 5000 (OR=1.237) and the elderly living alone (OR=1.409).

Table 6 displays the outcomes of the logistic regression analysis. The predictor of the occurrence of somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression among the rural study elderly was explored using logistic regression. It demonstrates that the elderly aged 70 to 79 years were

0.278 times more likely than the elderly aged 60 to 69 years to be suffering from social dysfunction. This finding also demonstrates that the odds ratio is higher among people aged 80 years and above. As a result, the risk of developing somatic symptoms, anxiety and insomnia, as well as social dysfunction and severe depression, rises with age. The lower odds value of the female depicts that the female elderly were 0.564 times more likely than the male reference group to acquire somatic symptoms, 0.519 times more likely to suffer from anxiety and insomnia, and 0.542 times more likely to develop severe depression. Elderly who are financially dependent on family members were 6.582 times more likely to experience social dysfunction than those who were engaged in a variety of economic activities. The senior pensioners were also 3.425 times more likely than the reference group to suffer from social dysfunction. The elderly from lower socioeconomic group were 3.312 times more likely than those from higher socioeconomic group to experience anxiety and insomnia. However, no statistically significant effect of religion, marital status, education, monthly household income, or living arrangements on the development of somatic symptoms, anxiety and insomnia, social dysfunction, or severe depression were found in this logistic regression model.

Discussion

The study has made an attempt to measure the sociodemographic determinants of psychological health status of the rural elderly. Psychological health status was measured using Goldberg's 28 item General Health Questionnaire. Overall psychological distress among the elderly was measured using GHQ total score. Four subscales of GHQ-28, namely somatic symptoms, anxiety and insomnia, social dysfunction and severe depression were used to point out the specific aspect of elderly health. This study has measured the prevalence of somatic symptoms, anxiety and insomnia, social dysfunction and severe depression among the elderly living in a rural area. The present study examined the effect of sociodemographic characteristics like, age, sex, religion, marital status, educational level, occupational status, monthly household income, living arrangement and socioeconomic class, on overall psychological health as well as four different aspects of psychological health of the rural elderly by using statistical tools.

In a community-based study in rural Assam, it was observed that 24 % of the elderly suffer from psychological distress (Kwan 2016:34). However, in the present study, 62.5 % of the elderly were found to be psychologically morbid, with 80 percent of those aged 80 years and above being psychologically distressed. Elderly aged 80 years and above also had a higher prevalence of somatic symptoms (58%), anxiety and insomnia (71.1%) and social dysfunction (92.1%). Logistic regression also shows age as a significant predictor of social dysfunction. This findings coincide with the findings by Boralingaiah et al.(2012:363), Datta et al. (2013:96) and Bhandari et al. (2021:52). Earlier researches also documented that female elderly had higher prevalence of overall psychological distress and somatic symptoms, suffered more from anxiety and insomnia, experienced social dysfunction and had severe depression, as compared to their male counterparts (Agrawal and Keshri 2014:1; Nair 2015:4; Evandrou 2017:5). This scenario is also reflected in the present study. Sex was revealed to be a significant predictor of the existence of all subclinical diseases among the elderly in rural areas using logistic regression. Females were found to be more susceptible to illness than males. Agrawal and Keshri (2014:6) suggested that due to patriarchal customs such as patriarchal inheritance and gender division of labour, as well as a lack of social changes for older women in rural India, elderly females from rural areas were significantly marginalized in terms of socioeconomic conditions. This marginalized situation and also social negligence gave rise to psychological and physical ill-health among the elderly women. In case of religion, Muslim elderly showed higher presence of mental adversities in terms of anxiety and insomnia and severe depression compared to the Hindu elderly despite the fact that religion was not found to be a significant predictor in the logistic regression analysis. Similar result was also found by Bhandari and Paswan (2021:52). Socioeconomically disadvantaged and marginalized

condition of the Muslim elderly manifest in poor health conditions and low levels of health care services utilization. Moreover, relatively better quality of health care services is more concentrated in urban areas and, still to achieve the similar level of services in rural areas for elderly population. Lack of social security, lack of formal education, and financial dependence were found to be the significant factors for higher prevalence of the psychological ill-health.

