

## Original Research

### Prevalence and Associated Factors of Cognitive Impairment, Depression, and Disability among Older Adults with Chronic Illnesses in Batticaloa, Sri Lanka: A Cross-sectional Study

Viranga JK, Erandi SMI, Silva KHSD, Preethimali WMA, Samarakoon HMKS, Rathnakumari KN\*, Sandakumari HS

*Faculty of Nursing, KIU, Sri Lanka*

Received: 25/05/2025  
Accepted: 05/08/2025  
Available Online: 07/08/2025

#### Abstract

Older adults with chronic illnesses are at high risk of developing depression, cognitive impairment, and disability. However, limited research has examined the interrelationships between these conditions in post-conflict regions such as Batticaloa, Sri Lanka. This study aimed to assess prevalence and associated factors of depression, cognitive impairment, and disability among older adults with chronic illnesses in Batticaloa, Sri Lanka. A descriptive cross-sectional study was conducted among 427 older adults ( $\geq 60$  years) with chronic illnesses attending follow-up clinics at Batticaloa Teaching Hospital. Validated assessment tools were used, including the Geriatric Depression Scale, the World Health Organization Disability Assessment Schedule 2.0, and the Montreal Cognitive Assessment. Descriptive statistics were used to summarise the data. Pearson's correlation was applied to assess the associations between depression, cognitive impairment, and disability. Depression was prevalent in 69% of participants, with 22% experiencing severe symptoms. Cognitive impairment and disability were observed in 68% and 86% of participants, respectively. Depression was significantly correlated with disability ( $r=0.418$ ,  $p<0.001$ ), while cognitive impairment was negatively correlated with both depression ( $r=-0.216$ ,  $p<0.001$ ) and disability ( $r=-0.305$ ,  $p<0.001$ ). This study found that depression, cognitive impairment, and disability are highly prevalent among older adults with chronic illnesses in Batticaloa, Sri Lanka. Depression was closely linked to higher levels of disability, while cognitive impairment showed weaker associations with both conditions. The findings point to an urgent need for comprehensive geriatric assessments, community-based rehabilitation programs, and caregiver support mechanisms in Sri Lanka and similar settings.

**\*Corresponding author:**  
Rathnakumari KN  
Tel: +94 767214424  
Email: [nirosha@kiu.ac.lk](mailto:nirosha@kiu.ac.lk)

**Keywords:** *Aging population, Post-conflict settings, Functional impairment, Geriatric mental health, Functional impairment*

## Introduction

Global health has undergone a significant transition over the past century, shifting from a predominance of infectious diseases to a growing burden of non-communicable diseases. This change in the epidemiology of disease prevalence has been driven by advancements in medical technology, improvements in public health policies, and overall demographic changes in recent years, leading to an increased prevalence of chronic illnesses among older populations [1]. Chronic illnesses such as diabetes, cardiovascular disease, and stroke not only compromise physical health but also negatively impact mental health, contributing to conditions such as depression, cognitive decline, and disability [2]. These adverse effects of chronic illnesses can lead to a loss of independence, a reduced quality of life, and an increased burden on healthcare systems.

As these chronic illnesses may contribute to chronic pain, reduction in mobility, which leads to impairments in functionality, which will ultimately affect individuals' psychological wellbeing. Individuals with chronic illnesses have been reported to have a higher prevalence of depression in ranges between 9.3% and 25% especially those who are diagnosed with hypertension, coronary artery disease, and diabetes [3,4]. As research suggested, depression was associated with a higher risk for cardiovascular risk, which can be both a cause and consequence of cognitive decline and disability [5].

Sri Lankan research highlights the increased prevalence of depression, cognitive impairment,

and disability among older adults. When it comes to Jaffna, it has shown that 44.3% of the prevalence of depression, in Galle it is 76% and 31.7% Kandy. Further, the research conducted on disability in Jaffna showed 95.9% of disability prevalence, and in Kegalle, 10% of the older adults reported having difficulties in activities of daily living. Other than that, cognitive impairments are also a pressing concern among this population, where in Jaffna 67.7% [6] reported, and in Galle 80.3% of the individuals reported it. All the higher prevalence suggests that older individuals have higher rates of depression, disability, and cognitive impairment, which can further interfere with their daily living.

