

# Non-communicable diseases and their impact on depression, anxiety, and stress among the geriatric population residing in old age homes in Chennai, Tamil Nadu

Swathi Ramesh<sup>1</sup>, Kalpana Kosalram<sup>1</sup>, V. Srinivas<sup>2</sup>

<sup>1</sup>School of Public Health, SRM Institute of Science and Technology, Kattankulathur, Tamil Nadu, India, <sup>2</sup>Geri Care Organization, Adyar, Chennai, Tamil Nadu, India

## ABSTRACT

**Background:** Non-communicable diseases (NCDs) are most prevalent among the elderly population. Mental illness and chronic disease conditions are of utmost significance when considering their implications on various aspects such as well-being, quality of life, cost of treatment, and longevity of the affected individuals. There is a paucity of data from India to assess the prevalence of NCDs and their relation to depression, anxiety, and stress among the elderly population. **Aim:** The present study aims to determine the prevalence of NCDs and their relationship with depression, anxiety, and stress (DASS) among the geriatric population that resides in senior citizen homes (Old age homes) in Chennai. **Materials and Methods:** A cross-sectional study was conducted among the elderly population in old age homes located in Chennai. The research was carried out through offline methods during the period of January 2023 to April 2023. A total of 311 participants were involved in this study who were aged 60 and older. DASS 21 was used to study depression, anxiety, and stress. **Results:** The overall prevalence of depression was 84.2%, anxiety was 49.2%, and stress was 55.9% among the study participants. The findings of the study show that there is a statistically significant association, the odds of diabetes were 2 times higher (OR- 2.082, 95% CI: 1.225-3.888), the presence of hypertension was nearly 4.1 times higher (OR- 4.116, 95% CI: 2.110-8.030) and the odds of the presence of visual impairment were nearly 1.8 times higher (OR-1.810, 95% CI: 0.976-3.357) in developing the symptoms of depression. **Conclusion:** Screening of non-communicable diseases (NCDs) such as hypertension, diabetes, etc. for DASS among the elderly population is recommended at regular intervals, as elderly people are considered to be the most vulnerable age group population, worldwide.

**Keywords:** Anxiety, depression, elderly, non-communicable disease, stress

## Introduction

The prioritization of mental health and well-being is integral to mitigating the worldwide impact of non-communicable diseases

**Address for correspondence:** Ms. Swathi Ramesh, SRM School of Public Health, SRM IST, Chengalpet, Kattankulathur, Chennai - 603203, Tamil Nadu, India.  
E-mail: swathiramesh19@gmail.com

Received: 12-05-2023

Revised: 05-07-2023

Accepted: 11-07-2023

Published: 30-09-2023

(NCDs).<sup>[1]</sup> NCDs are commonly classified as chronic diseases due to their prolonged duration. In the twenty-first century, one of the most significant concerns facing global health is addressing non-communicable diseases (NCDs), which have emerged as one of the most significant threats to public health.<sup>[2]</sup> Cancer, Cardiovascular disease (CVD), chronic respiratory diseases, and type 2 diabetes are among the most prevalent NCDs with physical manifestations.<sup>[3]</sup> As per the World Health Organization (WHO) report, NCDs account for 71% of all global mortality,

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

For reprints contact: WKHLRPMedknow\_reprints@wolterskluwer.com

**How to cite this article:** Ramesh S, Kosalram K, Srinivas V. Non-communicable diseases and their impact on depression, anxiety, and stress among the geriatric population residing in old age homes in Chennai, Tamil Nadu. J Family Med Prim Care 2023;12:1931-7.

