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Original Article

Depression, Anxiety, Stress and Loneliness among the Elderly Living in Families in Rural Karnataka, Southern India: A Cross-Sectional Study

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ABSTRACT

Background: Population aging is a global phenomenon with an increasing number of elderly individuals experiencing psychological problems. This study aimed to assess the prevalence of depression, anxiety, and stress among the elderly living in Manchi Village, Karnataka. **Materials and Methods:** A cross-sectional study was conducted among 138 elderly individuals in the Manchi Grama panchayat, Bantwal Taluk, Dakshina Kannada district. Stratified random sampling was used to select the participants. Data were collected through one-on-one interviews using a socio-demographic questionnaire, the Depression Anxiety Stress Scale (DASS-42), and the UCLA Loneliness Scale (Version 3). Descriptive statistics and chi-square tests were used for analysis. **Results:** Among the participants, 36.2% exhibited symptoms of depression (14.4% mild, 10.1% moderate, 10.1% severe), 85.6% reported anxiety (43.4% mild, 20.2% moderate, 21.7% severe), and 71.7% experienced stress (46.4% mild, 13.0% moderate, and 12.3% severe). A significant association was found between depression and family type (p=0.022), with higher levels of depression in nuclear families. Women reported higher depression rates (60%), whereas men showed higher anxiety (73.7%) and stress (60.6%) levels. **Conclusion:** This study revealed the prevalence of mental health issues in the rural elderly population. Family structure significantly affects depression levels, highlighting the need for targeted mental health interventions, educational programs, and community-based initiatives to enhance the psychological well-being of elderly individuals.

Keywords: Elderly, Depression, Anxiety, Stress, Loneliness, Rural population.

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INTRODUCTION

The global population is undergoing a continuous shift in its age composition, influenced by rising life spans and declining fertility rates. As people live longer, the number of elderly people in the total population is rapidly increasing. Globally, there were 727 million people aged 65 years or older in 2020. Over the next three decades, the global number of the elderly is projected to more than double, reaching over 1.5 billion in 2050. All regions will see an increase in the size of their elderly population between 2020 and 2050. The share of the global population aged 65 years or over is expected to increase from 9.3% in 2020 to 16% by 2050 (World Health Organization, 2020).

Population aging is a global phenomenon with virtually every country in the world experiencing growth in both the size and the proportion of older persons in the population. In 2019, there were 703 million persons aged 65 years or over in the global population (United Nations Department of Economic and Social Affairs, 2020).

Population aging is a human success story that reflects the advancement of public health, medicine, and economic and social development, and its contribution to the control of disease, prevention of injury, and reduction in the risk of premature death. The extension of human longevity and subsequent decrease in fertility levels inevitably leads to a shift in the population age distribution from younger to older ages. This demographic trend presents both opportunities and challenges for society, particularly in terms of healthcare needs and psychological well-being of the elderly population.

The purpose of the current study was to assess the prevalence of depression, anxiety, and stress in the elderly living in Manchi village, Karnataka, and to identify the factors associated with these psychological issues.

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MATERIALS AND METHODS

A cross-sectional study was conducted in the Manchi Grama Panchayat, Bantwal Taluk, and Dakshina Kannada districts. The study population was comprised of elderly individuals residing in their families in this region.

Study design and participants

The cross-sectional study was conducted from April 2022 to October 2022. The inclusion criteria were: (1) individuals aged 60 years and above, (2) residing with their families in Manchi Grama panchayat, and (3) willing to participate in the study. Exclusion criteria included: (1) individuals with known psychiatric disorders, (2) those taking psychotropic medications, (3) those with severe cognitive impairment, and (4) those unable to communicate.