As a part of Sri Lanka, which has undergone and been affected by conflict situations and due to that experiencing frequent displacements, bereavements, and also facing numerous socioeconomic problems [9], the Batticaloa District, located in eastern Sri Lanka, remains an underexplored context for examining and assessing these factors. These factors can contribute to increased vulnerability of the individuals residing in this area. Further, the existing literature does not provide any evidence from the Batticaloa District and the interconnection between these different variables. Therefore, this study aimed to assess the prevalence and associated factors of depression, cognitive impairment, and disability among older adults with chronic illnesses attending the follow-up clinic in Batticaloa, Sri Lanka.

## Methods

This was a descriptive cross-sectional study. It was approved by the Ethics Review Committee of KIU University (KIU\_ERC\_2024\_410), and institutional approval was also obtained from the hospital. The study was conducted in the medical follow-up clinics at Batticaloa Teaching Hospital, located in the Batticaloa District of Eastern Province, Sri Lanka from August 24 to September 24, 2024. This area presents unique healthcare challenges that significantly impact patient experiences and medical outcomes, as it is an area affected by conflict.

Sample size was calculated using Daniel's formula [10]. The minimum required sample size was 427. Inclusion criteria included the participants of 60 years or older, diagnosed with chronic illnesses for over one year according to medical records, residing in the Batticaloa District, and willing to provide informed voluntary written consent. Individuals with severe sensory impairments or psychiatric disorders were excluded from the study based on clinical records and a basic assessment. The research team developed an interviewer-administered questionnaire including three sections. The questionnaire sought data on demographic information; age, gender, marital status, living arrangements, educational background, and duration of illness etc. The 15-item Geriatric Depression Scale [11], the 12-item World Health Organization Disability Assessment Schedule 2.0 [12], and the Montreal Cognitive Assessment [13] were also used for the study.

The Geriatric Depression Scale has been translated [14] and validated [15] for local use. Previous studies have reported strong reliability

for this scale, with Cronbach's alpha of  $\alpha = .73$  [11]. The Geriatric Depression Scale uses a scoring system that ranges from 0 to 15 points. Scores between 0 and 4 were considered normal, indicating the absence of significant depressive symptoms. A score between 5 and 8 represented mild depression. Scores from 9 to 11 signify moderate depression, whereas scores between 12 and 15 are categorized as severe depression.

The Montreal Cognitive Assessment demonstrated exceptional specificity and sensitivity in detecting mild cognitive impairment among the elderly population. This tool has been translated into both Sinhala [16] and Tamil [17]. Previous studies have reported strong reliability for this scale, with Cronbach's alpha of  $\alpha = .81$  [16]. Scores of 24 or higher indicate normal cognitive function. Conversely, scores of 23 or lower were classified as representing abnormal cognitive function, which may suggest potential cognitive impairment.

The World Health Organization Disability Assessment Schedule 2.0 was validated within Sri Lanka, with translations performed in Sinhala and Tamil [6]. Previous studies have reported strong reliability for this scale, with Cronbach's alpha of  $\alpha=0.92$  [18]. The World Health Organization Disability Assessment Schedule presents a five-point categorization of disability. The first level represented no difficulty in functioning. The second level indicated mild difficulty. Moderate difficulty is characterized by a third level. The fourth level signifies severe difficulty. The fifth level represents extreme or complete difficulties in functioning.

