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NEWS & VIEWS

ANNOUNCEMENT

The Indian Gerontological Association is thrilled to introduce a pioneering book, 'Challenges in Gerontological Care,' edited by K.L.Sharma and Sandra P.Hirst. The 27 articles delve into a wide range of topics, offering practical strategies to address the diversity of vulnerability in older adults, help them maintain their diminished reserve, and improve their well-being in the last phase of their lives. These strategies will equip you with the necessary tools to provide the best care for older adults. The book discusses the challenges and required nursing care, family care, and tertiary care, emphasising demographic and other influences on the availability of family, social, and governmental support. It also promotes healthy lifestyles and the acquisition of coping skills, strong family and social ties, and active interests to develop reserves and ensure they are strong in later life. The book also provides interventions to develop compensatory supports, including access to stable housing, good acute care and rehabilitation when needed, substitute professional social and psychological help in times of crisis, long-term assistance, and income support. Policy initiatives to reduce vulnerability are also discussed, ensuring that adults reach later life with 'reserve,' thereby reducing the challenges they face later in life."With its in-depth exploration of the challenges in gerontological care, this book has the potential to ignite a significant revolution in the field. It will be an invaluable resource for geriatric nurses, social workers, healthcare professionals, and gerontologists, providing them with the knowledge and strategies to better serve older adults. We are confident that you will find this edition both engaging and enlightening, and we hope it inspires you to be part of this revolution in gerontological care.

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Impact of Temperature and Flow Characteristics of Aquatic Environment on Body Balance in Adult Zebrafish

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ABSTRACT

Postural correction and balance improvement are considered effective strategies for enhancing balance in the geriatric population. This experimental study, which provides crucial insights into the water temperature range for maintaining motor activity in adult zebrafish, is of significant importance. The findings, a water temperature of 31.2–33.8 °C and a flow rate of 5.5–11.9 cm/s, not only support other studies performed on older animals but also pave the way for further research. These findings shed light on the potential of hydrotherapy, specifically in the form of an underwater treadmill, to improve balance in older adults, thereby contributing significantly to the advancement of geriatric care. This new knowledge will enlighten researchers, clinicians, and students interested in aquatic therapy, gerontology, and animal models, and underscores the importance of their work.

Keywords : Hydrotherapy, Underwater Treadmill, Animal Model, Balance Improvement, Older Adults

According to WHO (2007) reports, approximately 28–35% of people aged 65 years and older, and 32–42% of those aged 70 years and older, experience a loss of balance that leads to an accidental fall. The high prevalence of falls can have serious consequences on the quality of life of older people, resulting in prolonged hospitalisation, higher economic cost, institutionalisation, need for care, social isolation, anxiety, and depression (Xing *et al.*, 2023). Therefore, the inclusion of therapies and exercises that aim at improving the balance and posture of elderly adults is important (Di Lorito *et al.*, 2021). Hydrotherapy, also known as aquatic therapy, is considered an emerging intervention for improving balance in older adults (Jakovljevic & Vauhnik, 2011) due to its several hydrodynamic properties (Muñoz *et al.*, 2019). Among the several forms of hydrotherapy, the underwater treadmill is the most recent type of aquatic exercise (Denning *et al.*, 2010). However, to better understand the biophysical basis of hydrotherapy in improving balance, aquatic animal models, such as fish, may be used in research. Among the several fish models, the zebrafish, a freshwater fish commonly found in rivulets, is considered an important model for studying ageing, disease, and repair of the nervous system, as well as other degenerative neuromuscular disorders (De Groef *et al.*, 2015; Abou-Dahech & Williams, 2024). The balance system includes visual, musculoskeletal, sensory–somatic, and vestibular control (MacKinnon, 2018). In the case of aquatic organisms, the rheotactic response, which is the tendency to swim in a direction opposite to that of the water flow, is one such multi-sensory reflexive behaviour that involves visual, vestibular, hydromechanical, and proprioceptive cues (Burbano *et al.*, 2021; Coombs *et al.*, 2020).

In our study, we developed an artificial water-flow swim tunnel, designed to mimic an underwater treadmill, to investigate the influence of specific water parameters on the postural orientation of adult zebrafish. This innovative approach enabled us to gain valuable insights into the potential mechanisms by which hydrotherapy can improve body balance in older adults.

Methodology

For this experimental study, researchers housed healthy adult zebrafish in a laboratory facility constructed in accordance with the guidelines of the CCSEA, New Delhi. The fish were fed three times daily with dry food pellets, and the water conditions in their housing were maintained according to standard guidelines. Importantly, our experimental procedure was approved by the IAEC-ISI, ensuring the ethical conduct of our research.

The artificial water flow swim tunnel (Fig. 1) was developed using a two-sided, open glass cylinder confined by safety nets (Bhattacharya *et al.*, 2025a). One of the extremities of the tunnel was attached to an underwater vacuum pump, fixed to the short wall of a rectangular glass chamber, for creating an artificial water-flow medium. The flow rate of water within the tunnel was manually regulated by adjusting the pressure difference between the inlet and outlet of the channel (connector pipe) attached to the vacuum pump (Bhattacharya *et al.*, 2025b).

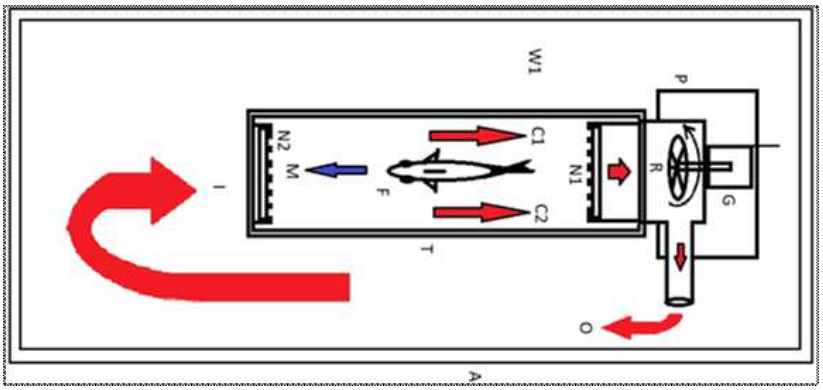

Fig. 1 : *The schematic representation of the artificial water flow swim tunnel for fish resembles an underwater treadmill*

A – Bath chamber, W1 – circulating water, P–underwater vacuum pump, G - motor, R – rotary blades, O – pump outlet, I – pump inlet, C1-C2 – direction of water flow, F – fish, M – fish swimming direction, T – artificial water flow swim tunnel, N1-N2 – safety nets

The water parameters used for the study included a combination of both physical and hydrodynamic factors. The physical factor included water temperature, and the hydrodynamic factor included flow velocity (the rate of water flow within the tunnel). From the flow velocity, the nature of the water flow, i.e., laminar or turbulent, was computed in terms of the Reynolds number.

The study was performed on 10 healthy adult zebrafish of mixed gender. To assess the water temperature range for maintaining motor activity, five adult fish were used. Similarly, to analyse the optimal range of water flow rate, another five adult fish were chosen. The experiments were performed during the daytime.

The effect of the selected parameters on the postural orientation of the animal model was studied in terms of positive rheotactic response (fish swimming in a direction opposite to that of water flow). The whole experiment was recorded using a camera. The alignment and position of the fish within the cylindrical tunnel, along the X-axis, were later tracked from the video recordings, using animal tracker software.

Results

The mean value of the water temperature (°C) was found to be 32.94 ± 0.918, and that of water flow rate ($cm.s^{-1}$) was 8.618 ± 2.089. The optimum rangeof physical and hydrodynamic parameters for circulating water, necessary to maintain proper balance, posture, and orientation of the model fish, is represented in Table 1.

The ability of the fish to maintain the postural orientation was noted from the X-axis position of the fish inside the swimming tunnel. It was found that, beyond the optimum range of water temperature and flow rate, the fish failed to maintain their normal postural orientation.

Table 1

The optimum range of the water parameters for the maintenance of postural orientation of the model fish

Water Parameters	Optimum Range
Temperature (°C)	31.2 – 33.8
Flow rate ($cm.s^{-1}$)	5.5 – 11.9
Reynolds Number (computed)	1371 – 2966

Discussion

Postural control and balance are key factors that regulate daily life activities of humans across all age groups, from toddlers to elderly adults (Punakallio, 2003). In terms of biomechanics, balance can be defined as the ability to maintain body equilibrium while sustaining optimal levels of stability (Kovacevic *et al.*, 2024). Recent studies have reported that aquatic therapy significantly improves dynamic balance in the human population aged 60 years and above (Jain *et al.*, 2022). It is becoming increasingly evident that the prevalence of balance disorders in the elderly population is relatively high and rises with age (Wang *et al.*, 2024). It has already been reported that older adults are more susceptible to degenerative diseases that affect motor and sensory functions like Parkinson's, sclerosis, osteoarthritis, age-related bone loss (like osteoporosis) and so on (Chou *et al.*, 2023). Apart from this, stroke is another common disease affecting the geriatric population, which is associated with physical disabilities like abnormal gait and limb function (Yoo *et al.*, 2014). Thus, several factors contribute to the increased risk of falls and loss of balance in the geriatric population.

Some studies conducted in the recent past have discussed the several benefits of using the underwater treadmill. It is considered a low-impact yet high-resistance form of exercise due to its various hydrodynamic characteristics, such as temperature, viscosity, surface tension, hydrostatic pressure, turbulence, buoyancy, and drag force (Timothy, 2020; Conners *et al.*, 2019; Muñoz *et al.,* 2019; Yoo *et al.*, 2014). Studies have also shown that water-based

exercises (WBE) are more effective than land-based exercises (LBE) because they carry a lower risk of traumatic fracture and apply less stress to weight-bearing joints due to the buoyancy and viscosity of water (Simas *et al.*, 2017; Song & Oh, 2022). Hydrotherapy for the elderly is also considered to have a positive influence on pain, muscle strength and quality of life (Mooventhan & Nivethitha, 2014). Studies have also highlighted the efficacy of aquatic therapy in improving dynamic gait mechanicsin older adults (Zafer *et al.*, 2025). Most studies on underwater treadmills have reported the xiphoid process or metasternum as the optimal anatomical position for achieving the highest water levelin older adults (Lim, 2020; Yoo *et al.*, 2014).

The temperature of water is considered a crucial factor in aquatic therapy because it influences the tonicity of muscles. It is known that a reduced water temperature increases muscle tone, resulting in stiffening. Whereas, increased temperature reduces muscle tone and increases flexibility (Nakano *et al.*, 2012; Yoo *et al.*, 2014). In the present study, for the fish model, the optimal water temperature range as observed was 31.2 – 33.8 °C, during which the animals could maintain normal postural orientation inside the swim tunnel of the fabricated arrangement, but beyond the range, they faced difficulty in maintaining normal balance as observed in the recordings; the finding is similar to that of other studies conducted on human subjects, where they have reported a water temperature of 32 – 34 °C, suitable for functional aquatic training exercises (Lim, 2020; Stevens *et al.*, 2015; Mooventhan & Nivethitha, 2014; Yoo *et al.*, 2014), for body balance improvement.

Apart from temperature, the rate of water flow is another important parameter that indicates water turbulence (jet streaming) and influences the walking speed of the individual undergoing aquatic treadmill training (Meredith *et al.*, 2011). In the study, the optimal range of water flow rate for the model animal was found to be 5.5–11.9 cm/s. The increased velocity of water flow within the underwater treadmill arrangement provides better resistance

to the subject and may be beneficial in improving balance and muscle strength in older adults (Kauffman *et al.*, 2014). Studies on human subjects have demonstrated that gait training in an underwater treadmill with water-jet resistance not only improves static and dynamic balance but also helps in postural correction (gait abilities) in elderly patients with gait abnormalities suffering from chronic stroke (Lim, 2020). The utility of the present work lies in its ability to decipher the mechanism underlying the benefits obtained from undergoing hydrotherapy by older adults with an increased risk of falls. This population is growing at an alarming rate, with India being no exception. Thus, based on the study findings using the fish model, it can be noted that maintaining a water temperature of 31.2–33.8 °C and a flow rate of 5.5–11.9 cm/s may provide a suitable hydrodynamic environment for the underwater treadmill. In the future, we plan to fabricate an underwater treadmill for testing its efficacy in improving balance in older adults under laboratory conditions.

Conclusion

It has been noted that, within a specific temperature range and flow rate of the immediate aquatic environment, organisms can maintain body balance, which is crucial for preventing falls in older adults. Beyond the range, there is deterioration in balance. The findings align with earlier reports, based on studies conducted on human models. Hence, it may be concluded that maintaining the optimal range of temperature and flow rate is crucial for older adults who decide to engage in swimming and other exercises in an aquatic environment. The effectiveness of the experimental set-up is also found to be satisfactory. The caveat remains that additional experiments with repetitions may be conducted to strengthen the results.

References

Abou-Dahech, M. S., & Williams, F. E. (2024). Aging, age-related diseases, and the zebrafish model. *J. Demen. Alzheimer's Dis.*, *1*(1), 48–71.

Bhattacharya B, Roy S, Bal B, Mukherjee S, Ghosh K. (2025a). Effect of Short-term Exposure to Momentary DC electrical field on Orientation Reflex of Fish. *Goya.*, 18(3), 24-30.

Bhattacharya B, Roy S, Bal B, Mukherjee S, Ghosh K. (2025b). Effect of Short-term Exposure to Momentary DC electrical field on Orientation Reflex of Fish. *Sci and Cult.*, 91(7-8), 466–470.

Burbano-L, D. A., & Porfiri, M. (2021). Modeling multi-sensory feedback control of zebrafish in a flow. *PLoS Comput. Biol.*, *17*(1), e1008644.

Chou, S. M., Yen, Y. H., Yuan, F., Zhang, S. C., & Chong, C. M. (2023). Neuronal senescence in the aged brain. *Aging Dis.*, *14*(5), 1618.

Conners, R. T., Caputo, J. L., Coons, J. M., Fuller, D. K., & Morgan, D. W. (2019): Impact of underwater treadmill training on glycemic control, blood lipids, and health-related fitness in adults with type 2 diabetes. *Clin. Diabetes*, *37*(1), 36–43.

Coombs, S., Bak-Coleman, J., & Montgomery, J. (2020). Rheotaxis revisited: a multi-behavioral and multisensory perspective on how fish orient to flow. *Journal of Experimental Biology*, *223*(23), jeb223008.

Denning, W. E., Bressel, E., & Dolny, D. G. (2010). Underwater treadmill exercise as a potential treatment for adults with osteoarthritis. *Int. J. Aquatic Res. Edu.*, *4*(1), 9.

De Groef, L., Dekeyster, E., & Moons, L. (2015). The zebrafish as a gerontology model in nervous system aging, disease, and repair. *Ageing Res. Rev.*., *24*, 358-368.

Di Lorito, C., Long, A., Byrne, A., Harwood, R. H., Gladman, J. R., Schneider, S., ... & van der Wardt, V. (2021). Exercise interventions for older adults: A systematic review of meta-analyses. *J. Sport Health Sci.*, *10*(1), 29–47.

Jain, PP., Kanase, S.B., Ranak, A., (2022). Effect of Aquatic Exercises on Postural Control in Elderly Population, *Neuroquantology* 20(16), 5349.

Jakovljeviè, M., & Vauhnik, R. (2011). Aquatic exercises versus land-based exercises for elderly patients after a total hip replacement. *TEST-ZV*, *80*(4).

Kauffman, T. L., Scott, R. W., Barr, J. O., & Moran, M. L. (Eds.). (2014). *A Comprehensive Guide to Geriatric Rehabilitation E-Book*. Elsevier Health Sciences.

Kovacevic, M., Krasnik, R., Mikov, A., Mikiæ, D., Zvekiæ-Svorcan, J., Vukliš, D., Novakovic, D.D., & Đeliæ, M. (2024). Factors affecting balance performance in adolescents. *Children.*, *11*(4), 436.

Lim, C. G. (2020). Effect of underwater treadmill gait training with water-jet resistance on balance and gait ability in patients with chronic stroke: a randomized controlled pilot trial. *Front. Neurol.*, *10*, 1246.

MacKinnon, C. D. (2018). Sensorimotor anatomy of gait, balance, and falls. *Handb. Clin. Neurol.*, *159*, 3–26.

Meredith-Jones, K., Waters, D., Legge, M., & Jones, L. (2011). Upright water-based exercise to improve cardiovascular and metabolic health: a qualitative review. *Complement.Ther. Med.*, *19*(2), 93–103.

Mooventhan, A., & Nivethitha, L. (2014). Scientific evidence-based effects of hydrotherapy on various systems of the body. *N. Am. J. Med. Sci.*, 6(5), 199.

Muñoz, A., Saitua, A., Becero, M., Riber, C., Satué, K., de Medina, A. S., ... & Castejón-Riber, C. (2019). The use of the water treadmill for the rehabilitation of musculoskeletal injuries in the sport horse. *J. Vet. Res., 63*(3), 439.

Nakano, J., Yamabayashi, C., Scott, A., & Reid, W. D. (2012). The effect of heat applied with stretch to increase range of motion: a systematic review. *Phys. Therapy Sport*, *13*(3), 180–188.

Punakallio, A. (2003). Balance abilities of different-aged workers in physically demanding jobs. *J. Occup. Rehabil.*, *13*, 33-43.

Simas, V., Hing, W., Pope, R., & Climstein, M. (2017). Effects of water-based exercise on bone health of middle-aged and older adults: a systematic review and meta-analysis. *Open Access J. Sports Med.*, 39–60.

Song, J. A., & Oh, J. W. (2022): Effects of aquatic exercises for patients with osteoarthritis: systematic review with meta-analysis. In *Healthcare* (Vol. 10, No. 3, p. 560). MDPI.

Stevens, S. L., Caputo, J. L., Fuller, D. K., & Morgan, D. W. (2015). Effects of underwater treadmill training on leg strength, balance, and walking performance in adults with incomplete spinal cord injury. *J. Spinal Cord Med.*, *38*(1), 91–101.

Timothy, A. (2020). Hydrotherapy, aquatic physiotherapy, and the application of the Bad Ragaz ring method. *J. Adv. Healthc.*, *2*(II).

Wang, J., Li, Y., Yang, G. Y., & Jin, K. (2024). Age-related dysfunction in balance: a comprehensive review of causes, consequences, and interventions. *Aging Dis.*, 2024-0124.

WHO (2007). *WHO Global Report on Falls Prevention in Old Age,* Geneva.

Xing, L., Bao, Y., Wang, B., Shi, M., Wei, Y., Huang, X., ... & Qin, D. (2023): Falls caused by balance disorders in the elderly with multiple systems involved: Pathogenic mechanisms and treatment strategies. *Front.Neurol.*, *14*, 1128092.

Yoo, J., Lim, K. B., Lee, H. J., & Kwon, Y. G. (2014). Cardiovascular response during submaximal underwater treadmill exercise in stroke patients. *Ann.Rehabil. Med.*., *38*(5), 628–636.

Zafer, A. M. I., Shanb, A. A., Alzahrani, M. A., Sharma, A., & Rizvi, M. R. (2025). Efficacy of Treadmill Training on Balance and Fall Risks in the Elderly: A Systematic Review. *F1000 Research*, *13*, 330.

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Relationship between Multiple Chronic Morbidities and Depression among IndianUrban and Rural Older Adults : A Comparative Study

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ABSTRACT

This study, based on the Longitudinal Ageing Study in India (LASI) Wave 1 (2017–2018), uncovers a significant association between multiple chronic conditions and depression among 65,562 older adults aged 45 years and above. It compares urban and rural settings in India, using nationally representative data from the Longitudinal Ageing Study in India (LASI) Wave 1 (2017–2018). The authors meticulously analysed the data using Descriptive Statistics and the Logistic Regression technique to explore the association between depression and specific chronic diseases, including hypertension, diabetes, cardiovascular diseases, stroke, and bone-related conditions. The findings, which reveal a significantly higher depression prevalence among older adults with multiple chronic conditions, have the potential to revolutionise healthcare policies, particularly in the context of India's ageing population. The risk of depression increases as the number of morbidities rises, with stroke and neurological disorders showing the strongest association. Functional limitations in Activities of Daily Living (ADL) and Instrumental Activities of Daily

Living (IADL) further elevate the risk. The study also brings to light a distinct rural-urban disparity, with rural older adults bearing a higher burden of multimorbidity-related depression, possibly due to limited healthcare access and socioeconomic disadvantages. Additionally, individuals with lower education levels demonstrate a higher likelihood of depression. These findings underscore the urgent need for integrated healthcare policies that address both physical and mental health, with a particular focus on rural populations. Targeted interventions, early screening programs, and improved healthcare accessibility can play a crucial role in mitigating the burden of depression among India's ageing population.

Keywords : Multi-morbidity**,** Health care policies, Rural–urban population, Activities of Daily Living, Living arrangements, Community-based interventions

One of the most pressing concerns associated with ageing is the increasing burden of health-related issues, particularly chronic diseases and mental health disorders. Depression, a significant public health concern, is notably prevalent among older people. Studies have reported that nearly one-third of individuals seeking medical care in India exhibit symptoms of depression, with prevalence estimates for mood disorders ranging from 0.5 to 78 per 1,000 population. Furthermore, a systematic review suggests that around one-third of older adults in India suffer from depression, with a higher prevalence observed among women. Community-based studies indicate that the prevalence of depression in the geriatric population ranges between 22 per cent and 46 per cent. The impact of depression extends beyond mental health, as it is associated with reduced quality of life, increased risk of anxiety disorders, suicidal tendencies, and higher mortality rates among older adults. Given its high prevalence, depression among India's ageing population demands special attention, particularly in the context of modifiable risk factors.

The ageing process is often accompanied by an increased likelihood of developing chronic diseases. According to Mini's (2009) study, approximately 63 per cent of India's elderly population suffers from at least one chronic condition, with arthritis, hypertension, cataracts, and diabetes being the most common. The recently published Longitudinal Ageing Study in India (LASI) indicates that among individuals aged 45 and above, 28% have cardiovascular diseases (CVDs), 12% have diabetes, 6% have chronic obstructive pulmonary disease (COPD), and 9% have arthritis. Chronic diseases are strongly associated with mental health challenges, including late-life depression. Research indicates that individuals with multiple chronic conditions frequently experience psychological distress, ranging from mild depressive symptoms to severe mental disorders. Additionally, studies suggest that depression is more prevalent among individuals with chronic conditions such as heart or lung disease, diabetes, hypertension, and stroke. Gunn et al. have documented that an increasing number of chronic diseases correlates with a higher risk of depression.

Furthermore, functional health limitations are recognised as significant predictors of depressive symptoms. Gallagher *et al.* reported that functional impairment exacerbates depression, particularly in older adults experiencing difficulties in Activities of Daily Living (ADL). The gender disparity in depression prevalence is also well-documented, with several studies indicating a higher incidence among women than men. Some research suggests that depressive symptoms serve as a significant risk factor for cardiovascular disease-related mortality in older women. In contrast, others highlight an increased mortality risk for men with depression.

Despite the known interplay between depression and chronic diseases, there is limited research on how multiple and specific chronic conditions influence depressive symptoms among India's older population. This knowledge gap is particularly relevant given the high prevalence of chronic conditions such as hypertension,

diabetes, and CVDS among elderly individuals. Additionally, the rural-urban divide in healthcare access, lifestyle factors, and social support structures may contribute to variations in the association between multimorbidity and depression.

Objectives of the study

1. Study the significant association between specific chronic diseases and depression among older adults
2. Assess whether the associations differ across urban and rural settings
3. To examine the relationship between the number of chronic diseases and the risk of depression among older adults in India.

By leveraging data from LASI Wave I, this study provides a comparative analysis of the relationship between multiple chronic morbidities and depression among older adults in urban and rural India. The findings will contribute to a deeper understanding of the health challenges faced by the ageing population and inform targeted interventions to address mental health disparities across different residential settings.

Data

This study is based on data from the Longitudinal Ageing Study in India (LASI) Wave 1 (2017–2018), a nationally representative survey that examines the health, economic, and social dimensions of ageing in India. The dataset comprises a representative sample of 72,250 individuals aged 45 years and above, including their spouses, covering all states and union territories (UTS) of India, except Sikkim. LASI employs a multistage stratified area probability cluster sampling designto select participants systematically.

The survey provides comprehensive scientific insights into demographic factors, household economic conditions, chronic diseases, symptom-based health issues, functional and mental health status, biomarkers, healthcare access, employment patterns, and

social behaviours. The dataset enables comparative analyses across states and regions, facilitating a deeper understanding of the ageing process in India. Additionally, LASI is structured to assess the impact of evolving policies and behavioural trends on the ageing population, making it a valuable resource for research on geriatric health and well-being.

Sampling Procedure

The survey employed a three-stage sampling design for rural areas and a four-stage sampling design for urban areas, ensuring a representative sample. In each state and union territory (UT), the first stage involved selecting Primary Sampling Units (PSUS), which included sub-districts (Tehsils/Talukas). In the second stage, villages were selected in rural areas, while wards were chosen from the selected Primary Service Units (PSUs) in urban areas.

For rural areas, the third stage consisted of selecting households from the chosen villages. In contrast, urban areas followed an additional fourth stage—a Census Enumeration Block (CEB) was chosen randomly, and households were then sampled from this block. This multi-stage stratified sampling approach ensured a representative selection at each stage.

The survey collected data through individual interviews with consenting respondents aged 45 years and above, including their spouses, regardless of age, within the sampled households. Additionally, LASI incorporated biomarker assessments and direct health examinations to enhance the reliability of health-related findings.

The present study focuses on individuals aged 45 years and above. The adequate sample size consists of 65,562 older adults aged 45 years and above, ensuring a robust dataset for analysis. Further details regarding the sampling methodology can be found in the official LASI survey report.

Outcome Variable

The primary outcome variable in this study is significant depression, which is categorised as 0 for individuals not diagnosed with depression and 1 for those diagnosed with depression. The assessment of major depression among older adults presenting symptoms of dysphoria was conducted using the Composite International Diagnostic Interview—Short Form (CIDI-SF). A score of 3 or higher on a 0–10 scale was considered indicative of probable major depression.

This scale is a well-established tool for estimating psychiatric diagnoses. It has been validated in field settings and widely applied in population-based health surveys. It is specifically validated for use among community-dwelling older adults, making it a reliable measure for assessing depression in this study.