Sample size calculation

The required sample size for this study was determined using the following formula: $N= 4pq/d^2$. Where p=prevalence proportion, q=1-p, d=desired level of absolute precision, and N=required sample size. Considering the prevalence of depression among the elderly in a previous study (Mandolikar *et al*., 2017) to be 75.5% (p=0.755), relative precision (d=10% of p=7.5%), and 10% of the non-response rate/sample loss, the calculation was: $N=3.84\times0.755\times0.245/(0.075)^2 = 126$. By adding a 10% non-response rate, the final sample size was 138.

Sampling Technique

Stratified sampling was used in this study. There were 822 elderly individuals distributed among the seven wards in Manchi Village. As the total sample size was 138, 20 elderly individuals were randomly selected from each ward using a simple random sampling. Twenty elderly individuals were selected from each of the six wards, and eighteen elderly individuals were selected from the seventh ward to reach a sample size of 138.

Inclusion criteria

Elderly individuals aged above 60 years.

Those residing with their families in rural areas of Karnataka.

Those who are physically and mentally capable of responding to the survey or interview.

Exclusion criteria

Elderly individuals living alone or in institutional settings, such as old-age homes.

Those who refused to provide consent for the study.

Ethical considerations

Before conducting the study, the investigator submitted a synopsis and a request letter for ethical clearance to the Yenepoya Ethics Committee-2. The study was approved with protocol number YEC-1/2022/044 for the period from April 6, 2022, to October 5, 2022.

Data collection tools

Three tools were used for data collection.

1)Socio-demographic questionnaire: A self-designed tool for collecting data on sociodemographic variables including age, sex, religion, marital status, educational level, occupation, residence, monthly income, morbidities, and family details.

2)Depression Anxiety Stress Scale (DASS-42): This scale assesses symptoms of depression, anxiety, and stress in adults using a 42-item questionnaire (Lovibond and Lovibond, 1995). Each item was rated on a 4-point Likert scale ranging from 0 (did not apply to me) to 3 (applied to me very much). The DASS-42 measures the severity of a range of symptoms that are common to depression, anxiety, and stress.

3)UCLA Loneliness Scale (Version 3): This scale was used to assess loneliness among older adults (Russell, 1996). The UCLA-LS consists of 20 statements (11 negative and 9 positive), to which responses are given on a 4-point Likert-type scale ranging from 1 (never) to 4 (often). Statement scores range from 20 to 80, with higher scores indicating higher levels of loneliness (Panayiotou *et al*., 2023).

Statistical analysis

Data were entered in Microsoft Excel, and SPSS software was used for statistical analysis. Categorical variables were presented as frequencies and percentages. The chi-squared test was used to determine the association between different variables. Statistical significance was set at $p<0.05$.

RESULTS

Socio-demographic characteristics

Out of the 138 questionnaires handed out, every patient consented to participate in the interviews. Slightly more than half of the participants (63%) were women, a majority (50%) were married, and nearly half (44.9%) were between the ages of 60 and 64. Most participants were part of nuclear families (57.2%), lacked formal education (73.2%), and were financially independent (88.4%). A large proportion (94.2%) suffered from chronic illnesses, with diabetes (40.5%) and a combination of diabetes and hypertension (31.8%) being the most prevalent conditions (Table 1).

Prevalence of depression

The study findings indicate that the majority of the elderly participants (63.8%) had a normal mental health status. However, a considerable proportion (36.2%) exhibited symptoms of depression (Table 2).

Table 1: Distribution of Demographic characteristics of the study population (*n*=138).

Variables	Frequency (*n*=138)	Percentage (%)
Age (in years)		
60-64	62	44.9
65-70	28	20.3
71-80	30	21.7
81 and above	18	13.0
Gender		
Male	51	37.0
Female	87	63.0
Marital Status		
Married	69	50.0
Single	30	21.7
Widowed	25	18.1
Divorced	14	10.1
Type of Family		
Nuclear Family	79	57.2
Extended Family	59	42.8
Education		
Illiterate	101	73.2
Primary school and Middle School	7	5.1
High school	4	2.9
PUC	10	7.2
Graduate	1	0.7
Post-graduate	15	10.9
Financial dependence		
Self	122	88.4
Others	16	11.6
Presence of chronic disease		
Yes	130	94.2
No	8	5.8
If yes, Type of disease*		
Diabetes	56	40.5
Blood Pressure	23	16.6
Both Diabetes and blood pressure	44	31.8
Cancer	7	5.1

*Multiple responses.