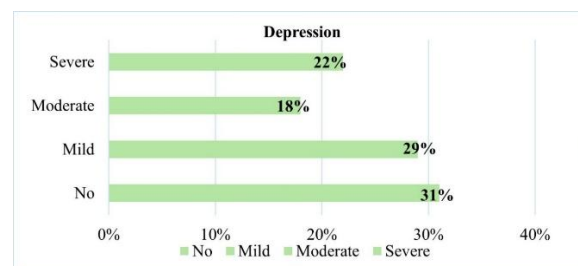
Statistical analysis was conducted using SPSS version 25.0 (IBM, New York, United States). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarise the demographic, clinical characteristics, and the prevalence of depression, disability, and cognitive impairment. For inferential statistics, Pearson's correlation coefficients were employed to assess the relationships between depression, cognitive impairment, and disability. The significance level of  $p < 0.05$  was considered statistically significant.

## Results

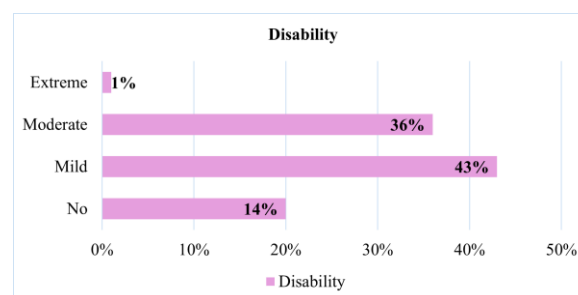
The study included 427 participants with a mean $\pm$ SD age of 67 $\pm$ 6 years, ranging from 60 to 85 years. Females constituted the majority at 67% (n=287). Most participants were married (70%, n=300) and had completed secondary education (38%, n=161). A majority lived with family (75%, n=322), attended the clinic alone (64%, n=271), and traveled 5–20 kilometers to the hospital (62%, n=263). The mean $\pm$ SD duration of chronic illness was 10 years ( $\pm$ 8), with a median of 9 years (IQR: 5–15). Hypertension (56%, n=238) and diabetes mellitus (53%, n=227) were the most prevalent chronic conditions, followed by Chronic Obstructive Pulmonary Disease (13%, n=55) and asthma (7%, n=29). (Table 01)

Among the participants, 69 % (n=291) reported depressive symptoms, categorized as mild (29%, n=124), moderate (18%, n=75), and severe (22%, n=92) (Figure 1). Disability was prevalent among 86% (n=369) of the participants, classified as mild (43%, n=185), moderate (36%, n=152), severe (7%, n=29), and extreme (0.7%, n=3) (Figure 2). As Figure 3 indicates, cognitive

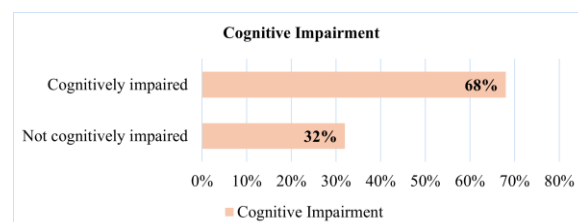
impairment was identified in 68% (n=291) of participants.



**Figure 1** Prevalence of the levels of depression



**Figure 2** Prevalence of the levels of disability



**Figure 3** Prevalence of cognitive impairment

**Table 01** Demographic details of the participants (n=427)

| Type                   | n (%)         |
|------------------------|---------------|
| Mean age ( $\pm$ SD)   | 67 ( $\pm$ 6) |
| <b>Gender category</b> |               |
| Male                   | 140 (33)      |
| Female                 | 287 (67)      |
| <b>Marital status</b>  |               |
| Single                 | 42 (10)       |
| Married                | 300 (70)      |
| Widowed                | 73 (17)       |
| Separated              | 12 (3)        |