The health gradient is virtually universally found across the socioeconomic spectrum, with the middle class having better health than the destitute and the wealthy having better health than the middle class. It is observed that employment position, employment status and family income are more powerful health predictors than degree of education (Blane 1995:903; Glymour 2014: 17-63). Logistic regression results of the present study also hinted at that kind of observation. Overall psychological morbidity was three times higher in the elderly from lower socioeconomic backgrounds than in the elderly from middle socioeconomic backgrounds. Social dysfunction was more common among financially dependent and retired people than among elderly people who were still working. The data also revealed that education and marital status had little bearing on the development of somatic symptoms, anxiety and insomnia, social dysfunction, or severe depression, which is consistent with Blane's (1995:904) findings. Datta et al. (2013:97) on the other hand, observed that education, marital status, monthly household income, and living arrangement were all significant predictors of somatic symptoms, anxiety, insomnia, social dysfunction, and severe depression. Anxiety and insomnia were more common among the study elderly from lower socioeconomic groups than among those from relatively better socioeconomic groups, as similarly observed by Datta et al. (2013:96) and Glymour et al. (2014: 17-63). The present study thus demonstrated that socio-demographic factors indeed remained important predictors of psychological ill-health of the rural elderly in a southern district of the Indian State of West Bengal.

Limitations

Many other factors that may affect psychological destress among the elderly were not included in the current study, which was one of the weaknesses of this study. Physical exercise, behavioural issues, and other social stressors can all have a significant impact on the mental health of the elderly (Kwan 2016:34; Bhatia 2020:1; Bhandari 2021:58). In a future study, these factors will also be considered. Another drawback is the small sample size and cross-sectional research approach. Longitudinal research on a large sample was not possible due to time and financial constraints. This provides a foundation for future research into the factors that contribute to the high prevalence of psychological morbidity in the elderly, particularly in the rural areas. This study, on the other hand, contributes to the understanding of the current profile of psychological distress of rural elderly from the eastern part of India. Till date, health practitioners and policymakers have paid little attention to psychological health, particularly among the elderly in rural areas, where psychological health is not thought to be a priority.

Conclusion

This study found that sociodemographic factors, like, age, sex, occupational status and socio-economic class, played a substantial role in psychiatric morbidity among older persons in the rural study area. This suggests that advancements on economic condition will benefit the health of the elderly. Programs like day care can assist psychologically sick seniors in living a healthy later life (Jacob 2007:447). However, the modern health-care infrastructure, particularly in rural areas, is not as helpful for the elderly (Dey 2012: 371-386). This study intends to raise awareness about the need for such programmes in rural areas to improve the psychological health of the elderly.

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Tables

Table 1: List of dependent and independent variables

Dependent Variables	Categories	Independent Variables	Categories
Somatic Symptoms[a]	Present (1)	Age Category	60-69 years (0)
	Absent (0)		70-79 years (1)
Anxiety and Insomnia[a]	Present (1)		80 years and above (2)
	Absent (0)	Sex	Male (1)
Social Dysfunction[a]	Present (1)		Female (2)
	Absent (0)	Religion	Hindu (1)
Severe Depression[a]	Present (1)		Muslim (2)
	Absent (0)	Marital Status	In wedlock (1)
Psychological Distress b	Present (1)		Not in wedlock (Widow/ Widower/ Divorced) (2)
	Absent (0)		
		Education	No Formal Education (0)
			Have Formal Education (1)
		Occupation	Financially Dependent (0)
			Pensioner (1)
			Engaged in financial activities (2)
		Monthly Household Income	≤ Rs. 5000 (0)
			Rs. 5001 to 10000 (1)
			Rs. 10001 to 15000 (2)
			≥ Rs. 15001 (3)
		Socioeconomic class[α]	Lower class (0)
			Lower-Middle Class (1)
			Middle Class (2)
			Upper Middle Class (3)
			Upper Class (4)
		Living Arrangement	Living Alone (0)
			Living With Spouse(s) (1)
			Living in an extended family (2)

