Original Article

Determining the Prevalence of Depression and Assessing Health-seeking Behavior among the Geriatric Population in Urban Slums of Sea Coast City of Saurashtra Region of Gujarat in India: A Community-based Cross-sectional Study

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Abstract

Background: The elderly are disproportionately affected by depression, a devastating mental health illness that is common and causes significant impairment and a poor quality of life. In a community setting in India, this study sought to evaluate the prevalence of depression, degrees of associated disability, healthcare use patterns, health-seeking behavior, and awareness of government initiatives of mental health and care for the elderly. **Objectives:** This study was aimed to determine the prevalence of depression and to assess the health-seeking behavior among the geriatric population aged ≥60 years in the study area during the study period. **Methodology:** A cross-sectional community study including 450 senior citizens aged ≥60 years living in urban slums was carried out. Data were collected through structured interviews, utilizing the Geriatric Depression Scale using 30 items for assessing depression, the Sheehan Disability Scale for evaluating disability levels, and questionnaires on healthcare utilization, health-seeking behavior, and knowledge of government programs. **Results:** The prevalence of depression was high, with 129 (28.67%) participants suffering from mild depression and 33 (7.33%) from severe depression. Moderate to marked disruptions in their work (17, 51.52%), social life/leisure pursuits (24, 72.73%), and social responsibilities (family life) (27, 51.52%) were reported in a significant proportion of those with severe depression. Additionally, a substantial percentage reported feeling impaired and unproductive for most days of the week ($P < 0.001$). While the majority (358, 79.56%) visited healthcare providers, with 333 (93.02%) visiting government providers and 330 (92.18%) visiting community-level providers, the utilization of mental health services (10, 2.79%) and treatment for depression with antidepressants (7, 4.32%) was minimal. In addition, just 26 people (5.78%) and 3 people (0.67%) knew about the National Programme for Health Care of the Elderly and the Mental Healthcare Act of 2017, respectively, indicating a lack of knowledge regarding government initiatives pertaining to mental health and geriatric care. **Conclusion:** The study highlights the significant burden of depression, associated disabilities, and inadequate health-seeking behavior among the elderly population in the study setting. Efforts should focus on

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strengthening community-based mental health services, improving awareness and access to existing health services and government programs and addressing the various risk factors responsible for the emergence and persistence of depression, and poor health-seeking behavior in the aforementioned vulnerable group.

Keywords: *Community-based study, depression, disability, elderly, government programs, healthcare utilization, health-seeking behavior*

Introduction

With the number of people over 60 anticipated to double by 2050, the world's population is aging quickly.[1] Public health will be greatly impacted by this demographic change, especially in nations with low or middle incomes, where the impact of age-associated ailments and impairments is already substantial.[2] Depression is a common and debilitating mental illness that disproportionately affects the elderly population, significantly contributing to their disability burden and reducing their quality of life.[3]

In India, the senior population is a rapidly expanding demographic; projections indicate that by 2050, more than 19% of the nation's population would be 60 years of age or older.[1] Despite this shift in the population, depression and other mental health problems in the elderly continue to be underappreciated public health concerns in the nation (2018).[4] Previous research has shown that older persons in India had a significant prevalence of depression, which ranged from 8.9% to 62.16%.[5] However, the burden of depression and its associated impact on disability, healthcare utilization, and knowledge about available resources remain underexplored, particularly in resource-constrained settings.

According to Kiosses and Alexopoulos and Koopmans *et al*., depression in older individuals is frequently underdiagnosed and undertreated, which increases the risk of death, reduces quality of life, and significantly impairs functional ability.[6,7] Addressing this issue requires a comprehensive understanding of the prevalence, disability levels, healthcare utilization patterns, and awareness of existing government programs and policies related to elderly care and mental health.

While previous studies have examined depression prevalence among the elderly in India, there is limited research exploring the interplay between depression, disability levels, healthcare utilization patterns, and awareness of government programs, particularly in resource-constrained urban settings. This study aims to fill this knowledge gap by providing a comprehensive assessment of these factors, offering novel insights that can inform targeted interventions and policy decisions to improve mental health care for the elderly in similar contexts.

Methodology

The study region included urban slums, and a community-based strategy was intended for this cross-sectional survey research. From November 2021 to December 2022, the study was conducted.

Eligibility criteria

Inclusion criteria

Individuals aged 60 years and older who had lived in the study region for the previous year and were given their permission to take part in the study were included.