Level of depression, anxiety, and stress

Table 3 presents the distribution of participants based on their level of depression. The majority of the participants (63.8%) had normal mental health, with depression scores ranging from 0 to 9. Mild depression (scores between 10 and 13) was observed in 14.4% of the participants, while 10.1% experienced moderate depression (scores between 14 and 20). Additionally, 10.1% of the participants were classified as having severe depression, with scores of 21 and above.

Table 4 presents the distribution of participants based on their level of anxiety. Only 14.4% of participants had normal levels of anxiety (scores ranging from 0 to 7). Mild anxiety (scores between 8 and 9) was the most prevalent, affecting 43.4% of the participants. Additionally, 20.2% of the participants experienced moderate anxiety (scores between 10 and 14), while 21.7% reported severe anxiety, with scores of 15 and above.

Table 5 presents the distribution of participants based on their level of stress. The results indicate that 28.3% of the participants had normal stress levels, with scores ranging from 0 to 14. Mild stress (scores between 15 and 18) was the most prevalent, affecting 46.4% of the participants. Additionally, 13.0% of the participants experienced moderate stress (scores between 19 and 25), while 12.3% reported severe stress, with scores of 26 and above.

Association of depression with demographic variables

Table 6 shows that the only significant association with depression among the elderly was the type of family (p=0.022), where those from nuclear families had higher depression levels compared to those from joint families. Other factors such as age, gender, marital status, education, financial dependence, and the presence of chronic disease did not show statistically significant associations with depression.

Gender differences in loneliness

Table 7 presents the gender differences in loneliness among elderly participants. The mean loneliness score for males is 26.40±5.75, while for females, it is slightly higher at 27.41±5.6. However, the t-value (1.005) and p-value (0.317) indicate that this difference is not statistically significant.

Depression, anxiety, and stress among different demographic groups

The 60-64 age group reports the highest levels of depression (33.3%) and anxiety (42.3%), while the 71-80 group experiences the most stress (25.2%). Males show higher anxiety (73.7%) and stress (60.6%) levels, whereas females have higher depression rates (60%). However, no significant differences are found (p=0.73). Widowed individuals report the highest depression (58%) and stress (33.3%), but no considerable associations are observed (p=0.92). Nuclear families have higher depression (90%) and stress (71.7%) rates, yet no significant differences are noted (p=0.89) (Table 8).

DISCUSSION

This cross-sectional study conducted among elderly residents of Manchi village in rural Karnataka reveals important insights into the mental health status of the elderly. Our findings indicate that a substantial proportion of elderly individuals experience psychological distress, with varying degrees of depression, anxiety, and stress.

In our study, it was found that 63.8% of the study participants did not have any kind of depression, while 36.2% had some level of depression. The prevalence of depression in our study is higher than that reported by Sahni *et al*., (2020) from North India, who found that depression was present in 40.7% of the elderly. A lesser prevalence was also found in a study done by Bincy *et al*., (2021) in Tamil Nadu wherein they found that the prevalence of depression was 67.5%. The substantial variation in the prevalence of depression across different studies can be attributed to various factors including socio-cultural differences, economic conditions, study settings, and the assessment tools used.

Table 2: Distribution of study participants according to the magnitude of depression.

Mental Health Status	Frequency	Percentage
Normal	88	63.8
Depression	50	36.2

Our study revealed that 10.1% of participants had moderate levels of depression, 10.1% had severe depression, and 14.4% had mild depression. These findings differ from other studies which have reported mild to moderate depression to be around 33.2%. The variations in the severity of depression among elderly populations across different studies highlight the complex nature of this mental health issue and the influence of various factors on its manifestation.