|                                              |          |
|----------------------------------------------|----------|
| <b>Educational level</b>                     |          |
| No formal education                          | 98 (22)  |
| Primary education                            | 139 (33) |
| Secondary education                          | 161 (38) |
| Tertiary education                           | 29 (7)   |
| <b>Living arrangements</b>                   |          |
| Alone                                        | 102 (24) |
| With family                                  | 322 (75) |
| Other                                        | 3 (1)    |
| <b>With whom patients come to the clinic</b> |          |
| Alone                                        | 271 (64) |
| With family                                  | 156 (36) |
| <b>Distance traveling to the hospital</b>    |          |
| Less than 05 km                              | 92 (22)  |
| 5-20 km                                      | 263 (62) |
| More than 20 km                              | 72 (16)  |
| <b>Disease characteristics</b>               |          |
| Hypertension                                 | 238 (56) |
| Diabetes Mellitus                            | 227 (53) |
| COPD                                         | 55 (13)  |
| Asthma                                       | 29 (7)   |
| Chronic Illness Duration Mean±SD             | 10 (±8)  |

**Table 02** Pearson's Correlation Coefficients among Disability (DIS), Depression (Dep), and Cognitive Impairment (CI) Levels

|                  | <b>Dis Level</b> | <b>Dep Level</b> | <b>CI Level</b> |
|------------------|------------------|------------------|-----------------|
| <b>Dis Level</b> | 1                |                  |                 |
| <b>Dep Level</b> | .418**           | 1                |                 |
| <b>CI Level</b>  | -.305**          | -.216**          | 1               |

\*\* Correlation is significant at the 0.01 level (2-tailed).

Among the sociodemographic factors, age showed significant positive correlations with depression ( $r=0.451$ ,  $p<0.001$ ) and disability ( $r=0.277$ ,  $p<0.001$ ), while demonstrating a weak

negative correlation with cognitive impairment ( $r=-0.177$ ,  $p<0.001$ ). Regarding disease-specific factors, hypertension was negatively correlated with both disability ( $r=-0.244$ ,  $p<0.001$ ) and cognitive impairment ( $r=-0.291$ ,  $p<0.001$ ), possibly suggesting that individuals with well-managed hypertension may experience fewer limitations in these domains. Additionally, the duration of chronic illness was positively correlated with depression ( $r=0.216$ ,  $p<0.001$ ) and disability ( $r=0.130$ ,  $p=0.007$ ), highlighting the cumulative psychological and functional burden associated with long-term illnesses.

## Discussion

The study involved 427 participants with a mean age of 67 years, the majority of whom were female. Most participants were married and had completed secondary education. A significant proportion of participants lived with family and traveled between 5 and 20 kilometers to reach the hospital. Hypertension and diabetes mellitus were the most prevalent disease conditions, with a mean duration of illness of 10 years. Further, this study identified a higher proportion of individuals who had undergone depression, disability, and cognitive impairment. Further, cognitive impairment showed a negative correlation with both depression and disability. Other than that, sociodemographic factors like age, marital status, and disease-related factors like illness duration were further found to have an association with these three variables.

The higher prevalence of depression (69%), identified in this study, can be due to the different factors in relation, such as chronic illnesses, sociodemographic factors, which can ultimately

increase the burden among the individuals. This finding aligns with the common statement that individuals with chronic illnesses are prone to depression [19], which can be influenced by various factors. These findings are also consistent with the other studies related to Sri Lanka. For instance, a study conducted in Jaffna showed a depression rate of 44% [6], and in Galle, reporting 76% and further in Kandy, it has been reported as 31.7%. These differences in the rates of depression among individuals can be due to healthcare accessibility and the socio-cultural aspects of the region.

The higher prevalence of reported cognitive impairment observed (68%) may be due to the interaction between cognitive decline as a result of aging and chronic health conditions. Similarly, 67.4% of the prevalence of cognitive impairment was reported in Jaffna [6], and in Galle it was reported as 80.3% [7]. These findings highlight that cognitive impairment is a common issue among older individuals with chronic illnesses, highlighting the role of chronic illnesses in increasing cognitive decline.

In this study 86% of the individuals reported some level of disability, which indicates a higher prevalence of impairment in functional abilities among the studied population. As per the previous studies, which were conducted, in Jaffna it reported that disability levels among the elderly were as high as 95.9%, reflecting a profound degree of dependence on daily functioning [6]. Further, another study reported 86.4% of participants had any form of disability, giving insights into the caregiver burden and higher psychosocial impact on individuals [20].

