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Burden of mental health disorders among elderly with multimorbidity: a community-based study

Abid Ali Ansari[1], Mohammed Atif[2], Tanuj Verma[3], Anas Ahmad Khan[4], Atul Kumar Singh[5]

[1]Assistant Professor, Department of Community Medicine Rama Medical College Hospital & Research Centre, Kanpur
[2]Lecturer, Faculty of Medicine, Department of Clinical Biochemistry, University of Omar Al Mukhtar, Libya
[3]Associate Professor, Department of Psychiatry, United Institute of Medical Sciences, Prayagraj
[4&5]Professor, Department of Community Medicine Rama Medical College Hospital & Research Centre, Kanpur

Corresponding Author:

Anas Ahmad Khan
Email:
anas.ahmad.khan@gmail.com

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ABSTRACT

Introduction: Population ageing and the increasing prevalence of chronic diseases have led to a growing burden of multimorbidity among the elderly, particularly in low- and middle-income countries like India. Mental health disorders such as depression and cognitive impairment frequently coexist with chronic conditions but often remain underdiagnosed. This study aimed to assess the burden of mental health disorders among elderly individuals with multimorbidity in a rural community setting.

Methods: A community-based cross-sectional study was conducted in a rural field practice area of Kanpur, Uttar Pradesh, from January 2023 to April 2024. A total of 350 elderly individuals aged ≥60 years were selected using multistage sampling. Data were collected using a pretested semi-structured questionnaire. Depression was assessed using the Geriatric Depression Scale, and cognitive impairment was evaluated using standard tools such as the Mini-Mental State Examination. Statistical analysis included descriptive and inferential methods, with $p<0.05$ considered significant.

Results: The study revealed a high prevalence of mental health disorders among the elderly with multimorbidity. Depression was present in 60.4% of participants, with 58.4% having mild and 41.6% severe depression. Cognitive impairment suggestive of dementia was observed in 25.4% of subjects. A significant association was found between musculoskeletal disorders and both depression and cognitive impairment ($p<0.05$), while hypertension was significantly associated only with cognitive impairment.

Conclusion: The findings highlight a substantial burden of mental health disorders among elderly individuals with multimorbidity. There is a need for integrated, community-based healthcare strategies focusing on early detection, comprehensive management, and improved access to mental health services to enhance the quality of life in this vulnerable population.

Keywords: *Multimorbidity, Depression, Elderly, Cognitive Impairment*

INTRODUCTION

Population ageing is a global phenomenon with profound implications for public health systems, particularly in low- and middle-income countries such as India. The proportion of elderly individuals is increasing rapidly due to improved life expectancy and declining fertility rates, leading to a demographic transition that is accompanied by a rising burden of chronic diseases and disabilities [1]. With advancing age, individuals are more likely to develop multiple chronic

conditions simultaneously, a state referred to as multimorbidity, commonly defined as the coexistence of two or more chronic diseases [2]. Multimorbidity has emerged as a major healthcare challenge, affecting nearly half of the elderly population in certain settings and contributing significantly to functional decline, increased healthcare utilization, and reduced quality of life [3].

Alongside physical health conditions, mental health disorders constitute a critical yet often under-recognized component of geriatric health. Depression, anxiety, and cognitive disorders are among the most prevalent psychiatric conditions in older adults, frequently coexisting with chronic physical illnesses [4]. Community-based studies have reported that depression remains the most common mental disorder among the elderly, often accompanied by anxiety symptoms that complicate diagnosis and management [5]. In India, systematic reviews have estimated the prevalence of depression among older adults to be substantial, reflecting the growing mental health burden in this age group [6]. Similarly, studies from urban settings have highlighted a considerable prevalence of anxiety, depression, and cognitive impairment among the elderly, influenced by both health system and socio-demographic factors [7].

The relationship between multimorbidity and mental health is complex and bidirectional. On one hand, the presence of multiple chronic diseases increases the risk of developing mental health disorders due to factors such as chronic pain, functional limitations, polypharmacy, and financial burden [8]. On the other hand, mental health conditions such as depression can exacerbate physical illnesses by affecting treatment adherence, lifestyle behaviors, and physiological pathways [9]. Evidence suggests that older adults with multimorbidity are significantly more likely to experience depressive symptoms compared to those without chronic conditions [10]. A large population-based study in India demonstrated that nearly one-third of older adults with multimorbidity suffer from depression, with functional impairment and behavioral factors acting as important mediators [11].