Exposure Variables

The key explanatory variable in this study is the number of chronic conditions among older adults. This variable is categorised as 0 for individuals with no morbidity, 1 for those with a single chronic condition, 2 for individuals with any two chronic conditions, and 3+ for those with three or more chronic conditions.

This variable was derived from participants' responses to the question: "Has a health professional ever diagnosed you with any of the following diseases?" The listed chronic conditions included:

1. Hypertension (high blood pressure)
2. Diabetes (high blood sugar)
3. Chronic lung diseases, such as asthma, chronic obstructive pulmonary disease (COPD), chronic bronchitis, or other persistent lung conditions
4. Chronic heart diseases, including coronary heart disease (heart attack or myocardial infarction), congestive heart failure, or other heart-related conditions

5. Stroke
6. Arthritis, rheumatism, osteoporosis, or other bone/joint diseases
7. Neurology
8. High cholesterol

All chronic conditions were **self-reported** and classified into binary responses: **"No"** (not diagnosed) and **"Yes"** (diagnosed).

Covariates

The study includes several sociodemographic and economic variables. Age is categorised into four groups: 45–59 years, 60–69 years, 70–79 years, and 80 years and above. Sex is classified into male and female categories. Marital status is categorised into two groups: those currently in a marital union and those not in a union. Educational status is classified into three levels: no schooling/primary education, secondary education, and higher education. Caste is recoded into three categories: Scheduled Caste/Scheduled Tribe (SC/ST), Other Backwards Class (OBC), and Others, where the "Others" category represents individuals with a relatively higher social status. Religion is classified into Hindu, Muslim, and Other, with the latter category including Christian, Sikh, Buddhist, Jain, Jewish, Parsi, Atheist, and other religious groups.

Living arrangements arecategorised into three groups: living alone or with a spouse, living with a spouse and children, and living with children and others. The monthly per capita expenditure (MPCE) quintile is calculated based on household consumption data, includingfood and non-food expenditures. Food expenditure is collected with a seven-day reference period, while non-food expenditures are reported based on 30-day and 365-day reference periods. These expenditures are standardised to a 30-day reference period, and the MPCE is used as a summary measure of consumption, which is then categorised into five quintiles, ranging from poorest to richest.

Places of residence are classified as rural and urban, while regions arecategorised into North, Central, East, Northeast, West, and South. Difficulties in Activities of Daily Living (ADLs) are measured based on the number of challenges faced in performing basic self-care activities, such as getting out of bed, changing positions from sitting to standing, eating, bathing, dressing, grooming, and maintaining personal hygiene. ADL difficulty is coded as 0, 1, 2, or 3 or more problems. Similarly, Instrumental Activities of Daily Living (IADL) are coded based on the level of difficulty in performing tasks essential for independent living, such as preparing a hot meal, grocery shopping, making phone calls, managing medications, handling household chores, managing finances (e.g., paying bills and tracking expenses), and navigating unfamiliar locations. Individuals who reported difficulty in these activities lasting more than three months were classified accordingly.

Method

This study employed descriptive statistics and bivariate analyses to assess the prevalence of depression among individuals aged 45 years and above across different states and union territories (UTs) of India, as well as across various explanatory variable categories. The Chi-square test was utilised to examine intergroup differences in depression prevalence among older adults.

Additionally, binary logistic regression analysis was conducted to evaluate the association between depression and specific chronic conditions and the impact of multiple chronic conditions on depression risk. The findings are presented in terms of odds ratios (OR) with 95% confidence intervals (CI), allowing for a clearer understanding of the relationship between chronic morbidities and depression. Furthermore, the analysis was conducted separately for urban and rural populations to investigate potential differences based on place of residence.

Table 1

Socio-demographic and health profile of adults aged 45 and above in India, LASI Wave 1

	Total (N=65562)		Rural (N= 42424)		Urban (N=23138)	
Variables	%	N	%	N	%	N
Age						
45-59	52	34098	51.1	21699	53.6	12399
60-69	28.9	18974	29.4	12459	28.2	6515
70-79	13.9	9101	14	5927	13.7	3174
80+	5.2	3389	5.5	2339	4.5	1050
Sex						
Male	46.5	30479	46.9	19889	45.8	10590
Female	53.5	35083	53.1	22535	54.2	12548
Marital status						
Currently in union	25.6	16793	25	10602	26.8	6191
Not in union	74.4	48769	75	31822	73.2	16947
Education						
No schooling	47	30821	57.1	24205	28.6	6616
Primary	24.6	16096	23.8	10112	25.9	5984
Secondary	22.8	14929	16.8	7123	33.7	7806
Higher	5.7	3716	2.3	984	11.8	2732
Cast						
SC/ST	24.8	16279	20.3	8614	33.1	7665
OBC	37.6	24629	37.4	15882	37.8	8747
Others	37.6	24654	42.3	17928	29.1	6726
Religion						
Hindu	73.4	48099	74.5	31612	71.3	16487
Muslim	11.9	7803	9.6	4087	16.1	3716
Others	14.7	9660	15.9	6725	12.7	2935
Living arrangement						
Living alone/ with spouse	19.3	12671	20.5	8692	17.2	3979
Living with spouse and children	57.2	37519	57.1	24228	57.4	13291
Living with children and others/Others	23.4	15372	22.4	9504	25.4	5868

MPCE quintile						
Poorest	19.7	12941	19.6	8304	20	4637
Poorer	20.1	13190	20	8500	20.3	4690
Middle	20.1	13163	20.1	8545	20	4618
Richer	20.1	13210	20.2	8564	20.1	4646
Richest	19.9	13058	20.1	8511	19.7	4547
ADL						
No	85.4	56021	85.4	36240	85.5	19781
Yes	14.6	9541	14.6	6184	14.5	3357
IADL						
No	66.9	43851	63.6	27001	72.8	16850
Yes	33.1	21711	36.4	15423	27.2	6288
Depressive symptoms						
No	72.5	47517	71.6	30371	74.1	17146
Yes	27.5	18045	28.4	12053	25.9	5992
Blood Pressure						
No	71.3	46713	75.7	32107	63.1	14606
Yes	28.7	18849	24.3	10317	36.9	8532
Diabetes						
No	87.1	57133	91.4	38775	79.3	18358
Yes	12.9	8429	8.6	3649	20.7	4780
Chronic lung disease						
No	99.3	65120	99.4	42177	99.2	22943
Yes	0.7	442	0.6	247	0.8	195
Heart disease						
No	96.4	63194	97.3	41264	94.8	21930
Yes	3.6	2368	2.7	1160	5.2	1208
Stroke						
No	98.2	64367	98.4	41728	97.8	22639
Yes	1.8	1195	1.6	696	2.2	499
Bone related						
No	85.4	55962	86	36470	84.2	19492
Yes	14.6	9600	14	5954	15.8	3646
Neurology						
No	97.7	64080	97.9	41526	97.5	22554
Yes	2.3	1482	2.1	898	2.5	584
High cholesterol						
No	96.5	63257	97.8	41491	94.1	21766
Yes	3.5	2305	2.2	933	5.9	1372

Multiple morbidity						
No morbidity	55.7	36516	61.3	26008	45.4	10508
Any one morbidity	27	17696	25.5	10818	29.7	6878
Two morbidity	12.3	8057	9.8	4139	16.9	3918
Three or more morbidities	5	3293	3.4	1459	7.9	1834

Table 1 presents the socio-demographic and health profile of older adults aged 45 and above across rural and urban populations. Among the 65,562 surveyed individuals, 52% were aged 45–59, 28.9% were between 60 and 69, and only 5.2% were aged 80 years and above. The sample consisted of 46.5% males and 53.5% females, with a slightly higher proportion of females in urban areas. Regarding marital status, 25.6% of respondents were currently in a marital union, with a higher percentage among urban dwellers compared to rural populations.Educational attainment was low, with 47%of individuals having no formal schooling. This proportion was significantly higher in rural areas (57.1%) compared to urban areas (28.6%). In contrast, higher education was more common in urban settings (11.8%) than in rural areas (2.3%). The caste distribution showed that 24.8% belonged to the Scheduled Caste/Scheduled Tribe (SC/ST), 37.6% to the Other Backwards Class (OBC), and 37.6% to Other castes, with a higher proportion of SC/ST in urban areas. Religiously, 73.4% identified as Hindu, 11.9% as Muslim, and 14.7% belonged to other religions.Regarding living arrangements, 57.2% of older adults lived with their spouse and children, 19.3% lived alone or with a spouse only, and 23.4% lived with children and others. The monthly per capita expenditure (MPCE) quintiles were evenly distributed, with each category comprising approximately 20% of the population, ensuring balanced socio-economic representation.Regarding functional health, 14.6% of the respondents reported difficulty in Activities of Daily Living (ADL). In comparison,33.1% of participants experienced difficulty with Instrumental Activities of Daily Living (IADL), with rural residents facing slightly more challenges in daily activities than urban dwellers. Depressive symptoms were present in 27.5% of the total population, with a higher prevalence in rural areas (28.4%) compared to urban

settings (25.9%).Among chronic conditions, 28.7% of respondents had been diagnosed with high blood pressure, with urban residents (36.9%) being more affected than rural individuals (24.3%). Diabetes prevalence was 12.9% overall, but significantly higher in urban areas (20.7%) compared to rural regions (8.6%). Chronic lung disease and neurological disorders were relatively rare, affecting 0.7% and 2.3% of the population, respectively. Heart disease (3.6%) and stroke (1.8%) were more prevalent among urban residents. Bone-related issues (14.6%) and high cholesterol (3.5%) were more frequently reported in urban areas.In terms of multiple morbidities, 55.7% of older adults reported no chronic conditions, while 27% had one, 12.3% had two, and 5% had three or more chronic illnesses. Urban populations had a higher prevalence of multiple morbidities, with 7.9% reporting three or more conditions, compared to 3.4% in rural areas. This data highlights significant disparities in health, socio-economic conditions, and disease burden among older adults across rural and urban India.

Table 2

Bivariate and logistic regression estimates for depression by chronic condition and background characteristics among older adults in India

		AOR CI 95%	
		Urban	Rural
Variables	P value		
Age	<0.001		
45-59@		Ref.	Ref.
60-69		.934(.868-1.006)	.918***(.871-.968)
70-79		.986(.895-1.085)	.905***(.844-.970)
80+		1.146(.991-1.326)	1.005(.910-1.109)
Sex	<0.001		
Male		Ref.	Ref.
Female		.919*	.937**(.892-.985)
Marital status	<0.001		
Currently in union		Ref.	Ref.
Not in union		.707***	.667***(.600-.741)

Educational status	<0.001		
No schooling		Ref.	Ref.
Primary		.764***(.704-.829)	.902***(.852-.954)
Secondary		.781***(.718-.850)	.803***(.749-862)
Higher		.649***(.574-.734)	.588***(.493-.702)
Caste	<0.001		
SC/ST		Ref.	Ref.
OBC		1.100*(1.022-1.184)	1.017(.957-1.081)
Others		.934(.860-1.015)	1.035(.972-1.103)
Religion	<0.001		
Hindu		Ref.	Ref.
Muslim		.909*(.836-.990)	1.032(.959-1.111)
Others		.733***(.660-.814)	.714***(.669-.764)
Living arrangement	<0.001		
Living alone/ with spouse		Ref.	Ref.
Living with spouse and children		.637***(.584-.695)	.718***(.676-.763)
Living with children and others/Others		.587***(.504-.684)	.726***(.655-.804)
MPCE quintile	<0.001		
Poorest		Ref.	Ref.
Poorer		.940(.857-1.031)	.936(.874-1.002)
Middle		.800***(.727-.880)	.896***(.836-.960)
Richer		.750***(.680-.827)	.883***(.823-.947)
Richest		.732***(.660-.812)	.873***(.812-.939)
ADL	<0.001		
No		Ref.	Ref.
Yes		1.533***(1.401-1.676)	1.828***(1.718-1.945)
IADL	<0.001		
No		Ref.	Ref.
Yes		1.437***(1.332-1.551)	1.442***(1.372-1.516)
Blood Pressure	<0.001		
No		Ref.	Ref.
Yes		.994(.782-1.140)	1.002(.802-1.253)

Diabetes	<0.001		
No		Ref.	Ref.
Yes		.922(.766-1.110.)	.896(.716-1.122)
Chronic lung disease	<0.001		
No		Ref.	Ref.
Yes		1.375(.983-1.923)	1.315(.943-1.834)
Heart disease	<0.001		
No		Ref.	Ref.
Yes		1.051(.861-1.282)	1.108(.874-1.404)
Stroke	<0.001		
No		Ref.	Ref.
Yes		1.442***(1.140-1.824)	1.457***(1.131-1.878)
Bone related	<0.001		
No		Ref.	Ref.
Yes		1.125(.935-1.353)	1.053(.845-1.313)
Neurology	<0.001		
No		Ref.	Ref.
Yes		1.617***(1.287-2.030)	1.783***(1.396-2.278)
High cholesterol	<0.001		
No		Ref.	Ref.
Yes		.886(.724-1.084)	.804(.630-1.027)

Based on the logistic regression results presented in Table 2, the analysis reveals key factors associated with depression among older adults in urban and rural settings.

The likelihood of depression increases with age in rural areas, particularly for those aged 60–69 (AOR: 0.918, CI: 0.871–0.968) and 70–79 (AOR: 0.905, CI: 0.844–0.970), indicating a significant association. However, for those aged 80 and above, no significant association was observed in either urban or rural settings. Regarding sex, older women were less likely to experience depression than men, with a significant association observed in rural areas (AOR: 0.937, CI: 0.892–0.985). Older adults who were not in a marital union exhibited a lower risk of depression in both urban (AOR:

0.707) and rural (AOR: 0.667) areas, indicating that being married serves as a protective factor. Educational attainment showed a strong negative association with depression, meaning that individuals with higher education were significantly less likely to experience depression. Those with primary (AOR: 0.764 in urban areas; 0.902 in rural areas), secondary (AOR: 0.781 in urban areas; 0.803 in rural areas), and higher education (AOR: 0.649 in urban areas; 0.588 in rural areas) had lower odds of depression compared to those without formal schooling.

Among caste groups, OBC individuals in urban areas exhibited a slightly higher risk of depression (AOR: 1.100, CI: 1.022–1.184), whereas no significant association was found in rural areas. Regarding religion, Muslims in urban areas were slightly less likely to have depression (AOR: 0.909, CI: 0.836–0.990), while individuals belonging to "Other" religious groups had significantly lower odds of depression in both urban (AOR: 0.733, CI: 0.660–0.814) and rural areas (AOR: 0.714, CI: 0.669–0.764). Living arrangements had a significant influence on depression. Older adults living with their spouse and children or with other family members had a significantly lower risk of depression compared to those living alone or only with a spouse. The association was stronger in urban areas (AOR: 0.637 for those living with spouse and children; 0.587 for those living with others) compared to rural areas (AOR: 0.718 and 0.726, respectively). Economic status, measured by MPCE quintiles, showed that wealthier individuals had lower odds of depression. In both urban and rural areas, individuals in the middle, richer, and richest quintiles had significantly reduced odds of depression compared to the poorest group.

The presence of difficulties in Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL) was strongly associated with depression. Those who experienced problems with ADLs were at a significantly higher risk in both urban (AOR: 1.533, CI: 1.401–1.676) and rural areas (AOR: 1.828, CI: 1.718–1.945). Similarly, individuals with IADL

difficulties also had significantly increased odds of depression in urban (AOR: 1.437, CI: 1.332–1.551) and rural (AOR: 1.442, CI: 1.372–1.516) areas. Among chronic health conditions, stroke had a significant positive association with depression in both urban (AOR: 1.442, CI: 1.140–1.824) and rural areas (AOR: 1.457, CI: 1.131–1.878). Neurological disorders also showed a strong association with depression, with higher odds in both urban (AOR: 1.617, CI: 1.287–2.030) and rural areas (AOR: 1.783, CI: 1.396–2.278). However, other chronic conditions like hypertension, diabetes, chronic lung disease, heart disease, bone-related diseases, and high cholesterol did not show significant associations with depression.

Overall, the analysis indicates that age, gender, marital status, education, economic status, living arrangements, and functional difficulties (ADL and IADL) play a critical role in determining depression among older adults. Certain chronic conditions, especially stroke and neurological disorders, are significantly associated with depression, highlighting the need for targeted mental health interventions in ageing populations. The disparities between urban and rural areas suggest that while some factors affect both settings equally, others (such as economic status and education) play a stronger role in rural contexts.

Table 3

Logistic regression estimates of depression with number of chronic conditions by place of residence among older adults in India, LASI Wave 1

No of chronic diseases	Unadjusted	Model 1	Model 2	Model 3
Rural				
0	Ref.	Ref.	Ref.	Ref.
1	1.285***	1.230***	1.264***	1.179***
2	1.532***	1.456***	1.538***	1.357***
3+	1.644***	1.533***	1.704***	1.379***

Urban				
0	Ref.	Ref.	Ref.	Ref.
1	1.118***	1.075**	1.108***	1.043
2	1.309***	1.219***	1.288***	1.155***
3+	1.580***	1.460***	1.604***	1.345***

Model 1 : Adjusted for individual socio-demographic factors like age,sex and marital status

Model 2: Adjusted for age,sex,marital status, caste, religion, education, MPCE quintile and living arrangement

Model 3: Adjusted for age,sex,marital status, caste, religion, education, MPCE quintile,living arrangement and functional difficulties of ADL and IADL

Table 3 presents the results of the logistic regression analysis, which examines the association between the number of chronic conditions and depression among older adults in India, stratified by rural and urban residence. The findings indicate a clear trend: as the number of chronic conditions increases, the likelihood of experiencing depression also rises, with more potent effects observed in rural areas. In rural settings, older adults with a single chronic condition had significantly higher odds of depression compared to those with no chronic conditions (Unadjusted OR: 1.285; Model 3 OR: 1.179). The risk further increased for individuals with two chronic conditions (Unadjusted OR: 1.532; Model 3 OR: 1.357), and those with three or more chronic conditions exhibited the highest odds of depression (Unadjusted OR: 1.644; Model 3 OR: 1.379). While the odds slightly decreased in the adjusted models, the association remained significant even after controlling for socio-demographic factors, economic status, and functional difficulties (ADL and IADL).A similar pattern was observed in urban areas, although the overall odds of depression were slightly lower compared to those in rural areas. Older adults with one chronic condition had a higher likelihood of depression (Unadjusted OR: 1.118), but the association became weaker and

non-significant in Model 3 (AOR: 1.043). The odds of developing a chronic condition increased for those with two chronic conditions (Unadjusted OR: 1.309; Model 3 OR: 1.155) and were highest for individuals with three or more chronic conditions (Unadjusted OR: 1.580; Model 3 OR: 1.345). Although adjustments for socio-demographic, economic, and functional factors slightly reduced the odds, the association remained significant.The results highlight a strong and positive association between the number of chronic conditions and depression among older adults in both rural and urban settings. The trend is more pronounced in rural areas, where older individuals with multiple chronic illnesses face a higher risk of depression. Even after adjusting for socio-demographic characteristics, economic status, and functional difficulties, the association remains significant, emphasising the need for integrated healthcare approaches that address both physical and mental health concerns in ageing populations.

Conclusion

The study underscores the strong association between chronic diseases and depression in India's ageing population, emphasising that individuals with multiple chronic conditions face a heightened risk of developing depressive symptoms. The findings underscore the need for comprehensive healthcare policies that encompass both physical and mental health, particularly in rural areas with limited access to healthcare. Early identification of depressive symptoms in individuals with chronic illnesses is crucial. However, the study also emphasises the vital role of community-based interventions and awareness programs in improving mental health outcomes. Special attention should be given to individuals with functional limitations, those with lower socioeconomic status, and those with lower education levels, as education is a protective factor against depression. Policy efforts should focus on improving geriatric healthcare services, promoting mental health screenings, and strengthening support systems for older adults to ensure a better quality of life in later years.

References

Gallagher, D., Mhaoláin, A. N., Greene, E., Walsh, C., Denihan, A., Bruce, I., ...& Lawlor, B. A. (2010). Late life depression: A comparison of risk factors and symptom severity in depressed and non-depressed community living older adults. *Journal of Affective Disorders, 126*(3), 372–378. https://doi.org/10.1016/j.jad.2010.04.024

Chatterji, S., Byles, J., Cutler, D., Seeman, T., & Verdes, E. (2015). Health, Functioning, and Disability in Older Adults—Present Status and Future Implications. *The Lancet, 385*(9967), 563–575. https://doi.org/10.1016/S0140-6736(14)61462-8

Gunn, J., Ayton, D., Densley, K., Pallant, J. F., Chondros, P., Herrman, H., &Dowrick, C. (2012). The association between chronic illness, multimorbidity and depressive symptoms in an Australian primary care cohort. *Social Psychiatry and Psychiatric Epidemiology, 47*(2), 175–184. https://doi.org/10.1007/s00127-010-0330-z

International Institute for Population Sciences (IIPS) & NPHCE, MoHFW. (2020). *Longitudinal Ageing Study in India (LASI) Wave 1, 2017–18, India Report.* Mumbai: IIPS.

Meher, T., Muhammad, T., Tiwari, P., & Joshi, J. (2021). The association between single and multiple chronic conditions and depression among the older population in India: A comparative study between men and women. *International Journal of Geriatric Psychiatry, 36*(9), 1367–1376. https://doi.org/10.1002/gps.5538

Mini, G. K. (2009). Prevalence and correlates of multiple chronic conditions among older adults in Kerala, India. *Indian Journal of Medical Research, 129*(6), 643–648.

Patel, V., Chatterji, S., Chisholm, D., Ebrahim, S., Gopalakrishna, G., Mathers, C., ...& Reddy, K. S. (2011). Chronic diseases and injuries in India. *The Lancet, 377*(9763), 413–428. https://doi.org/10.1016/S0140-6736(10)61188-9

Pilania, M., Yadav, V., Bairwa, M., Behera, P., Gupta, S. D., & Khurana, H. (2019). Prevalence and predictors of depression in community-dwelling elderly in rural Haryana, India. *Indian Journal of Community Medicine, 44*(1), 47–52. https://doi.org/10.4103/ijcm.IJCM_198_18

Prince, M. J., Wu, F., Guo, Y., Gutierrez Robledo, L. M., O'Donnell, M., Sullivan, R., & Yusuf, S. (2015). The Burden of Disease in Older People and Its Implications for Health Policy and Practice. *The Lancet, 385*(9967), 549–562. https://doi.org/10.1016/S0140-6736(14)61347-7

Sengupta, P., & Benjamin, A. I. (2015). Prevalence of depression and associated risk factors among the elderly in urban and rural field practice areas of a tertiary care institution in Ludhiana. *Indian Journal of Public Health, 59*(1), 3–8. https://doi.org/10.4103/0019-557X.152845

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A Study of Nutritional Status and Associated Factors among the Elderly Males of Dantan-1 Block, Paschim Medinipur, West Bengal

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ABSTRACT

This cross-sectional study investigates the nutritional status and related factors among 300 elderly men in the Chakismailpur Gram Panchayat of the Datan-1 block in the Paschim Medinipur district of West Bengal, India. The study Participants were selected following a purposive sampling method. Data were collected using a structured schedule and interview methods. Appropriate descriptive and inferential statistical analyses were employed to interpret the data, with a p-value of < 0.05 deemed statistically significant. According to the WHO (1995) guidelines, only 2.0% of participants were classified as underweight, while the majority (87.3%) had a normal body mass index (BMI), and 10.7% fell into the overweight category. The prevalence of abdominal obesity among participants was 9.3%. Different socio-economic and lifestyle factors have a statistically significant association with the nutritional status of participants., Based on the present findings, it can be concluded that socioeconomic factors that enhance socioeconomic status and facilitate informed lifestyle choices are vital for improving nutritional health among older adults.

Keywords : Abdominal obesity, BMI, Elderly, Malnutrition, Rural area, Socio-economy

With rising life expectancy and declining fertility rates globally, the population is ageing at an unprecedented pace (Medhi *et al.,* 2006). Ageing encompasses irreversible, continuous changes that involve physiological and metabolic abnormalities, as well as declines in both physical and mental abilities, loss of muscle mass, and reduced immune function, occurring from birth until death. Food choices and inadequate dietary intake can negatively influence these transformations (Vellas *et al.,* 2000; Shatestein *et al.,* 2013; Motadi *et al.,* 2022). Proper nutrition is crucial for older adults due to the physiological changes associated with ageing (Agbozo *et al.,* 2018; Motadi *et al.,* 2022).

The risk of malnutrition is significantly higher in older adults compared to their younger counterparts. Several studies have shown that many community-dwelling older adults experience inadequate protein and calorie intake (Amarya *et al.,* 2015). In later life, factors such as reduced food intake, malabsorption, and increased metabolism contribute to malnutrition (Morley, J.E., 1998). As a demographic, older adults are more susceptible to physical disabilities, age-related diseases, and functional impairments, which can complicate efforts to maintain adequate nutritional status (Amarya *et al.,* 2015). Additionally, many older adults face financial challenges stemming from family issues, low income, irregular support from facilities (Khole & Solleti, 2018), and insufficient preparedness for ageing (Roy, 2019), all of which can further impact their nutrition and overall quality of life (Mane, 2016). A key objective of clinical nutrition is to prevent and treat malnutrition.

Malnutrition is a critical factor closely associated with poor health outcomes among older adults (Zhang *et al.,* 2017; Naparat & Kamlai, 2021). It can lead to unintentional weight loss and result in a progressive decline in overall health, including impaired muscle function, reduced physical activity, diminished immune response, and cognitive decline, ultimately increasing mortality rates (Evans, 2005; Amarya *et al.,* 2015; Sukkriang & Somrak, 2021). In older adults, nutritional status plays a significant role in the ageing process

and overall health (Amarya *et al.,* 2015). He *et al.* (2018) demonstrated that nutritional status has a significant influence on disability and physical performance among the elderly. Furthermore, changes in body composition with ageing can affect nutritional status.

Aims and objectives : This study examines the nutritional status and its correlates among the elderly male population residing in Chakismalipur Gram Panchayat, located in the Dantan-I Block of Paschim Medinipur District, West Bengal, India.