With regard to anxiety, the majority of participants (43.4%) had mild anxiety, 21.7% had severe anxiety, and 20.2% had moderate anxiety. These findings are lower than those reported by Thagunna *et al*., (2020), who reported severe anxiety in 85.5% of the elderly, and 20.2% of the total participants reported a moderate level of anxiety. The different prevalence rates of anxiety could be due to variations in socio-economic factors, cultural contexts, and support systems available to the elderly in different regions.

In terms of stress levels, 46.4% of participants had mild stress, 12.3% had severe stress, and 13% had moderate stress. Similar findings were reported by Varghese *et al*., (2020), who found that 46.7% of the elders had moderate stress, followed by 30% with high levels of stress. Stress has been a major mental health problem affecting a large portion of the population globally, with prevalence rates ranging from 10% to 55%.

Table 3: Distribution of Participants According to the Level of Depression (*n*=138).

Depression Range	Inference	Frequency	Percentage
0-9	Normal	88	63.8
10-13	Mild depression	20	14.4
14-20	Moderate depression	15	10.1
21 and above	Severe depression	15	10.1
Total		138	100

Table 4: Distribution of Participants According to the Level of Anxiety (*n*=138).

Anxiety Range	Inference	Frequency	Percentage
0-7	Normal	20	14.4
8-9	Mild Anxiety	60	43.4
10-14	Moderate Anxiety	28	20.2
15 and above	Severe Anxiety	30	21.7
Total		138	100

Table 5: Distribution of study Participants according to the level of stress (*n*=138).

Stress Range	Inference	Frequency	Percentage
0-14	Normal	39	28.3
15-18	Mild stress	64	46.4
19-25	Moderate stress	18	13.0
26 and above	Severe stress	17	12.3
Total		138	100

Table 6: The association of the level of depression among the elderly with the selected demographic variables.

Variables	Depression score	Chi-square	*p*-value
	≤9	> 9	
Age (in years)			
60-64	54 (87.1%)	8 (12%)	
65-70	26 (92.9%)	2 (7.1%)	
71-80	26 (86.7%)	4 (13.3%)	
81 And above	18 (100%)	0 (0%)	
Gender			
Male	48 (94.1%)	3 (5.9)	1.612
Female	76 (87.4%)	11 (12.6)	
Marital status			
Married	10 (14.5%)	59 (85.5%)	4.048
Unmarried	3 (10%)	27 (90%)	
Widowed and widower	1 (4%)	24 (96%)	
Divorce	1 (0%)	14 (100%)	
Type of Family			
Nuclear	4 (5.1%)	75 (94.9%)	5.234
Joint	49 (83.1%)	10 (16.9%)	
Education			
Illiterate	9 (8.9%)	92 (8.9%)	
Primary school and Middle School	1 (14.3%)	6 (85.7%)	
High school	4 (100%)	0 (0%)	
PUC	10 (100%)	0 (0%)	
Graduate and post-graduation	4 (26.7%)	13 (73.3%)	
Financial dependence			
Self	109 (89.3%)	13 (10.7%)	0.301
Others	1 (6.3%)	15 (93.8%)	
Presence of chronic disease			
Yes	13 (9.9%)	118 (99.1%)	0.139
No	9 (14.3%)	6 (85.7%)	

*$p<0.05$, statistically significant.

A significant finding of our study was the association between depression and family type, with higher depression levels observed in nuclear families compared to joint families. This aligns with traditional Indian values where joint families are believed to provide better emotional and social support to the elderly. The lack of this support system in nuclear families may contribute to feelings of isolation and subsequently, depression among the elderly. However, no statistically significant associations were found between depression and other demographic variables such as age, gender, marital status, education, financial dependence, or the presence of chronic diseases.