[a] ≥4 Present, <4 Absent; b ≥17 Present, <17 Absent; aLower Class Score= <13, Lower- Middle Class score= 13-23, Middle Class score= 24-32, Upper Middle Class= 33-42, Upper Class (> 43)

Table 2: Socio-demographic characteristics of the rural elderly

Variables	Frequency	Percentage	Variables	Frequency	Percentage
Age category			*Occupation*		
60-69 years	267	65.4	Financially dependent	166	40.7
70-79 years	103	25.2	Pensioner	87	21.3
80 years and above	38	9.3	Engaged in financial activities	155	38.0
Sex			Monthly Household Income		
Male	193	47.3	≤ Rs. 5000	171	41.9
Female	215	52.7	Rs. 5001 to 10000	136	33.3
Religion			Rs. 10001 to 15000	45	11.0
Hindu	191	46.8	≥ Rs. 15001	56	13.7
Muslim	217	53.2	Socioeconomic class		
Marital Status			Lower class	50	12.3
In wedlock	276	67.6	Lower-middle class	294	72.1
Not in wedlock (widow/widower/ divorced)	132	32.4	Middle class	64	15.7
Education			Living arrangement		
No formal education	232	56.9	Living alone	50	12.3
Have formal education	176	43.1	Living with spouses	102	25.0
			Living in an extended family	256	62.7

Table 3: Prevalence of psychological distress among the rural elderly according to GHQ 28 total score among the rural elderly (n=408)

Independent variables	n	Psychological distress (according to GHQ-28 total score)	
		Present	Absent
Total	408	255 (62.5%)	153 (37.5%)
Age category			
60-69 years	267	149 (55.8%)	118 (44.2%)
70-79 years	103	75 (72.8%)	28 (27.2%)
80 years and above	38	31 (81.6%)	7 (18.4%)
χ^2 Value (df)		15.684 (2)**	
Sex			
Male	193	97 (50.3%)	96 (49.7%)
Female	215	158 (73.5%)	57 (26.5%)
χ^2 Value (df)		23.415 (1)**	
Religion			
Hindu	191	117 (61.3%)	74 (38.7%)
Muslim	217	138 (63.6%)	79 (36.4%)
χ^2 Value (df)		0.237 (1)	
Marital status			
In wedlock	276	153 (55.4%)	123 (44.6%)
Not in wedlock (widow/ widower/ divorced)	132	102 (77.3%)	30 (22.7%)
χ^2 Value (df)		18.169 (1)**	
Education			
No formal education	232	158 (68.1%)	74 (31.9%)
Have formal education	176	97 (55.1%)	79 (44.9%)
χ^2 Value (df)		7.205 (1)**	
Occupation			
Financially dependent	166	122 (73.5%)	44 (26.5%)
Pensioner	87	63 (72.4%)	24 (27.6%)
Engaged in financial activities	155	70 (45.2%)	85 (54.8%)
χ^2 Value (df)		32.091 (2)**	
Monthly Household Income			
≤ Rs. 5000	171	120 (70.2%)	51 (29.8%)
Rs. 5001- 10000	136	82 (60.3%)	54 (39.7%)
Rs. 10001- 15000	45	23 (51.1%)	22 (48.9%
≥ Rs. 15001	56	30 (53.6%)	26 (46.4%)
χ^2 Value (df)		8.976 (3)*	
Socioeconomic class			
Lower class	50	40 (80.0%)	10 (20.0%)

Lower-middle class	294	194 (66.0%)	100 (34.0%)
Middle class	64	21 (32.8%)	43 (67.2%)
χ2 Value (df)		32.125 (2)**	
Living arrangement			
Living alone	50	41 (82.0%)	9 (18.0%)
Living only with spouses	102	63 (61.8%)	39 (38.2%)
Living in an extended family	256	151 (59.0%)	105 (41.0%)
χ^2 Value (df)		9.486 (2)**	