Method

Sample

This cross-sectional study was conducted involving 300 older adult males from the Chakismailpur Gram Panchayat within the Datan-1 block of Paschim Medinipur district, West Bengal, India. The research employed a cross-sectional, ex post facto design, focusing on participants aged 60 years and above.A previous study was conducted among this population to understand their condition of hypertension (Adak *et al.,* 2024). Villages were selected through purposive sampling, encompassing all elderly individuals who met the predefined inclusion criteria via a total enumeration process. The sample size is calculated by the following formula (Krejcie & Morgan, 1970):

$$n = \frac{NZ^2p(1-p)}{d^2(N-1)+Z^2p(1-p)}$$

where: n = Sample size; Z = Standard normal deviation with 95% confidence interval i.e., 1.96; d = (allowable error) = 5% = 0.05; N = Total population = 624 (total estimated elderly population in the study area, i.e. Chakismailpur gram panchayat); p = Expected Proportion = 0.50. The minimum sample size was calculated using the formula above as 239.

Demographic and socio-economic background data of all participants were meticulously collected, serving as potential influencing factors on nutritional status. Data collection employed

structured interviews and scheduling methods to gather first-hand information from each participant. Informed consent was obtained, and confidentiality protocols were strictly adhered to throughout the study.

Tools Used

Anthropometric measurements, including height, weight, hip circumference (HC) and Waist circumference (WC), were taken following standardised procedures (Weiner & Lourie, 1969). Height was measured using Martin's anthropometer, recorded to the nearest 0.1 cm, with subjects positioned upright without footwear on a level surface, ensuring alignment with the Frankfort horizontal plane. Body weight was assessed using an analogue weighing scale, recorded to the nearest 0.5 kg under conditions of minimal clothing to ensure measurement accuracy. Hip circumference was measured at the maximum girth of the buttocks, with the measuring tape maintained parallel to the ground to prevent constriction.

Statistical Analysis of Data

Subsequently, collected data were organised and analysed using SPSS (Statistical Package for Social Sciences) version 16, employing both descriptive and inferential statistical techniques. A p-value of < 0.05 was considered the threshold for statistical significance. Nutritional status was determined based on Body Mass Index (BMI) categories(WHO, 1995), while abdominal obesity was assessed using waist circumference (WC) according to the WHO (2008) and waist-hip ratio (WHR) according to the WHO (1989).

Results

Table 1 provides a summary of the socio-economic characteristics of the participants. Most participants were in the young-old age group (60-69 years), accounting for 79.3% of the sample. A smaller proportion was in the middle-old age group (70-79 years) at 19.3 per cent, while only 1.3 per cent were in the oldest age group (80 years and above).

Table 1

Socio-Economic Status of the participants

Age group	**N**	**(%)**
60-69	238	79.3
70-79	58	19.3
80 & above	4	1.3
Educational status		
Preliterate	60	20
Primary	66	22
Secondary	137	45.7
HS & above	37	12.3
Occupation status		
Agriculture	128	42.7
Labour	24	8.0
Self-employment	73	24.3
Retiredment	20	6.7
Unemployemnt	55	18.3
Family income (Monthly in Rs.)		
< 6000	76	25.3
12001-20000	150	50.0
>20000	74	24.7
House Types		
Kaccha	152	50.7
Pucca	130	43.3
Semi-Pucca	18	6
Social-class		
Upper-middle-class	119	39.7
Lower-middle-class	115	38.3
Upper-lower-class	66	22.0

Regarding educational attainment, most participants (45.7%) had completed secondary education. Among them, 20 per cent had no formal education, 22 per cent had primary education, and the smallest group (12.3%) had higher secondary education or

above. As for participants' occupations, 42.7per cent of participants were engaged in agriculture, and a minority (6.7%) were retired from a service or job. Regarding monthly income, 50 per cent of participants' families earned between 12,001 and 20,000 Rs. 25.3 per cent earned less than 6,000 Rs., and 24.7 per cent earned more than Rs. 20,000. According to the Modified Kuppuswamy social class classification (2023) (Dalvi & Kalghatgi, 2023), most participants were classified as upper-middle class (39.7%) or lower-middle class (38.3%). Regarding housing, 50.7% resided in kaccha houses, 43.3% lived in pucca houses, and only 6% occupied semi-pucca houses.

Table 2

Nutritional status of the elderly males according to WHO (1995)

Classification	Principal cut-off points	Frequency	Percentage
Underweight	<18.50	6	2
Normal	18.50 – 24.99	262	87.3
Overweight	> 25.00	32	10.7

Table 3

Abdominal obesity according to WC and WHR category

	Abdominal obesity			
	Yes		No	
	Frequency	Percentage	Frequency	Percentage
WC	28	9.3	272	90.7
WHR	80	26.7	220	73.3

Table 2 presents the nutritional status of the older male adult participants. According to the WHO (1995), only 2.0% of the participants were underweight, the majority (87.3%) had a normal body mass index (BMI), and 10.7% were overweight. Table 3 illustrates the prevalence of abdominal obesity among the study participants, with 9.3% classified as obese based on waist circumference (WC) and 26.7% based on waist-to-hip ratio (WHR).

Table 4

Nutritional status and associated factors among the elderly participants

Socio-economic background	Nutritional Status			$\div^2$
	Underweight n (%)	Normal n (%)	Overweight n (%)	
Age group:				
60-69	4 (1.7)	205 (86.1)	29 (12.2)	$\div^2 = 3.613$
70-79	2 (3.4)	53 (91.4)	3 (5.2)	p = .461
80 & above	0	4 (100.0)	0	
Educational status				
Preliterate	3 (5.0)	54 (90.0)	3 (5.0)	$\div^2 = 8.421$
Primary	1 (1.5)	59 (89.4)	6 (9.1)	p = .209
Secondary	2 (1.5)	119 (86.9)	16 (11.7)	
HS & above	0	30 (81.1)	7 (18.9)	
Occupation				
Agriculture/ Labour	3 (2.3)	111 (86.7)	14 (10.9)	$\div^2 = 11.484$
Self-employment	1 (1.4)	57 (78.1)	15 (20.5)	p = .022
Retirement/	0	17 (85.0)	3 (15.0)	
Unemployment				
Monthly income				
< 6000	5 (6.6)	69 (90.8)	2 (2.6)	$\div^2 = 18.149$
12001-20000	0	128 (85.3)	22 (14.7)	p = .001
>20000	1 (1.4)	65 (87.8)	8 (10.8)	
Social-economic status (Modified Kuppuswamy Socio-economic Status)				
Upper-middle-class	0	100 (84.0)	19 (16.0)	$\div^2 = 13.533$
Lower-middle-class	3 (2.6)	100 (87.0)	12 (10.4)	p = .009
Upper-lower-class	3 (4.5)	62 (93.9)	1 (1.5)	
Physical activity				
Yes	0	93 (91.2)	9 (8.8)	$\div^2 = 3.844$
No	6 (3.0)	169 (85.4)	23 (11.6)	p = .146
Sleeping habit				
Regular	6 (2.3)	236 (88.7)	24 (9.0)	$\div^2 = 7.233$
Irregular	0	26 (76.5)	34 (23.5)	p = .027
Fast food consumption				
Yes	1 (0.9)	92 (82.9)	18 (16.2)	$\div^2 = 6.551$
No	5 (2.6)	170 (89.9)	14 (7.4)	p = .038

p <0.05

Table 4 illustrates the relationship between body mass index (BMI) and various factors among the study participants. The data reveal that the youngest age group (12.2%) had a higher prevalence of overweight individuals than the middle (5.2%) and oldest age groups. In contrast, the oldest age group primarily fell into the normal BMI category. However, age was not significantly related to BMI. Regarding education, individuals with no formal education were more likely to be underweight (5%) or have a normal BMI (90%), whereas those with higher education levels had a higher prevalence of overweight (18.9%).

Nevertheless, educational level and nutritional status were not found to be significantly associated. Regarding occupation, individuals engaged in agriculture or labour work predominantly had a normal BMI (86.7%). In contrast, self-employed individuals had a higher rate of overweight (20.5%). Occupation was significantly associated with BMI. Those with a lower monthly family income (< ₹ 6000) had a high percentage of individuals with a normal body mass index (BMI) (90.8%). Monthly family income was significantly associated with BMI. Additionally, individuals from the upper-middle class were more likely to be overweight (16.0%), while those in the upper-lower class predominantly had a normal BMI (93.9%).

However, participants who engaged in physical activity predominantly had a normal body mass index (BMI) (91.2%). In contrast, those who did not engage in physical activity had higher rates of being underweight (3.0%) or overweight (11.6%). Physical activity was significantly associated with BMI. Additionally, sleeping habits were statistically significant in terms of BMI. Most participants with regular sleeping habits (88.7%) had a normal BMI.

Conversely, participants with irregular sleeping habits had a higher prevalence of overweight (23.5%). Fast food consumption also showed a significant association with BMI. Participants who consumed fast food were more likely to be overweight (16.2%),

whereas most participants with a normal BMI (89.9%) did not consume fast food.

Table 5

Relationship of Abdominal Obesity with different factors

Associated factors	WC		÷²	WHR		÷²
	Yes	No		Yes	No	
Age group:						
60-69	26 (10.9)	212 (89.1)	÷² = 3.498 p = .174	66 (27.7)	172 (72.3)	÷² = 0.680 p = .712
70-79	2 (3.4)	56 (96.6)		13 (22.4)	45 (77.6)	
80 & above	0	4 (100.0)		1 (25.0)	3 (75.0)	
Educational status						
Preliterate	2 (3.3)	58 (96.7)	÷² = 4.448 p = .217	16 (26.7)	44 (73.3)	÷² = 2.839 p = .417
Primary	5 (7.6)	61 (92.4)		17 (25.8)	49 (74.2)	
Secondary	16 (11.7)	121 (88.3)		41 (29.9)	96 (70.1)	
HS & above	5 (13.5)	32 (86.5)		6 (16.2)	31 (83.8)	
Occupation						
Agriculture/ Labour	8 (5.3)	144 (94.7)	÷² = 11.494 p = .003	35 (23.0)	117 (77.0)	÷² = 8.487 p = .014
Self-employment	14 (19.2)	59 (80.8)		29 (39.7)	44 (60.3)	
Unemployment	6 (8.0)	69 (92.0)		16 (21.3)	59 (78.7)	
Monthly income						
< 6000	4 (5.3)	72 (94.7)	÷² = 2.198 p = .333	17 (22.4)	59 (77.6)	÷² = 1.107 p = .575
12001-20000	17 (11.3)	133 (88.7)		41 (27.3)	109 (72.7)	
>20000	7 (9.5)	67 (90.5)		22 (29.7)	52 (70.3)	
Social-class						
Upper-middle-class	16 (13.4)	103 (86.6)	÷² = 7.152 p = .028	35 (29.4)	84 (70.6)	÷²=1.002 p = .606

Lower-middle-class	11 (9.6)	104 (90.4)		30 (26.1)	85 (73.9)	
Upper-lower-class	1 (1.5)	65 (98.5)		15 (22.7)	51 (77.3)	
Sleeping habit						
Regular	23 (8.6)	243 (91.4)	$\div^2$ = 1.3083 p = .25	65 (24.4)	201 (75.6)	$\div^2$=5.972 p = .015
Irregular	5 (14.7)	29 (85.3)		15 (44.1)	19 (55.9)	

$p < 0.05$

Table 5 illustrates the association between abdominal obesity and various factors. Abdominal obesity was more prevalent among the younger age group, although age itself was not significantly related to abdominal obesity. A notable relationship was observed between educational status and abdominal obesity. Higher-educated individuals had higher rates of abdominal obesity (13.5% according to waist circumference and 29.9% according to waist-to-hip ratio) compared to those with no education or primary education (3.3% and 7.6% for WC; 26.7% and 25.8% for WHR). Occupation also showed a significant association with abdominal obesity. Self-employed individuals had higher rates of abdominal obesity (19.2% for WC and 39.7% for WHR) compared to those engaged in agriculture or labour and the unemployed (5.3% and 8.0% for WC; 23.0% and 21.3% for WHR). Higher-income families exhibited a greater prevalence of abdominal obesity (11.3% for WC and 27.3% for WHR) compared to low-income families (5.3% for WC and 22.4% for WHR). Additionally, individuals in the upper-middle class had higher rates of abdominal obesity (13.4% for waist circumference [WC] and 29.4% for waist-to-hip ratio [WHR]) compared to those in the upper-lower class (1.5% for WC and 22.7% for WHR). Social class was significantly associated with work capacity (WC). Finally, individuals with irregular sleeping habits had higher rates of abdominal obesity (13.4% for WC and 29.4% for WHR). Sleeping habits were significantly associated with waist-to-hip ratio (WHR).

Discussion

Nutrition is crucial for maintaining health, functional independence, and quality of life, particularly in older adults (Kshetrimayum *et al.*, 2013; Yap *et al.*, 2007). Nutritional status in the elderly is affected by various overlapping factors. Adequate nutrition is essential for promoting improved health outcomes (Shalini *et al.*, 2020). The present study was conducted among the elderly males of the Dantan I block of Paschim Medinipur. Most of the elderly in the study area (79.3%) are in the young old age group (60-69 years). A significant proportion (19.3%) of old-old individuals (70-79 years) were also found in the area, but the oldest-old individuals were scarce (1.3%). Compared to other rural elderly populations, the present study population show better educational status, with 45.7 per cent secondary and 12.3 per cent HS and above educated. Three-fourths of the participants continue to work despite their advanced age. Agriculture is the most common occupation (42.7%) of the participants. Most participants reported a family income of more than 10,000/-, which is not very low compared to other reported rural elderly populations. Though most participants (50.7%) live in the "Kaccha" house, a nearly similar number of participants live in the "Pucca" house (43.3%) and the "semi-pucca" house (6%). The modified Kuppuswamy social class classification (2023) indicates that most participants belong to the middle class (78%). From the socio-economic profile, it is evident that the present study population has a relatively high socio-economic status compared to most rural elderly populations in India (Srivastava *et al.*, 2021; Ayushree *et al.*, 2023; Gohar *et al.*, 2024). The influence of overall better socio-economic conditions can be observed in the nutritional status of the participants, which will be discussed in a later section.

Only 2% of the study participants were found to be underweight. Compared to other studies, the participants in this study demonstrate a significantly better nutritional status. This improvement may be attributed to their more favourable socio-

economic conditions compared to the populations in other studies, such as Ayushree *et al.* (2023), Khan *et al.* (2023), and Kandapan *et al.* (2023). Most study participants (87.3%) have a normal nutritional status, significantly better than that observed in other study populations (Khole & Soletti, 2018; Biswas & Biswas, 2020). While the prevalence of underweight individuals is low in this group, overweight and obesity remain concerns, as the current study shows a higher percentage of participants classified as overweight or obese. Additionally, central obesity is an issue, with a notable portion of participants identified as having central obesity based on waist circumference (9.3%) and waist-to-hip ratio (26.7%) measurements. Recent studies indicate an increase in overnutrition and a decrease in undernutrition over the past few decades, mainly due to socio-economic and lifestyle improvements, which may explain the findings of this study (Singla, 2012; Smith, 2015; Pingali *et al.*, 2019; Little *et al.*, 2020; Nguyen *et al.*, 2021; Bhandari *et al.*, 2021; Aiyar *et al.*, 2021; Saha *et al.*, 2023).

Various socioeconomic and lifestyle factors impact nutritional status. In this study, we collected data on participants' age, educational status, occupation, monthly income, physical activity levels, sleeping habits, and the frequency of fast food consumption (defined as at least once a week). These factors were analysed to determine their influence on participants' nutritional status. Additionally, the socioeconomic status of the participants was evaluated using the Modified Kuppuswamy Socioeconomic Status scale (Dalvi & Kalghatgi, 2023), which was also considered as a factor affecting nutritional status. The present study found that several factors were statistically significantly associated with the participants' nutritional status. These factors include occupation ($\div^2 = 11.484$, $p < 0.05$), monthly income ($\div^2 = 18.149$, $p < 0.05$), socioeconomic status ($\div^2 = 13.533$, $p < 0.05$), sleeping habits ($\div^2 = 7.233$, $p < 0.05$), and frequent fast food consumption ($\div^2 = 6.551$, $p < 0.05$). Numerous other studies have also demonstrated that these socioeconomic and lifestyle factors are significantly

related to nutritional status (Vaish et al., 2020; Nazri et al., 2021; Vidyalakshmi et al., 2021; Babar et al., 2022; Saha et al., 2023; Varghese et al., 2024).The present study analysed the influence of various factors on central obesity. Both occupation ($\div^2 = 11.494$, $p < 0.05$) and socioeconomic class ($\div^2 = 7.152$, $p < 0.05$) were found to have a statistically significant association with central or abdominal obesity based on waist circumference (WC) categories. Additionally, occupation ($\div^2 = 8.487$, $p < 0.05$) and socioeconomic class also showed a significant association with central obesity based on waist-to-hip ratio (WHR) categories. Other studies have also reported the importance of these factors. Therefore, improving socioeconomic conditions and managing lifestyle choices are essential for maintaining good nutritional health.

Conclusion

The present study found that most participants demonstrated a good nutritional status. However, overweight and obesity continue to be significant challenges within the study population. Socioeconomic factors and practical lifestyle management are crucial for maintaining proper nutrition and health, as many socioeconomic and lifestyle elements significantly influence participants' nutritional status. Further in-depth studies are needed to better understand the evolving patterns of nutritional status among the elderly population. In conclusion, improving socioeconomic status and managing lifestyle choices are essential for better nutritional health.

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References

Adak, A., Das, P., Roy, S. (2024). A study of hypertension and associated factors among the elderly male population of

Dantan-Medinipur, West Bengal. *Indian Journal of Gerontology*, 38 (1), 169-183.

Agbozo, F., Amardi-Mfoafo, J., Dwase, H., Ellahi, B. (2018). Nutritional knowledge, dietary patterns, and anthropometric indices of older persons in four peri-urban communities in Ga West Municipality, Ghana. *African health sciences*, 18(3), 743–755.

Aiyar, A., Rahman, A., Pingali, P. (2021). India's Rural Transformation and Rising Obesity Burden. *World Development*, 138.

Amarya, S., Singh, K., Sabharwal, M. (2015). Changes during ageing and their association with malnutrition. *Journal of Clinical Gerontology and Geriatrics*, 6 (3), 78–84.

Ayushree, B. R. A., Biswal, R., Munda, M., Udgata, J., Bhoi, B. (2023). An assessment of nutritional status of the elderly in Bolangir district of Odisha: a community-based study. *International Journal of Community Medicine and Public Health*, 10 (9)

Babar, S., Arif, T., Shakoor, A., Ashraf, T., Anwaar, T. (2022). Nutritional status and dietary habits of elderly population and their association with socio-demographic factors in a village of Punjab.*Research Square*, DOI: 10.21203/rs. 3. rs-1570277/v1.

Bhandari, P., Gayawan, E., Yadav, S. (2021). Double burden of underweight and overweight among Indian adults: spatial patterns and social determinants. *Public Health Nutrition*, 24 (10), 2808–2822.

Dalvi, T., Kalghatgi, S.A. (2023). Update of Kuppuswamy Socioeconomic Status classification Scale for the Indian population. *J Indian Assoc Public Health Dent*, 21, 282–3.

Evans, C. (2005). Malnutrition in the elderly: A Multifactorial Failure to Thrive. *The Permanente Journal*, 9 (3), 38-41.

Gohar, M., Barua, K., Srivastava, S., Mahajan, H., Pawaiya, A. S., Nagar, S. K. (2024). A cross sectional study to assess the

under nutrition amongst the elderly population in a rural area of district Gautam Buddha Nagar, Uttar Pradesh. *J Family Med Prim Care*, 137, 80-86.

He, X., Li, Z., Tang, X., Zhang, L., Wang, L., He, Y., Jin, T., Yuan, D. (2018). Age- and sex-related differences in body composition in healthy subjects aged 18 to 82 years. *Medicine*, 97 (25).

Kandapan, B., Pradhan, I., Pradhan, J. (2023). Food insecurity and malnutrition among Indian older adults: findings from longitudinal ageing study in India, 2017-18. *Journal of Population Ageing*, 16 (3), 639-659.

Khan, J., Chattopadhyay, A., Shaw, S. (2023). Assessment of nutritional status using anthropometric index among older adult and elderly population in India. *Scientific Reports*, 13 (1): 13015.

Khole, C. V., and Soletti, A. (2018). Nutritional status of older adults in the old age homes: A study in Pune city. *Current Research in Nutrition and Food Science Journal*, 6 (1), 234-240.

Kshetrimayum, N., Reddy, C. V., Siddhana, S., Manjunath, M., Rudraswamy, S., Sulavai, S. (2013). Oral health-related quality of life and nutritional status of institutionalized older adults population aged 60 years and above in Mysore City, India. *Gerodontology*, 30(2), 119–125.

Little, M., Humphries, S., Dodd, W., Patel, K., Dewey, C. (2020). Socio-demographic patterning of the individual-level double burden of malnutrition in a rural population in South India: a cross-sectional study. *BMC Public Health*, 20, 1-14.

Mane, A. B. (2016). Ageing in India: some social challenges to elderly care. *J Gerontol Geriatr Res*, 5 (2).

Medhi, G. K., Hazarika, N. C., Borah, P. K., Mahanta, J. (2006). Health problems and disability of elderly individuals in two population groups from same geographical location. *JAPI*, 54, 539–544.

Morley, J. E. (1998). Symposium on 'Nutrition and the elderly ': Protein-energy malnutrition in older subjects. *Proceedings of the Nutrition Society*, 57 (4), 587–592.

Motadi, S. A., Khorommbi, T., Maluleke, L., Mugware, A., Mushaph, L. (2022). Nutritional status and dietary pattern of the older adults in Thulamela Municipality of Vhembe District. *African journal of primary health care & family medicine*, 14 (1), 1–8.

Naparat, S., Kamlai, S. (2021). Correlation between mini nutritional assessment and anthropometric measurements among community-dwelling older age individuals in rural Southern Thailand. *J Multidiscip Healthc*, 14, 1509-1520.

Nazri, N. S., Vanoh, D., Leng, S. K. (2021). Malnutrition, low diet quality and its risk factors among older adults with low socioeconomic status: a scoping review. *Nutrition Research Reviews*, 34(1) : 107–116.

Nguyen, P. H., Scott, S., Headey, D., Singh, N., Tran, L. M., Menon, P., Ruel, M. T. (2021). The double burden of malnutrition in India: Trends and inequalities (2006–2016). *Plos one*, 16(2).

Pingali, P., Aiyar, A., Abraham, M., Rahman, A. (2019). The nutrition transformation: from undernutrition to obesity. *Transforming food systems for a rising India*, 93–133.

Roy, S. (2019). On Development and Sustainability: The Issue of Ageing in India. *Journal of the Anthropological Survey of India*, 68 (1), 27 40.

Saha, A., Mandal, B., Muhammad, T., Barman, P., Ahmed, W. (2023). Gender-specific determinants of overweight and obesity among older adults in India: evidence from a cross-sectional survey, 2017-18. *BMC Public Health*, 23(1)

Shalini, T., Chitra, P. S., Kumar, B. N., Madhavi, G., Reddy, G. B. (2020). Frailty and Nutritional Status Among Urban Older Adults in South India, *Journal of Aging Research*. https://doi.org/10.1155/2020/8763413

Shatenstein, B., Gauvin, L., Keller, H., Richard, L., Gaudreau, P., Giroux, F., Payette, H. (2013). Baseline determinants of global diet quality in older men and women from the NuAge cohort. *The journal of nutrition, health & aging*, 17, 419–425.

Smith, L. C. (2015). The great Indian calorie debate: Explaining rising undernourishment during India's rapid economic growth. *Food Policy*, 50, 53–67.

Srivastava, S., Chauhan, S., Patel, R. (2021). Socio-economic inequalities in the prevalence of poor self-rated health among older adults in India from 2004 to 2014: a decomposition analysis. *Ageing International*, 46 (2), 182-199.

Sukkriang, N., Somrak, K. (2021). Correlation between mini nutritional assessment and anthropometric measurements among community-dwelling elderly individuals in rural Southern Thailand. *Journal of Multidisciplinary Healthcare*, 1509-1520.

Vaish, K., Patra, S., Chhabra, P. (2020). Nutritional status among elderly: A community-based cross-sectional study. *Indian Journal of Public Health*, 64, 266–70. DOI: 10.4103/ijph.IJPH_150_19

Varghese, M., Varghese, D., Nair, D. S., Baxla, R. (2024). Prevalence of Malnutrition and Related Factors in the Elderly Population. *International Journal of Science & Healthcare Research,* 9 (1), 187–194.

Vellas, B., Guigoz, Y., Baumgartner, M., Garry, P. J., Lauque, S., Albarede, J. L. (2000). Relationships between nutritional markers and the mini nutritional assessment in 155 older persons. *Journal of the American Geriatrics Society*, 48 (10), 1300–1309.

Vidyalakshmi, M., B. Kirubhakaran, B. (2021). Assessment of Nutritional Status and Its Associated Factors in the Elderly in Rural Areas of Tamil Nadu, India. *Galore International Journal of Health Sciences and Research*, 6 (1), 38–43.

Weiner, J. S., Lourie, J. A. (1969). Human Biology: *A Guide to Field Methods. International Biological Programme Handbook No. 9*. Oxford: Blackwell Scientific Publications.

World Health Organization. (1989). *Measuring obesity: classification and description of anthropometric data. Report on a WHO consultaion on the epidemiology of obesity*, Warsaw. Copenhagen: World Health Organization Regional Office for Europe.

World Health Organization. (1995). *Physical status: The use of and interpretation of anthropometry. Report of a WHO Expert Committee. Technical Report Series No. 854*. Geneva: World Health Organization.

World Health Organization. (2008). *Waist circumference and waist-hip-ratio: report of a WHO expert consultation*. Geneva: World Health Organization.

Yap, K. B., Niti, M., Ng, T. P. (2007).Nutrition screening among community-dwelling older adults in Singapore. *Singapore medical journal*, 48 (10), 911–916.

Zhang X., Pang, L., Sharma, S. V., Li, R., Nyitray, A. G., Edwards, B. J. (2019). Prevalence and factors associated with malnutrition in older patients with cancer. *Journal of Geriatric Oncology*, 10, 763–769.