Exclusion criteria

Individuals who withheld their consent to engage in the research study for any reason were not allowed to participate. The Mini-Cog test was given to the study participants, and those with a score of <3, which suggests cognitive impairment or dementia, were not allowed to continue in the study. It is debatable whether depression was appropriately evaluated in those with dementia, and it is important to obtain a history of significant events that occurred in the preceding year. The trustworthiness of the data might be impacted by information provided by subjects with prediagnosed psychiatric conditions other than depression (anxiety, paranoid disorders, delusion, hallucinations, schizophrenia, etc.), hence they were excluded.

Estimation of sample size

A systemic review analysis that comprised 51 papers from 16 Indian states with 56 datasets estimated that 34.4% of senior citizens in India suffer from depression. To assess the sample size for the current investigation, an estimated prevalence of 34% was suggested. Based on the presumed prevalence rate of 34% and an allowed error margin of 5% allowed error, the study's required sample size was determined to be 359 people at a significance level of α =0.05. Using the aforementioned formula, the sample size was estimated. $Z^2pq/\delta 2 = (2)\ 2\times\ (34)(66)/(5)^2 = 359$ is the value of n. The minimum size of the sample required for the research study was raised to 432 people in order to account for a 20% nonresponse.[8]

Sampling technique

The study was conducted in all 27 slums in urban within the study area during a 12-month period, from the beginning of November 2021 to the end of October 2022. In the research region, 114,604 people

are living in 27 distinct urban slums. We investigated each of the 27 slums in urban areas for our study. For the study to be completed in one slum, a number of factors were taken into consideration in order to meet the goal of researching multiple indicators. To complete the study, 16 senior citizens 60 years of age and older were selected from each slum geographical area. Therefore, the sample size consisted of = 27 slum areas × 16 elderly people = 432. We adopted simple random sampling, and the primary sampling unit was house. While collecting data from 16 elder people, each slum area was first divided arbitrarily into 4 quadrants. Then, in each quadrant, the estimated total number of houses was tallied. Then, the random number was generated with the help of a random number table. The random number that was generated was the first house to be enquired for elder people aged ≥60 years old. The Mini-Cog test was used to evaluate each elderly resident of the home for cognitive impairment and determine whether or not they should be interviewed for the study. All elderly study participants were included in the study if two or more of them were identified living in the same household. Every eligible person was informed of the study's purpose and asked for their informed consent. The nearest subsequent house was then added to the research, continuing in the correct direction from the first chosen home, until the necessary four individuals from that quadrant were recruited. When multiple elderly individuals (2 or more) were found in the final selected house of a quadrant, all of them were included in the study, even if this resulted in exceeding the target sample size of 4 individuals per quadrant or 16 individuals per cluster.

Study instruments

Pretested, predesigned, semi-structured questionnaire cum observational checklist was prepared. This tool was tested on the field during the pilot study, and based on observations, it was duly modified. The questionnaire was used to collect information on sociodemographic factors; disability level evaluation; and questionnaires on healthcare utilization, health-seeking behavior, and knowledge of government programs. The prevalence of depression was assessed using the standard depression assessment scale.

a. Geriatric Depression Scale using 30 items (GDS-30): A tool to determine the prevalence and the level of depression[9]
b. Sheehan Disability Scale (SDS) (a brief, patient-rated measure of disability and impairment)[10]
c. Questions regarding health-seeking behavior and knowledge related to government programs will be used for data collection.

Pilot study

Before the pilot study's data collection, the content validity of the questionnaire was completed by consulting subject-matter experts. To standardize the questionnaire and obtain insight into any operational challenges that might arise during the main investigation, a pilot study was carried out in an area that was not included in the main study. Interviews with subjects were conducted using the questionnaire. To ensure that the questions' meaning would remain the same, the questionnaire was translated into the native tongue, Gujarati, and then back to English. Any individual who can read and write in any language with comprehension is considered literate in our study (they were questioned regarding it while participating and were not assessed the same). Interviewers underwent a 2-day training program on administering the questionnaires, ethical considerations, and sensitive interviewing techniques. To ensure privacy during interviews on sensitive topics, interviews were conducted in a separate room or private area of the participant's home, with only the interviewer and participant present. Participants were informed of their right to skip any questions they felt uncomfortable answering.

Data collection tools

Data were collected from the elder persons by interview method using pretested and semi-structured questionnaires. The interview schedule was administered in Gujarati language. Questionnaire included the information regarding various sociodemographic factors; various scales as mentioned above; questions regarding government programs; and questions regarding healthcare-seeking behavior. Pretesting of the questionnaire was done by pilot interview before data collection. After receiving each participant's informed consent, data were collected. This entire process took place in their home.

Data analysis

Data analysis was performed using IBM SPSS Statistics for Windows, version 26.0 (IBM Corp., Armonk, N.Y., USA). Descriptive statistics were used to summarize the sociodemographic characteristics of the study participants, the prevalence of depression, disability levels, healthcare utilization patterns, and awareness of government programs. Continuous variables were presented as means and standard deviations, while categorical variables were presented as frequencies and percentages.