Recent global evidence further underscores the magnitude of this problem. A systematic review and meta-analysis reported that the prevalence of depression among elderly individuals with multimorbidity can be as high as 46.7%, which is markedly higher than in those without chronic conditions [12]. This highlights the substantial burden of coexisting mental and physical health problems in ageing populations. Furthermore, certain clusters of chronic diseases, particularly cardiometabolic and musculoskeletal conditions, have been shown to be strongly associated with depressive symptoms, suggesting shared biological and psychosocial pathways [3].

Despite growing recognition of this issue, mental health disorders in the elderly often remain underdiagnosed and undertreated, especially in community settings. Factors such as stigma, lack of awareness, limited access to mental health services, and overlap of somatic and psychological symptoms contribute to this treatment gap [13]. Additionally, the presence of multimorbidity complicates the clinical presentation of mental health disorders, making their identification and management more challenging in primary care settings [14]. In resource-limited settings, where healthcare systems are already burdened, addressing the dual challenge of multimorbidity and mental health becomes even more critical.

Given the increasing ageing population and the rising prevalence of chronic diseases, it is essential to understand the burden and patterns of mental health disorders among elderly individuals with multimorbidity. Community-based studies are particularly important in this context, as they provide a more accurate representation of the true burden outside institutional settings and help identify unmet healthcare needs. Such evidence is crucial for informing integrated care models that address both physical and mental health in a holistic manner.

Therefore, the present study aims to assess the burden of mental health disorders among elderly individuals with multimorbidity in a community-based setting. By exploring the magnitude and associated factors, this study seeks to contribute to the existing body of evidence and support the development of targeted interventions to improve the overall well-being and quality of life of the ageing population.

Objectives

1. To determine the prevalence and burden of mental health disorders (depression, anxiety, and cognitive impairment) among elderly individuals with multimorbidity
2. To assess the association between multimorbidity and mental health disorders, including the influence of socio-demographic and clinical factors

METHODOLOGY

Study design and setting:

A community-based cross-sectional study was conducted in the rural field practice area of Rama Medical College Hospital & Research Centre, Shivrajpur, Kanpur Nagar, Uttar Pradesh. This area serves as a designated rural health training center catering to a defined population with established healthcare outreach services.

Study period:

The study was carried out over a period of 16 months from January 2023 to April 2024.

Study population:
The study population comprised elderly individuals aged 60 years and above residing in the selected rural field practice area for at least one year. Individuals who were seriously ill, unable to communicate, or unwilling to provide consent were excluded from the study.

Sample size estimation:
The sample size was calculated using the formula:
$N = 4pq / L^2$
Where,
n = required sample size
p = prevalence of the characteristic under study (assumed as 70% to obtain maximum sample size)
q = (1 − p)
L = permissible margin of error (5%) at 95% confidence level
Based on this formula, the calculated sample size was 318. Considering a non-response rate of 10%, the final sample size was increased to 350 participants.

Sampling technique:
A multistage sampling technique was employed. In the first stage, villages under the rural field practice area were listed, and a predetermined number of villages were selected using simple random sampling. In the second stage, households within the selected villages were chosen using systematic random sampling. All eligible elderly individuals in the selected households were included until the required sample size was achieved.

Data collection tools and procedure:
Data were collected using a predesigned, pretested, semi-structured questionnaire through face-to-face interviews. The questionnaire included sections on socio-demographic details, lifestyle factors, and clinical history of chronic diseases.

Multimorbidity was defined as the presence of two or more chronic conditions in an individual, based on self-reporting and available medical records where feasible. Information regarding common chronic conditions such as hypertension, diabetes mellitus, chronic respiratory diseases, cardiovascular diseases, osteoarthritis, and others was collected.

Mental health assessment was carried out using standardized and validated tools. Depression was assessed using the Geriatric Depression Scale (GDS), anxiety using an appropriate screening scale, and cognitive impairment using a standard cognitive assessment tool such as the Mini-Mental State Examination (MMSE). Appropriate cut-off scores were used to categorize participants.

Study variables:
The primary outcome variable was the presence of mental health disorders (depression, anxiety, and cognitive impairment). The main independent variable was multimorbidity. Other variables included age, gender, education, marital status, socioeconomic status, lifestyle factors, and functional status.

Data analysis:
Data were entered in Microsoft Excel and analyzed using appropriate statistical software (Epiinfo). Descriptive statistics such as mean, standard deviation, frequency, and percentage were used to summarize the data. The prevalence of mental health disorders among elderly with multimorbidity was calculated.