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Healthcare and Well-being among Elderly Members of the Indigenous Khasi Community : An Exploratory Study

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ABSTRACT

The Khasi indigenous community has a unique, traditional approach to healthcare for the elderly. This study was planned to investigate the health and well-being of the elderly in the Khasi community. A sample of 20 elderly participants, comprising 15 individuals aged 67 to 91 years and five elderly traditional healers aged 61 to 70 years, was selected using a purposive sampling method from urban, semi-urban, and rural areas of the Khasi Hills. This diverse selection ensured a broad understanding of the Khasi community's healthcare practices. The study employed a qualitative research approach with an unstructured, exploratory design, allowing for a comprehensive examination of healthcare practices and the identification of challenges faced by the elderly related to healthcare and well-being within the Khasi community. As per the interviews with traditional healers, the common health issues faced by

the elderly include both high and low blood pressure, asthma and bronchitis, diabetes, burning sensations, bowel complaints, cancer, mental depression, and other ailments. To treat these health issues, the indigenous tribe practices traditional healing as a primary form of healthcare and utilises home remedies for various illnesses. The healers utilise their medicinal plants available in the region, such as Piper longum, Curcuma longa (Lakadong turmeric, well-known for its high quality), Solanum nigrum, Clerodendrum colebrookianum, Artemisia nilagirica, Clerodendrum serratum, and others. As far as the well-being of elderly people is concerned, older people within the Khasi community are treated with profound respect and high regard as preservers and teachers of culture and tradition, custodians of wisdom and knowledge, and a support system, as well as spiritual and religious healers.

Keywords : Elderly Members, Khasi tribe, Healthcare, Well-being, and Quality of life

The Khasi community of Meghalaya is known for its unique traditional healthcare practices. Over time, these individuals have developed these practices to cater to the physical, emotional, and spiritual health needs of their community members, with a special focus on the elderly.According to the profile of cancer and related health indicators in the Northeast region of India, the life expectancy of Khasis is 66.8 years for males and 72.4 years for females (Meghalaya, n.d.). Very few people reach the age of 90 or live to be 100 years old. Topography, climate, culture, lifestyle, dietary habits, and societal relationships all play a significant role in human longevity. The Khasi Hills are sloped and steep, and people practice farming in their vicinity, often far from home. Hence, their work becomes burdensome, including walking and carrying raw materials from the farm to their house and from the house to the station where vehicles can reach. Not all villages in

Meghalaya are accessible by transportation. Thus, their heavy tasks and hazardous activities when they were young affect them as they grow older. The habit of smoking and eating local tobacco and betel nut, and drinking rice beer and other illicit alcohol, also hampers their health. When they are old, many suffer from various illnesses such as joint pain, asthma, cancer, high blood pressure, bronchitis, back pain, poor eyesight, mental illness, and acquired disabilities such as the loss of hands, legs, eyesight, and other body parts due to accidents (Ahmmed, 2011).

Khasi Indigenous Healthcare

The WHO defined health as "a state of complete physical, mental, and social well-being, not merely the absence of disease or infirmity" (Callahan, 1973). The indigenous Khasi community also views health from a holistic approach. They are closely connected to Mother Earth and draw all necessary resources from it, for example, food, clothing, shelter, water, medicinal plants, knowledge, and experiences. The Khasi community, predominantly residing in the state of Meghalaya, Northeast India, is well known for its unique way of life, which involves practising a matrilineal and matrilocal system. The Khasi tribe is rich in indigenous culture, beliefs, practices, and rituals, particularly in their traditional healthcare knowledge.

The strategic geographical location and unique climate conditions of this plateau region in Meghalaya have isolated and distanced it from mainstream India, leading the dwellers to depend more on the available resources for their livelihood. For the healthand well-being ofthis tribal community, the people are more inclined toward natural healing. This consistent proximity to nature has led to the development of knowledge that is evident and reflected in their culture and beliefs. Over time, these individuals have come to rely entirely on the traditional healthcare system. The recipes and doses of these medicines are passed down orally from one generation to the next. It is an entirely undocumented practice. Indigenous healthcare practices, rooted in centuries of

tradition, offer a holistic approach to community well-being. These practices, although they have lost some of their glory and demand in the age of modern science and technology, cannot be underestimated or belittled for the value they possess. Some tribal communities practice traditional ways of healing health issues, and these still prove to be effective in many ways.

Concept of Wellbeing among the Khasi

Well-being encompasses a state of wellness, health, and happiness. The Centres for Disease Control and Prevention (CDC) describe well-being as the presence of positive emotions and moods, the absence of negative emotions, satisfaction with life, fulfilment, and positive functioning. Well-being is closely linked to health, happiness, and overall satisfaction (CDC, 2022). Following their traditional practices to maintain well-being within the community, the Khasi tribe is protected by the Sixth Schedule of the Indian Constitution, which enables them to exercise their indigenous practices freely. For instance, there is the establishment of the "Hima" areas under the jurisdiction of the "Chief" or the "Syiem," and the roles of the doloi, sordar, rangbahshnong (headman), and other stakeholders. The village council, or "DorbarShnong," serves as the local governing body, overseeing development and prosperity, as well as maintaining peace and tranquillity within the village. This is the indigenous structure for maintaining community well-being. Regarding the well-being of the elderly, it is the ethical responsibility of children to look after their parents as they age. This social and ethical concern also involves advising young people to respect and treat their elders with kindness and consideration. Societystigmatises children who do not carefor their parents respectfully, believing that they will be cursed and will not live long. The elderly will not bless them, and these irresponsible children will receive no grace.

Objectives of the Study

1. To conduct an in-depth examination of healthcare practices for the elderly within the Khasi community.

2. To identify the challenges faced by the elderly related to healthcare and well-being in the current scenario.

Method

Sample

A sample of 20 elderly participants, comprising 15 individuals aged 67 to 91 years and five elderly traditional healers aged 61 to 70 years, was selected using a purposive sampling method from urban, semi-urban, and rural areas of the Khasi Hills. A purposive sampling strategy was employed to select participants, ensuring a diverse and inclusive sample that could accurately describe the healthcare and well-being of the elderly. Some elderly participants had been placed in shelter homes by their children and relatives. In contrast, others, such as traditional healers who were still able to work, remained in their own homes within their communities.

Tools Used

The data collection tool used was in-depth interviews with the traditional healers and elderly members of the Khasi community. Open-ended questionnaires were developed to explore their health and well-being, covering topics such as the types of illnesses they have experienced, the indigenous healing practices they follow, their role in the community in promoting well-being, and the challenges they encounter within their families and the community, including those beyond illnesses. Data analysis is subjective, as is typical for qualitative research, and is based on the experiences shared by the elderly, observation, and secondary data accessed through a literature review.

Findings

The respondents reported a variety of health conditions that are common in old age. Diabetes emerged as the most prevalent health issue, affecting 20 per cent of the respondents. Other frequently reported conditions include blood pressure problems, asthma and bronchitis, bowel complaints, burning sensations, cancer, and mental depression, each accounting for approximately

13.3 per cent of the sample. This distribution illustrates the multifaceted health challenges faced by the elderly in the community, including both chronic physical illnesses and mental health concerns.

The presence of conditions such as hypertension, diabetes, respiratory ailments, and gastrointestinal issues highlights the need for regular medical care and preventive health services. Notably, mental depression was reported by two individuals, pointing to the psychological burden that can accompany ageing, particularly when combined with financial or social vulnerability. Overall, the data emphasises the importance of a comprehensive approach to elderly care in the Khasi community—one that addresses both physical and mental health within the context of their socioeconomic realities.

The elderly of the Khasi tribe are the backbone and pillars of the long-standing Khasi society, passing down traditions from one generation to the next. Through interaction with the elderly, the researcher noted their significant role and contributions toward well-being through innovative planning, shaping, and moderating the unique matrilineal society and rich cultural heritage.

Indigenous Healing of Illnesses in Elderly People : Regarding the health issues of the elderly, the researcher sought information from Khasi traditional healers who are experienced and knowledgeable about medicinal plants that can treat common illnesses faced by older adults, such as

1. Arthritis and Muscle Strain: Mrs. Nancy Palei (name changed), a 61-year-old traditional healer who practices massage therapy, suggested that she use massage techniques to treat arthritis and muscle strain. She applied an ethnomedicinal oil prepared by F. Langja (name changed), a 70-year-old traditional healer. The ointment is made through the decoction of the bark, leaves, and roots of *Clerodendrum colebrookianum*. She also uses Pro Joint Pain Reliever, an anti-inflammatory agent. She said that

"*The Almighty is blessing me with the gift of healing people through massage therapy. I have been an instrument of healing for many, including bureaucrats and politicians. I have also taught five other women the methods and techniques of massage. I am massaging muscles, tissues, and other parts of the body, which impacts various illnesses"(F. Langja, Female,70 Years).*

2. Asthma and Bronchitis: According to interviews with Mr. P. Syngkli (name changed), a 68-year-old prominent Khasi traditional healer in the West Khasi Hills District. He specialises in asthma and bronchitis, and suggested using the flowers and leaves of *Artemisia nilagirica*. The preparation involves infusing the flowers and decocting the leaves. *Clerodendrum serratum* is also useful; the decoction from the root can be consumed, and the infused oil can be applied topically.

3. Diabetes: *According to an interview with Mr. B. Sungoh (name changed), a 63-year-old, he is commonly referred to as "Doctor" by the people of the region, as he is skilled in treating illnesses using traditional techniques and medicinal herbs.Hesuggested thatCurcuma longa*, or turmeric from Lakadong, is primarily used to make medicine due to its high-quality medicinal properties and national recognition. This plant is used to treat diabetes and other illnesses. The rhizome is dried, ground into a powder, and then mixed with water for consumption. The 'Purple Yam' (*Dioscorea alata*) is also used medicinally for diabetes; the tuber can be ground into a fine paste and mixed with water to create a medicinal preparation. Another medicinal plant for diabetes is *Cassia auriculataLinn*. The recommended preparation is 30 grams of the buds and 10 grams of the seed powder, mixed thoroughly and taken with one teaspoon of honey twice a day.

4. Burning Sensation: Mr. Sngapsing Rani (name changed), 65 years old, suggested that *Hibiscus rosa-sinensis* is available in the region and is medicinal for burning sensations. The flowers, leaves, and roots can be used. Dried or fresh flowers and roots can be strained and drunk as tea. Flowers, leaves, and roots can be mixed with a carrier oil, and the infused oil can be strained for use on skin conditions. He said that many elderly people are facing this

problem, and it comes and goes.Henarrated that it is difficult to treat completely with herbal medicine. One of the beneficiaries,Mrs. Jeny Raswai (name changed), 70 years old, said that "*Ka dawaikhasi ka kham suki ban treikam ban ka koit suki suki"*, which means "Khasi indigenous medicine *slowly* ***gives results****, and the* ***curing of illnesses takes time****."*

5. Healing Fractured Bones and Bowel Complaints: Mr. Tynroid (name changed) is a 66-year-old specialist in healing fractured bones. He has learned and practised since childhood, when he would look after the cattle, taking them out for grazing. When the cattle fell and suffered from bone fractures, he practisedcuring them by crafting them with bamboo and applying medicinal plants. Gradually, he started to heal fractured bones and bowel complaints in human beings. Many elderly people experience pain in the bowels and joints. The available medicinal plant that can be used is *Cannabis sativa*. The dried flowers are usually taken. Three grams are powdered and mixed with butter and sugar to form a paste.

6. Cancer: *In order to treat cancer,many traditional healers are trying to find out the curative plants, yet it is not guaranteed 100% that the medicinal plants alone can heal the illness. Most patients seek medicine from various sources, combining modern and traditional medicine.However, some of the medicinal plants used by the healers include Dioscorea bulbifera, which is available in the region for the treatment of cancer and ulcers; only the tuber of this plant is utilised.* Another locally available herb is *Panax pseudo-ginseng*. The root of this plant is used to treat illnesses. The leaves of *Taxus baccata L.*alsohave medicinal importance for cancer treatment. The rhizome of *Curcuma longa* is also one of the best herbs for cancer, and the best quality is available in the country (Marbaniang, 2024).

7. Mental Depression: It is the practice of the community, the church, and other civil groups to visit the elderly, especially those who are bedridden. Communicating with them and listening to them during these visits, whether they are at their own homes or an old age centre, helps them to release stress and depression. The elderly

long to see people visiting them. The researcher practised visiting the elderly for one month at an old-age home. They would wait near the gate or outside the door, longing to see visitors. A 75-year-old woman said, "*Hep wad julehbeinia ki kmie ki kpa, sumarbhaia ki haba ki lahtymmen*," which means, "Dear child, do notmistreat your parents when they are old; take care of them properly." Her plea stemmed from her own experiences; she had returned to Mercy Home twice because she could not bear the lifestyle her children imposed on her at home. When she misses home, she goes for a few days and then returns to the old age centre.

Apart from the common illnesses mentioned above, the elderly face numerous other complex illnesses that may not be fully addressed by the traditional wisdom and ethnomedicine available in the region.

I. Well-being

This study explored indigenous well-being practices among the elderly within the Khasi community. The key findings include:

1. Preservers and Teachers of Culture and Tradition

A 90-year-oldman said, "*ki balasan ki la iohi shwa ia ka sngi u bnai,"* which means "*the elderly have seen the sun and moon first*" and thus possess more knowledge and experience. They preserve and teach the young ones about Khasi philosophy, folk tales, myths, faith, culture, customs, traditions, policies, and actions to govern the Hima (kingdom) or the Dorbar Shnong (village council) within the framework of Khasi culture, as outlined in the Sixth Schedule of the Indian Constitution. The sharing of knowledge is primarily achieved through oral narratives, songs, and folk tales, ensuring that younger generations are well-versed in inheriting their culture, beliefs, and practices.

2. Custodian of Wisdom and Knowledge

Among the Khasis, the elderly are considered the source of wisdom and knowledge. One elderly person, aged 79, from Cherrapunji, stated that despite not being literate, they possess

natural wisdom based on their experience and the teachings of Mother Nature. He said "*Ngidei ki stadsla, ym ki stadkot"*. Based on their experiences, the elderly are often regarded as repositories of wisdom. They are available to offer knowledge and guidance to the young ones in various aspects of life, including traditional farming methods, worship and belief in the spirits of nature and God the Creator, organising traditional gatherings, and addressing social issues and family matters.

3. Decision Makers and Leaders

In many Indian societies, including Khasi society, elders are highly respected within their clans and villages. The younger ones seek blessings, guidance, and permission from the elders before engaging in any activities. They contribute insights and experiences to family and community affairs.Often, the younger ones will ask the elderly for information related to their lineage and marriage prospects, specifically which clans they can marryinto, and which are prohibited due to inter-clan relationships or other forms of family bonding. The elderly also play a vital role in governing community land, sacred groves (*khlawkyntang, khlawadong*), and making decisions about distributing properties to their children.

4. Caregivers and Support System

Elderly men and women play a vital role in the family and community by providing healthcare support. They guide young married couples in childcare, ensuring the well-being of children, and teaching them manners, morals, and social values. They are highly concerned and strictly adhere to the rules regarding the marriage of young people, taking into account their kin and social standing. Many elderly individuals used to practice as traditional healers, attending to patients using ethnomedicine and traditional knowledge. The elderly also assisted as midwives to women giving birth at home. Unfortunately, many women in rural areas still opt to give birth at home, despite the government providing financial

assistance and healthcare services in institutions through various schemes, including Janani Shishu Suraksha Karyakaram (JSSK), Rashtriya Kishor Swasthya Karyakram (RKSK), and Kasturba Poshan Sahay Yojana (KPSY). A 34-year-old woman who invited the traditional healer to assist in giving birth said that:"*ym don Blei tang ha ki hospital ne jaka ai jingsumarSorkar, u don ha ingruh."*Which they believe means God is not only in a hospital or government institute, but He is also in our own homes. In such situations, older adults play a significant role, as they know how to help according to the circumstances. Fortunately, the woman delivered the baby safely with the help of the elder traditional healer.

5. Spiritual and Religious Leaders

Khasi indigenous religion often allows the elderly to participate in worshipping deities, offering prayers, and performing sacrifices. They teach and guide the young ones about their faith, maintaining a good connection with the divine. In cases of illnesses believed to be caused by evil spirits, witchcraft, sorcerers, or other supernatural forces, people turn to the elderly for prayer, interceding with God the creator for good health. The elderly are aware of the signs and symbols present in nature and act accordingly to ensure peace and harmony within the community and with the natural world(Nongthliew, 2024).According to their belief, they can pray to the Almighty to stop the rain during ritualsor askfor the Almighty's blessing on their farming and livelihood. An 80-year-old indigenous religion leader narrated that*"Sincerity, integrity, morals, and values, along with knowledge and wisdom, are essential to intercede with God Almighty so that He listens to prayer and petition. That is why I could chase out devil spirits or witchcraft (nongshohnoh)".* Thus, the elderly are powerful in praying and highly impactful as religious leaders in their own indigenous faith and belief.

II. Challenges Faced by the Elderly in the Khasi Community

Despite the noble roles and responsibilities of younger generations, several issues related to the health and well-being of

the elderly are evident in society. Based on the study's findings,this research aims to highlight the followingkey challenges faced by the elderly in the Khasi community.

1. Healthcare Access: India is making significant progress in assisting the elderly through various schemes and programs. However, health disparities among the elderly still prevail, especially in rural areas and among Below Poverty Line (BPL) families. The researcher witnessed the vulnerability of the elderly among the Khasis, particularly the underprivileged, who face health issues. Most of them will not be able tomanage to have standard healthcareon their own or travel to proper institutions for better treatment due to financial crises and a lack of support. Instead, they tend to seek health support from traditional healers, which is locally available and less expensive. We are aware that traditional healers are not typically educated in science and technology, nor are they well-informed about the use of advanced medical equipment, such as X-rays and scanning. Thus, diagnosing the illnesses of the elderly is complicated. However, the elderly are concerned not to spend so much money on their treatment, as they are aged and often feel ready to leave this world. They prefer to use the money for the well-being of the younger ones, whether their children, grandchildren, or great-grandchildren (Ansari, 2021).

2. Loneliness and Isolation: In old age, life becomes increasingly critical as physical strength diminishes, retirement from the workplace occurs, social involvement decreases, and separation from children becomes more common due to work schedules and other factors. Within Khasi society, we observed certain families where children leave their elderly parents alone in their hometown and migrate to the city or town in search of jobs. The elderly, who have spent their entire lives in the village, hesitate to move to the city to live with their children. They are attached to their properties, their homes, their belongings, and the community in which they live. Some children place their parents in old age homes, mostly "Mercy Home" at Demthring, Shillong, which religious nuns run.

The researcher visited the centre several times and interacted with the elderly, who shared their heart-touching stories. One elderly person from the sample said, "I was left alone at home during the day as my children had to go to work. No one looked after my needs. They used inappropriate language that hurt my sentiments, making me feel like I am a curse to their lives.".

3. *Financial Security*: Money is a significant concern for human beings. The elderly feel insecure without financial stability in the form of a post-retirement pension fromorganised sectors. The Indira Gandhi National Old Age Pension Scheme (IGNOAPS) provides financial assistance to elderly individuals from Below Poverty Line (BPL) families, offering Rs. 500 to those between 60 and 79 years old and Rs. 550 to those 80 years and above (Meghalaya, 2025).Given the current economic climate, this amount of money is insufficient for the elderly, who are particularly vulnerable to health and other issues. As we are aware, the Khasi tribe is mainly engaged in agriculture (58%), which is not a formal job sector that generates stable income. Thus, the old-age pension scheme is also minimal, unlike the pensions of those whoare superannuated fromthe government sector. If there is a financial constraint during their old age, they also hesitate to ask their children for what they want.

4. *Physical and Mental Health Issues*: The deterioration of physical health is adverse in old age. Chronic diseases like diabetes, cardiovascular disease, hypertension, arthritis, cancer, kidney diseases, Parkinson's disease, dementia, and depression become more prevalent. Caring for these illnesses requires proper medical care and financial support. These illnesses are critical and put the elderly in challenging life situations, particularly inlow-income families.

5. *Lack of Facilities at Home*: Among the Khasi tribe, the majority of people are agrarian (58%), with low levels of income and difficulty accessing facilities related to the needs of the elderly. These include nursing care, palliative care, convenient washrooms, beds and bedding, wheelchairs, and other necessities.

6. *Self-Sympathy*: The elderly often express feelings of guilt and discomfort about troubling their children or others withassistance with activities of daily living (ADL), such as bathing, washing, dressing, feeding, accompanying them to the bathroom, and spending time with them. Elderly people sometimes consider themselves a problem and a burden to their children and younger family members. Among the Khasis and other groups of people, some individuals live alone, either because ofremaining singlewithout marrying, divorce, becoming childless, or being abandoned by their children and family members. It is a very critical situation for an elderly person to live alone and manage to feed themselves through various means.

7. *Widows and Widowers*: The separation of the loving bond of a couple by death or other reasons is a heartbreaking event. According to Khasi belief, once a marriage is formalised, the couple should be together until death. The bonding is strong, and if one of them passes away, pain and lamentation follow, as the sole supporter, both physical and emotional, is no more.

8. *Abuse and Exploitation*: The traits of the aged are similar to those of infants, which can irritate caregivers, including their children. Some children failto reciprocate the care and protection their parents provided when they were young. Instead, they abuse them verbally or physically when they become old. Some of them put their aged parents in shelters or oldage homes because they cannot take care of them any longer.

Discussion

The descriptions above underscore their wisdom in treating illnesses using indigenous practices, including medicinal plants available in the region, along with prayer, rituals, and faith. Common health issues faced by the elderly in their old age include diabetes, asthma, bronchitis, hypertension, hypotension, cancer, burning sensations, bone fractures, joint pain, heart disease, hearing loss, dementia, depression, anxiety, and others. While it is

acknowledged that traditional healers cannot treat all illnesses, particularly those that require advanced technology for diagnosis and treatment, their contributions to primary healthcare, particularly in dealing with minor illnesses, have been recognised globally. Among the Khasi community, the elderly play a vital role as teachers and healers, imparting knowledge to younger generations about indigenous healing methods, types of herbal plants, and the process of preparing medicine, which is deeply rooted in faith and trust in the power of the Almighty God.

Apart from the health aspect, the elderly also play a significant role in promoting well-being in the community, and they are highly respected in society. According to the findings, they contribute to preserving and teaching culture and tradition, and some serve as religious leaders, particularly those who still follow the indigenous faith "*Niam Tynrai."* They act as custodians of land and other properties, which they distribute to their children according to the family's needs and arrangements. Unfortunately, among the Khasis, the majority of parents still adhere to the matrilineal system of sharing properties only with their daughters, unless they do not have a female child, in which case they pass it on to their sons. However, it is worth noting that some have started adopting equal property sharing among all children, regardless of gender.

The elderly play a crucial role in their clans, often presiding over meetings in the village or in the clan council *(Dorbar Kur),*which comprises people from the same clan living in different locations.

Despite the significant role they play in healthcare and overall well-being, it is undeniable that the elderly often struggle in their later years. Various factors contribute to their challenges, including poverty, ill health, inadequate home facilities, widowhood, childlessness, abandonment by their children, abuse, exploitation, and others. According to the findings, Meghalaya needs to establish more nursing homes to serve elderly individuals who are mistreated by their children or lack caregivers. The Indira Gandhi National Old Age Pension Scheme (IGNOAPS) provides financial

assistance to elderly individuals from Below Poverty Line (BPL) families, offering Rs. 500 to those between 60 and 79 years old and Rs. 550 to those 80 years and above (Meghalaya, 2025).However, given the rising costs of goods, products, and services, the pension amount seems minimal. The government needs to reconsider the policy and increase the pension scheme, as Rs. 500-550 per month is insufficient in today's times. Other facilities also need to be improved to pay tribute to the elderly, enhance healthcare, and promote well-being in their old age.

Conclusion

The revered Khasi indigenous tenet, "*kamaiia ka hok*" (earn righteousness), is increasingly disregarded by many Khasi families due to intercultural influences. The pursuit of wealth and material possessions often overshadows the responsibility of ensuring the well-being of elderly parents. In earlier times, disrespectful communication with elders was considered unethical and impolite. Old age homes and nursing centres were nonexistent; children revered their parents as second only to God, a sentiment expressed in the local saying, "*ki kmie ki kpa, ki dei ki Blei baar"* (parents are the second God). It is disheartening to witness the growing number of elderly parents residing in old-age homes in Meghalaya. As Professor Streamlet Dkhar of the Khasi Department at NEHU expressed her concerns during the fifth anniversary of the Council Ki Rangbah Kur ka Brie, held on January 7, 2025, in Hynniewtrep, she lamented the neglect shown by children and family members toward their ageing parents. The question arises: where are the children responsible? Where are the youngest daughters of the families, who are traditionally and socially obligated by the matrilineal system to care for their parents in their old age("Lanang Bun Ki Kmie Ki Kpa Kiba Sah Ha Ki Ing Tymmen, Shano Ki Khun," 2025). The changing social dynamics brought about by modernisation and urbanisationare a significant concern, as children lose their sense of filial duty and cultural values, neglecting their parents' health and well-being. It is imperative to address the welfare

of the elderly, particularly their economic dependency. The old age pension scheme must be strengthened and efficiently implemented to ensure that the elderly receive adequate financial support. Access to quality healthcare, including free checkups and other medical services, is crucial, especially for the elderly residing in remote areas. Mental health, while often overlooked in societal discourse, is a significant concern that requires attention to ensure the mental well-being of the elderly. Overall, the health and well-being of the elderly in the Khasi Hills of Meghalaya are influenced by a complex interplay of factors, including social structures, economic conditions, and the availability of healthcare facilities.

References

Ahmmed, F. (2011). Marginalisation of Aged Khasi Indigenous Community: An Ethnographic Exploration. *Journal of Exclusion Studies*, *1*(1), 63. https://doi.org/10.5958/j.2231-4547.1.1.007

Ansari, H. (2021). Care of the Elderly in India: Issues and Challenges. *International Journal of Creative Research Thoughts (IJCRT)*, *9*(6 June 2021).

Callahan, D. (1973). The WHO Definition of "Health." *The Hastings Center Studies*, *1*(3), 77. https://doi.org/10.2307/3527467

CDC. (2022, August 3). *Well-Being Concepts*. Centers for Disease Control and Prevention. https://archive.cdc.gov/hrqol/wellbeing.htm

Meghalaya (2025). National Social Assistance Programme (NSAP). *Meghalaya.Gov.In*. https://meghalaya.gov.in/schemes/content/37326#:~:text=Indira%20Gandhi%20National%20Old%20Age%20Pension%20Scheme

Nongthliew, B. (2024). *Traditional healer* [Personal communication].