The prevalence of depression was calculated with 95% confidence intervals (CIs). Chi-square tests were used to examine the associations between categorical variables,

such as the relationship between depression status and healthcare utilization patterns, or gender differences in health-seeking behavior. Fisher's exact test was used when the expected cell frequencies were <5.

The Shapiro–Wilk test was used to assess the normality of continuous variables. For normally distributed data, independent *t*-tests were used to compare means between two groups (e.g., depressed vs. nondepressed participants), while one-way ANOVA was used for comparisons between more than two groups. For nonnormally distributed data, Mann–Whitney *U*-tests and Kruskal–Wallis tests were used for two-group and multi-group comparisons, respectively.

Multivariate logistic regression analysis was performed to identify factors associated with depression, with depression status as the dependent variable and sociodemographic characteristics, disability levels, and healthcare utilization as independent variables. Odds ratios with 95% CIs were calculated.

The SDS scores were analyzed using descriptive statistics and compared across depression severity categories using the Kruskal–Wallis test, followed by *post hoc* Dunn's tests with Bonferroni correction for multiple comparisons.

To assess the relationship between depression severity and healthcare utilization, we used the Cochran–Armitage test for trend. Spearman's rank correlation coefficient was used to examine the association between depression scores and disability levels.

All statistical tests were two-tailed, and $P < 0.05$ was considered statistically significant. To address the issue of multiple comparisons, we applied the Benjamini–Hochberg procedure to control the false discovery rate at 0.05.

Power analysis was conducted using Power analysis was conducted using G*Power 3.1.9.7 (Heinrich-Heine-Universität Düsseldorf, Düsseldorf, North Rhine-Westphalia, Germany) to ensure adequate sample size for detecting significant associations. Based on an expected depression prevalence of 34%, a desired precision of ± 5%, and a 95% confidence level, the required sample size was calculated to be 345. Our sample size of 450 provided sufficient power for the planned analyses.

Missing data were handled using multiple imputation techniques when the proportion of missing data was <10% for any variable. Cases with more than 10% missing data were excluded from the analysis.

Ethical issues considered

The Institutional Ethics Committee approved the research study.

Operational definitions

I. Age: Age was expressed in terms of completed years.
II. Education:
   a. Illiterate: Not enrolled in school and lacking reading and writing skills
   b. Literate: Those who could comprehend what they were reading and writing in at least in minimum one language
   c. Primary school: Those with less than an eighth-grade education
   d. Middle school: Those who studied for the eighth grade passed
   e. High school: Individuals who completed their studies through the tenth grade successfully
   f. Posthigh school diploma: People who studied for the 12th grade pass
   g. Graduation: Individuals with a bachelor's degree completed
   h. Postgraduation (professional): Those with a completed master's degree.
III. Occupation: Definitions are as follows to decide types of occupation:
   a. Unskilled worker: Individuals performing tasks that do not call for formal education or specialized training, e.g., peon, coolie, and watchman
   b. Semi-skilled worker: Individuals who perform tasks that call for training in order to perform their regular duties effectively, e.g., library attendant and factory laborer
   c. Skilled worker: People who perform labor that necessitates extensive expertise in rather complex tasks, e.g., electrician and carpenter
   d. Clerical, shop owner, etc.: People who work in jobs that need some math proficiency, as well as likely some reading and writing, e.g., clerk and typist
   e. Semi-professional: Here, a college degree or posthigh school education is necessary. It also requires a low-level professional training program, e.g., diploma engineers, high school teachers, lecturers in college, junior administrators, musicians, and research assistants
   f. Professional: Here, the position necessitates making decisions, setting policies, and carrying them out. They also indicate artistic endeavors, e.g., doctors, senior administrative officers, senior lecturers, associate professors/readers, principals/deans, advocates, engineers, expert musicians, news editors, and auditors' managers.
IV. Types of family:
   a. Nuclear family (elementary family): It consists of a married couple and their kids, who are still considered dependents. Primary family is another name for it

b. Joint Family: Together, the husband, wife, kids, and husband's family remain. It is therefore an organization or coalition of more than two nuclear families. Another name for it is extended family. The ladies are spouses, daughters, or widows, while all of the men are blood relatives. In India, it is typical. It is the nuclear family's lateral expansion
c. Three-generation family (vertically extended family): In the west, such is typical. This is typically a home with members of three different generations. It frequently happens when young couples who are still living with their parents are unable to locate independent housing. It is the nuclear family's linear expansion.