Inferential statistics were applied to assess associations between variables. Chi-square test was used for categorical variables, and independent t-test or ANOVA for continuous variables where applicable. Multivariable logistic regression analysis was performed to identify independent predictors of mental health disorders. A p-value of <0.05 was considered statistically significant.

Ethical considerations:
Ethical clearance was obtained from the Institutional Ethics Committee of Rama Medical College Hospital & Research Centre. Written informed consent was obtained from all participants prior to data collection. Confidentiality and anonymity of participants were strictly maintained throughout the study.

RESULTS

Table 1: Status of Mini cog assessment for dementia

Variable	Category	Frequency	Percentage
Item Recalled	0	14	4
	1	45	13
	2	95	27

	3	192	55
	Total	346	100
Clock Drawing Test	Normal	249	72
	Abnormal	97	28
	Total	346	100

As evident from the above table, 55% of the people could recall all the three items, while 4 % could not recall even a single item. Also the clock drawing test showed that 72% of the people could do it normally while the remaining 28% had some sort of difficulty in performing this test

Table 2: Prevalence of Dementia among sample

Dementia	**Frequency**	**Percentage**
Present	88	25.4
Absent	258	74.6
Total	**346**	**100.0**

From the above table it was found that 25.4% of the study samples had some degree of dementia as screened by the mini-cog assessment test.

Table 3: Status of Geriatrics Depression Score

Variable	**Response**	
	Yes (%)	**No (%)**
Are You Basically Satisfied With Your Life	71.7	28.3
Have You Dropped Many Of Your Activities & Interests	84.4	15.6
Do You Feel That Your Life Is Empty	36.4	63.6
Do You Often Get Bored	75.1	24.9
Are You In Good Spirits Most Of The Time	56.4	43.6
Are You Afraid That Something Bad Is Going To Happen To You	14.5	85.5
Do You Feel Happy Most Of The Time	59.2	40.8
Do You Often Feel Helpless	49.7	50.3
Do You Prefer To Stay At Home Rather Than Going Out And Doing Things	68.2	31.8
Do You Feel That You Have More Problems With Memory Than Most	29.5	70.5
Do You Think It Is Wonderful To Be Alive Now	72.5	27.5
Do You Feel Worthless The Way You Are Now	22.3	77.7
Do You Feel Full Of Energy	18.2	81.8
Do You Feel That Your Situation Is Hopeless	31.5	68.5
Do You Feel That Most People Are Better Off Than You Are	64.2	35.8

As noted from the above table for geriatrics depression score questionnaire, it was found that 71.7% of subjects were satisfied with their life. Most of the subjects (84.4%) had stopped doing their activities of interest. Almost 2/3rd of subject felt that their life was empty. 3/4th of them were got bored often.
Half of the respondents feel helpless at times. Less than 1/4th (18.2%) had felt that they were full of energy

Table 4: Prevalence of Depression among samples

Depression	**Frequency**	**Percentage**
Present	209	60.4
Absent	137	39.6
Total	346	100.0

Out of the total sample 60.4% of the subjects suffered from some degree of depression, while 39.6% did not had any depressive symptoms.

Table 5: Grading of Depression among samples

Depression	Frequency	Percentage
Mild	122	58.4
Severe	87	41.6
Total	209	100.0

From the above table we can see that out of the total 209 subjects , 58.4% of the subjects had mild depression while 41.6% suffered from severe depression

Table 6: Status of Dementia according Health Profile

Variables	Category	Dementia		Chi-square test
		Absent	Present	
Hypertension	Yes	105(91.3)	10(8.7)	χ^2=25.446
	No	153(66.2)	78(33.8)	p=0.000
Musculoskeletal problems	Yes	157(70.1)	67(29.9)	χ^2=6.715
	No	101(82.8)	21(17.2)	p=0.010

Table no 6 shows significant association of dementia with musculoskeletal problems. Its proportion is higher among persons with musculoskeletal problems.

Table 7: Status of Depression according to Health Profile

Variables	Category	Depression		Chi-square test
		Absent	Present	
Hypertension	Yes	46(40.0)	69(60)	χ^2=0.012
	No	91(39.4)	140(60.6)	p=0.914
Musculoskeletal problems	Yes	61(27.2)	163(72.8)	χ^2=40.599
	No	76(62.3)	46(37.7)	P=.000

Subjects suffering from musculoskeletal problems were more prone to be depressed.(p=0.000)

DISCUSSION

The present community-based study highlights a substantial burden of mental health disorders among the elderly population with multimorbidity. The findings demonstrate that 25.4% of the participants had cognitive impairment suggestive of dementia, while a significantly higher proportion (60.4%) exhibited depressive symptoms. These findings underscore the growing dual burden of physical and mental health conditions among older adults, particularly in rural settings.