### Access this article online

#### Quick Response Code:



**Website:**  
<http://journals.lww.com/JFMPC>

**DOI:**  
10.4103/jfmprc.jfmprc\_801\_23

resulting in the demise of 41 million individuals every year. With such a high global death toll, NCDs have been getting significant attention from both governments and the community on a global scale.<sup>[4]</sup> According to the WHO, NCDs are anticipated to constitute a growing absolute proportion of global mortality, with an estimated increase to approximately 70% of all deaths by the year 2030.<sup>[5]</sup> NCDs exhibit notable disparities in low- and middle-income countries (LMICs), where over three-quarters of global non-communicable disease mortalities occur, amounting to a staggering 31.4 million deaths.<sup>[5]</sup> NCDs were predominantly prevalent in LMICs, accounting for 86% of cases. In addition, it is noteworthy that over 40% of non-communicable disease-related fatalities in low-income nations occurred before 60 years of age, which is almost three times the corresponding proportion in high-income nations (13%).<sup>[6]</sup> The majority of NCDs are non-infectious in nature and arise from an intricate combination of genetic, physiological, behavioral, and environmental factors; they exhibit common modifiable behavioral risk factors such as tobacco consumption, unhealthy dietary habits, physical inactivity, and excessive alcohol consumption; hence, these risk factors consequently result in conditions such as overweight and obesity, elevated blood pressure, and increased cholesterol levels, ultimately leading to the onset of diseases.<sup>[7]</sup>

The aging process among individuals is an inevitable phenomenon that is bound to occur. Elderly individuals exhibit a more pronounced physical deterioration compared to earlier stages of life and are vulnerable to specific illnesses that are associated with their physical decline, resulting in a weakened and debilitated state.<sup>[8,9]</sup> It is anticipated that from 2015 to 2050, the population of people aged 60 and older across the globe will nearly double, reaching around 2.1 billion individuals.<sup>[10]</sup> Countries with low and middle incomes (LMICs), such as India, are seeing considerable increases in the proportion of their elderly population.<sup>[10]</sup> According to the census that was conducted in 2011, the proportion of the elderly population in India who was disabled was reported to be 5.1%, and in India, more than half of the people in the 65 and older age bracket are affected by at least one chronic illness.<sup>[11]</sup> Mental health illnesses have been linked to various disabilities, mortality, and chronic illnesses, especially in the aging population; hence, maintaining good health among the elderly population is crucial to ensuring their independence, security, and sustained productivity during their later years.<sup>[10]</sup> NCDs such as CVD, diabetes, and cancer possess the capacity to detrimentally affect the well-being of older individuals, increase healthcare expenditures, and place an additional burden on family caregivers.<sup>[12]</sup>

## Study rationale

Literature shows that there is a huge gap existing between NCDs and their relationship with depression, stress, and anxiety. There's been a limited study that intends to study the relationship between NCDs and DASS. People with NCDs are at risk of developing one and other, and require long-term care that is proactive, patient-centered, community-based, and sustainable. Such care can be delivered equitably only through health systems based

on primary health care. So, it becomes a huge threat to our healthcare system, especially to the primary care provider and family physicians. Hence, the current study will merge the gap between the evaluation and treatment in the primary care setting.

Depressive disorders, anxiety, stress, and psychosocial factors have been found to significantly influence the prognosis and outcome of NCDs such as hypertension and diabetes.<sup>[13]</sup> Given the dearth of literature pertaining to NCDs and mental health concerns among the elderly population in India, it is crucial to investigate the prevalence of NCDs and their impact on mental health issues among the elderly population; hence, the objective of this research is to investigate the prevalence and determinants contributing to NCDs in conjunction with mental health issues among elderly individuals residing in retirement homes located in Chennai.

## Materials and Methods

### Study design

The study was a cross-sectional research study that was conducted in the old age homes of Chennai, Tamil Nadu.

### Study setting and period

The study was carried out with participants drawn from a variety of old age homes located within the Chennai areas of Tamil Nadu. The research was conducted from the period of January 2023 all the way through April 2023.

### Sampling and study participants

The sample size of the study was calculated using Cochran's formula to determine adequate sample size:

$$n^0 = z^2 pq/e^2$$

Assuming the prevalence of stress and NCDs as 50%, with a precision of 6%, confidence interval of 95%, and 10% non-response rate, the sample size was calculated to be 306, by oversampling we finally collected 311 samples. Individuals aged 60 years and above, and who are residing in old age homes were recruited consecutively until the required sample size has been attained.

The research was carried out using online data collection tools from January 2023 to April 2023.

Help Age India released a report on the directory of old age homes in 2009, and it was used to compile the list of old age homes. Online platforms have been accessed to gather information about old age homes that are available in Chennai. When all of the information regarding the old age homes has been gathered, a total of 235 old age home details have been collected from the accessed reports. Only 45 of the 235 old age homes that were approached were granted permission to participate in the study. After obtaining permission, the researcher met with the manager in person and explained the details of the

research study to the Trustee and the in-charge person of the selected old age homes, which includes the purpose of the study as well as the confidentiality of the study, in regards to both the participants and the old age homes. From these 45 old age homes, 22 were selected using a simple random sampling method. In each old age home, a universal sampling strategy was utilized, and there were, on average, 15–20 residents has been selected based on inclusion and exclusion criteria.