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Death of an Adult Child and Its Implications to Health and Emotional Wellbeing of Elderly Parents in Ilorin South Council Area of Kwara State, Nigeria

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ABSTRACT

The study examined the implications of health and emotional well-being of elderly parents who had experienced the death of an adult child in Ilorin South Council area of Kwara state, Nigeria. A multi-stage sampling procedure was adopted, and In-depth interviews (IDIs) were conducted with 18 participants selected from the three major districts of Ilorin South Council Area, Kwara State. The data collected were assembled into themes, transcribed, and thematically analysed. Study findings revealed that some socio-demographic characteristics of participants, such as gender, marital status, religious belief, educational level and socio-economic status of elderly parents, to a large extent, were accountable for differences in health and emotional wellbeing of elderly parents consequent to the death of their adult child. The study also established that, even though Social Workers understand the ripple effects associated with the loss of a child at an advanced stage, counselling therapy and other professional skills were employed to help participants retain

their sense of purpose in life. Several participants, however, reported that improved relationships with friends, family members, and coworkers significantly contributed to restoring their hope and well-being during their traumatic experience. The study therefore recommends that elderly parents be exposed to end-of-life counselling by social workers and that the nation strengthen its social protection policies. This is crucial to avoid over-reliance on children for financial security during old age, and the urgency of these policy improvements cannot be overstated.

Keywords : Adult-child; Death; Elderly-parent; Emotional-health, Wellbeing, End- of- life counselling

Generally, human beings see death as an abstraction, a natural evil and a phenomenon which inflicts pains beyond man's solution and which all human beings must bow to when the time comes, with breathing and the workings of all the organs becoming paralysed. Safa *et al.* (2021) observed that the level of emotional trauma experienced on the death of an adult child is akin to a hole in the human heart or amputation. The loss of an adult child, especially by parents who have reached an advanced age in their lives, seems to be a traumatic experience that nobody prays to go through. In the event of such an occurrence, the emotional/ psychological trauma and health risks could be enormous, irrespective of whether the child has reached the age of adolescence or not. Asad and Nawait (2018), Safa *et al.,* (2021) all maintain that the trauma associated with the loss of an adult child by a parent is unpalatable and manifest in the forms of anxiety, depression, sadness, sleeping difficulty, anger, despair, mental illness, high blood pressure and other forms of cardio vascular diseases. In other words, the impact on the well-being of the elderly parent is very high to the extent that, in some cases, the older adult whose child died cannot see anything good again in life and could attempt suicide to die along with the child (Gijzen *et al.,* 2016).

Carr and Monney (2021) also observed that the stress related to the death of a child of any age in the later life of a parent could undermine physical health and generate multiple aspects of mental health, including symptoms of anxiety, depression, grief and loneliness. One of the significant implications is that life expectancy at old age is increasing, which indirectly increases the chances of older adults seeing the death of any of their children during their lifetime. In a longitudinal study carried out in the United States(2022), Gerber (2022) revealed that 71 per cent of older adults aged 65 and above had encountered at least the death of one or more of their children within the past years of their lives. The experience of this monumental loss by parents seems to go against the natural order of how we expect life to follow because no parent would like to witness the death of their child/grandchild, especially at an adolescent stage, a loss that leaves a long-lasting and enduring impact on their lives, often leading to prolonged suffering and pain.

In Nigeria and many other countries of the world, children are regarded as the pride and happiness of their parents. Lin and Wolf (2020) noted that many parents in their advanced age rely on their adult children for their support and care in response to their parents' increasing frailty. Having a male child for instance in most African societies give the parent all the confidence and assurance that they have gotten somebody that will perpetuate the ancestral line or support the family economically (Inyang-Etoh & Ekanem, 2016) while daughters are expected to provide better emotional supports to parents in addition to providing other socio-economic securities when they get married and make their own homes or earn wages in employment (Chu, 2021). It is also expected that children should repay their parents as part of their social security obligations for the care and upbringing they received. This is one of the central tenets of the extended family system in Africa right from the pre-colonial era to the present time which makes older adults rely more on their children for sustenance in times of

need and equally promotes cohesion, togetherness and cooperation among family members (Okoli *et al.,* 2021). For a parent to lose his or her adult child at such a later stage of life, this could snowball into such physiological and psychological consequences, such as psychiatric hospitalisation or long-lasting depression and other unjust feelings towards themselves and things around them (Yang *et al.*, 2020).

Lekalakala-Mokgele (2018) argues that the level of emotional trauma and physical health dislocation are never the same for every older parent that may have experienced the death of his or her adult child, rather it is subject to the relationships that existed between the deceased child and the parent, gender of the deceased child, circumstances of the death, society's culture among other factors. The provisions of attachment theory, developed by John Bowlby, a British Psychologist in the early 1950s, also demonstrate that children, from their early childhood, develop extensive relationships with parents, which amount to certain expectations from both parents and children (Cherry, 2022). This affectional bond or mutuality, which supports security, nurturance, and responsiveness in the relationship, helps produce a coherent and well-organised personality in later life (Cherry, 2022). However, the dissolution of these emotionally and socially significant ties with the death of the child could be very devastating to the well-being of the parents (Trevino *et al.,* 2021).

In the same vein, the gender of the deceased child could shape both the health and emotional well-being of the elderly parent who experienced the loss. Many cultures in Nigeria and other Asian countries still appear to uphold the inheritance laws which endorse the transfer of properties and wealth to the male child who should carry on the family and guarantee the father's pseudo-immortality. Hence, the death of a male child is bound to be more painful to parents, not only emotionally but also tends to increase the parents' financial burdens, especially when the deceased child is the only son of the family (Lee *et al.*, 2015). Research evidence has not yet

been able to gauge the number of parents who have died spontaneously with the unanticipated death of the adult child in Nigeria. Marum *et al.* (2014), however, argue that elderly parents who had experienced the loss of a child at the adult stage tend to have poor health status with diseases such as diabetes or some forms of cancer, unlike those who have not had such experiences. Alikor (2022) noted that as a result of the economic crunch that had befallen Nigeria and many other countries of the world with inflation rising above 20 per cent and unemployment rate of about 33.3 per cent, many promising adult children continue to die on daily basis through suicides, accidents, drug intake, homicides, armed robbery and others in a bid to meet up with the economic challenges. This indicates the possibility of many older adults losing a child in their lifetime. Similarly, certain socio-demographic factors associated with the elderly parents such as gender, marital status, income level, belief system, educational level amongst others are likely to exert influence on both health and emotional wellbeing of elderly parents who had experienced the death of an adult child (Lee *et al.,* 2015; Feldman *et al,* 2017; Base, 2018; Kahler, 2022; Walsh *et al,* 2022). However, there is no conclusive research evidence on the uniformity of the effect of these variables on the health and emotional well-being of elderly parents across various countries. The study argues that Social work could make vital contributions in the restoration of the functional capacities and well-being of individuals who have experienced the loss of a child, especially at an advanced age, to minimise the adverse effects of the loss.

Many studies conducted in Nigeria and other countries on the death of an adult child/children and its implications on older adults' wellbeing were strongly influenced by cultural/ethnic differences (Asad & Nawait, 2018; Safa *et al,* 2021; Gerber *et al,* 2022) with none situated in the study area or dwelling exhaustively on the emotional and health wellbeing implications of adult child's deathon elderly parents. More so, none of the studies considered

the vital roles that social workers could play to assist elderly parents enhance their health/emotional well-being consequent to the loss of an adult child. It is against this backdrop that the study was set to examine the health and emotional well-being of elderly parents who had experienced the death of an adult child in Ilorin South Council area of Kwara state, Nigeria. Specifically, the study attempted to pursue the following objective: (i) To ascertain the effect of some socio-demographic factors such as gender, marital status, religious affiliation, level of education and socio-economic status on elderlyparents' wellbeing following the death of an adult child. (ii) To examine the coping strategies adopted by older adults in Ilorin South Council area of Kwara State consequent to the death of an adult child and finally, (iii) To ascertain the role of Social Workers and other human service professionals towards enhancing the health and emotional wellbeing of elderly parents confronted with the death of their adult child/children.

Method

The study, conducted in the Ilorin South Council Area of Kwara State between April and June 2024, employed a qualitative research methodology (in-depth Interviews and documentary analysis) to explore how the death of an adult child affects the health and emotional well-being of elderly parents. The target population of the study were elderly parents (male and female) residing in Ilorin South Council Area within the period of the study and reported to have lost an adult child in the last five (5) years. A multi-stage sampling procedure was used to select eighteen (18) participants aged sixty (60) years and above. In doing that, six (6) participants each were chosen from the three major districts of the council area (Akanbi, Balogun-Fulani and Oke-Ogun).The interview was, however, complemented with data from textbooks, internet materials, Journal articles and conference papers. Prior to the interview, verbal consent was obtained from participants, and the study objectives were carefully explained to them. The researchers did not lead participants according to any preconceived

notion, nor did they encourage participants to provide particular responses. Thereafter, the collected data were transcribed, assembled, and developed into themes for coding. Thematic analysis was employed at the end to analyse the collected data. The themes were revisited as the analysis progressed to ensure clarity and uniformity of the data.

Results

(1) Socio-demographic profile of participants: The socio-demographic profile of participants reveals that more females (12) reported having lost an adult child compared to males (6) within the age group of 60 years and above. A greater number of the participants were married (11), and 7 participants were found to be widowed. Similarly, the majority of participants (10) were Muslims while the remaining (8) were Christians. Participants' educational status also indicates that the majority (15) had secondary and tertiary educational training, respectively. At the same time, a smaller proportion (3) held a primary school leaving certificate, and none reported not having any formal education. Almost half of the total sample (9) were civil servants, followed by those in business or allied trade (5), while 4 participants were identified as retirees. It was also revealed that most of the children lost by their parents occurred within the last five years.

(2) Relationship between the gender of the elderly parents and well-being on the death of an adult child : Elderly parents who had experienced the loss of an adult child were asked to provide information on how they felt during the period of the loss. Almost all the participants were of the view that despite the expectation that older adults are mature and have the wisdom that could help them in responding positively to traumatic life events, the loss of an adult child is not easy to absorb for both men and women. Many of them, however, stated that women have a higher risk of being exposed to health and depressive symptoms in the event of losing an adult child during old age. A female participant in Tanke Bubu had this to say:

You know that women are the weaker sex. We do not have the type of heart that men possess. Whenever I remember the nine-month pregnancy and how I nurtured the child right from infancy, how do I explain it again? You know that, naturally, children are closer to their mothers because we are the ones who attend to their needs all the time. Fathers are hardly seen in the house. The shock should be more severe in us (the mothers) than in the men (60-year-old, P.2)

(3) Influence of the marital status of elderly parents who lost an adult child on health/emotional well-being : On whether the marital status of elderly parents who had experienced the loss of an adult child is capable of affecting their emotional/health wellbeing, the majority of participants believed that depressive symptoms, anxiety, loneliness, physical disability and mortality are more likely when one is a widow or a widower than when one is comfortably married. A female participant in Gaa-Akanbi expressed thus:

> "The anxiety of losing an adult child is more painful for a widow than for amarried one. After the death of one's husbandor wife, the hope of any mother or father lies in the children. If my first son is still alive, I will not be engaged in thismenial job. Already, he had promised me when he was going for his national service that he wouldrepay me for all the suffering I had endured while training him. His death terminated my joy and my entire future. I have had no other person to help me since then. If my husband is still alive, I may not feel it so much. It is also the same for men whose wives are no more when they experience such a loss" (71-year-old, P.15).

Similarly, a male participant in Offa-Garage reacted this way:

> "The pains could be mild or highly reduced if one is married and living together. When I lost my 16-year-old child, I tried to hold myself together to avoid the double tragedy of losing my wife. I was even the one whoencouraged my wife to

> accept the situation as it is, since we do not have the strength to reverse it. We resorted to reading the scripture daily, and it helped us to recover from the situation quickly. Bearing such a loss involving the death of an adult child can easily be endured when one has a marital partner" (61-year-old, P.1).

(4) Influence of the religious beliefs of the elderly parent who has experienced the loss of an adult child on health/emotional well-being.

On whether spirituality or religious belief of elderly parents who lost an adult child is capable of influencing the parents' health/ emotional wellbeing, almost all the participants acknowledged the positive role of religion or spirituality in healing the anxiety, anger, high blood pressure and other depressive symptoms recorded or experienced during the loss of an adult child. A male participant in Oke-Odo explains thus:

> "Death is compulsory and irreversible for all of us, whether you like it or not. As a 'born again' child of God, I hope to make heaven when it is my turn to die. When I lost my first son five years ago, it was not easy for me, but I relied on the words of God and consoled myself. I only prayed that God should grant him eternity, knowing fully well that one day I will die equally. It is God who gives children life generally, and He can take it back at any time. I was consoled because I am aware that God knows everything concerning the death of the child, who am I to query God? Many people were surprised to see me in the church the next week after the incident. This is my view" (70-year-old, P.5).

A female participant in Agbabiaka, however, remarked, "looking unto God is the only answer while passing through the calamity of the death of one's child, especially in old age" (62-year-old, P.9).

(5) Relationship between the educational status of the elderly parents who had experienced the death of an adult child and health /emotional wellbeing.

Participants' opinion on whether the educational levels of elderly parents who had experienced the death of an adult child are capable of affecting their health and emotional well-being was also sought. A greater number of the participants affirmed that educational exposure of the individual counts a lot in determining how one recovers when confronted with the death of his/her adult child. A male participant in Fufu stated thus:

> "Many of these educated people, especially those who read medicine and other courses related to human lives, have seen a lot. They do not feel the pains of death, even if it is their own child, like many of us who did not go to university. Medical doctors and nurses see people dying daily in hospitals. They know that humans are mortal and one should learn to cope when faced with the death of a relation, parent or child" (60-year-old, P.17).

(6) Relationship between the socio-economic status of elderly parents who lost their adult child and health/emotional well-being.

On the relationship between the socio-economic status of elderly parents who had experienced the death of an adult child and its impact on the parents' health/emotional wellbeing, almost all the participants affirmed that poverty or richness does not erase the negative feelings when one loses his or her child. One of the female participants inthe "F" Division stated thus:

> "It is an error for one to lose his or her child at an advanced stage of life, no matter one's social standing. This is to tell you that being wealthy or poor does not exempt one from the agony that follows the death of a close person" (60-year-old, P.4).

A male participant in Tanke Iledu,however, had a different opinion, put thus:

> "Rich people or these highly placed individuals do feel the pains, but not like the poor ones who express hopelessness when they

> experience a loss. If a rich man loses his or her child, he/she can choose to go for adoption because he/she has what it takes. A wealthy man may decide to marry another wife and start raising children. The deceased child may not have been the primary breadwinner of the family or may not have played a significant financial support role. The primary reasons why the poor ones cry bitterly are that the deceased may be the one providing for the entire family when he/she was alive" (62-year-old, P.13).

(7) Participants' views on the coping strategies employed by parents who experienced the death of an adult child to sustain their well-being.

Participants' opinion was also sought on the coping strategies adopted during the periods of the loss that helped in sustaining the elderly parents' health and emotional well-being. A female participant in Tanke Bubu explained:

> "People visited us, encouraged us and gave us various gifts-money, food stuff and other items. Throughout the two weeks, many of my church members visited my house to cook for me, fetch water, and perform other domestic chores. Our pastor and his wife were always there, encouraging us with the words of God. The situation raised my spiritual life, bringing me closer to the things of God"(65-year-old, P.18).

A male participant residing beside the MFM Tank expressed his view thus:

> "It is not good to stay alone when one is experiencing this form of calamity. When I lost my child, people, friends, relations, co-workers, church members, and other good-spirited individuals did not abandon me. Their words of advice, gifts and other forms of encouragement helped me a lot in coping" (61-year-old, P.1).

(8) Participants' views on the role of Social workers in the health and emotional well-being of elderly parents who have experienced the loss of an adult child.

Finally, the study attempted to capture the participants' views on the role played by social workers and other allied professionals in sustaining the health and emotional well-being of elderly parents confronted with the loss of their adult child/children. Brito-Pons *et al.* (2018) argue that when clients in grief are supported within the spaciousness of acceptance, empathy, encouragement, and non-judgmental attitudes, they are empowered to approach their pain and anxieties with tenderness and courage. One of the female participants residing in Tanke Ajanaku responded thus:

> "It is evident that some of these professionals, like social workers, can help during such a turbulent period of loss, but you cannot get them easily. This is the main reason why many people rely on their spiritual leaders for counselling. Being with a counsellor during a time of loss makes one stronger and helps them gradually forget the situation" (60-year-old, P.11).

Discussion

The loss of an adult child by parents in their later stage of life tends to bring anger and feelings of bitterness, with a compounding effect on the health and emotional well-being of parents. However, as time passes, affected parents strive to find a way to move on with their lives and rediscover happiness and meaning once more. In this study, the implications of the health and emotional well-being of losing an adult child by elderly parents in Southeast, Nigeria, were examined. According to the multiple responses from participants in the In-depth interview, all the participants affirmed that the death of an adult child attracts severe shock and apathy, anxiety, depression, suicidal thoughts, mental illness, loss of appetite and untimely death to parents. More so, participants' responses indicated an association between the parents' gender and the level of health and emotional well-being in the course of experiencing the death of an adult child. One of the female participants said, 'Mothers are the ones who carried the child for nine months and nurtured them from infancy, the children are closer

to the mother, which makes women feel the pains more than men.' This finding is supported by Lee *et al.* (2014), who indicated that gender is an important factor considered in the adjustment process when an individual has experienced the loss of a close one, as it is always more difficult for women to recover quickly than men. In other words, women tend to have long-lasting psychological symptoms because of their close ties with children in the process of parenting. This has also been a central tenet of attachment theory, as previously discussed, which maintains that the affectional bond in child-parent dyads facilitates mothers' ability to serve as the children's primary caretakers from infancy through adulthood (Cherry, 2022). This does not imply that men do not feel the pains of losing any of the children, but they try to comport themselves and avoid displaying their emotions outwardly.

Participants' opinions also revealed that the marital status of the individual is another factor that comes into play when considering the well-being of elderly parents who have experienced the death of an adult child. One of the participants in the in-depth interview explained that the anxiety of losing an adult child is more painful for a widow/widower compared to a married couple. This finding is in agreement with an earlier study by Lekalakala-Mokgele (2018) that the widowed are more susceptible to decline in wellbeing in the event of losing an adult child because of the substantial assistance and support the deceased may have been giving the family during his/her lifetime.

It was also revealed from the study findings that the elderly parents' belief system or level of spirituality could alter the health and emotional well-being in the case of the death of an adult child. All the participants in the in-depth interview concurred that religion is a moderating factor for anxiety as it relates to the existential question of life and death. This finding confirms the results of an earlier study by Safa *et al.* (2021), which found that professing one's faith based on one's religious inclination leads people who have experienced the loss of a close person to view it

as the work of providence and God's will. Lekalakala-Mokgele (2018) also argued that religious belief instils faith in one to realise that God has the absolute power to decide on all issues related to human existence. In the same vein, Feldman (2017) observed that individuals who profess great faith in their religion tend to experience positive growth and well-being in the event of a loss, compared to those who do not subscribe to any form of religious belief. It was therefore not surprising to observe that many of the in-depth interview participants continued to reiterate how they relied on their religious faith and experienced a quick recovery during their ordeals.

Another finding revealed by the participants was that the educational status of the individuals contributes much to moderating their well-being during the period of loss. A greater number of the participants stated that, although death is painful to everybody, educated people do not feel it so sharply because many of them had read widely and witnessed many horrible situations in the process of their studies, which had given them the courage to stand firmly when passing through trials in their journey of life. This finding corroborates the view of Tei and Fujino (2022) that the more educational experiences one possesses, the greater the chances of understanding, handling, and making meaningful sense of life generally, as well as how to cope with critical situations. Baran and Justin (2016) alsoemphasised that in some developed countries, knowledge of grief care and end-of-life communication studied in the schools helps in handling the emotional and health challenges encountered by elderly parents who have experienced the loss of a child using the 'experience-induced empathic approach'.

It was further captured from the study findings that the socio-economic status of the individual, to a large extent, is capable of influencing the health and emotional well-being of elderly parents who had experienced the death of an adult child. Many of the participants, however, argued that whether one is

wealthy or poor, the agony of losing a child at an advanced stage of one's life is very traumatic, especially if the deceased child is the breadwinner of the family. This finding supports the submission of Lee et al (2015) that the loss of an adult child may not only be a source of emotional distress but could also entail acute financial loss, which poses a threat to well-being in later life. In many instances, some elderly parents may run into psychiatric disorders. In contrast, others become frustrated and wish he/she die after remembering all the positive traits of the deceased child as well as the socio-economic securities provided by the deceased when he/she was alive.

Again, the participants' opinion on the coping strategies adopted by elderly parents who had experienced the death of an adult child revealed that religious beliefs, which strengthened their ability to anchor their faith in God, in addition to their interactive relationship with family members, church members, co-workers and friends, enhanced their wellbeing. This finding aligns with the view of Feldman *et al.* (2016) that an individual's religious belief serves as a moderating factor during periods of anxiety, ultimately enhancingan individual's well-being.

Finally, the study attempted to ascertain the participants' views on the role of social workers and other human service professionals towards sustaining the health and emotional well-being of elderly parents who had experienced the loss of an adult child.The majority of the participants acknowledged the positive roles that Social Workers and other professionals could play in alleviating anxiety and depression that accompany the loss of a child at an advanced age of one's life. Participants, however, stated that the paucity and non-accessibility of these professionals poses a challenge and has resulted in many elderly parents now relying on their spiritual leaders, relations and friends for counselling and encouragement during their ordeal. This finding corroborates the submissions of Cecil (2020) that the presence of a Social Worker is a "quiet strength" to the individual in grief or bereavement.

Implications for Social Work Practice

The study argues that Social Work professionals are uniquely competent to help people overcome undesirable emotional states or depression in the time of grief/bereavement. In other words, assisting elderly parents who have lost their child to retain their sense of purpose is germane to the purpose and functions of Social Work. The study therefore has implications for reforming the social policies and practice framework of a nation's social welfare system to provide basic need fulfilment. Poor social protection policies and lack of palliatives for older adults seem to have been the primary reasons why many older adults who experience the loss of an adult child die or develop terminal illness within a short period of the incident. Addressing the employment policy that restricts women from paid jobs in some societies, for instance, will go a long way in promoting their financial security and reducing the level of trauma during old age and following the death of an adult child who may have been their source of economic sustenance. The study, therefore, illustrates the utility of social work skills and techniques in enhancing the coping capacities of older adults confronted with severe life trauma, such as that related to the loss of an adult child.

Conclusion

The study's outcome reveals that certain socio-demographic factors, including gender, marital status, religion, educational level, and socio-economic status of elderly parents, have a significant impact on the ability to cope and enhance positive well-being. The study also revealed that the presence of a Social Worker and other human service professionals could set the foundation for the healing and growth of elderly parents confronted with the death of their adult child/children. Given the above findings, the study recommends that elderly parents be exposed to grief studies and end-of-life counselling in addition to reviewing the nation's social protection policies and training more Social Workers.

References

Alikor, V. (2022). Nigeria's economy is in a disarray. Business Day.businessday.ng/opinion/article/article/article/article/article//nigerias-economy-is-in-disarray

Asad, K.W., Nawait, M.S. (2018). Grief and bereavement practices among Igbo people of South eastern, Nigeria: Implications for counselling. *Interdisciplinary* Journal *of Education*, 1(1), 111-121

Baran, C.N. & Justin, J.S. (2019). Communication skills: Declining bad news, conducting a goal of care family meeting and advance care planning. Prim. *Care clin. Pract.*, 46, 353–372.

Base, D. (2018).The financial impact of depression and grief. Money.c.uk/guides/h-financial-impact-of-depression-and-grief.

Carr, D. & Monney, H. (2021). Bereavement in later life. *Handbook of Ageing and Social Sciences.* Elsevier. https://doi.org/10.1016/B978-0-12-815970.5.00015.2

Cecil, M. (2020). Finding the elephant in the room: An AEDP journey to the heart of loss, presence, and self. Transformance: *AEDP Journal*, 10 (1). https://aedpinstitute.org/the-therapeutic-pressure-issues-cecilfinfings-the-elephant-in-the-room/

Cheery, K. (2022). What is Attachment Theory? Verywell mind, https://www.verywellmind.com/what is attachment theory-295337

Chu, S. (2021).Caring for elderly parents: The role of daughters. *Advances in Social Science, Education and Humanities Research*, 615, 324-330

Feldman, D.B., Fischer, I.C. & Gressis, R.A. (2017).Does religious belief matter for grief and death anxiety? Experimental philosophy meet psychology of religion. *Journal for Scientific Study of Religion,* 55(3), 531–539.

Gerber, K., Brijnath, B., Lock, K., Bryant, C., Hills, D. & Hjorh, L.(2022). Unprepared for the depth of my feelings, capturing grief in older persons through poetry. *Age and Ageing,* 51(3), afac 030. https://doi.org/10.1093/ageing/afac030.

Gijzen, S., L'Hoir, M.P., Boere-Boonekamp, M.M. & Need, A.(2016).How do parents experience support after the death of their child? *BMC Pediatr.* 16(1), 204.https://doi.org/10.1186/s12887-016-0749-9PMD:27927172.

Inyang-Etoh, E.C. & Ekanem, A. (2016).Child sex preferences and factors that influenced such choices among women in an obstetric population in Nigeria. *Scientific Research*,3, 1-10. http://doi.org/10.4236/09lib.1103005.

Kahler, R. (2022). The financial impact of grief and loss. advisorperspectives.com/articles/2022/05/31/th-financial-impact-of-grief-andloss.