The prevalence of dementia (25.4%) observed in this study is relatively high compared to general population estimates, which may be attributed to the inclusion of individuals with multiple chronic conditions. Multimorbidity has been consistently associated with cognitive decline due to cumulative vascular, metabolic, and inflammatory mechanisms [2,3]. Furthermore, global evidence indicates that ageing populations are increasingly affected by neurocognitive disorders, which significantly impact functional independence and healthcare utilization [4]. The Mini-Cog assessment findings, where 28% of participants demonstrated abnormal clock drawing and a small proportion failed recall tasks, further support the presence of cognitive impairment in this population.

Depression emerged as the most prevalent mental health disorder in the present study, affecting 60.4% of participants. This is considerably higher than earlier community-based estimates, which reported lower prevalence rates among elderly populations [5]. However, systematic reviews from India have highlighted a wide variation in prevalence, with higher rates observed in vulnerable populations, particularly those with chronic illnesses [6,7]. The high prevalence in this study can be attributed to the inclusion of individuals with multimorbidity, as multiple studies have demonstrated a strong association between chronic disease burden and depression [8].

The bidirectional relationship between chronic physical illnesses and depression has been well documented. Chronic conditions often lead to functional limitations, pain, and reduced quality of life, which contribute to depressive symptoms [9]. Conversely, depression negatively impacts disease management, treatment adherence, and health-seeking behavior, thereby worsening physical outcomes [10]. In the present study, the high burden of depression among elderly individuals with comorbid conditions aligns with findings from large population-based studies, which have shown that individuals with multimorbidity are significantly more likely to experience mental health disorders [11,12].

An important finding of the present study is the significant association between musculoskeletal disorders and both depression and dementia. Participants with musculoskeletal problems had a significantly higher prevalence of depression

(72.8%) and dementia compared to those without such conditions. This is consistent with previous literature, which suggests that chronic pain and physical disability are major contributors to psychological distress in older adults. Musculoskeletal disorders limit mobility and independence, leading to social isolation and reduced engagement in daily activities, which are known risk factors for depression [8,9].

Interestingly, hypertension did not show a statistically significant association with depression in this study, although it was associated with dementia. This may be due to variations in disease severity, duration, or treatment adherence. Previous studies have reported mixed findings regarding the association between hypertension and mental health outcomes, with some suggesting a link with cognitive decline but inconsistent associations with depression [10,11].

The high prevalence of depressive symptoms observed in this study also reflects the broader mental health treatment gap in low- and middle-income countries such as India. Limited access to mental health services, stigma, and lack of awareness contribute to underdiagnosis and undertreatment of mental health conditions in elderly populations [13]. Moreover, the coexistence of multimorbidity further complicates diagnosis and management, as symptoms of depression often overlap with physical illness [14].

Recent studies conducted during and after the COVID-19 pandemic have also highlighted an increased burden of depression among the elderly, attributed to factors such as social isolation, fear, and disruption of healthcare services [15]. Additionally, policy-level challenges in addressing geriatric mental health needs, particularly in resource-limited settings, further exacerbate this burden [16].

The association between comorbid conditions and reduced quality of life has been well established. Studies have demonstrated that individuals with multiple chronic conditions experience poorer health-related quality of life, which is further worsened by the presence of mental health disorders [17,18]. Recent evidence also suggests that higher comorbidity burden is associated with poorer mental well-being and nutritional status, indicating the multifactorial nature of health in the elderly [19].

Overall, the findings of this study emphasize the need for integrated healthcare approaches that address both physical and mental health conditions in the elderly. Early screening, community-based interventions, and strengthening primary healthcare systems are essential to reduce the burden of mental health disorders among individuals with multimorbidity.

CONCLUSION

The present study demonstrates a high burden of depression and cognitive impairment among elderly individuals with multimorbidity in a rural community setting. The significant association of mental health disorders with chronic conditions, particularly musculoskeletal disorders, highlights the need for integrated and comprehensive geriatric care. Early identification and management of mental health conditions, along with effective control of chronic diseases, are crucial to improving quality of life in this vulnerable population. Strengthening community-based screening programs and enhancing access to mental health services should be prioritized to address the growing burden of geriatric mental health issues.

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