The inmates have to reside in the retirement community for a minimum of 6 months; they should not be diagnosed with any significant psychiatric disease; and they had to provide their informed consent voluntarily, these were the criteria for the inclusion of the study participants. People who did not give their consent, people who were unable to answer the questions, and people who were suffering from severe psychiatric illnesses were all excluded from participation in the study. Therefore, 311 inmates were chosen for the study after considering the inclusion and exclusion criteria.

### Data collection and tools

A questionnaire that had been piloted and tested beforehand served as the primary data collection tool for this study. The semi-structured questionnaire focuses on the socio-demographic information of the individuals who are participating in the study, as well as their morbidity profiles, personal habits, and healthcare expenses. Katz index independence and DASS 21 are structured questionnaires. We also reviewed the patient's medical history and noted our findings to confirm the presence of the condition. Before administering the questionnaire, written and verbal consent was obtained from the individuals who participated in the study. It was made clear to the participants that their participation was totally dependent on their own will and that no data would be recorded that could be used to identify them in any ways. During the process of administering the questionnaire, a concise paragraph was incorporated to elucidate the underlying objective of the research to the study participants.

The validity and reliability of the semi-structured questionnaire were established by preliminary testing. The questionnaire was then translated into Tamil, which is the language spoken in the area. The Kobo Collect software was used to gather all the data. The socio-demographic variables included the subjects' ages, genders, levels of education, and occupations, as well as their marital status, family income, and the type of senior living facility they resided in. The existence of major NCDs, consumption of alcohol and cigarettes, dietary patterns, sleeping patterns, medication intake, height, and weight are all examples of morbidity and personal behavior variables. The healthcare expenditure variable compiles information regarding the expenses that research participants incurred for their medical care.

The Katz index of independence of ADL was utilized in order to determine each participant's level of functional impairment. The Katz index of independence of ADL evaluates a person's ability to perform the six most fundamental daily living activities:

bathing, dressing, using the toilet, transferring, continence, and eating. The degree to which an individual is independent in each of the six functions is measured by a yes-or-no score. After tallying up all of the points, we classified the respondent's level of functioning as either full function, moderate function, or severe functional impairment. The Katz index of independence has been applied for the purpose of determining an older individual's capacity to carry out activities of daily living without assistance.

A standardized 21-item questionnaire (DASS-21) was used to assess the levels of depression, anxiety, and stress among the study participants. It is made up of three different subscales that assess stress, anxiety, and depression separately. On a scale from 0 (does not apply to me) to 3 (applies to me most of the time), the experiences of the participants were recorded using a Likert scale. The total scores on each subscale are added up, and the results are arranged according to four severity levels: mild, moderate, severe, and extremely severe. The DASS-21 has been shown to be reliable and accurate when used to assess levels of stress, anxiety, and depression in adult populations.

### Ethical consideration

Ethical approval was obtained from the institutional ethical committee of the School of Public Health, SRMIST, Kattankulathur, India 0004/IEC/2022.

### Data management and analysis

Statistical analysis was performed using SPSS version 22 (IBM Corp, NY, USA). Descriptive statistics were calculated for socio-demographics, morbidity profile, personal habits, Katz index, and DASS-21. Pearson's chi-square test was used to analyze the data at a significance level of  $P < 0.05$  to look for an association between morbidity profile and DASS-21.

## Results

Out of a total of 311 participants from 11 old age homes successfully participated in this study.

Table 1 shows the socio-demographic characteristics of the study participants. The major proportion of the study respondents are between the ages of 70–79 years old (38.6%) followed by 60–69 years (33.1%). Females were predominantly higher (63.0%) when compared with male participants. Most of the participants were staying in paid old age homes (49.8%). Almost 89.7% of the study participants belong to the Hindu religious community. About 28.3% of them have completed their secondary schooling, followed by illiterate (23.5%). Besides, 57.6% of the participants are not aware of their family income. 88.4% of them were unemployed/retired and most of the study participants were window/widowers (75.2%). Among the study participants, 77.2% of them are not having any kind of health insurance.