**p<0.005; **p<0.000 df: degree of freedom*

Table 4: Prevalence of psychological distress among the rural elderly according to the four GHQ 28 subscales among the rural elderly (n=408)

Independent variables	n	Somatic symptoms		Anxiety and insomnia		Social dysfunction		Severe depression	
		Present	Absent	Present	Absent	Present	Absent	Present	Absent
Age Category									
60-69 years	267	114 (42.7%)	153 (57.3%)	164 (62.5%)	100 (37.5%	165 (61.8%)	102 (38.2%)	101 (37.8%)	166 (62.2%)
70-79 years	103	61 (59.2%)	42 (40.8%)	68 (66.0%)	35 (34.0%)	81 (78.6%)	22 (21.4%)	46 (44.7%)	57 (55.3%)
80 years and above	38	22 (57.9%)	16 (42.1%)	27 (71.1%)	11 (28.9%)	35 (92.1%)	3 (7.9%)	17 (44.7%)	21 (55.3%)
χ^2 Value (df)		9.680* (2)		1.242 (2)		20.386**(2)		1.803 (2)	
Sex									
Male	193	69 (35.8%)	124 (64.2%)	107 (55.4%)	86 (44.6%)	117 (60.6%)	76 (39.4%)	55 (28.5%)	138 (71.5%)
Female	215	128 (59.5%)	87 (40.5%)	155 (72.1%)	60 (27.9%)	164 (76.3%)	51 (23.7%)	109 (50.7%)	106 (49.3%)
χ2 Value (df)		23.039** (1)		12.273** (1)		11.630**(1)		20.852** (1)	
Religion									
Hindu	191	94 (49.2%)	97 (50.8%)	113 (59.2%)	78 (40.8%)	141 (73.8%)	50 (26.2%)	63 (33.0%)	128 (67.0%)
Muslim	217	103 (47.5%)	114 (52.5%)	149 (68.7%)	68 (31.3%)	140 (64.5%)	77 (35.5%)	101 (46.5%)	116 (53.5%)
χ^2 Value (df)		0.124 (1)		3.991* (1)		4.104* (1)		7.770** (1)	
Marital status									
In wedlock	276	116 (42.0%)	160 (58.0%)	170 (61.6%)	106 (38.4%)	170 (61.6%)	106 (38.4%)	101 (36.6%)	175 (63.4%)
Not in wedlock (widow/ widower/ divorced)	132	81 (61.4%)	51 (38.6%)	92 (69.7%)	40 (30.3%)	111 (84.1%)	21 (15.9%)	63 (47.7%)	69 (52.3%)
χ^2 Value (df)		13.368** (1)		2.551 (1)		21.080** (1)		4.604* (1)	