There was a significant positive correlation observed between depression and disability, and these findings are similar to the previous studies, which have shown that depression symptoms can increase functional disability among older adults. Research has demonstrated that depression in elderly individuals can contribute to functional impairment, particularly in those with chronic conditions, as depression often leads to decreased motivation, lack of energy, and poor health behaviors [15]. Similarly, a study found that depressive symptoms significantly increased the risk of disability among elderly populations, further supporting the present findings [21].

Age significantly influenced the mental and physical health outcomes of the participants. A positive correlation was observed between older age and both depression ( $r=0.451$ ,  $p<0.000$ ) and disability ( $r=0.277$ ,  $p<0.000$ ), consistent with the established decline in physical and mental health that accompanies aging [22]. These associations suggest that as individuals grow older, they may experience greater emotional distress and physical limitations, potentially due to accumulating health conditions, reduced mobility, social isolation, and the psychosocial stressors linked to aging. Interestingly, there was a weak negative correlation between age and cognitive impairment ( $r= -0.177$ ,  $p<0.000$ ), indicating that older participants were somewhat less likely to exhibit severe cognitive impairment. This could be due to several factors, such as survival bias where individuals with preserved cognitive function are more likely to live into older age.

In terms of disease-specific factors, hypertension demonstrated a negative correlation with both disability and cognitive impairment. These

findings indicate that effective management of hypertension may help reduce the risk of functional and cognitive decline [23]. Prior research supports this notion, showing that controlling blood pressure can slow the progression of cognitive impairment and physical disability in elderly patients [24]. Furthermore, the positive correlations between the duration of chronic illness and both depression ( $r=0.216$ ,  $p<0.000$ ) and disability ( $r=0.130$ ,  $p=0.007$ ) emphasize the cumulative psychological [25] and physical burdens [26] associated with long-term illnesses. This underscores the importance of early intervention and ongoing care to effectively manage these complex conditions.

A notable strength of this study is its focus on a conflict-affected region, which provides critical insight into the psychological and functional health challenges of an underserved and often overlooked population. The study contributes to the limited body of evidence on how sociodemographic and disease-specific variables relate to mental health outcomes such as depression, disability, and cognitive functioning in this unique context. The use of standardized and validated measurement tools enhances the reliability of the findings, while the relatively large sample size improves the statistical power and generalizability of the results within the studied area.

However, the study also has several limitations. The cross-sectional design restricts the ability to establish causality between the observed variables. The use of a convenience sampling method may introduce selection bias and limit the generalizability of the findings beyond the selected regions. Additionally, although efforts

were made to include Tamil-speaking participants, language barriers and cultural differences may have influenced the accuracy of self-reported responses. Lastly, the reliance on self-report questionnaires could be subject to recall bias and social desirability bias, particularly in assessing sensitive topics such as mental health. Future studies employing longitudinal designs and more representative sampling strategies are recommended to confirm these findings and better understanding of the temporal relationships among chronic illness, psychological wellbeing, and functional status in conflict-affected settings.

## Conclusion

This descriptive cross-sectional study highlighted the high prevalence of depression (69%), disability (86%), and cognitive impairment (68%) among older adults with chronic illnesses attending follow-up clinics in the Batticaloa District. The findings revealed notable associations between depression and disability, as well as inverse relationships between cognitive impairment and both depression and disability. Increasing age and longer illness duration were significantly associated with greater levels of depression and disability. Moreover, sociodemographic factors such as gender and living arrangements were found to be related to severe depression. The observed associations underscore the importance of further longitudinal and interventional research to explore the underlying mechanisms and potential strategies to support psychological and functional wellbeing in this population.

### Funding statement

The authors received no financial support for the research, authorship, and/or publication of this article.