Lekalakala-Mokgele E. (2018). Death & Dying : Elderly persons' experiences of grief over the loss of family members S *Afr Fam Prach,* 60(5) : 151-154

Lee, C., Glei, D.A., Weinstein, M. & Goldman, N. (2015). Death of a child and parental wellbeing in old age: Evidence from Taiwan. *Soc. Sci. Med.,* 101, 166-173

Lin, I.F. & Wolf, D.A. (2020). Division of Parent Care Among Adult Children. *Journal of Gerontology science: Psychological sciences and Social sciences*, 75(10), 2230-2239

Marum, G, Jacelyne Clench-Aas, Ragnhild B. Nes, & Ruth Kyaersti Raanaas (2014), The relationship between negative life events, Psychological distress and life satisfaction : A population based study, *Qual Life Res,* 23 : 2151

Safa, A., Adib-Hajbaghery, M., Rezael, M. & Araban, M.(2021). The meaning of losing a child in older adults: A qualitative study, *BMC Geriatric*, 21: 652, 1-9

Tei, S. & Fujino, J.(2022).The educational value of sense of coherence for grief care. *Font Psychol.*, 13. 1037637

Trevino, E., Miranda, C., Hernandez, M., & Villalobos, C. (2021). Socioeconomic status, parental investment and implications for subjective well being during global pandemic of covid-19 *Front. Educ,* 6 : 762780

United Nations Organization (2022).World population prospect: Summary of results. https://www.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/wpp2022-summary-of-results.pdf

Walsh, K., King, M., Jones, L., Tookman, A. & Blizard, R. (2002. Spiritual belief may affect outcome of bereavement: perspective study. *BMJ,* 324(7353), 1551

Yang, L., Wong, X. & Subramanian, S.V.(2020). Association between older adults' parental bereavement and their health and well-being: Evidence from the China Health and Retirement Longitudinal Study. *Journal of Effective Disorder*, 272(1), 207-214.

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Development of Bharatiya Geriatric Loneliness Scale

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ABSTRACT

The primary focus of the study was to develop a scale that measures geriatric loneliness and to assess its reliability and validity. This study was a collaborative effort, drawing on the expertise of researchers from various disciplines. Following the item writing and item selection via expert review, the finalised set was administered to a sample of 170 individuals aged 60 and above to evaluate the scale's reliability. The collected data was scored, and the analysis was performed using SPSS. The reliability was assessed using Cronbach's Alpha, and the reliability coefficient was 0.73, indicating that the test has good reliability. The value of KMO (Kaiser-Meyer-Olkin) was .70. Bartlett's test of sphericity (x^2 = 1642.17, p <.001) indicated that correlations between items were sufficiently significant to perform EFA (Exploratory Factor Analysis). Eigen values e" 1 were considered. After the EFA, four factors were considered: social support, communication, social media, and social touch, each comprising a total of 11 questions. This scale will help future researchers, clinical psychologists and counsellors to assess loneliness in geriatrics.

Keywords : Geriatric loneliness, Exploratory factor analysis, Reliability, Geriatric loneliness scale.

In contemporary society, loneliness has emerged as a significant phenomenon affecting individuals across diverse age demographics. However, it has notably escalated among the elderly population, primarily attributed to the ramifications of the COVID-19 pandemic (Michaela *et al.*, 2024). Loneliness is defined as a psychological condition which is characterised by hardship or discomfort that arises when an individual feels a discrepancy between their aspirations for social connectivity and their actual social experiences. Furthermore, confident individuals, despite being surrounded by others throughout the day or being in long-term marital relationships, continue to experience profound and pervasive feelings of loneliness. Empirical research has demonstrated that both social isolation and loneliness have considerable adverse effects on the health and overall well-being of older adults, with prevalence rates ranging from 10% to 28% (Goran *et al.*, 2023). Consequently, there is an escalating imperative to develop a standardised assessment tool capable of quantifying loneliness among geriatric populations.

Loneliness is conceptualised as the negative emotional state that arises when there is a divergence between the interpersonal connections one aspires to possess and those that one perceives to be currently available (Perlman, and Peplau 1982). Loneliness remains one of the most inadequately defined psychological constructs. A theoretical framework for understanding loneliness was proposed by Gierveld (1987), which underscores the cognitive mechanisms that mediate the relationship between attributes of the social network and the subjective experience of loneliness. This theoretical framework additionally highlights the significance of individual perceptions and interpretations concerning the network of social relationships. This theoretical context has the following elements under consideration: (a) the descriptive attributes of the social network, (b) subjective assessments of the social network, (c) contextual background

variables, and (d) personality traits that may contribute to the experience of loneliness.

Recent studies indicate a moderate level of loneliness among older adults. In a study conducted by Sanjeed *et al.* (2023), the researchers found that 17% of the elderly experienced a high level of loneliness, while most (67%) had a moderate level of loneliness, and 16% had a low level of loneliness. There can be various factors that can contribute to feelings of loneliness among the elderly. Negra *et al.* (2023) highlighted the factors associated with social isolation and loneliness in older adults. The factors include unmarried status, old age, poorsocioeconomic status, lower educational level, living alone and in isolation, and poor social relationships, among others. Ishgaley & Ishmuhametov (2023) emphasised the prevalence of loneliness among individuals residing in elderly care homes, where they found that these individuals are more susceptible to experiencing loneliness. They also focused on "Marital Status" as a factor for developing the feeling of loneliness among the geriatricpopulation, where they stated that married individuals were less likely to experience loneliness compared to divorced or widowed individuals.

According to Hui *et al.* (2023), a higher level of loneliness was associated with reduced involvement in social groups, lower access to instrumental and informational support, more frequent negative interactions, a diminished sense of being helpful to others, decreased satisfaction with financial circumstances, and increased levels of stress and depressive symptoms. In contrast, greater social participation and support, along with reductions in stress and depressive symptoms, were linked to lower loneliness. Furthermore, shifts in depressive symptoms, declines in financial satisfaction, and heightened stress impacted both the emotional and social aspects of loneliness. Specifically, reduced social connections, support, and engagement contributed to social loneliness, while greater physical disability was uniquely associated with emotional loneliness.

A study conducted by Adam *et al.* (2023) aimed to examine the prevalence of loneliness among older adults during and after the COVID-19 pandemic. Findings indicated that prior to the pandemic, the prevalence of loneliness varied significantly by country, with Nigeria showing the highest rate at 46% and Australia the lowest at 5%, resulting in an average global prevalence of 25.6%. Certain groups, such as individuals residing in senior housing or those with disabilities, experienced higher levels of loneliness compared to the general elderly population, with an average prevalence of 47.8%. During the pandemic, loneliness became more widespread, with the overall prevalence rising to an average of 39.4%, markedly higher than the pre-pandemic figure of 25.6%. According to Priya *et al.* (2023), in India, 13.4% of the elderly reported frequent loneliness. The prevalence of loneliness among the elderly was found to be maximum in the Andaman and Nicobar Islands and minimum in Tripura. Age, current marital status, region, religion, MPCE quintile, number of chronic conditions, number of Activities of Daily Living (ADL), and Instrumental Activities of Daily Living (IADL) difficulties, involvement in physical activity, involvement in yoga/meditation, number of social networks, participation in social activities, and involvement in leisure activities like reading books, engaging in activities such as watching television or using a computer was found to have a significant link to feelings of loneliness. Higher levels of loneliness were also associated with not being married, having multiple chronic health conditions (more than two), experiencing difficulties with more than two activities of daily living (ADLs) and instrumental activities of daily living (IADLs), a lack of physical activity, not participating in yoga or meditation practices, and having a limited social network.

Lee *et al.* (2019) sought to develop and validate the Korean Geriatric Loneliness Scale (KGLS), a culturally sensitive tool for the reliable assessment of loneliness among older adults in South

Korea. To create the scale, researchers conducted in-depth interviews with 10 elderly individuals to develop preliminary items, followed by administering the draft to 322 community-living adults aged 65 and older. They assessed content, construct, and criterion-related validity, conducted exploratory and confirmatory factor analyses, and measured reliability through internal consistency and test–retest methods. Exploratory factor analysis of the scale revealed three distinct dimensions: family relationship loneliness, social loneliness, and not belonging,which collectively explained 91.6% of the variance. Upon refinement, a 14 item three-factor structure was supported by confirmatory factor analysis. The diagnostic validity of the scale was good, with a cutoff score of 32 providing 71.0% sensitivity, 80.2% specificity, and an AUC of .83. Reliability measures were excellent: Cronbach's á was .90, and the intraclass correlation coefficient for test–retest reliability was .89. Overall, the KGLS had good psychometric properties, indicating that it is a valid and reliable measure of loneliness in older Korean adults.

Rationale for the study

Loneliness is a growing concern among the geriatric population, often resulting from age-related factors such as retirement, bereavement, declining health, and reduced social engagement (Sanjeed *et al.*, 2023; Negra *et al.*, 2023). Despite the availability of established tools, such as the Revised UCLA Loneliness Scale and the De Jong Gierveld Loneliness Scale (1987), their application in older adults has revealed significant psychometric limitations. These include multidimensionality despite unidimensional scoring, susceptibility to item wording biases, and inconsistent structural validity across age groups (Zoutewelle-Terovan *et al.,* 2014). Given these constraints, there is a clear need to develop a psychometrically robust, age-appropriate scale that accurately captures the experience of loneliness in older adults. This study aims to address that gap by developing a standardised tool tailored explicitly to the geriatric context.

Method

Aim

To develop a scale that measures loneliness among individualsin later stages of life and validate it.

Item writing and Item selection

The development of a scale begins with the crucial step of generating relevant items. Initially, we developed 40 items, considering all the factors that lead to social isolation and loneliness in old age (Negra *et al.*, 2023). After the initial process of item writing, the entire pool of items was evaluated by two subject matter experts with specialisation in psychometrics and health psychology.Following an expert review, a total of 28 items were selected and subsequently administered to the participants.

Sample

One hundred and seventy participants, residing in various rural and urban areas of West Bengal and Odisha, were selected for this research. The sample size was selected after performing a priori analysis in G* Power. Participants were included in the study based on the eligibility criterion of being 60 years of age or older.

Procedure

The sample size comprises 170 individuals from various parts of West Bengal and Odisha. A purposive sampling method was employed to administer the selected items to the target population, which consisted of individuals aged 60 and above residing in various old-age shelter homes. Ethical approval was granted by the departmental ethics committee (Department of Psychology, Sikkim University). The data was collected offline with proper informed consent. It was conducted in July 2024. The scoring was based on the data received from the participants. The collected data were analysed using SPSS Version 25, through which reliability testing and exploratory factor analysis (EFA) were conducted.The norms and scoring of the test were also established.

Results

Table 1

Descriptive Statistics

	N	Mean	Std. Deviation	Variance
Do you frequently converse with family members?	170	.60	.491	.241
Do you often feel left out or excluded from your family after a conflict?	170	.29	.454	.206
Do you often feel bad due to the loss of a family member?	170	.89	.309	.095
Do you have someone who will take care of you when you are physically ill?	170	.61	.490	.240
Do you frequently engage in conversations with the members of your social group?	170	.59	.493	.243
Do you often feel left out or excluded from your social group after a conflict?	170	.19	.392	.154
Do you often regret not being able to do things that you are willing to do?	170	.69	.462	.214
Do you often feel unhappy doing something alone?	170	.48	.501	.251
Do you spend the whole day doing nothing?	170	.36	.483	.233
Do you stay with your spouse?	170	.52	.501	.251
Do you have frequent conversations with your spouse?	170	.51	.501	.251
Do you often feel bad due to the loss of your spouse?	170	.29	.457	.209
Do you love interacting with your neighbours?	170	.76	.425	.181
Do you often feel confined to a room?	170	.43	.496	.246
Do you often feel like talking to someone?	170	.77	.422	.178
Do you feel like no one understands you?	170	.41	.493	.243

Do you feel hesitant about reaching out to people around you and expressing your feelings?	170	.47	.501	.251
Do you have friends?	170	.59	.494	.244
Do you often feel alone because you have lost most of your friends?	170	.65	.479	.230
Do you feel like you are losing touch with the people around you?	170	.42	.496	.246
Do you feel satisfied with the relationship you have with the people surrounding you?	170	.64	.481	.231
Do you often feel bad about your disability or illnesses?	170	.71	.457	.209
Do you feel dissatisfied with your life when you reflect on it?	170	.49	.501	.251
Do you often feel alone due to a lack of companionship?	170	.40	.491	.241
Do you use any social media applications?	170	.53	.501	.251
Do you like spending time on social media?	170	.49	.501	.251
Do you often feel bad because you have fewer friends or followers on your social media handles?	170	.07	.257	.066
Do you feel accompanied while communicating with your online friends and family?	170	.44	.498	.248
Valid N (listwise)	170			

Table 2

KMO and Barlett's Test

Kaiser-Meyer-Olkin measure of sampling adequacy.	.708		
	Approx. Chi Square	**Sig.**	**df**
Bartlett's Test of Sphericity.	1642.175	.000	378

Graph 1 – *Scree Plot.*

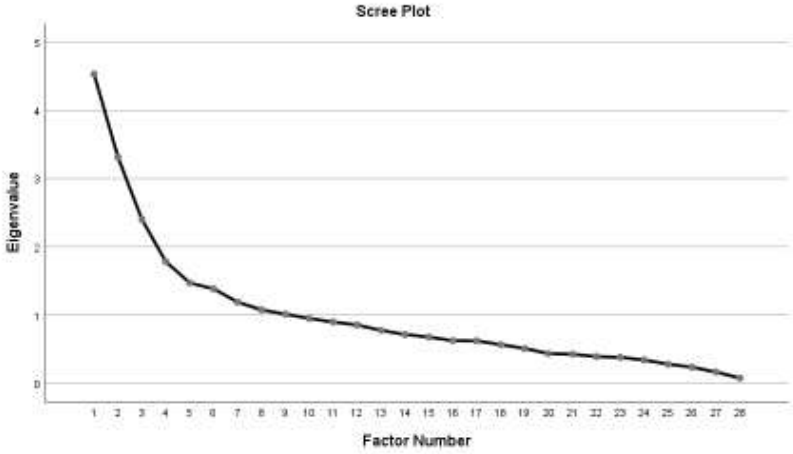

Table 3

Rotated Factor Analysis

	Factor			
	1	2	3	4
Do you frequently engage in conversations with the members of your social group?	.769			
Do you frequently converse with family members?	.742			
Do you feel satisfied with the relationship you have with the people surrounding you?	.736			
Do you have friends?	.695			
Do you have someone who will take care of you when you are physically ill?	.632			
Do you stay with your spouse?		.922		
Do you have frequent conversations with your spouse?		.891		
Do you use any social media applications?			.951	
Do you like spending time on social media?			.795	
Do you often feel left out or excluded from your family after a conflict?				.611
Do you feel like you are losing touch with the people around you?				.533

Table 4

Cronbach's Alpha

Cronbach's Alpha	Cronbach's Alpha based on standardised items	No. Of items
.730	.727	11

Discussion

Table 1 presents the descriptive statistics for each item, including the total number of participants (170), mean value, standard deviation, and variance. From the value of variance for each item we can say that except two items i.e. "Do you often feel bad due to loss of a family member?"and "Do you often feel bad due to having fewer friends or followers on your social media handles?" all items were helpful in our study as the value of variance of almost all the items were more than 0.15 which indicates that the items are informative, suitable for group comparisons or deeper analysis, shows variation in experience or opinion.At the same time, the values of variance for these two items are 0.095 and 0.066, respectively, indicating that they are less valuable (not suitable for distinguishing between groups).

Exploratory Factor Analysis

Table 2 shows the values of the KMO-Meyer-Olkin (KMO) test. Exploratory Factor Analysis (EFA) was conducted on data collected from a randomly selected sample of 170 individuals to identify the underlying structure of the Bharatiya Geriatric Loneliness Scale (BGLS) without imposing prior assumptions or restrictions. To assess the suitability of the data for factor analysis, the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, based on Kaiser's 1974 method, was calculated and found to be 0.70. Additionally, Bartlett's test of sphericity yielded a significant result ($\div^2 = 1642.17$, $p < .001$), confirming that the inter-item correlations were adequate for performing EFA.

Eigen Values

Eigen values e" 1 were considered. Graph 1 shows the Scree plot. A Scree plot was developed, from which it can be depicted that eigenvalues up to 4 are greater than 1; therefore, it is considered. From 5, there is an elbow joint, which depicts that it is not beneficial to proceed with the extraction.

Rotated Factor Matrix

Table 3 depicts the rotated factor matrix. From the table, it can be seen that there are four factors for which values greater than 0.500 are accepted, whereas values less than 0.500 are suppressed. A study by Syaharuddin *et al.* (2023) suggests that families that provide social support to older individuals develop a supportive environment, thereby reducing the risk of geriatric loneliness. According to Ibrahim *et al.* (2019),a significant negative correlation exists between social support and loneliness among geriatric individuals. This is the reason why social support is one of the four dimensions 4. Questions under factor 1 (Social Support) are: Do you frequently engage in conversations with members of your social group? Do you have frequent conversations with family members? Do you feel satisfied with the relationship you have with the people surrounding you? Do you have friends? Do you have someone who will take care of you when you are physically ill? According to Panahi *et al.* (2017), a significant negative correlation exists between communication and loneliness. Therefore, the following questions are under the dimension named communication. Questions under factor 2 (Communication) are: Do you stay with your spouse? Do you have frequent conversations with your spouse? According to Wang *et al.* (2024), increased social media usage among older adults reduces the level of loneliness. Therefore, social media usage is one of the four dimensions 4. Questions under factor 3 (Social Media Usage) are: Do you use any social media applications? Do you enjoy spending time on social media? A study conducted by Manchana (2024) suggests that social connection helps individuals cope with loneliness;

therefore, social connection is one of the four dimensions. Questions under factor 4 (Social connection): Do you often feel left out or excluded from your family after a conflict? Do you feel like you are losing touch with the people around you?

Reliability

The reliability of the BGLS was assessed using Cronbach's Alpha, which yielded a coefficient of .73. This indicates that the scale is reliable and consistent in measuring geriatric loneliness. Researchers and practitioners can have confidence in the BGLS as a valid tool for assessing and addressing geriatric loneliness.

We encountered some limitations during the development process of the test. The sample size considers people from only a specific part of India, which may affect the generalizability of the results. Secondly, the sample size is smaller, which may have affected the reliability coefficient value, and thirdly, we used a two-point rating scale, which could also have impacted the reliability coefficient value. Moreover, the test results demonstrate good reliability; hence, this questionnaire will aid future research on geriatric loneliness. This questionnaire will also help clinical psychologists, counsellors, and other mental health professionals assess geriatric loneliness and treat it accordingly.

Scoring

The questionnaire involves a dichotomous rating scale whereone is assigned to "No" and zero is assigned to "Yes". For items, 'Do you often feel left out or excluded from your family after a conflict?' and 'Do you feel like you are losing touch with the people around you?' there is a reverse scoring i.e. one will be assigned to "Yes" and zero will be assigned to "No". The scores should be added; the higher the score, the higher the loneliness.

Norms

1. This questionnaire should be applied to individuals aged 60 and above.

2. The individual should complete the questionnaire in a well-lit, well-ventilated room. No external factors, such as noise or temperature, should affect the individual's concentration while filling out the questionnaire.
3. A high level of social desirability is observed when individuals fill out the questionnaire due to the presence of family members or the experimenter. Therefore, if the individual is comfortable, they should fill out the questionnaire alone in a room.
4. The questionnaireemploys a two-point rating scale, where one point is assigned to "No" and zero points are assigned to "Yes". For items, 'Do you often feel left out or excluded from your family after a conflict?' and 'Do you feel like you are losing touch with the people around you?' there is a reverse scoring i.e. one will be assigned to "Yes" and zero will be assigned to "No". The scores should be added; the higher the score, the higher the loneliness.
5. The individual themselves should complete the questionnaire; it should not be filled out by family members or the experimenter, as interviewing the individuals alone will render the response invalid.
6. **Instructions for filling out the questionnaire:** Read the questions carefully and answer them by giving a (') mark in the options following the questions. There are no correct or incorrect responses, and no hidden questions designed to mislead you. As you respond, please remember these three important guidelines:

- Respond to the questions honestly and sincerely. Do not give an untrue answer to a question, thinking that it is the "right thing to say".
- Read each question correctly and mark the option that feels relatable to you.
- Answer every question. Some questions may not be relatable to you, but please ensure that you answer all the questions.

Conclusion

The study aimed to develop a scale that measures loneliness among older adults aged 60 and above. The study's results indicate that the reliability coefficient has a value of 0.73, suggesting that the test possesses good reliability. The value of KMO (Kaiser-Meyer-Olkin) was .70. Bartlett's test of sphericity ($\div^2 = 1642.17$, $p < .001$) showed that the inter-item correlations were strong enough to justify conducting an Exploratory Factor Analysis (EFA). Eigenvaluesup to 4 were considered. After EFA, there were only 11 questions under four dimensions. To measure loneliness among all age groups, various scales and methods are used, including the UCLA Loneliness Scale and the Social Isolation Scale. However, there are only a few methods or scales to assess loneliness among individuals aged 60 and above. In today's generation, social media plays a significant role in shaping people's lifestyles; therefore, one of the dimensions considered in the scale was 'social media'. This study is particularly relevant to the global geriatric population, given the moderate to high level of loneliness experienced by these individuals.

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References

Adam, E., Cohen, M., & Yagil, D. (2023). Loneliness before and after COVID-19: Sense of Coherence and Hope as Coping Mechanisms. *International Journal of Environmental Research and Public Health*, 20(11), 5981. https://doi.org/10.3390/ijerph20115981

De Jong-Gierveld, J. (1987). Developing and testing a model of loneliness. Journal of Personality and Social Psychology, 53(1), 119. https://doi.org/10.1037/0022-3514.53.1.119

Fromm-Reichman, F. (1959). Psychoanalysis and psychotherapy: Selected papers. University of Chicago Press.

Gierveld, J. J. (1987). Developing and testing a model of loneliness. *Journal of Personality and Social Psychology*, 53(1), 119-128. https://doi.org/10.1037//0022-3514.53.1.119

Goran, M. I., Allman, A., Banks, S., Basques, J., Bassuk, K., Bear, S., … & Zavaleta, K. (2023). *Social isolation and loneliness in older adults: Opportunities for the health care system*. The National Academies Press.

Hui, S., Ng, M. Y., Kwok, C. H., Yu, J. T., & Kwok, T. C. Y. (2023). Social-ecological factors influencing loneliness and social isolation in older people: a scoping review. *BMC Geriatrics*, 23(1), 726. https://doi.org/10.1186/s12877-023-04423-7

Ibrahim, N. M., Salem, A. E., & El-Hadidy, S. A. (2019). Relationship between social support, loneliness, and depression among elderly people. *International Journal of Nursing Didactics*, 9(1), 39-47.

Ishgaley, I., & Ishmuhametov, I. (2023). Loneliness in old age: A study of elderly people in Latvia. *Baltic Journal of Legal and Social Sciences*, 2(2), 7-17. https://doi.org/10.30525/2592-8813-2023-2-2

Lee, E., Kim, J. H., Kim, H. J., & Song, J. Y. (2019). Development and validation of the Korean Geriatric Loneliness Scale (KGLS). *Archives of Gerontology and Geriatrics*, 85, 103901. https://doi.org/10.1016/j.archger.2019.103901

Manchana, V. (2024). Loneliness and social connections: Lived experiences on predictors and coping with loneliness among Indian older adults: A phenomenological study. *Journal of Human Behavior in the Social Environment*, 35(3), 438–453. https://doi.org/10.1080/10911359.2024.2310242

Michaela, D. S., Thais, R., Natalia, S. A., Debora, B. C., Jennifer, S. M., Leonardo, F., ... & amp; Teixeira, Q. I. (2024). The Relationship between Lifestyle, Mental Health, and Loneliness in the Elderly during the COVID-19 Pandemic. *Healthcare*, 12(9), 876. https://doi.org/10.3390/healthcare12090876

Negra, B., Cripe, B., & Barnes, B. (2023). Loneliness and Social Isolation in Older Adults. *Missouri Medicine*, 120(2), 160-164.

Panahi, S., & Kazemian, M. (2017). The association between information and communication technologies, loneliness and social connectedness: A scoping review. *Journal of Cyberpsychology, Behavior, and Social Networking*, 20(6), 337-347.

Perlman, D. and Peplau, L. A., (1982). *Loneliness: A sourcebook of current theory, research and therapy*. John Wiley & Sons.

Priya, S., & Dwivedi, R. (2023). Prevalence and correlates of loneliness in the later life—insights from Longitudinal Ageing Study in India (LASI) Wave-1. *Indian Journal of Psychiatry*, 65(9), 917-925. https://doi.org/10.4103/indianjpsychiatry.indianjpsychiatry_134_23

Sanjeed, A. R. (2023). Loneliness among Elderly. *Research & Review Journal of Geriatric Nursing and Health Sciences*, 5(2), 14-22.

Syaharuddin, S., Utami Dewi, S., Fredy Saputra, M. K., Muhammad Nur, Q., & Iqbal, C. (2023). The Relationship of Family Social Support with Loneliness in the Elderly. *Jurnal Edukasi Ilmiah Kesehatan*, 1(3), 92-98. https://doi.org/10.61099/junedik.v1i3.22

Wang, P. H., & Yen, C. F. (2024). The relationship between social media usage and loneliness among younger and older adults: the moderating effect of shyness. *BMC Psychology*, 12(1), 343. https://doi.org/10.1186/s40359-024-01727-4

Zoutewelle-Terovan, M. V., Van Tilburg, T. G., & De Jong Gierveld, J. (2014). The reliability and validity of the De Jong Gierveld Loneliness Scale and the UCLA Loneliness Scale. *Research on Aging*, 36(6), 723-745.

Appendix

Below is the final scale for assessing geriatric loneliness, along with the socio-demographic sheet.

BHARATIYA GERIATRIC LONELINESS SCALE

Name - _____

Age - _____

Gender - _____

Occupation - _____

Instructions: The following page contains various questions. Please read the questions carefully and answer them by giving a (') mark in the options following the questions. There are no correct or incorrect responses, and no hidden questions designed to mislead you. As you respond, please remember these three important guidelines:

1. Respond to the questions honestly and sincerely. Do not give an untrue answer to a question, thinking that it is the "right thing to say".
2. Read each question correctly and mark the option that feels relatable to you
3. Answer every question. Some questions may not be relatable to you, but please ensure you answer all questions.