From Table 2 we can conclude that 54.0% of the study participants are consuming non-vegetarian and 61.1% of the

**Table 1: Socio-demographic characteristics of study participants (n=311)**

Characteristics (n=311)	Variables	Total (n)	Percentage (%)
Age	60–69	103	33.1
	70–79	120	38.6
	80–89	78	25.1
	90–99	10	3.2
Gender	Male	115	37.0
	Female	196	63.0
Type of old age home	Free	138	44.4
	Paid	155	49.8
	Semi-paid	18	5.8
Religion	Hindu	279	89.7
	Muslim	18	5.8
	Christian	14	4.5
Occupation	Agricultural labor	8	2.6
	Business/self-employed	8	2.6
	Salaried with retirement money	20	6.4
	Unemployed	275	88.4
Education	Illiterate	73	23.5
	I-V std	45	14.5
	VI-X std	88	28.3
	+2/PUC	47	15.1
	Degree/Diploma	43	13.8
	Postgraduate	11	3.5
Family Income	Professional Degree	4	1.3
	Not Known	179	57.6
	1000–1999	13	4.2
Marital status	2000 and above	119	38.3
	Married	59	19.0
	Never married	18	5.8
Possession of health insurance	Window/Widower	234	75.2
	Yes	71	22.8
	No	240	77.2

study participants are doing any sort of physical activity in their daily routine. Among the study participants, 55.6% of them were having quality sleep. 53.7% of them are staying in old age homes for more than a year and 18.6% of them are staying there for <6 months. Consumption of alcohol and tobacco was low, about 5.1% and 6.8%.

Among the study participants the prevalence of arthritis/Joint pain was higher in rate (65.3%) followed by visual impairment (65.0%), hypertension (56.9%), diabetes (54%), cataract (54.3%), CVD (35%), and stroke (16.4%) show in Table 3.

The prevalence of severe depression, anxiety, and stress (DASS) was 29.6%, 12.5%, and 21.2%, respectively. Further, the summary of the depression, anxiety, and stress scale (DASS21) has been presented in Table 4.

Among the study participants, the odds of diabetes were 2 times higher in developing symptoms of depression (OR-2.082, 95% CI: 1.225-3.888), the odds of hypertension were 4.1 times

**Table 2: Lifestyle characteristics of the study participants (n=311)**

Characteristics (n=311)	Variables	Total (n)	Percentage (%)
Alcohol consumption	Yes	16	5.1
	No	295	94.9
Tobacco consumption	Yes	21	6.8
	No	290	93.2
Food pattern	Non-veg	168	54.0
	Veg	143	46.0
Physical activity	Yes	190	61.1
	No	121	38.9
Quality of sleep	Yes	173	55.6
	No	138	44.4
Duration of stay	<6 months	58	18.6
	>6 months	36	11.6
	1 year	50	16.1
	>1 year	167	53.7

higher in developing the symptoms of depression (OR-4.116, 95% CI:2.110-8.030), and the odds of visual impairment were 1.8 times higher in developing the symptoms of depression (OR-1.810, 95% CI: 0.976-3.357). The association between diabetes, hypertension, and visual impairment with depression was statistically significant ( $P < 0.05$ ) [Table 5].

Table 6 shows the association between NCDs and anxiety among the study participants. On analysis using Pearson's chi-square test, NCDs were found to be significant with anxiety ( $P < 0.05$ ). Among the study participants diagnosed with diabetes had 3.6 times higher odds of developing anxiety compared to those without diabetes (OR-3.699, 95% CI: 2.309-5.925). Those who had hypertension were 2.3 times more likely to experience anxiety (OR-2.338, 95% CI: 1.476-3.705). The odds of experiencing anxiety were 2.2 times greater among participants with CVD (OR-2.283, 95% CI: 1.416-3.683). The odds of anxiety were 2.1 times higher among the participants with unintentional injuries (OR-2.110, 95% CI: 1.291-3.447).

Table 7 shows the association between NCDs and stress among study participants. Participants with diabetes had 2.2 times higher odds of developing stress when compared with participants without diabetes (OR-2.217, 95% CI: 1.404-3.501), and the odds of experiencing stress were found to be 3.9 times higher among the individuals with hypertension (OR-3.931, 95% CI: 2.443-6.323). The odds of developing stress were 2.2 times higher among the participants with CVD (OR-2.028, 95% CI: 1.248-3.294) and 3 times higher among the participants with stroke (OR-3.009, 95% CI: 1.503-6.007). Stress was found to be statistically significant with NCDs ( $P < 0.05$ ).