### Ethical considerations

This study was approved by the Ethics Review Committee of KIU University (KIU\_ERC\_2024\_410) on September 19, 2024

### Declaration of conflicting interest

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Author contributions

KNR and HSS supported the study design and provided contextual and methodological insights during data interpretation. KNR and HSS were involved in the overall study conception and design, oversight of study implementation, and provision of methodological guidance to field coordinators. KNR critically revised the manuscript for intellectual content. JKV, SMIE, KHSDS, WMAP, and HMKSS were responsible for data collection. KNR and HSS facilitated access to the data collection settings. All authors read and approved the final manuscript.

### References

1. Izquierdo M, Merchant RA, Morley JE, *et al.* International Exercise Recommendations in Older Adults (ICFSR): Expert Consensus Guidelines. *The journal of nutrition, health & aging.* (2021);25(7):824-853 <https://doi.org/10.1007/s12603-021-1665-8>
2. Pacholko A, Iadecola C. Hypertension, Neurodegeneration, and Cognitive Decline. *Hypertension.* (2024);81(5):991-1007
3. Ingle VK, Pandey I, Singh AR, Pakhare A, Kumar S. Screening of Patients with Chronic Medical Disorders in the Outpatient Department for Depression Using Handheld Computers as Interface and Patient Health Questionnaire-9 as a Tool. *International Journal of Applied and Basic Medical Research.* (2017);7(2) <https://doi.org/10.1161/HYPERTENSIONAH.A.123.21356>
4. Zhang Y, Chen Y, Ma L. Depression and cardiovascular disease in elderly: Current understanding. *Journal of Clinical Neuroscience.* (2018);47:1-5 <https://doi.org/10.1016/j.jocn.2017.09.022>
5. Sohani ZN, Samaan Z. Does Depression Impact Cognitive Impairment in Patients with Heart Failure? *Cardiology Research and Practice.* (2012);2012(1):524325 <https://doi.org/10.1155/2012/524325>
6. Sivayokan B, Somasiri NC, Maheswaran T, *et al.* Depression, Disability, and Cognitive Impairment Among Elders With Medical Illnesses Attending Follow-Up Clinics at a Tertiary Care Hospital in Northern Sri Lanka. *Cureus.* (2022);14(12):e32379 <https://doi.org/10.7759/cureus.32379>
7. Abeysekera NWBY, De Zoysa E. Higher prevalence of geriatric depression, catastrophizing pain and sleep disorders in institutionalized elders: a cross-sectional study in Galle District, Sri Lanka. *BMC Geriatrics.* (2021);21(1):685 <https://doi.org/10.1186/s12877-021-02536-9>
8. Khaltar A, Priyadarshani NG, Delpitiya NY, Jayasinghe C, Jayasinghe A, Arai A, Tamashiro H. Depression among older people in Sri Lanka: With special reference to ethnicity. *Geriatrics & Gerontology International.* (2017);17(12):2414-2420 <https://doi.org/10.1111/ggi.13090>
9. Siriwardhana C, Wickramage K. Conflict, forced displacement and health in Sri Lanka: a review of the research landscape. *Conflict*