1. Do you frequently converse with family members? Yes No
2. Do you often feel left out or excluded from your family after a conflict? Yes No
3. Do you have someone who will take care of you when you are physically ill? Yes No
4. Do you frequently engage in conversations with the members of your social group? Yes No
5. Do you stay with your spouse? Yes No

6. Do you have frequent conversations with your spouse? Yes No
7. Do you have friends? Yes No
8. Do you feel like you are losing touch with the people around you? Yes No
9. Do you feel satisfied with the relationship you have with the people you are surrounded with? Yes No
10. Do you use any social media applications? Yes No
11. Doyou like spending time on social media? Yes No

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Screening of Cognitive Status in Older Adults and Cluster Analysis with the Health Variables

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ABSTRACT

The study aimed to screen the cognitive status of 32 older adults aged 60-89 years residing in the North 24 Parganas district, West Bengal, India. The screening of cognitive status was carried out by trained personnel using the Montreal Cognitive Assessment (MoCA) scale. Hierarchical cluster analysis was performed on anthropometric variables, BIA-measured body composition parameters, physical activity level, dietary nutrient intake, and cognitive performance using SPSS Gradpack 29.0. The results revealed distinct cluster formations between the cognitive screening score (MoCA score) and other health variables, including anthropometric variables, BIA-measured body composition parameters, level of physical activity, and dietary nutrient consumption. These findings have significant practical implications for the early detection and management of cognitive impairment in older adults, providing valuable insights for future studies and interventions in this area. This emphasis on practical implications is designed to engage the reader and pique their interest in the study's findings.

Keywords : Cognitive status, older adults, MoCA, health variables, cluster analysis.

Ageing is an irreversible biological phenomenon that leads to several changes in the human body, setting limitations in performing physiological and functional activities, as well as leading to a decline in cognitive functions among older adults (Auyeung *et al.*, 2008; Deary *et al.*, 2009; Mondal *et al.*, 2024). The process of ageing brings several changes in brain function that lead to differences in thinking, memorisation and behaviour in older adults (Lezak, 2004). Cognitive impairments are pretty common in older adults (Woodford & George, 2007; Banerjee *et al.*, 2022) and can be categorised into:

1. The impairment in cognitive function since birth, which is also known as intellectual disability.
2. The impairment that results from accidents or injuries to the head.
3. Acute decline in cognitive function, also known as delirium.
4. Chronic decline in cognitive function, also known as dementia (Starr, 2010).

The cognitive status assessment in older adults is a challenging evaluation, as it involves psychological, neurological, and psychiatric evaluations (Porrselvi & Shankar, 2017). The assessment of cognitive status is used to screen for the presence of any cognitive impairment or differential state, severity of the impairment, progression of cognitive disorders and diseases and also for treatment efficacy (Young *et al.*, 2011; Leonardo *et al.*, 2014; Chatterjee *et al.*, 2022; Bhattacharjee *et al.*, 2022). This assessment requires a rigorous approach and training, similar to other essential assessments, such as electrocardiograms. It should be conducted in an appropriate environment —i.e., a quiet setting with adequate lighting and without interruption by others (Starr, 2010). There are several tools available for cognitive status

assessment, among which the Montreal Cognitive Assessment (MoCA) is a specialised cognitive status screening tool for older adults that focuses on the screening of early impairment in cognitive performance (Trzepacz *et al.*, 2015; Pinto *et al.*, 2019).

Age-related cognitive status impairment has a multifactorial aetiology (Deary *et al.*, 2009). Adequate Nutritional status, physical activity, dietary pattern, and nutrient consumption help modulate age-related cognitive impairment (Smith & Blumenthal, 2016; Chatterjee *et al.*, 2017; Xu *et al.*, 2023; Mukherjee *et al.*, 2024). The present study aimed to assess the cognitive status of older adults in the North 24 Parganas district, West Bengal, India, and report the pattern of cluster formation of the cognitive status screening score (MoCA score) in relation to other health status variables using cluster analysis.

Method

The study was conducted on 32 older adults aged 60-89 years, of both sexes, who voluntarily participated and were chosen using a simple random procedure, residing in the North 24 Parganas district, West Bengal, India. After informed consent, measurement of anthropometric variables like body height (cm), body weight (kg), waist circumference (cm), hip circumference (cm), calf circumference (cm), and mid-upper arm circumference or MUAC (cm) were carried out using anthropometric measurement set, following recommended procedures (Heymsfield *et al.*, 2000). Body Mass Index (BMI), Waist-to-Hip Ratio (WHR) and Waist-to-Height Ratio (WHtR) were calculated (WHO, 2008). Body composition parameters, including body fat percentage, visceral fat, subcutaneous tissue, and skeletal muscle mass, were assessed using the Bio-electrical Impedance analysis tool and procedure (Xu *et al.*, 2021). Physical activity levels were collected using the IPAQ-SF questionnaire and calculated (Lee *et al.*, 2011). Data on dietary consumption of nutrients were collected using the FAO 24-hour dietary recall method questionnaire, and the nutrients were converted and calculated using the standard reference value

(Gopalan *et al.*, 2023). The screening of cognitive status was performed by trained personnel using the Montreal Cognitive Assessment (MoCA) tool (Hobson, 2015). Descriptive statistical analyses and Hierarchical cluster analysis were performed using SPSS Gradpack 29.0. The Institutional Human Ethical Committee of the University approved the study protocol.

Results

The present study consisted of 32 older adults, both sexes, aged 60-89 years, residing in the districts of North 24 Parganas, West Bengal, India, and were selected using a simple random sampling procedure. Among the study participants, 11 (34.4%) were female and 21 (65.6%) were male. The age (average) of the female study participants was 66.6 ± 6.91 years [Minimum: 60, Maximum: 80](presented in Arithmetic mean ± Standard deviation form) and 66.5 ± 7.45 years [Minimum: 60, Maximum: 89] for males.Table 1 presents the anthropometric variables and MoCA score of the study participants.

Table 1

The anthropometric variables and MoCA score of the study participants

Anthropometric variables	**Female**			**Male**		
	AM±SD	Min.	Max.	AM±SD	Min.	Max.
Body height (cm)	149.1±5.37	140	156.4	161.5±5.32	152.5	175
Body weight (kg)	51.2±13.09	26.3	71.9	56.4±15.00	36.6	104.6
Waist circumference (cm)	91.9±13.75	72	108	86.7±12.95	69	118
Hip circumference (cm)	89.9±12.18	66	106	89.0±8.61	75	115
Calf circumference (cm)	30.4±3.07	24.5	34.5	31.0±3.23	25	40
Mid upper arm circumference (cm)	26.0±5.07	16	32.5	25.6±3.13	20	32
BMI	22.8±4.65	13	29.9	21.5±4.52	14.8	34.2
WHR	1.02±0.065	0.93	1.12	0.98±0.076	0.81	1.12
WHtR	0.62±0.076	0.51	0.71	0.54±0.068	0.43	0.67
MoCA score	**15.5±7.52**	**4**	**28**	**20.8±5.69**	**6**	**29**

AM: Arithmetic Mean, SD: Standard Deviation, Min: Minimum, Max: Maximum

The average linkage between the variables, as formed into clusters with the coefficient values, is presented as an agglomeration schedule in Table 2.

Table 2

The average linkage between the variables

Stage	Combined clusters		Difference between clusters	The stage of the cluster first appears		New stage
	Cluster I	Cluster II		Cluster I	Cluster II	
1	9	10	5.54	0	0	2
2	9	12	33.77	1	0	8
3	7	8	549.50	0	0	5
4	4	5	1281.75	0	0	9
5	6	7	1738.42	0	3	6
6	1	6	3207.69	0	5	8
7	3	11	12524.64	0	0	9
8	1	9	17480.08	6	2	10
9	3	4	28095.20	7	4	10
10	1	3	122961.51	8	9	11
11	1	2	471620.29	10	0	0

Fig. 1 : presents the clusters of MoCA scores and anthropometric variables, along with the age and sex of the study participants.

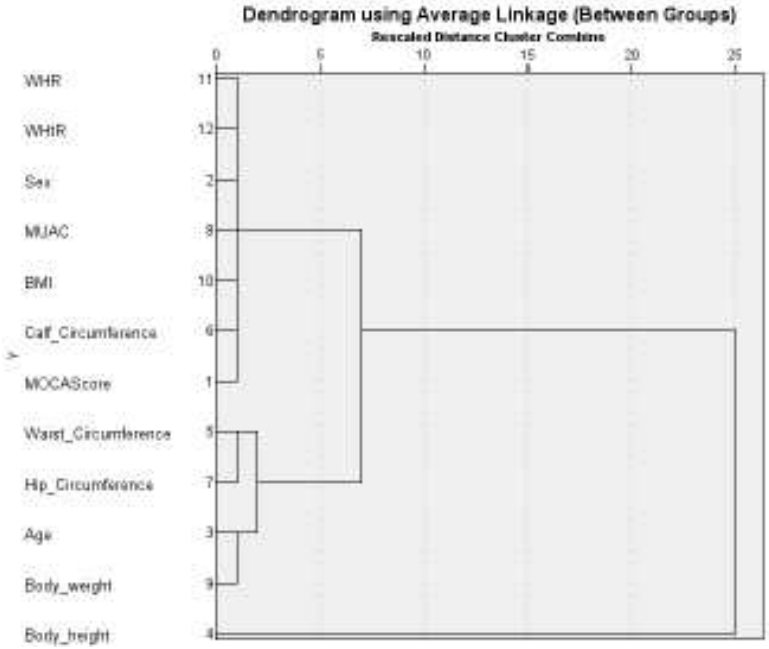

Fig. 1: The average linkage of the MoCA score with the anthropometric variables, along with age and sex of the study participants

Fig. 1 shows that the MoCA score first clusters very closely with Waist Circumference, and then the cluster (MoCA score + Waist Circumference) merges closely with Hip Circumference. WHR and WHtR are clustering together at a different branch and separately from the MoCA score. Age clusters close to body weight and body height separately. BMI and MUAC cluster together, but not directly with the MoCA score.

Table 3 presents the body composition variables measured by bioelectrical impedance analysis (BIA) and the physical activity (MET-min/week) performed by the study participants.

Table 3

The body composition variables measured by BIA and physical activity level of the study participants

Body composition variables	**Female**			**Male**		
	AM±SD	Min.	Max.	AM±SD	Min.	Max.
Body fat percentage	37.5±4.06	31.7	43.0	26.6±6.35	9.3	34.4
Visceral fat	8.4±4.08	3.5	16	9.5±7.92	0.5	30.0
Subcutaneous tissue (%)	29.6±3.43	24.5	35.4	18.0±4.50	6	24
Skeletal muscle mass (%)	21.1±1.87	18.1	24.2	27.2±1.93	23.4	31.0
Physical activity (MET -minutes per week)	1327.5± 775.36	462	2866.5	2324.3± 2792.33	115.5	9093.0
Sitting duration (mins.week^{-1})	1813.6± 729.11	420	2520	2026.7± 1461.39	140	5040

AM: Arithmetic Mean, SD: Standard Deviation, Min: Minimum, Max: Maximum

The average linkage between the variables, as formed into clusters based on the coefficient values, is presented in Table 4 as an agglomeration schedule.

Table 4

The average linkage between the variables

Stage	Combined clusters		Difference between clusters	The stage of the cluster first appears		New stage
	Cluster I	Cluster II		Cluster I	Cluster II	
1	2	4	2295.78	0	0	3
2	1	5	2389.08	0	0	3
3	1	2	4160.02	2	1	4
4	1	3	9533.81	3	0	5
5	1	7	1674680.26	4	0	6
6	1	6	281812410.94	5	0	0

Fig. 2 presents the clusters between MoCA score, measured body composition parameters and physical activity level of the study participants in a dendrogram.

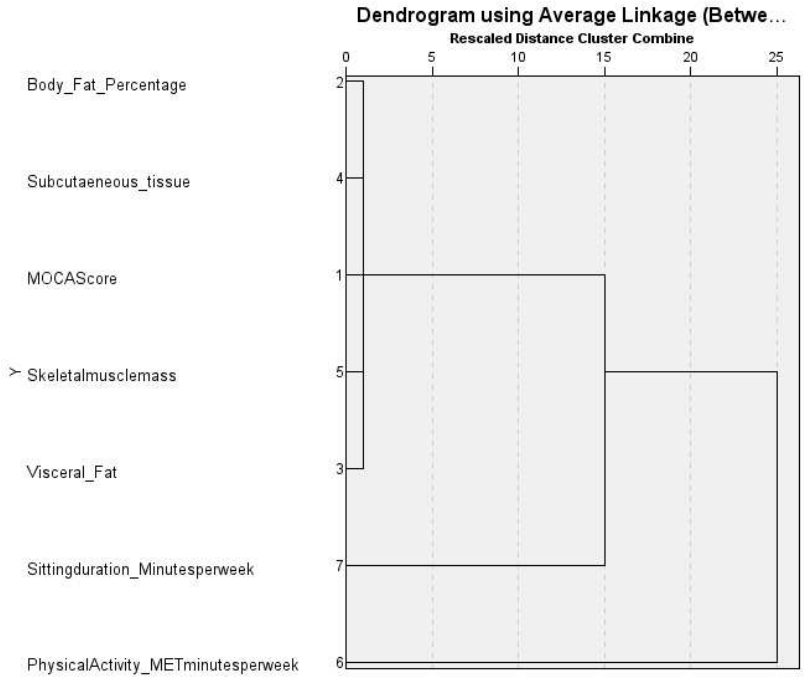

Fig. 2: The average linkage of MoCA score with body composition variables and physical activity status of the study participants.

Fig. 2 shows that body fat percentage and subcutaneous tissue are very tightly clustered together (almost at a distance of 0–1). MoCA Score clusters closely with skeletal muscle mass (they join at a small rescaled distance, under 5). Visceral Fat joins later, linking closer to the MoCA score andskeletal muscle mass cluster. Sitting duration and physical activity (MET-mins.week^{-1}) clustered together, but at a longer distance.

Table 5 presents the average dietary nutrient consumption of the study participants.

Table 5

Average dietary nutrient consumption of the study participants

Nutrients	**Female**			**Male**		
	AM±SD	Min.	Max.	AM±SD	Min.	Max.
Protein (g)	26.9±14.03	8.7	52.9	41.8±15.41	18.6	66.7
Fat (g)	15.1±7.30	2.0	25.9	23.6±5.77	14.5	37.6
Carbohydrate (g)	151.1±91.68	72.6	393.7	226.2±101.15	65.1	418.6
Energy (kcal)	846.7±455.32	393.3	2000.8	1275.8±457.92	563.7	2144.6
Crude fibre (g)	3.2±1.79	0.9	6.0	3.5±2.07	0.4	7.2
Calcium (mg)	243.0±258.52	42.7	727.2	464.6±323.31	85.4	1189.7
Iron (mg)	10.3±6.08	3.5	24.5	11.5±7.28	2.8	27.6
Vitamin C (mg)	38.5±32.75	7.7	119.8	50.3±35.20	7.0	129.2
Zinc (mg)	3.4±2.43	0.9	8.2	5.0±2.22	0.8	8.9

AM: Arithmetic Mean, SD: Standard Deviation, Min: Minimum, Max: Maximum

The average linkage between the variables, as formed into clusters based on the coefficient values, is presented in Table 6 as an agglomeration schedule.

Table 6: The average linkage between the variables

Stage	Combined clusters		Difference between	The stage of the cluster first appears		New stage
	Cluster I	Cluster II	clusters	Cluster I	Cluster II	
1	4	10	230.32	0	0	3
2	1	3	2537.83	0	0	4
3	4	8	2706.15	1	0	4
4	1	4	8222.15	2	3	5
5	1	2	28433.94	4	0	6
6	1	9	70820.69	5	0	7
7	1	5	1352336.89	6	0	8
8	1	7	6992762.26	7	0	9
9	1	6	42686417.69	8	0	0

Fig. 3 presents the clusters between the MoCA score and the average dietary nutrient consumption (both macro- and micronutrients) of the study Participants in a dendrogram.

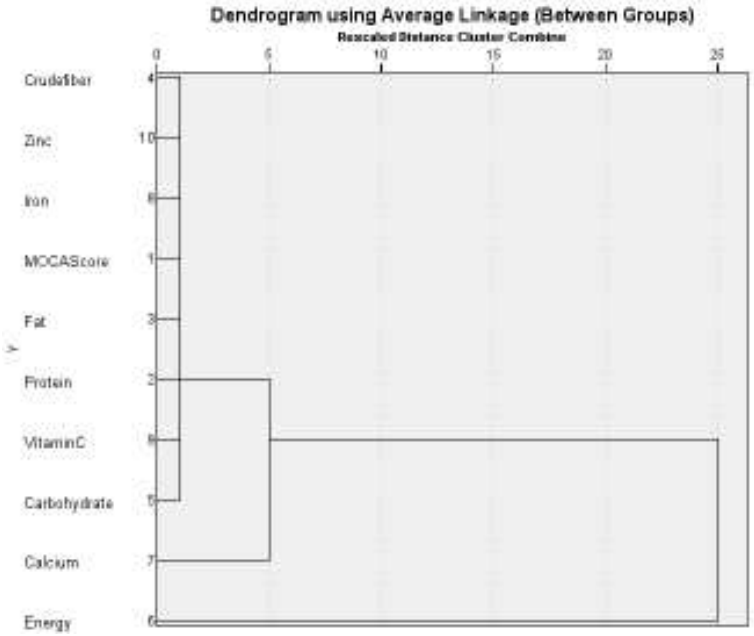

Fig. 3: The clusters between the MoCA score and the average dietary nutrient consumption of the study participants.

Fig. 3 shows that crude fibre clusters closely with zinc (very early, at almost zero distance), then iron joins the crude fibre and zinc cluster (still very close), and then the MoCA score joins this crude fibre–zinc–iron cluster next. Fat and protein are closely associated with each other. Vitamin C and carbohydrate form another small cluster. Calcium and energy are linked together farther away, and all these clusters join together at larger distances later.

Discussion

Nutritional status and healthy lifestyle practices play a crucial role not only in the prevention ofnon-communicable diseases (Banerjee *et al.*, 2017; Bardhan *et al.*, 2025; Mondal *et al.*, 2025)

but also help in minimising the age-related cognitive performance decline among older adults (Tucker, 2016; Sanders *et al.*, 2016). The present study, using hierarchical cluster analysis, revealed that among the anthropometric variables, the MoCA score was most closely linked with waist circumference, followed by hip circumference, suggesting that measures of central obesity may be associated with cognitive performance among older adults. Whereas, among the BIA-measured body composition parameters, the MoCA score clustered most closely with skeletal muscle mass, suggesting a potential positive relationship between higher muscle mass and better cognitive performance. Visceral fat was subsequently found to join this cluster, indicating a possible additional influence of central adiposity on cognitive status. Physical activity level (MET-mins.week^{-1}) and sitting duration clustered separately, suggesting different behavioural patterns in the study participants. In case of dietary nutrient consumption, MoCA scores clustered most closely with dietary intake of crude fibre, zinc, and iron. This suggests a potential positive relationship between cognitive performance and the intake of these specific nutrients. In contrast, fat and protein intake, as well as energy and calcium intake, clustered separately, implying that overall macronutrient intake might not directly influence cognitive score to the same extent as certain micronutrients.

The findings are in agreement with previous studies highlighting that poor nutritional status, reduced physical activity, and adverse body composition changes (like sarcopenia and visceral obesity) contribute to accelerated cognitive decline in ageing populations (Smith & Blumenthal, 2016; Xu *et al.*, 2023). Another study conducted on Korean older adults found that adequate consumption of macro- and micronutrients was associated with optimal cognitive function (Lee *et al.*, 2001).

A limitation of the study is that the sample size is relatively small, which restricts the generalizability of the findings. The cross-sectional nature of the study precludes any causal inference between

cognitive function and health variables, as well as factors such as comorbidities, medication use, and psychosocial influences that could affect mental status. Despite these limitations, the study offers preliminary insights into the complex interplay between health parameters and cognitive status in older adults from West Bengal, India, underscoring the need for integrated approaches in ageing research. Future research with larger, more diverse samples and longitudinal follow-up is necessary to validate these findings and explore the causal relationships.

Conclusion

The study assessed the cognitive status of older adults in North 24 Parganas, West Bengal, India. It examined the relationship between anthropometric variables, body composition parameters, physical activity levels, dietary nutrient intake, and cognitive performance. Through hierarchical cluster analysis, it was found that these multidimensional health parameters are interconnected with cognitive performance.

References

Auyeung, T. W., Kwok, T., Lee, J., Leung, P. C., Leung, J., & Woo, J. (2008). Functional decline in cognitive impairment–the relationship between physical and cognitive function. *Neuroepidemiology*, *31*(3), 167-173.

Banerjee, N., Chatterjee, S., Bardhan, S., &Mukherjee, S. (2022). Impact of select design characteristics in food packaging on consumer behaviour: A study on the Elderly population in Kolkata, In: Chakrabarti, D., Karmakar, S., Salve, U.R. (eds) *Ergonomics for Design and Innovation*, Springer Nature, Singapore, 391, pp1045-1057. https://doi.org/10.1007/978-3-030-94277-9_89.

Banerjee, N., Chatterjee, S., Bhattacharjee, S., Chatterjee, S., Chatterjee, A., Santra, T., *et al.* (2017). Impact of Bharatnatyam Dancing on Select Anthropometric Indices Related to Cardiovascular Health Status: A Study in Adult

Bengalee Females.*International Journal of Research in Medical and Basic Sciences*, *3*, 18-28.

Bardhan, S., Saha, S., Mondal, S., & Mukherjee, S. (2025). Relationship between Two Diabetes Risk Factors - Diabetes' Obesity Indicators and Physical Activity: A Study in Bengali Young Adult Females. *Goya*, *18*(2), 292-297. https://doi.org/10.5281/zenodo.14859713.

Bhattacharjee, S., Santra, T., Chatterjee, A., Chatterjee, S., Banerjee, N., Chatterjee, S., et al. (2022). Cognitive Status of Adult Bengalee Male Individuals Undergoing Training in Football, In: Chakrabarti, D., Karmakar, S., Salve, U.R. (eds) *Ergonomics for Design and Innovation*, Springer Nature, Singapore, 391, pp 1303-1311. https://doi.org/10.1007/978-3-030-94277-9_111.

Chatterjee, S., Banerjee, N., Chatterjee, S., Bardhan, S., Saha, S., & Mukherjee, S. (2022). Cognitive Ability improvement in Indian Classical Dancing: A Study in Bengalee Female, In: Chakrabarti, D., Karmakar, S., Salve, U.R. (eds) *Ergonomics for Design and Innovation*, Springer Nature, Singapore, 391, pp. 727–737. https://doi.org/10.1007/978-3-030-94277-9_62.

Chatterjee, S., Banerjee, N., Santra, T., Chatterjee, S., Chatterjee, A., Bhattacharjee, S., et al. (2017). Obesity – Motor Ability Linkage: A Study on Adult Bengalee Kathak Danseuses.*Science and Culture*, *83*(11-12), 400-405.

Deary, I. J., Corley, J., Gow, A. J., Harris, S. E., Houlihan, L. M., Marioni, R. E., et al. (2009). Age-associated cognitive decline. *British Medical Bulletin*, *92*(1), 135-152.

Gopalan, C., Sastri, B.V.R., &Balasubramanian, S.C. (2023). *Nutritive Value of Indian Foods*, ICMR-National Institute of Nutrition, Hyderabad.

Heymsfield, S.B., Nunez, C., Testolin, C., & Gallagher, D. (2000). Anthropometry and methods of body composition

measurement for research and field application in the elderly. *European Journal of Clinical Nutrition*, *54*(3), S26-S32.

Hobson, J. (2015). The Montreal Cognitive Assessment (MoCA). *Occupational Medicine*, *65*(9), 764-765.

Lee, P.H., Macfarlane, D.J., Lam, T.H., & Stewart, S.M. (2011). Validity of the international physical activity questionnaire short form (IPAQ-SF): A systematic review. *International Journal of Behavioural Nutrition and Physical Activity*, *8*, 1-11.

Lee, L., Kang, S.A., Lee, H.O., Lee, B.H., Park, J.S., Kim, J.H., et al. (2001). Relationships between dietary intake and cognitive function level in Korean elderly people. *Public Health, 115*(2), 133-138.

Leonardo, K.C., Talmelli, L.F.S., Diniz, M.A., Fhon, J.R.S., Fabricio-Wehbe, S.C.C., & Rodrigues, R.A.P. (2014). Assessment of cognitive status and frailty in elderly individuals living at home. *CiencCuidSaude*, *13*(1), 120-27.

Lezak, M. D. (2004). *Neuropsychological assessment*. Oxford University Press, USA.

Mondal, S., Bardhan, S., Chatterjee, S., Chatterjee, S., Banerjee, N., Mukherjee, S. (2024). Relationship between Body Balance and Nutritional Status in Indian Elderly. *Indian Journal of Gerontology*, *38*(3), 384-394.

Mondal, S., Chakraborty, E., Chatterjee, S., Banerjee, N., & Mukherjee, S. (2025). Assessment of the Nutritional Status by Anthropometry and MNA-SF: A Study in Bengalee Elderly. *Science and Culture*, *91*(3-4), 264-268. https://doi.org/10.36094/sc.v89.2025.Assessment _of_the_Nutritional_Status_by_Anthropometry.Mondal.264.

Mukherjee, S., Mondal, S., Dey, M., Bardhan, S., Saha, S., & Banerjee, N. (2023). Development and Analysis of a Dietary

Fibre-rich Food Supplement for the Elderly: An Initial Work. *IIChE-CHEMCON*. (Dec. 2023). https://doi.org/10.36375/prepare_u.iiche.a391.

Pinto, T.C., Machado, L., Bulgacov, T.M., Rodrigues-Junior, A.L., Costa, M.L., Ximenes, R.C., et al. (2019). Is the Montreal Cognitive Assessment (MoCA) screening superior to the Mini-Mental State Examination (MMSE) in the detection of mild cognitive impairment (MCI) and Alzheimer's Disease (AD) in the elderly? *International Psychogeriatrics*, *31*(4), 491-504.

Porrselvi, A.P., & Shankar, V. (2017). Status of Cognitive Testing of Adults in India. *Ann Indian Acad Neurol. 20*(4), 334-340. https://doi.org/10.4103/aian.AIAN_107_17.

Sanders, C., Behrens, S., Schwartz, S., Wengreen, H., Corcoran, C.D., Lyketsos, C.G., et al. (2016). Nutritional status is associated with faster cognitive decline and worse functional impairment in the progression of dementia: The Cache County Dementia Progression Study. *Journal of Alzheimer's Disease*, *52*(1), 33-42.

Smith, P.J., & Blumenthal, J.A. (2016). Dietary Factors and Cognitive Decline. *J PrevAlzheimers Dis. 3*(1), 53-64.