## Discussion

The current research investigates the possibility that stress, anxiety, and depression are linked to NCDs. The findings of the study indicate that participants who had diabetes, hypertension,

**Table 3: Frequency of the non-communicable disease among study participants (n=311)**

Variables		Total (n)	Percentage (%)
Diabetes	Yes	168	54.0
	No	143	46.0
Hypertension	Yes	177	56.9
	No	134	43.1
Cardiovascular disease	Yes	109	35.0
	No	202	65.0
Cancer	Yes	9	2.9
	No	302	97.1
Arthritis/Joint Pain	Yes	203	65.3
	No	108	34.7
Visual Impairment	Yes	202	65.0
	No	109	35.0
Hearing Impairment	Yes	116	37.3
	No	195	62.7
Unintentional injuries	Yes	97	31.2
	No	214	68.8
CKD	Yes	14	4.5
	No	297	95.5
Parkinson's	Yes	23	7.4
	No	288	92.6
Cataract	Yes	169	54.3
	No	142	45.7
Stroke	Yes	51	16.4
	No	260	83.4

**Table 5: Association of NCDs and depression among study participants (n=311)**

Variables	Depression		OR, 95% CI	P
	Yes	No		
Diabetes	Yes	113 (36.3%)	2.082 (1.115–3.888)	0.020*
	No	19 (6.1%)		
Hypertension	Yes	99 (31.8%)	4.116 (2.110–8.030)	0.000*
	No	14 (4.5%)		
Visual impairment	Yes	86 (27.7%)	1.810 (0.976–3.357)	0.057*
	No	23 (7.4%)		

and CVD had a significantly higher prevalence of anxiety and stress and it also shows the association between diabetes, hypertension, and unintentional injuries with depression and there is no significant association between NCDs like cancer, cataract, visual impairment, hearing impairment with DASS. According to the findings of the study, around 94.5 percent of the respondents who participated in the study are afflicted with multiple NCDs, while only 5.5 percent of them have a single non-communicable disease condition.

Among the study group of individuals who participated in our research, we discovered an association between diabetes and DASS that was statistically significant. DASS have all been linked to an increased risk of developing diabetes, according

**Table 4: Frequency distribution of DASS among the study participants (n=311)**

Characteristics	Variable	Total (n)	Percentage (%)
Depression	Normal	49	15.8
	Moderate	170	54.7
	Severe	92	29.6
Anxiety	Normal	158	50.8
	Moderate	114	36.7
	Severe	39	12.5
Stress	Normal	137	44.1
	Moderate	108	34.7
	Severe	66	21.2

**Table 6: Association of NCDs and anxiety among the study participants (n=311)**

Variables	Anxiety		OR, 95% CI	P
	Yes	No		
Diabetes	Yes	46 (14.8%)	3.699 (2.309–5.925)	0.000*
	No	97 (31.2%)		
Hypertension	Yes	50 (16.1%)	2.338 (1.476–3.705)	0.000*
	No	84 (27.0%)		
CVD	Yes	85 (27.3%)	2.283 (1.416–3.681)	0.001*
	No	117 (37.6%)		
Hearing Impairment	Yes	102 (32.8%)	0.715 (.415–1.135)	0.096
	No	93 (29.9%)		
Unintentional injuries	Yes	93 (29.9%)	2.110 (1.291–3.447)	0.003*
	No	121 (38.9%)		

to the findings of a study that was carried out in Karnataka by Parameshwari Krishna, involving diabetic patients.<sup>[14]</sup> A study done by Verma M *et al.* found that the presence of chronic diseases such as diabetes leads to DASS.<sup>[15]</sup>

Among the participants, it was found to have a substantial statistical relationship between hypertension and DASS. Similar findings have been found from a study conducted in Punjab in 2017 by Madhur Varma *et al.* found that the presence of chronic diseases like hypertension leads to DASS.<sup>[15]</sup> A study by Brinkmann B *et al.* found that there is an association between CVD and depression among the study participants.<sup>[16]</sup>