V. Extent of financial dependency:
   a. Having enough money or income to cover one's living needs for the remainder of a person's life without needing to work or rely on others is known as financial independence
   b. Those who merely partially rely on the deceased (i.e., direct close relatives or others) for care, affection, and assistance are known as partial dependents
   c. Those who were completely dependent on the deceased are known as total dependents.

VI. Marital status:
   a. Unmarried: Man/woman who has not married ever
   b. Married: Married and husband and wife both alive
   c. Widow/Widower: Married man/woman, but his/her spouse died and he/she did not remarry; divorced: Couple legally separated
   d. Separated: Man/woman who lived separated from his/her spouse (not divorced/not remarry).

Results

A summary of the 450 senior study participants' sociodemographic characteristics is given in Table 1. The gender distribution was 197 (43.78%) males and 253 (56.22%) females. Most were in the age group of 60–74 years (364, 80.89%), followed by 75–84 years (59, 13.11%) and ≥ 85 years (27, 6.00%). The predominant religion was Hindu (322, 71.55%), followed by Muslim (121, 26.89%) and Christian (7, 1.56%). A significant proportion were not literate (261, 58%), with only a few having professional degrees (3, 0.67%) or graduate-level education (5, 1.11%).

The majority were unemployed (292, 64.89%), and among those employed, most were unskilled workers (134, 29.78%). The marital status distribution

Table 1: Sociodemographic and baseline profile of the geriatric study participants

Characteristics	Frequency (*n*=450), *n* (%)
Gender	
Male	197 (43.78)
Female	253 (56.22)
Age (years)	
60–74	364 (80.89)
75–84	59 (13.11)
≥85	27 (6.00)
Religion	
Hindu	322 (71.55)
Muslim	121 (26.89)
Christian	7 (1.56)
Education	
Professional degree	3 (0.67)
Graduate	5 (1.11)
Intermediate/diploma	4 (0.89)
High school	8 (1.78)
Middle school	47 (10.44)
Primary school	122 (27.11)
Not literate	261 (58.00)
Occupation	
Professional	1 (0.22)
Semi-professional	2 (0.44)
Clerical/shop/farm	16 (3.56)
Skilled worker	5 (1.11)
Unskilled worker	134 (29.78)
Unemployed	292 (64.89)
Marital status	
Married	287 (63.78)
Unmarried	5 (1.11)
Separated	4 (0.89)
Widow	129 (28.67)
Widower	18 (4.00)
Divorced	7 (1.55)
Family monthly income (₹=In rupees)	
≤10,000	287 (63.78)
10,001–20,000	103 (22.89)
20,001–30,000	47 (10.44)
30,001–40,000	8 (1.78)
>40,000	5 (1.11)
SE class (modified BG Prasad's classification, 2022)	
I (upper)	16 (3.55)
II (upper middle)	40 (8.89)
III (middle)	107 (23.78)
IV (lower middle)	149 (33.11)
V (lower)	138 (30.67)
House ownership status (own/rented)	
Own	413 (91.78)
Rented	37 (8.22)
Family size	
1–5	245 (54.45)
6–10	168 (37.33)

Contd...

Table 1: Contd...

Characteristics	Frequency (*n*=450), *n* (%)
11–15	27 (6.00)
>15	10 (2.22)
Number of children	
0	73 (16.22)
1–2	308 (68.45)
>2	69 (15.33)
Type of family	
Nuclear	162 (36.00)
Joint	140 (31.11)
Three-generation family	148 (32.89)
Extent of financial dependency	
Independent	72 (16.00)
Partially dependent	109 (24.22)
Totally dependent	269 (59.78)
Type (on whom) financial dependency	
Self	72 (16.00)
Spouse	30 (6.67)
Children	324 (72.00)
Distant family members	24 (5.33)
Health insurance	
Government	213 (47.33)
Private	2 (0.45)
No insurance	235 (52.22)
GDS-30 score	
0–9 (no depression)	288 (64.00)
10–19 (mild depression)	129 (28.67)
20–30 (severe depression)	33 (7.33)

SE: Socioeconomic, GDS-30: Geriatric Depression Scale using 30 items

showed that 287 (63.78%) were married, 129 (28.67%) were widows, and 18 (4.00%) were widowers.

In terms of family income, 287 (63.78%) had a monthly income of ₹10,000 or less, and only 5 (1.11%) had an income exceeding ₹40,000. Based on the modified BG Prasad's classification for socioeconomic status, most people were from the lower class (138, 30.67%) and the lower middle class (149, 33.11%). Most participants owned their houses (413, 91.78%), and the family size ranged from 1 to 5 members for 245 (54.45%), followed by 6–10 members (168, 37.33%).