Education									
No formal education	232	126 (54.3%)	106 (45.7%)	162 (69.8%)	70 (30.2%)	164 (70.7%)	68 (29.3%)	109 (47.0%)	123 (53.0%)
Have formal education	176	71 (40.3%)	105 (59.7%)	100 (56.8%)	76 (43.2%)	117 (66.5%)	59 (33.5%)	55 (31.3%)	121 (68.8%)
χ^2 Value (df)		7.821* (1)		7.371* (1)		0.828 (1)		10.305** (1)	
Occupation									
Financially dependent	166	97 (58.4%)	69 (41.6%)	116 (69.9%)	50 (30.1%)	138 (83.1%)	28 (16.9%)	84 (50.6%)	82 (49.4%)
Pensioner	87	48 (55.2%)	39 (44.8%)	59 (67.8%)	28 (32.2%)	70 (80.5%)	17 (19.5%)	38 (43.7%)	49 (56.3%)
Engaged in financial activities	155	52 (33.5%)	103 (66.5%)	87 (56.1%)	68 (43.9%)	73 (47.1%)	82 (52.9%)	42 (27.1%)	113 (72.9%)
χ^2 Value (df)		21.980** (2)		7.219* (2)		55.478** (2)		18.981** (2)	
Monthly household income									
≤ Rs. 5000	171	92 (53.8%)	79 (46.2%)	112 (65.5%)	59 (34.5%)	121 (70.8%)	50 (29.2%)	88 (51.5%)	83 (48.5%)
Rs. 5001-10000	136	62 (45.6%)	74 (54.4%)	87 (64.0%)	49 (36.0%)	94 (69.1%)	42 (30.9%)	50 (36.8%)	86 (63.2%)
Rs. 10001-15000	45	21 (46.7%)	24 (53.3%)	29 (64.4%)	16 (35.6%)	30 (66.7%)	15 (33.3%)	10 (22.0%)	35 (77.8%)
≥ Rs. 15001	56	22 (39.3%)	34 (60.7%)	34 (60.7%)	22 (39.3%)	36 (64.3%)	20 (35.7%)	16 (28.6%)	40 (71.4%)
χ^2 Value (df)		4.343 (3)		0.426 (3)		0.940 (3)		18.890** (3)	
Socioeconomic class									
Lower class	50	28 (56.0%)	22 (44.0%)	41 (82.0%)	9 (18.0%)	39 (78.0%)	11 (22.0%)	28 (56.0%)	22 (44.0%)
Lower-middle class	294	151 (51.4%)	143 (48.6%)	190 (64.6%)	104 (35.4%)	212 (72.1%)	82 (27.9%)	125 (42.5%)	169 (57.5%)
Middle class	64	18 (28.1%)	46 (71.9%)	31 (48.4%)	33 (51.6%)	30 (46.9%)	34 (53.1%)	11 (17.2%)	53 (82.8%)
χ^2 Value (df)		12.722** (2)		13.837* (2)		17.825** (2)		19.948** (2)	
Living arrangement									
Living alone	50	34 (68.0%)	16 (32.0%)	38 (76.0%)	12 (24.0%)	43 (86.0%)	7 (14.0%)	30.0 (60.0%)	20 (40.0%)
Living only with spouses	102	48 (47.1%)	54 (52.9%)	60 (58.8%)	42 (41.2%)	59 (57.8%)	43 (42.2%)	47 (46.1%)	55 (53.9%)
Living in an extended family	256	115 (44.9%)	141 (55.1%)	164 (64.1%)	92 (35.9%)	179 (69.9%)	77 (30.1%)	87 (34.0)	169 (66.0%)
χ^2 Value (df)		9.004* (2)		4.315 (2)		12.761* (2)		13.735** (2)	

**p<0.005; **p<0.000 df: degree of freedom; Financial activities includes labourer, agri-horticulturist, business and service*

Table 5: Logistic regression analysis of GHQ-28 total score in respect to socio-demographic characteristics of the rural elderly

Independent variables	Psychological distress (according to GHQ-28 total score)	
	OR (95% CI)	p value
Age category		
60-69 years	Reference category	
70-79 years	0.400 (0.156-1.027)	0.057
80 years and above	0.760 (0.283-2.038)	0.585
Sex		
Male	Reference category	
Female	0.629 (0.341-1.161)	0.138
Religion		
Hindu	Reference category	
Muslim	1.065 (0.657-1.726)	0.799
Marital status		
In wedlock	Reference category	
Not in wedlock (widow/widower/ divorced)	0.894 (0.445-1.796)	0.754
Education		
No formal education	0.885 (0.514-1.524)	0.660
Have formal education	Reference category	
Occupation		
Financially dependent	1.730 (0.927-3.227)	0.085
Pensioner	1.494 (0.739-3.019)	0.263
Engaged in economic activities	Reference category	
Monthly household income		
≤ Rs. 5000	1.237 (0.565-2.708)	0.595
Rs. 5001 to 10000	1.020 (0.502-2.073)	0.957
Rs. 10001 to 15000	0.795 (0.335-1.885)	0.602
≥ Rs. 15001	Reference category	
Socioeconomic class		
Lower class	3.958 (1.366-11.466)	0.011
Lower-middle class	2.391 (1.175-4.868)	0.016
Middle class	Reference category	
Living arrangement		
Living alone	1.409-0.536-3.701)	0.487
Living with spouses	1.044 (0.562-1.938)	0.891
Living in an extended family	Reference category	
Nagelkerke R2	0.193	
Classification percentage	70.1%	

*CI: Confidence Interval; *significant; OR- Odds Ratio*

Table 6: Logistic regression analysis of GHQ28 subscales in respect to socio-demographic characteristics of the rural elderly.