A similar conclusion was seen by Amiri M in 2018, in which the study indicated that the prevalence of joint pain was 51%.<sup>[17]</sup> Among the participants of the present study, the prevalence of arthritis/joint pain was quite frequent (65.3%). In Chennai, researchers Anitha Rani *et al.* reported that the prevalence of arthritis was 21.9%, considerably less than the current study's findings.<sup>[18]</sup> In contrast, Thakur RP *et al.* observed that the prevalence of arthritis was 44.7% among the elderly participants

**Table 7: Association of NCDs and stress among the study participants (n=311)**

Variables	Stress		OR, 95% CI	P
	Yes	No		
Diabetes				
Yes	109 (35.0%)	65 (20.9%)	2.217 (1.404–3.501)	0.001*
No	59 (19.0%)	78 (25.1%)		
Hypertension				
Yes	124 (39.9%)	50 (16.1%)	3.931 (2.443–6.323)	0.000*
No	53 (17.0%)	84 (27.0%)		
CVD				
Yes	73 (23.5%)	101 (32.5%)	2.028 (1.248–3.294)	0.004*
No	36 (11.6%)	101 (32.5%)		
Stroke				
Yes	39 (12.5%)	135 (43.4%)	3.009 (1.508–6.007)	0.001*
No	12 (3.9%)	125 (40.2%)		

in their study.<sup>[19]</sup> This demonstrates that the prevalence of arthritis/joint pain is higher among the elderly population who are staying in old age homes.

It has been found that the prevalence of visual impairment in the present study was the second biggest morbidity when compared to all other morbidities, which accounted for around 65% of the total. A study that was conducted in Chennai in 2012 by Jaiganesh D found that the prevalence of visual impairment was 64%, which is equivalent to the findings of the present study. Another study that was conducted by Thakur *et al.* found that 83.29% of the participants in their study suffered from visual impairment, which is a figure that is higher when compared with the present study.<sup>[19]</sup>

In this study, the prevalence of hypertension was found to be 56.9% among the participants, but in a previous study by Gopalakrishnan S *et al.*, the prevalence of hypertension was found to be 72.8% among the participants; however, when compared with this study, the prevalence of present was found to be lower.<sup>[13]</sup>

According to the findings of this study, the prevalence of diabetes, cataracts, and CVD was determined to be 54%, 54.3%, and 35%, respectively. A study done by Geetha K *et al.* states that the prevalence of hypertension among tribes of Tamil Nadu was found to be 16.5%.<sup>[20]</sup> In another research that was carried out in Chennai in the year 2019, by Reshmaa Shri *et al.*, the prevalence of diabetes was found to be 35%, and the prevalence of CVD was found to be only 4%.<sup>[21]</sup> In contrast to the findings of the present investigation, Raja Sakkarapani TC, observed that the prevalence of cataracts was 71%, which is substantially higher than those found in the present study.<sup>[22]</sup> Therefore, we hypothesize that the high prevalence of NCDs and mental health issues might be owing to psychological co-morbidities leading to hypertension, diabetes, and CVDs; and chronic diseases leading to psychological illnesses such as stress, anxiety, and depression. The findings of this study have substantial ramifications for the field of public health.

## Conclusion

The study revealed a high prevalence of arthritis/joint pain, visual impairment, hypertension, diabetes, cataract, cardiovascular disease, and stroke among the residents of the old age homes. There is a statistically significant association between DASS among individuals who are dealing with diabetes, hypertension, and CVDs. The findings of the study emphasize the importance of establishing specialized clinics for the elderly by the government in various health centers. These medical facilities would conduct outreach activities to screen for NCDs such as hypertension, diabetes, stroke, and cardiovascular disease in old age homes. It is important to remember that, in order to achieve better treatment outcomes, it is important to incorporate psychological intervention components in the management of chronic diseases among elderly individuals residing in old age homes. This approach can effectively address the health problems faced by this population.

## Limitations

Our study was limited by involving participants from old age home-bound elderly of the selected old age homes in Chennai, Tamil Nadu, excluding elderly participants who are residing in community settings, and hospital settings.

## Acknowledgment

We would like to express our gratitude to the participants of the study and the in-charge person, managing director of all the selected old age homes.

## Financial support and sponsorship

Nil.

## Conflicts of interest

There are no conflicts of interest.