Regarding the number of children, 308 (68.45%) had 1–2 children, and 73 (16.22%) had no children. The type of family was evenly distributed among nuclear families (162, 36%), joint families (140, 31.11%), and three-generation families (148, 32.89%). A substantial proportion (269, 59.78%) were financially dependent, primarily on their children (324, 72.00%). Additionally, 235 (52.22%) had no health insurance, while 213 (47.33%) were covered by government health insurance.

Table 1 also shows the prevalence of depression in the geriatric study participants based on their scores on the GDS-30. It shows that 129 (28.67%) had normal scores (0–9), indicating no depression. However, a significant proportion (129, 28.67%) had mild depression (scores 10–19), and 33 (7.33%) had severe depression (scores 20–30).

Table 2 it examines the level of disability and impairment experienced by the depressed study subjects (162), as measured by the SDS. The data are presented separately for those with mild depression (n = 129) and severe depression (n = 33).

For those with mild depression, the majority reported mild disruptions in their work (124, 96.12%), social life/leisure activities (126, 97.67%), and family life/social responsibilities (126, 97.67%). In contrast, among those with severe depression, a significant proportion experienced moderate to marked disruptions in these areas (work: 17 moderate, 51.52%; 16 marked, 49.48%; social life/leisure activities: 24 moderate, 72.73%; 9 marked, 27.27%; family life/social responsibilities: 27 moderate, 51.52%; 6 marked, 49.48%).

Regarding the total number of days lost because of depressive symptoms, most of those with mild depression reported missing 2–3 days (34, 26.36% and 42, 32.56%, respectively) of work or normal daily responsibilities. In contrast, those with severe depression more frequently reported missing 3–7 days (10 for 3 days, 30.30%; 8 for 7 days, 24.24%).

For days unproductive, a significant proportion of those with mild depression (63, 48.84%) and severe depression (27, 81.82%) reported feeling impaired by their depressive symptoms for 7 days, even though they went to work.

It presents the study participants' distribution based on the type of healthcare providers they visited and their depression status. The data show that a higher percentage of depressed individuals visited healthcare providers compared to those without depression.

Overall, 358 out of 450 (79.56%) participants visited healthcare providers, with the majority (333, 93.02%) visiting government health providers and (330, 92.18%) visiting community-level health providers. A lower percentage (94, 26.26%) visited private health providers, and only a small proportion (10, 2.79%) visited mental health providers. Additionally, 43 (12.01%) sought help from traditional healers.

Among those without depression, 205 out of 288 (71.18%) visited healthcare providers, with 186 (90.73%) visiting government providers and 184 (89.76%) visiting community-level providers.

Table 2: Sheehan Disability Scale and distribution of depressed study participants

SDS	Mild depression (*n*=129)[+], *n* (%)	Severe depression (*n*=33)[+], *n* (%)	Total (*n*=162)[+], *n* (%)
Do the depressive symptoms disrupt your work? Not at all/mild/moderate/markedly/extremely (1–10 score)			
Not at all (0)	1 (0.78)	0	1 (0.62)
Mildly (1–3)	124 (96.12)	0	124 (76.54)
Moderately (4–6)	4 (3.10)	17 (51.52)	21 (12.96)
Markedly (7–9)	0	16 (49.48)	16 (9.88)
Have the depressive symptoms disrupted your social life/leisure activities? Not at all/mild/moderate/markedly/extremely (1–10 score)			
Not at all (0)	1 (0.78)	0	1 (0.62)
Mildly (1–3)	126 (97.67)	0	126 (77.78)
Moderately (4–6)	2 (1.55)	24 (72.73)	26 (16.05)
Markedly (7–9)	0	9 (27.27)	9 (5.55)
Have the depressive symptoms disrupted your family life/social responsibilities? Not at all/mild/moderate/markedly/extremely (1–10 score)			
Not at all (0)	1 (0.78)	0	1 (0.62)
Mildly (1–3)	126 (97.67)	0	126 (77.78)
Moderately (4–6)	2 (1.55)	27 (51.52)	29 (17.90)
Markedly (7–9)	0	6 (49.48)	6 (3.70)
Days lost: On how many days in the last week did your depressive symptoms cause you to miss work or leave you unable to carry out your normal daily responsibilities?			
0	13 (10.08)	0	13 (8.02)
1	10 (7.75)	0	10 (6.17)
2	34 (26.36)	3 (9.09)	37 (22.85)
3	42 (32.56)	10 (30.30)	52 (32.10)
4	12 (9.30)	4 (12.12)	16 (9.88)
5	8 (6.20)	5 (15.16)	13 (8.02)
6	3 (2.33)	3 (9.09)	6 (3.70)
7	7 (5.42)	8 (24.24)	15 (9.26)
Days unproductive: On how many days in the last week did you feel so impaired by your depressive symptoms, that even though you went to work, your productivity was reduced?			
0	1 (0.78)	0	1 (0.62)
1	0	0	0
2	1 (0.78)	0	1 (0.62)
3	7 (5.43)	0	7 (4.32)
4	29 (22.48)	3 (9.09)	32 (19.75)
5	22 (17.05)	2 (6.06)	24 (14.81)
6	6 (4.65)	1 (3.03)	7 (4.32)
7	63 (48.84)	27 (81.82)	90 (55.56)