- and Health. (2014);8(1):22  
<https://doi.org/10.1186/1752-1505-8-22>
10. Daniel WW, Cross CL. *Biostatistics: a foundation for analysis in the health sciences*. John Wiley & Sons; (2018).
  11. Yesavage JA, Sheikh JL. 9/Geriatric Depression Scale (GDS). *Clinical Gerontologist*. (1986);5(1-2):165-173  
[https://doi.org/10.1300/J018v05n01\\_09](https://doi.org/10.1300/J018v05n01_09)
  12. Üstün TB, Chatterji S, Kostanjsek N, *et al.* Developing the World Health Organization disability assessment schedule 2.0. *Bulletin of the World Health Organization*. (2010);88:815-823
  13. Nasreddine ZS, Phillips NA, Bédirian V, *et al.* The Montreal Cognitive Assessment, MoCA: A Brief Screening Tool For Mild Cognitive Impairment. *Journal of the American Geriatrics Society*. (2005);53(4):695-699  
<https://doi.org/10.1111/j.1532-5415.2005.53221.x>
  14. Sarkar S, Kattimani S, Roy G, Premarajan KC, Sarkar S. Validation of the Tamil version of short form Geriatric Depression Scale-15. *J Neurosci Rural Pract*. (2015);6(3):442-446  
<https://doi.org/10.4103/0976-3147.158800>
  15. Kulathunga M, Umayal S, Somaratne S, Srikanth S, Kathirarachchi S, De Silva K. Validation of the Geriatric Depression Scale for an elderly Sri Lankan clinic population. *Indian Journal of Psychiatry*. (2010);52(3):254-256  
<https://doi.org/10.4103/0019-5545.70979>
  16. Karunaratne S, Hanwell R, De Silva V. Validation of the Sinhala version of the Montreal Cognitive Assessment in screening for dementia. *Ceylon Medical Journal*. (2011);56(4):147-153
  17. Coonghe P, Fonseka P, Sivayokan S, Kesavaraja A, Malhotra R, Ostbye T. Adaptation and Validation of the Tamil (Sri Lanka) Version of the Montreal Cognitive Assessment (MOCA). *Kalyani: Journal of the University of Kelaniya*. (2019);33(1-2):1-14
  18. Abidin E, Seet V, Jeyagurunathan A, *et al.* Validation of the 12-item World Health Organization Disability Assessment Schedule 2.0 in individuals with schizophrenia, depression, anxiety, and diabetes in Singapore. *PloS one*. (2023);18(11):e0294908  
<https://doi.org/10.1371/journal.pone.0294908>
  19. Sodhi B, Malik M, Agarwal P, Basu S. The prevalence and predictors of depression and disability in older adults and elderly patients with Diabetes in India: Cross-sectional analysis from the Longitudinal Study on Ageing. *Diabetes & Metabolic Syndrome: Clinical Research & Reviews*. (2023);17(4):102765  
<https://doi.org/10.1016/j.dsx.2023.102765>
  20. Farrell AF, Krahn GL. Family Life Goes On: Disability in Contemporary Families. *Family Relations*. (2014);63(1):1-6  
<https://doi.org/10.1111/fare.12053>
  21. Buss SS, Aponte Becerra L, Trevino J, Fortier CB, Ngo LH, Novak V. Depressive symptoms exacerbate disability in older adults: A prospective cohort analysis of participants in the MemAID trial. *PloS one*. (2022);17(11):e0278319  
<https://doi.org/10.1371/journal.pone.0278319>
  22. Bekić S, Babić F, Filipčić I, Trtica Majnarić L. Clustering of Mental and Physical Comorbidity and the Risk of Frailty in Patients Aged 60 Years or More in Primary Care. *Med Sci Monit*. (2019);25:6820-6835  
<https://doi.org/10.12659/msm.915063>
  23. Theofilis P, Doumani G, Tsatsani G-C, *et al.* The Role of Hypertension in Cognitive Dysfunction. *Journal of Clinical Medicine*. (2024);13(19):5979
  24. Aronow WS. Managing Hypertension in the elderly: What's new? *American Journal of Preventive Cardiology*. (2020);1:100001  
<https://doi.org/10.1016/j.ajpc.2020.100001>

- 
25. Buvneshkumar M, John KR, Logaraj M. A Study on Prevalence of Depression and Associated Risk Factors among Elderly in a Rural Block of Tamil Nadu. *Indian Journal of Public Health*. (2018);62(2):89-94  
[https://doi.org/10.4103/ijph.IJPH\\_33\\_17](https://doi.org/10.4103/ijph.IJPH_33_17)
  26. Sowmiya K, Kumar PG, Nagarani N. A study on prevalence and correlates of functional disability among the elderly in rural Tamilnadu. *International Journal of Medical Research & Review*. (2015);3(4):430-435  
<https://doi.org/10.17511/ijmrr.2015.i4.086>