Gender differences were observed in the prevalence of different psychological issues. Depression was more common among females (60%) compared to males (40%), although this difference was not statistically significant. A different pattern was seen with anxiety and stress, where males showed higher prevalence rates (73.7% for anxiety and 60.6% for stress) compared to females. These gender differences could be attributed to various factors including societal roles, coping mechanisms, and physiological differences.

Marital status also appeared to influence psychological well-being, with widowed individuals reporting the highest rates of depression (58%) and stress (33.3%). This could be attributed to the loss of a life partner and the subsequent changes in lifestyle and social interactions. However, these associations were not statistically significant.

Table 7: Gender differences associated with respect to loneliness among elderly persons.

Variables	Male (*n*=51)	Female (*n*=87)	*t* value	*p*-value
Loneliness (0-60)	26.40±5.75	27.41±5.6	1.005	0.317

Values are expressed as Mean±SD.

Table 8: Depression, anxiety and stress among elderly population.

	Depression (*n*=124)	Anxiety (*n*=131)	Stress (*n*=121)	*p*-value
Age				
60-64	20 (33.3)	50 (42.3)	30 (30.3)	<0.9
65-70	15 (25)	35 (29.6)	25 (19.01)	
71-80	10 (16.6)	15 (12.7)	29 (25.2)	
81 And above	5 (8.3)	18 (15.2)	15 (15.1)	
Gender				
Male	20 (40)	87 (73.7)	60 (60.6)	<0.73
Female	30 (60)	31 (26.3)	39 (39.3)	
Marital status				
Married	15 (30)	58 (49.1)	51 (51.5)	<0.92
Unmarried	6 (12)	22 (21.1)	15 (15.1)	
Widow/widower	29 (58)	38 (32)	33 (33.3)	
Type of family				
Nuclear	45 (90)	60 (50.8)	71 (71.7)	<0.89

Values are expressed as n (%).

Loneliness, another important aspect of psychological well-being among the elderly, showed a slightly higher mean score among females (27.41) compared to males (26.40), although this difference was not statistically significant. Loneliness is a complex emotion that can be influenced by various factors including social connections, family support, and individual personality traits.

These findings highlight the complex interplay of various demographic, social, and health factors in influencing the psychological well-being of the elderly population. The high prevalence of depression, anxiety, and stress in this study population emphasizes the need for targeted interventions to address these mental health issues among the elderly, particularly in rural settings.

CONCLUSION

The study reveals a concerning prevalence of depression, anxiety, stress, and loneliness among the elderly living in families in rural Karnataka. A significant portion of the participants (36.2%) experience varying degrees of depression, while anxiety (85.6%) and stress (71.7%) are also prevalent, indicating critical mental health challenges within this demographic. The findings highlight the impact of various socio-demographic factors, including age, gender, marital status, and family structure, on mental health outcomes.

Given the high rates of chronic diseases and low literacy levels, there is an urgent need for targeted mental health interventions and educational programs that address both physical and psychological well-being. Community-based initiatives that promote social interaction and support can help mitigate feelings of isolation and improve the overall mental health of the elderly.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

RECOMMENDATIONS

- Based on the findings of our study, we propose the following recommendations:
- Implement community-based mental health screening programs specifically targeting the elderly population in rural areas.

- Develop and implement stress management and anxiety reduction workshops tailored to the needs and cultural context of rural elderly individuals.
- Promote family engagement and support systems, particularly in nuclear family settings, to reduce feelings of isolation among the elderly.
- Integrate mental health care services with existing healthcare facilities to ensure comprehensive care for the elderly with chronic physical conditions.
- Conduct awareness campaigns to reduce stigma associated with mental health issues and promote help-seeking behavior among the elderly.

ABBREVIATIONS

DASS-42: Depression Anxiety Stress Scale (42 items); **PUC:** Pre-University Course; **SD:** Standard Deviation; **SEM:** Standard Error of the Mean; **UCLA-LS:** University of California, Los Angeles Loneliness Scale; **WHO:** World Health Organization.

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