[+]Column percentage. SDS: Sheehan Disability Scale

For those with mild depression, 121 out of 129 (93.80%) visited healthcare providers, with 115 (95.04%) visiting government providers and 114 (94.21%) visiting community-level providers.

All 32 out of 33 individuals (96.97%) with severe depression visited government and community-level health providers. A higher percentage of those with severe depression (5, 15.63%) visited mental health providers compared to those with mild depression (4, 3.31%) and those without depression (1, 0.49%).

Regarding treatment for depression, only 7 out of 162 depressed individuals (4.32%) were taking antidepressants, with a higher percentage (5 out of 7, 71.43%) among those with severe depression. None of the depressed individuals were receiving antidepressants supported with talking therapy.

Table 3 also shows study participants distributed according to knowledge regarding government programs and depression.

It examines the awareness of the study participants regarding government programs related to elderly care and mental health and its association with depression status.

Overall, only 26 out of 450 (5.78%) were aware of the National Programme for Health Care of Elderly (NPHCE), and 3 out of 450 (0.67%) were aware of the

Table 3: Study participants distributed according to the type of healthcare providers they had visited, knowledge regarding government programs, and depression

Healthcare providers (*n*=358)	No depression[+], *n* (%)	Mild depression[+], *n* (%)	Severe depression[+], *n* (%)	Total[+], *n* (%)
Total (multiple responses)	205/288 (71.18)	121/129 (93.80)	32/33 (96.97)	358/450 (79.56)
Government health provider	186/205 (90.73)	115/121 (95.04)	32/32 (100.00)	333/358 (93.02)
Community-level health provider	184/205 (89.76)	114/121 (94.21)	32/32 (100.00)	330/358 (92.18)
Private health provider	69/205 (33.66)	21/121 (17.36)	4/32 (12.50)	94/358 (26.26)
Mental health provider	1/205 (0.49)	4/121 (3.31)	5/32 (15.63)	10/358 (2.79)
Traditional healer	23/205 (11.22)	13/121 (10.74)	7/32 (21.88)	43/358 (12.01)
Were depressed persons taking any treatment for depression? (*n*=162)				
Treatment of depressed study subjects (*n*=162)	**No depression[#], n (%)**	**Mild depression[#], n (%)**	**Severe depression[#], *n* (%)**	**Total (*n*=162)[+], *n* (%)**
Antidepressants only	0	2/7 (28.57)	5/7 (71.43)	7/162 (4.32)
Antidepressants supported with talking therapy	0	0	0	0
Study participants were distributed according to knowledge regarding government programs and depression				
Knowledge regarding government programs (*n*=450)	**No depression, *n* (%)**	**Mild depression, *n* (%)**	**Severe depression, *n* (%)**	**Total, *n* (%)**
NPHCE	16/26 (61.54)	9/26 (34.61)	1/26 (3.85)	26/450 (5.78)
The Mental Healthcare Act, 2017	3/3 (100.00)	0	0	3/450 (0.67)

[+]Indicates column percentage calculated out of total respondents in that depression category; [#]Indicates row percentage calculated out of total respondents receiving that treatment. NPHCE: National Programme for Health Care of the Elderly

Mental Healthcare Act, 2017. Among those aware of the NPHCE, 16 out of 26 (61.54%) were individuals without depression, compared to 9 out of 26 (34.61%) with mild depression and 1 out of 26 (3.85%) with severe depression.

For the Mental Healthcare Act, of 2017, all 3 individuals aware of the program were without depression.

The data suggest a lack of knowledge regarding government programs related to elderly care and mental health, particularly among those with depression.

Figure 1 shows the distribution of healthcare-seeking behavior among not depressed, mildly depressed, and severely depressed elderly study subjects, showing that 4.51%, 34.11%, and 66.67%, respectively, had a history of hospital admission in the last 12 months and 71.18%, 93.80%, and 96.67%, respectively, had visited outpatient health providers in the last 3 months. This difference was statistically highly significant (inpatient services: $\chi^2 = 113.257$, $P < 0.00001$*; and outpatient services: $\chi^2 = 34.662$, $P < 0.00001$*).