## References

- Stein DJ, Benjet C, Gureje O, Lund C, Scott KM, Poznyak V, *et al.* Integrating mental health with other non-communicable diseases. *BMJ* 2019;364:l295.
- Dhimal M, Karki KB, Sharma SK, Aryal KK, Shrestha N, Poudyal A, *et al.* Prevalence of selected chronic non-communicable diseases in Nepal. *J Nepal Health Res Counc* 2019;17:394-401.
- Uphoff E, Pires M, Barbui C, Barua D, Churchill R, Cristofalo D, *et al.* Behavioural activation therapy for depression in adults with non-communicable diseases. *Cochrane Database Syst Rev* 2020;8:CD013461.
- Budreviciute A, Damiati S, Sabir DK, Onder K, Schuller-Goetzburg P, Plakys G, *et al.* Management and prevention strategies for non-communicable diseases (NCDs) and their risk factors. *Front Public Health* 2020;8:574111.
- WHO Noncommunicable disease key facts. Available from: <https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases>.
- Boutayeb A, Boutayeb S, Boutayeb W. Multi-morbidity of non communicable diseases and equity in WHO Eastern

- Mediterranean countries. *Int J Equity Health* 2013;12:60.
7. World Health Organization. Noncommunicable diseases progress monitor 2022.
  8. Issalillah F, Aisyah N. The elderly and the determinants of stress. *Journal of Social Science Studies (JOS3)*. 2022;2:9-12.
  9. Santrock JW, Sumiharti Y, Sinaga H, Damanik J, Chusairi A. Life-span development (Perkembangan Masa Hidup Jilid 1 (2002).
  10. Sharma SK, Nambiar D, Ghosh A. Sex differences in non-communicable disease multimorbidity among adults aged 45 years or older in India. *BMJ Open* 2023;13:e067994.
  11. Velayutham B, Kangusamy B, Joshua V, Mehendale S. The prevalence of disability in elderly in India - Analysis of 2011 census data. *Disabil Health J* 2016;9:584-92.
  12. Pan American Health Organisation, World health organization. Available from: [https://www3.paho.org/hq/index.php?option=com\\_contentandview=articleandid=9979:healthy-aging-non-communicable-diseasesandItemid=0andlang=en#gsc.tab=0](https://www3.paho.org/hq/index.php?option=com_contentandview=articleandid=9979:healthy-aging-non-communicable-diseasesandItemid=0andlang=en#gsc.tab=0). [Last accessed on 2023 May 10].
  13. Anantha Eashwar VM, Gopalakrishnan S, Umadevi R. Prevalence of hypertension and its association with psychosocial factors among old age home inmates in an urban area of Kancheepuram district, Tamil Nadu. *Int J Community Med Public Health* 2017;4:3712.
  14. Krishna P. Depression, anxiety, and stress levels in patients with type 2 diabetes mellitus. *Natl J Physio Pharm Pharmacol* 2018;8:1570.
  15. Verma M, Grover S, Tripathy JP, Singh T, Nagaraja SB, Kathirvel S, *et al.* Co-existing non-communicable diseases and mental illnesses amongst the elderly in Punjab, India. *Eur Endocrinol* 2019;15:106-12.
  16. Brinkmann B, Payne CF, Kohler I, Harling G, Davies J, Witham M, *et al.* Depressive symptoms and cardiovascular disease: A population-based study of older adults in rural Burkina Faso. *BMJ Open* 2020;10:e038199.
  17. Amiri M. Problems faced by old age people. *The International Journal of Indian* 2018;6:52-62.
  18. Rani MA, Palani G, Sathiyasekaran BW. Morbidity profile of elders in old age homes in Chennai. *Natl J Community Med* 2012;3:458-64.
  19. Thakur R, Banerjee A, Nikumb V. Health problems among the elderly: A cross-sectional study. *Ann Med Health Sci Res* 2013;3:19-25.
  20. Geetha K, Kanniammal C, Kumar D. Prevalence of hypertension among economically productive tribal population in Tamilnadu. *Indian J Public Health Res Dev* 2020;11:553-6.
  21. Shri TR, Mendez AM. Health status and quality of life of geriatric population in old age homes and living with family in Chennai a comparative study. *Int J Innov Sci Res Technol* 2019;4:860-4.
  22. Raja Sakkarapani TC. A study of morbidity profile in South Indian geriatric population in a rural community at Thiruverkadu, Thiruvallur District (Doctoral dissertation, Madras Medical College, Chennai) (2017).