Independent variables	Somatic symptoms		Anxiety and insomnia		Social dysfunction		Severe depression	
	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value	OR (95% CI)	p value
Age Category								
60-69 years	Reference category							
70-79 years	0.777 (0.355-1.705)	0.530	0.608 (0.264-1.399)	0.242	0.278 (0.076-1.012)	0.052*	0.837 (0.377-1.861)	0.663
80 years and above	1.425 (0.632-3.215	0.393	0.718 (0.304-1.694)	0.449	0.497 (0.129-1.914)	0.310	1.054 (0.465-2.388)	0.899
Sex								
Male	Reference category							
Female	0.564 (0.320-0.996)	0.048*	0.519 (0.285-943)	0.031*	1.912 (0.923-3.962)	0.081	0.542 (0.301-0.974)	0.040*
Religion								
Hindu	Reference category							
Muslim	1.363 (0.859-2.163)	0.189	0.698 (0.439-1.110)	0.129	1.639 (0.966-2.780)	0.067	0.678 (0.424-1.086)	0.106
Marital Status								
In wedlock	Reference category							
Not in wedlock (Widow/ Widower/ Divorced)	0.909 (0.478-1.729)	0.771	1.745 (0.879-3.464)	0.112	0.648 (0.288-1.459)	0.295	1.405 (0.721-2.737)	0.317
Education								
No formal education	1.354 (0.807-2.272)	0.250	1.037 (0.616-1.747)	0.890	0.828 (0.454-1.512)	0.540	1.123 (0.664-1.900)	0.665
Have formal education	Reference category							
Occupation								
Financially dependent	1.645 (0.911-2.972)	0.094	1.129 (0.611-2.086)	0.698	6.582 (3.134-13.823)	0.000**	1.653 (0.898-3.043)	0.106
Pensioner	1.368 (0.703-2.663)	0.356	1.202 (0.604-2.393)	0.601	3.425 (1.563-7.505)	0.002**	1.366 (0.688-2.710)	0.373
Engaged in economic activities	Reference category							
Monthly Household Income								
≤ Rs. 5000	1.165 (0.547-2.480)	0.692	0.919 (0.433-1.949)	0.825	1.170 (0.508-2.698)	0.712	1.606 (0.732-3.525)	0.238

Rs. 5001 to 10000	1.065 (0.532-2.129)	0.859	0.906 (0.456-1.801)	0.779	1.271 (0.612-2.787)	0.490	1.066 (0.514-2.212)	0.864
Rs. 10001 to 15000	1.332 (0.570-3.114)	0.508	1.067 (0.453 (2.513)	0.882	1.196 (0.471-3.038)	0.706	0.601 (0.229-1.573)	0.299
≥ Rs. 15001	Reference category							
Socioeconomic class								
Lower class	1.090 (0.404-2.940)	0.865	3.312 (1.152-9.520)	0.026*	2.736 (0.896-8.353)	0.077	2.143 (0.755-6.083)	0.152
Lower-middle class	1.320 (0.637-2.733)	0.455	1.428 (0.722-2.822)	0.306	1.704 (0.823-3.527)	0.151	1.884 (0.834-4.257)	0.127
Middle class	Reference category							
Living Arrangement								
Living alone	1.822 (0.796-4.169)	0.155	1.273 (0.532-3.048)	0.588	1.879 (0.611-5.784)	0.271	1.577 (0.708-3.511)	0.265
Living with spouses	1.322 (0.722-2.419)	0.365	0.644 (0.351-1.182)	0.156	0.617 (0.320-1.192)	0.151	1.190 (0.639-2.218)	0.584
Living in an extended family	Reference category							
Nagelkerke R2	0.141		0.091		0.268		0.166	

*CI: Confidence Interval; *significant; OR- Odds Ratio*