Figure 2 shows the gender (depressed study subject) distribution of elderly study subjects based on healthcare-seeking behavior. It shows that out of those depressed study subjects who were male and female, 34 (47.89%) and 32 (35.16%), respectively, had a history of hospital admission in the last 12 months and 68 (95.77%) and 85 (93.41%), respectively, had visited outpatient health providers in the last 3 months. The difference was not statistically significant (inpatient services: $\chi^2 = 2.674$, $P = 0.102$; and outpatient services: $\chi^2 = 0.094$ with Yates' correction, $P = 0.76$).

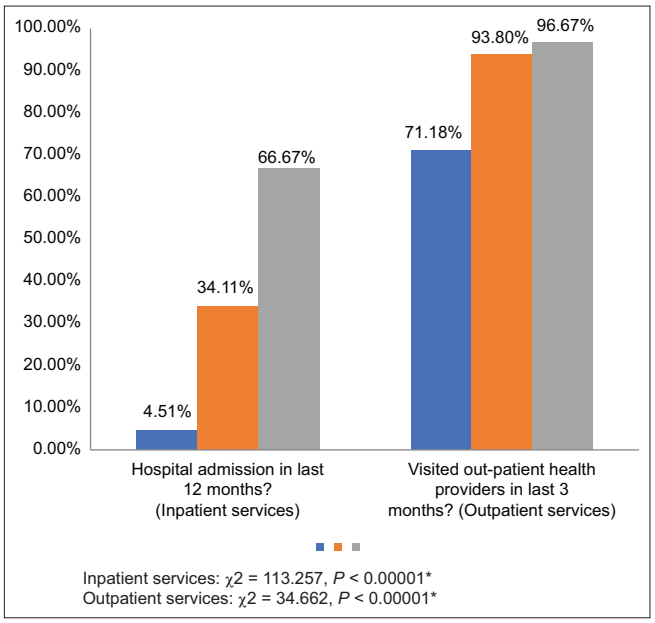

Figure 1: Study participants distributed according to healthcare-seeking behavior and depression ($n = 450$)

Discussion

The current research offers crucial insights into the sociodemographic profile of the elderly, prevalence of depression, disability levels, healthcare utilization patterns, and knowledge about government programs among elderly individuals in the study setting. Several

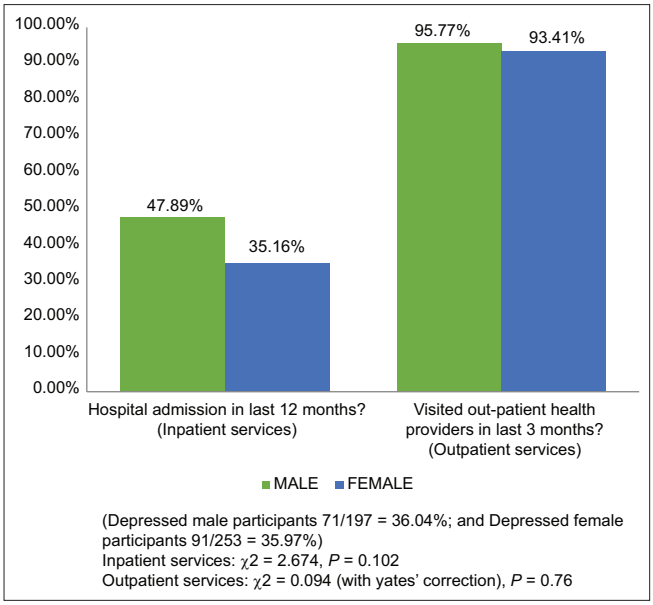

Figure 2: Study participants distributed according to healthcare-seeking behavior and gender (depressed study subject) (n = 162, depressed male participants 71/197 = 36.04% and depressed female participants 91/253 = 35.97%)

findings warrant further discussion in the context of existing literature.

Prevalence of depression

Among the senior participants in the study, depression was shown to be highly prevalent, with 28.67% suffering from mild depression and 7.33% from severe depression. These results are in line with several other research projects carried out across India along with other LMICs, which have documented a significant prevalence of depression among senior citizens.[11-13]

In the case of depression, for example, a systematic review analysis found that the average anticipated prevalence in old age was 31.74% (95% CI: 27.90, 35.59). The subgroup study used the GDS-30, and the pooled prevalence was higher in poor nations (40.78%) than in developed countries (17.05%). The high frequency was ascribed by the authors to several causes, including socioeconomic disadvantages, a shortage of social support, and restricted access to healthcare resources.[14]

In the same manner, a cross-sectional study conducted on the Turkish population brought attention to the association between depression and these three variables: low educational attainment, low socioeconomic status, and a lack of social security.[15]

Disability and impairment

The study's findings on disability and impairment levels, as measured by the SDS, are particularly concerning. A significant proportion of those with severe depression reported moderate to marked disruptions in their work, social life, and family responsibilities. Additionally, a substantial percentage of both mildly and severely depressed individuals reported feeling impaired and unproductive for most days of the week, even when they went to work.

These results are in line with earlier studies emphasizing the crippling impacts of depression on day-to-day functioning and production. For instance, previous studies also found that late-life depression significantly impacts functional abilities, cognitive performance, and quality of life.[16-18]

Healthcare utilization and treatment

The study's results on healthcare utilization patterns reveal some positive aspects, such as a high proportion of participants visiting government and community-level healthcare providers. Even so, it is alarming how little depression is treated with antidepressants and how few mental health services are sought.

According to earlier research, depression treatment gaps and underutilization of mental health services are issues that these results align with. In LMICs, less than one-fourth of people with mental disorders got treatment, with older persons experiencing a notably high treatment gap, according to a cross-national study by Kohn *et al*.[19,20]

The observed gender differences in health-seeking behavior, although not statistically significant, warrant further exploration. Possible explanations include differences in perceived health needs, societal norms and expectations, financial autonomy, and mobility constraints. Women may face additional barriers in accessing health care, such as family responsibilities or cultural restrictions on traveling alone.

Knowledge of government programs

The study's findings on the lack of knowledge (awareness) about government programs for elderly care and mental health are alarming. Only a small percentage of participants were aware of the NPHCE and the Mental Healthcare Act, of 2017, with even lower awareness among those with depression.

These results are consistent with earlier research emphasizing the need for greater knowledge and understanding of current government initiatives and regulations about mental health and elder care.[21,22] Addressing this knowledge gap is essential to improving older people's well-being and assuring improved access to services.

According to a study conducted in Uttarakhand by Mathias *et al*., out of 960 participants, those with depression were nearly five times more likely than those without to have visited an outpatient or inpatient

provider; additionally, women – both with and without depression – were significantly more inclined than men to have seen a health professional in the 3 months previous to the study.[23]

The results of this study, taken together, highlight the critical need for interventions to alleviate the high prevalence of depression, disability, and ignorance about services among the senior population – especially in areas with limited resources. The main goals should be to increase the availability of mental health services, raise public knowledge of government initiatives, and address the socioeconomic factors that contribute to the onset and severity of depression in this susceptible group.

The low utilization of mental health services and antidepressants observed in this study may be attributed to several factors. The stigma surrounding mental health issues, lack of awareness about mental health conditions and available treatments, limited accessibility of specialized mental health services in urban slums, and financial constraints could all contribute to this underutilization. Additionally, the preference for general healthcare providers over mental health specialists may reflect a tendency to somatize mental health symptoms or a lack of recognition of depression as a treatable condition.

These findings have important practical implications for policy and practice. First, there is a clear need to integrate mental health services into primary healthcare settings to improve accessibility. Second, community-based awareness programs should be implemented to reduce stigma and increase knowledge about mental health conditions and available treatments. Third, healthcare providers at all levels should receive training in recognizing and managing depression in the elderly. Finally, gender-sensitive approaches to healthcare delivery should be considered to address potential barriers faced by women in accessing mental health services.

Limitations

1. Because the study was targeted at a particular area, the results were unable to be generalized to other groups of people or environments
2. The study's cross-sectional design makes it impossible to establish causal links between the factors it examined
3. Because the study made use of self-reported data, it could have been influenced by social desirability or recall bias
4. The GDS was the only tool used to assess depression; a thorough clinical evaluation was not carried out
5. The study did not investigate potential risk factors or predictors of depression among the elderly participants, which could have provided valuable insights for targeted interventions.

Conclusion

The current study emphasizes how common depression is among the senior population under investigation, as well as the related difficulties that accompany it. The alarming prevalence of depression underscores the need for focused initiatives to address this issue of public health, as does the inadequate utilization of services for mental health and ignorance of available resources.

The main goals should be to enhance mental health services offered in the community, increase public knowledge of and access to government programs already in place, and address the socioeconomic factors that contribute to the emergence and persistence of depression in this susceptible group. Furthermore, encouraging task-sharing and capacity-building programs can assist in closing the gap in mental healthcare access and guarantee a more effective integration of mental health services into primary healthcare settings.

The elderly population's well-being and quality of life can be greatly enhanced by tackling these problems comprehensively and multisectoral, which will support the more general objectives of encouraging healthy aging and sustainable development.

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Conflicts of interest

There are no conflicts of interest.

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