Starr, J.M. (2010). Cognitive impairment in older adults: an assessment guide. *Clin Med (Lond),10*(6), 579-81. https://doi.org/10.7861/clinmedicine.

Trzepacz, P.T., Hochstetler, H., Wang, S., Walker, B., Saykin, A.J., & Alzheimer's Disease Neuroimaging Initiative. (2015). Relationship between the Montreal Cognitive Assessment and Mini-mental State Examination for assessment of mild cognitive impairment in older adults. *BMC Geriatrics*, *15*, 1-9.

Tucker, K. L. (2016). Nutrient Intake, Nutritional Status, and Cognitive Function with Ageing. *Annals of the New York Academy of Sciences*, *1367*(1), 38-49.

Woodford, H. J., & George, J. (2007). Cognitive assessment in the elderly: a review of clinical methods. *QJM: An International Journal of Medicine*, *100*(8), 469-484.

World Health Organisation. (2008): *Waist Circumference and Waist–Hip Ratio: Report of a WHO Expert Consultation*. https://www.who.int/publications/i/item/9789241501491.

Xu, L., Gu, H., Cai, X., Zhang, Y., Hou, X., Yu, J., et al. (2023). The Effects of Exercise for Cognitive Function in Older Adults: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Int. J. Environ. Res. Public Health, 20*(2), 1088.

Xu, Z., Liu, Y., Yan, C., Yang, R., Xu, L., Guo, Z., et al. (2021): Measurement of visceral fatand abdominal obesity by single-frequency bioelectrical impedance and CT: a cross-sectional study. *BMJ Open*, *11*(10), e048221.

Young, J., Meagher, D., &MacLullich, A. (2011). Cognitive assessment of older people. *BMJ*, *343*, d5042. https://doi.org/10.1136/bmj.d5042.

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Cognitive Stimulation Therapy's Impact on Mild Cognitive Impairment in Older Adults

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ABSTRACT

Mild Cognitive Impairment (MCI) in older adults is often a precursor to dementia and significantly affects cognitive and psychosocial functioning. This study evaluated the efficacy of Cognitive Stimulation Therapy (CST) in improving cognitive performance among older adults with MCI. A total of 30 participants diagnosed with MCI received 14 weeks of CST, while a control group received no intervention. Pre- and post-intervention assessments using the Addenbrooke's Cognitive Examination-Revised (ACE-R) revealed significant improvements in overall cognitive scores and specific domains, such as memory, attention, and fluency, in the CST group compared to the controls. These findings underscore the potential of CST as a non-pharmacological intervention to slow cognitive decline in MCI and significantly enhance the quality of life in older adults. The results support the incorporation of CST into community and clinical settings to promote cognitive health in

ageing populations. The study recruited 30 participants aged 61-75, with Mild Cognitive Impairment (MCI). Participants were divided into an experimental group, which underwent 14 weeks of Cognitive Stimulation Therapy (CST), and a control group that received no intervention. The findings indicated a statistically significant improvement in cognitive scores among CST participants, particularly in the domains of memory and language. Comparisons with the control group suggested that these improvements were distinct from typical changes observed over time, highlighting the potential benefits of the intervention. CST appears to provide substantial benefits for cognitive enhancement in older adults with MCI. These findings suggest that CST could serve as an effective, multifaceted intervention in managing MCI, thereby supporting cognitive well-being. Further research with larger sample sizes and more extended follow-up periods is warranted to confirm these outcomes and explore their sustainability.

Keywords : Mild cognitive impairment in Older Adults, Impact of Cognitive stimulation therapy, Intervention efficacy, Cognitive stress

As the global life expectancy continues to rise, the need to address mental health among the elderly, particularly in countries like India with a rapidly growing elderly population, has become a pressing public health priority. A complex interplay of physical, cognitive, and psychosocial changes accompanies ageing. While older adults often benefit from emotional stability and life experience, they also face increasing risks of cognitive decline, particularly in domains such as memory, attention, and executive functioning. These changes can have a significant impact on daily functioning, quality of life, and independence in later life. Older adults frequently encounter a variety of stressful life events, such as health crises or bereavement, which can adversely affect cognitive health.

Obtaining accurate data on mental illness prevalence is challenging due to social stigma and a shortage of trained mental health professionals, especially in lower-income regions. Despite these difficulties, evidence suggests that mental illness is a widespread and significant issue in India. Research from the southern states of India indicates that the prevalence of mental health disorders among older adults could reach as high as 27%, with conditions such as depression, anxiety, bipolar disorder, dementia, and alcohol dependence being prevalent (Reddy, *et al.* 2013). Data from India's National Sample Survey (NSS) indicate a notable positive correlation between the prevalence of mental illness and age, particularly in rural regions (Lakhan & Ekundayo, 2015). Additionally, the increasing incidence of mental illness, despite challenges in data collection, highlights a pressing public health issue. To effectively support the growing number of older adults and mitigate the impact of these health conditions, it is crucial to implement targeted interventions, improve access to healthcare, and increase awareness.

Review of Literature

Mild Cognitive Impairment (MCI): A Transitional Phase

Mild Cognitive Impairment (MCI) represents an intermediate state between normal cognitive ageing and dementia, characterised by noticeable cognitive deficits that do not significantly interfere with everyday functioning. Individuals with MCI may experience problems with memory, language, or executive function, placing them at a higher risk of progressing to Alzheimer's disease and other dementias (Polcher *et al.,* 2022). Early identification and intervention are therefore essential, especially since MCI often goes undiagnosed due to subtle symptom presentation and limited culturally sensitive assessment tools in countries like India (Alladi, 2014; Petersen *et al.,* 2014). Socioeconomic factors, educational background, and lifestyle also play crucial roles in the onset and progression of cognitive decline (Lalitha, 2015).

Non-Pharmacological Approaches to Cognitive Health

Given the absence of a definitive cure for dementia, non-pharmacological strategies have gained prominence for maintaining and enhancing cognitive functioning in older adults. These interventions aim to slow the trajectory of cognitive decline by targeting modifiable risk factors such as social isolation, physical inactivity, and unmanaged health conditions (Langa & Levine, 2014). Techniques such as aerobic exercise, cognitive rehabilitation, and structured mental stimulation have been shown to improve memory, attention, and problem-solving abilities (Shaikh *et al.,* 2014; Kumar *et al.,* 2022). Multimodal and person-centred approaches are efficient and are encouraged as part of comprehensive geriatric care (Pratyaksha *et al.,* 2022).

Cognitive Stimulation Therapy (CST): Evidence-Based Intervention

Cognitive Stimulation Therapy (CST) is a structured, group-based intervention designed to engage older adults in mentally stimulating activities, thereby improving cognitive functioning and psychosocial well-being. Initially developed in the UK and adapted for various cultural settings, CST has demonstrated efficacy in improving memory, language, and overall cognitive performance in individuals with MCI and early dementia (Bahar-Fuchs *et al.,* 2013; Chung *et al.,* 2013). Unlike pharmacological treatments, CST is cost-effective, non-invasive, and can be delivered by trained facilitators in both community and institutional settings. Its benefits are not limited to cognitive domains; CST also enhances mood, social engagement, and quality of life.

In the Indian context, the application of CST remains limited but is gradually gaining recognition, particularly in urban settings for geriatric care. Despite logistical challenges and limited awareness, initial studies show that CST is well-received among older adults and can be adapted to local languages and cultural contexts (Dasgupta *et al*., 2023; Sheetal *et al.,* 2024). However, there remains a need for controlled studies that evaluate CST's

effectiveness in Indian populations, especially among those with MCI, to inform clinical practice and policymaking.

Importance of Cognitive Stimulation Therapy (CST)

CST is built upon key principles designed to enhance mental functioning and well-being among older adults. Central to CST is the encouragement of new ideas, thoughts, and associations, which fosters cognitive engagement and growth. The approach values opinions over mere facts, promoting an environment where participants feel valued and heard. Reminiscence is used strategically, not just to revisit the past, but to connect with the present, offering continuity and relevance to the here and now (Ferrario & Demiray, 2024). Triggers are provided to aid recall, ensuring that participants can build on previous sessions with continuity and consistency. Learning in CST is often implicit, allowing participants to absorb and apply new information naturally. The therapy stimulates language and executive functioning, two key areas crucial for daily decision-making and communication. Above all, CST is person-centred, tailoring activities to the unique needs and preferences of each individual, ensuring that therapy is both meaningful and effective (Yates *et al.,* 2017).

According to Garrido-Pedrosa and Obradors (2017), the essential characteristics of non-pharmacological interventions for cognitive decline include Cognitive Stimulation, Cognitive Training, and Cognitive Rehabilitation. Cognitive Stimulation, usually conducted in group settings, involves techniques such as reminiscence and reality orientation to enhance overall cognitive functioning and promote social interaction. Cognitive Training targets specific cognitive abilities through structured and repetitive tasks of increasing difficulty, often incorporating computer-based programs. Cognitive Rehabilitation is an individualised approach that integrates both restorative and compensatory strategies, focusing on goal setting, environmental adjustments, and caregiver involvement to support everyday functioning.

This understanding of ageing, cognitive decline, and MCI highlights the need for developing effective diagnostic and therapeutic strategies that consider cultural, socioeconomic, and psychological factors, thereby ensuring a comprehensive approach to the cognitive health of ageing populations.

Objectives:

- To investigate the level of Cognitive functioning in older adults with Mild Cognitive Impairment (MCI)
- To examine the socio-demographic factors associated with Mild Cognitive Impairment (MCI)
- To study the efficacy of Cognitive Stimulation Therapy (CST) on the cognitive functions of individuals with Mild Cognitive Impairment (MCI).

Method

Sample

Phase I: Pre-Intervention Preparation and Assessment

In this initial phase, participants were provided with psycho-education to introduce them to the study's objectives and explain the nature of the intervention. Both participants and their caregivers gave informed consent, ensuring complete understanding and agreement to participate. Socio-demographic data were collected for each participant, followed by a pre-test to assess baseline cognitive functioning.

Participants were recruited through simple random sampling from rural and urban regions in the Krishna, Guntur, and NTR districts of Andhra Pradesh. A public call for participants was made via WhatsApp, emails, and at local psychiatry clinics, encouraging elderly individuals experiencing subjective memory to consider joining the study. After being informed of the study's details, those who consented were enrolled. Based on the inclusion criteria, 260 participants, grouped by age (61-69, 70-79, 80+), were selected. Cognitive and psychological assessments were

scheduled at times convenient for each participant to ensure ease of participation.

Participants were recruited from rural and urban areas across the Krishna, Guntur, and NTR districts of Andhra Pradesh using a randomised controlled sampling approach**.** A public call for participation was made via WhatsApp, email, and announcements at local psychiatric clinics, inviting elderly individuals experiencing subjective memory complaints to participate in the study. Those who responded and met the inclusion criteria were provided with complete study details, and informed consent was obtained. A total of 260 participants were enrolled and grouped by age (61–69, 70–79, and 80+ years). Cognitive and psychological assessments were scheduled at the participant's convenience to facilitate ease of participation.

- *Inclusion Criteria:*

➢ Subjects above 60+ years

➢ Subjects with a minimum of reading and writing knowledge

Subjects who give consent to participate in the study

- *Exclusion Criteria:*

➢ Persons with a known history of TBI and/or stroke

➢ Any known mental illness and substance abuse history.

➢ Subjects with smoking and drinking

➢ Non-cooperative subjects.

Phase II: Intervention and Evaluation

From the initial sample of 260, 60 participants aged 61-75 were chosen for the intervention phase. This subset included 30 participants with Mild Cognitive Impairment (MCI) and 30 with normal cognitive functioning. These 60 individuals were randomly assigned to one of two groups:

➢ Experimental Group: 30 participants (15 with MCI, 15 with normal cognitive functioning)

- Control Group: 30 participants (15 with MCI, 15 with normal cognitive functioning)

This paper is part of a larger study examining the effects of Cognitive Stimulation Therapy (CST) on cognitive function in older adults. While the broader study includes both participants with Mild Cognitive Impairment (MCI) and those with normal cognitive function, as well as other psychosocial measures, the present analysis focuses explicitly on the MCI subgroup. Within this subgroup, two distinct groups were examined: one group of 15 participants with MCI who underwent CST as part of the Experimental Group, and a second group of 15 participants with MCI who did not receive any intervention, representing the Control Group. The objective of this paper is to assess the impact of CST on cognitive performance in individuals with MCI, with a particular emphasis on comparing the outcomes of those who received the intervention to those who did not, in order to evaluate the effectiveness of CST in improving cognitive function in this population.

Tools used

a. The Addenbrooke's Cognitive Examination–Revised (ACE-R) is a comprehensive cognitive screening tool designed to assess five major cognitive domains: attention, memory, verbal fluency, language, and visuo-spatial abilities. The test is scored out of 100, with scores below 82 indicating cognitive impairment (sensitivity 0.84, specificity 1.00). To make the tool accessible to Telugu-speaking and low-literacy populations in India, Mekala et al. (2008) adapted the ACE-R into the Telugu language. This adaptation involved culturally and educationally appropriate modifications, including the replacement of literacy-dependent tasks with pictorial and verbal alternatives. The Telugu version retained strong psychometric properties and effectively distinguished between cognitively normal and impaired individuals. Adapted for use in diverse clinical settings, the ACE-R in Telugu facilitates the creation of a detailed cognitive profile, which is crucial for both

diagnostic assessment and monitoring therapeutic progress in older adults.

b. Socio-demographic Data–A semi-structured questionnaire collected data on variables such as age, gender, education, income source, socioeconomic status, locality, marital status, and family structure, providing context for analysis.

Cognitive Stimulation Therapy (CST): The intervention consisted of 14 weekly Cognitive Stimulation Therapy (CST) sessions, each lasting 45 minutes and aimed at enhancing cognitive domains like memory, attention, problem-solving, and language. Participants also received relevant homework to reinforce the session activities, with the attendant's support. The CST sessions promoted active engagement, a positive atmosphere, and mental well-being.

Method of testing

The present study uses a cross-sectional intervention design with a pre-test/post-test control group format. It is conducted in two phases, i.e., pre-intervention and intervention.:

Phase I : Pre-Intervention Preparation and Assessment. In this phase, older adults from rural and urban areas in Andhra Pradesh (Krishna, Guntur, and NTR districts) were screened using simple randomised controlled sampling. Initial recruitment involved advertisements through WhatsApp, emails, and psychiatric clinics, targeting elderly individuals with subjective memory complaints. Out of 417 interested individuals, 260 were selected after applying the inclusion criteria, namely subjects above 60 years of age, those with a minimum reading and writing knowledge, and individuals who consented to participate in the study.

Participants received psycho-education, covering the study's goals and procedures, and informed consent was obtained. Socio-demographic data were collected to analyse cognitive and psychological outcomes across age, gender, education, and socio-economic backgrounds. Assessments included cognitive and

psychological evaluations, and participants received personalised recommendations based on their results.

Phase II : Intervention and Post-Assessment. A subset of 60 participants was selected, comprising 30 individuals with Mild Cognitive Impairment (MCI) and 30 with normal cognition, matched across demographic factors such as age, gender, and locality. Caregivers were also involved to support ongoing cognitive exercises at home. The inclusion criteria for the intervention are specifically aged 61 to 75 years and with a minimum education level of 10th grade.

Execution of Intervention module : The same investigator served as both the assessor and the therapist throughout the intervention phase. This researcher was responsible for administering the pre- and post-intervention cognitive assessments as well as delivering the Cognitive Stimulation Therapy (CST) sessions. This continuity ensured consistency in both the therapeutic approach and the assessment process, while also allowing for close monitoring of participant engagement and response to the intervention.

Establishing Rapport : Initial Interaction - Begin with a warm and friendly introduction to make the subjects feel at ease. Explain the purpose of the study in simple terms.

Building Trust: Engage in small talk to establish trust and alleviate any anxiety the subjects may have. Show empathy and patience, listening to their concerns and answering their questions.

- Administering the Screening Test:

i. Explanation: Clearly explain the purpose and procedure of the screening test to the subjects. Ensure they understand that the test is not an exam but a tool to understand their cognitive functioning.

ii. Conducting the Test: Administer the screening tests in a calm and supportive manner. Encourage the subjects and provide breaks if needed to ensure they are comfortable.

During the orientation session, participants were introduced to the core principles and practical applications of Cognitive Stimulation Therapy (CST). They were actively engaged in exercises targeting attention and concentration, two fundamental cognitive functions that decline with age. One such activity was the Digit Span Test, which included both forward and backwards recall, used to assess and strengthen short-term and working memory. Research by Choi *et al.* (2014) supports the use of this test for evaluating attention and working memory. We also incorporated a verbal fluency task to help participants practice word retrieval and semantic associations, as shown in studies by Farina (2020) and Soltani (2021), which emphasise that verbal fluency is one of the first cognitive abilities to decline in individuals with Mild Cognitive Impairment (MCI).

To strengthen various cognitive domains, several interactive tasks were facilitated. Visual recall exercises involving picture memory helped participants practice recognising images and visual information, an ability vital for everyday functioning (Greene & Hodges, 1996). Digit cancellation and Stroop tasks were included, which are widely recognised for improving attention, psychomotor speed, and visual scanning skills (Brucki & Nitrini, 2008; Agrigoroaie & Tapus, 2018). Participants also participated in narrative recall tasks to enhance memory, attention, and language integration, as supported by Eekhof *et al.* (2021). The Trail Making Test (TMT) was used as both a diagnostic and an intervention tool to improve processing speed and cognitive flexibility, consistent with findings by Nascimento Silva (2021). In addition, participants engaged in colouring activities, shown by Holt *et al.* (2019) to reduce anxiety and improve attention and creativity, and drawing exercises, which Fernandes *et al.*, (2018) found to enhance memory through multisensory encoding.

Cognitive functions like recognition, implicit memory, and reasoning were also addressed. Participants took part in

recognition tasks informed by Ally (2012), which illustrated how familiarity and recollection affect decision-making in people with MCI and Alzheimer's disease. To highlight the role of implicit memory, particularly procedural memory, everyday tasks were discussed, supported by the findings of Kuo *et al.* (2018). Activities such as "Odd One Out" were used to stimulate deductive reasoning, a vital skill for logical thinking and problem-solving (Corbett *et al.*, 2015). Additionally, mandala colouring was introduced, which Alaves (2020) found to improve working memory in individuals with MCI significantly. The session concluded with reflective discussions to consolidate what was learned and to encourage participants to apply these CST strategies in their daily lives to promote ongoing mental well-being (Weil *et al.*, 2017).

Homework activities were collaboratively decided upon by both the participant and the researcher after the main activities of each session had been completed. During these sessions, the therapist and participant discussed which tasks would be most beneficial and aligned with the participant's interests. This approach ensured that the homework was both relevant and engaging, enhancing the participants' motivation to complete the assigned activities. Additionally, attendants were informed about the homework activities and their significance, and feedback was gathered from them to enhance the overall experience of the intervention.

Caregivers of participants who had them were also involved in the intervention process. They received education about the importance of the homework activities designed to reinforce the skills and exercises covered during Cognitive Stimulation Therapy (CST) sessions. The inclusion of caregivers in this process was critical, as it provided a support system outside of the formal sessions, helping to encourage the continuation of cognitive exercises at home and enhancing the overall effectiveness of the intervention.

Results And Discussion

The data collected was systematically analysed to address the study's objectives, providing insights into the effectiveness of Cognitive Stimulation Therapy (CST).

Table 1

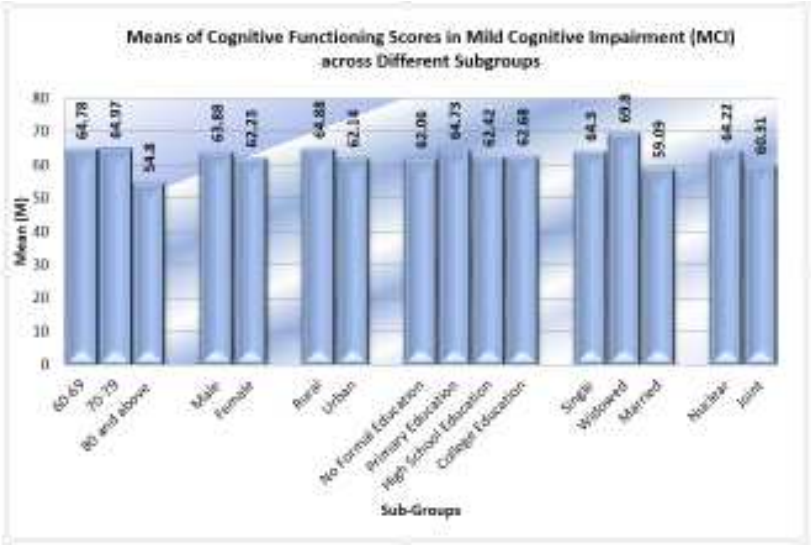
Means and S.D.s of Cognitive Functioning in Mild Cognitive Impairment (MCI) Across Different Subgroups.

S.No	Sub-Group	N	M (σ)
1	Age		
	60-69	42	64.78 (13.75)
	70-79	49	64.97 (11.03)
	80 and above	21	54.80 (16.36)
2	Gender		
	Male	52	63.88(14.47)
	Female	60	62.23(12.97)
3	Locality		
	Rural	35	64.88(12.61)
	Urban	77	62.14(14.09)
4	Education		
	No Formal Education	31	62.06(15.43)
	Primary Education	30	64.73(11.29)
	High School Education	26	62.42(15.63)
	College Education	25	62.68(12.25)
5	Marital Status		
	Single	76	64.30(12.75)
	Widowed	05	69.80(11.54)
	Married	31	59.09(15.55)
6	Family Status		
	Nuclear	77	64.22(12.93)
	Joint	35	60.31(14.95)

The slight advantage observed in rural participants may reflect lifestyle differences, possibly indicating that rural living offers

protective factors that support cognitive health. The group with primary education scored the highest, suggesting that even a basic level of education may contribute to cognitive resilience, although differences across educational levels were modest. The findings also indicate that family structure may influence cognitive health, possibly due to variations in social support or stress levels associated with different living arrangements. While age remains a significant factor in cognitive decline, the data suggest that other variables—such as locality, education, marital status, and family structure—also play a role in shaping cognitive performance among older adults.

Figure 1: Means of Cognitive Functioning in Different Sub-Groups



The cognitive performance of older adults across various demographic subgroups highlights how factors such as age, gender, locality, education, marital status, and family structure may impact cognition during the ageing process. Age shows a noticeable trend, with cognitive scores declining in the oldest group (80 and above), aligning with well-documented age-related cognitive decline.

Gender differences are minimal, as both males and females score similarly, suggesting a limited influence of gender on cognition within this sample. Locality data reveals a slight cognitive advantage for participants from rural areas compared to their urban counterparts, which may reflect the impact of lifestyle or environmental factors. Education appears to play a role, with individuals who have completed primary education scoring highest; however, the differences across educational levels are relatively modest, indicating that education may enhance cognitive resilience to some extent. Marital status also shows variation, with widowed individuals scoring highest, possibly due to the influence of social support and psychological factors on cognitive health. Family structure reveals a slightly higher cognitive score among those in nuclear families compared to joint families, which may reflect differences in family dynamics or stress levels. Overall, while age is a primary factor in cognitive decline, this data suggests that educational attainment, marital status, locality, and family structure also contribute to variations in cognitive health among older adults.

Table 2

Domain-Wise Cognitive Functioning Scores in Mild Cognitive Impairment (MCI) Groups.

S.NO.	Cognitive- Domains	MCI (n=112) M (σ)
1	Attention	12.93 (3.19)
2	Memory	12.75 (5.41)
3	Fluency	5.62 (2.88)
4	Language	20.41 (4.25)
5	Visuospacial	11.10 (3.81)
6	MMSE-on- acer	20.41 (4.85)
7	Acer score	63.00 (13.65)

The above table aims to highlight the differences in cognitive functioning scores across specific domains among individuals diagnosed with Mild Cognitive Impairment (MCI).

Identifying these differences enhances our understanding of the cognitive profiles associated with MCI, thereby supporting the development of targeted interventions and improving the quality of care for individuals affected by MCI. Participants in the MCI group exhibited noticeable deficits across all cognitive domains assessed. The findings of this study also underscore significant correlations between various demographic factors and cognitive functioning in older adults, emphasising the complex interplay of socio-environmental influences on cognitive performance.

Table 3

Correlation Matrix relates to Domain-Wise in Mild Cognitive Impairment (MCI) Scores with Socio-Demographic Variables.

S. No	Variables	Attention	Memory	Fluency	Language	Visuo spatial	MMSE -on- ACE-R	ACE-R score
1.	Age	-0.238*	0.274**	-0.043	-0.111	-0.022	-0.212*	-0.223*
2.	Gender	-0.173	-0.183	-0.006	0.050	0.172	0.086	-0.061
3.	Locality	0.033	0.017	0.097	0.102	0.153	0.102	0.094
4.	Religion	0.050	0.036	-0.001	0.167	0.172	0.134	0.120
5.	Education	-0.040	-0.043	-0.164	0.076	0.106	0.044	-0.001
6.	SES	0.071	0.062	0.086	0.115	-0.002	0.004	0.071
7.	Income Source	-0.143	-0.086	-0.211*	-0.138	-0.188*	-0.193*	-0.218*
8.	Employ-ment Status	0.039	0.074	-0.008	0.005	-0.030	0.091	0.034
9.	Marital Status	-0.038	-0.094	-0.134	-0.094	-0.105	-0.051	-0.151
10	Family Status	0.015	-0.038	-0.001	-0.100	-0.202*	-0.090	-0.115

*Significantat0.05level;**Significantat0.01level

The table above presents the results of the correlation analysis between various socio-demographic variables and cognitive domains in the MCI group, as assessed using the Addenbrooke's Cognitive Examination Revised (ACE-R).

The analysis indicates several noteworthy correlations between age and cognitive performance. Locality did not show significant correlations with any cognitive domains or ACE-R scores. Similarly, religion did not show significant correlations with cognitive domains, although weak positive trends were noted in language and visuo-spatial abilities. Education was not significantly correlated with any cognitive domains or ACE-R scores, and neither was socioeconomic status (SES), although weak positive trends were observed in some cases.

This study highlights important correlations between socio-demographic factors and cognitive performance in older adults, those with Mild Cognitive Impairment (MCI). The analysis reveals that rural residents tend to have lower language proficiency compared to their urban counterparts, as reflected in the negative correlation between locality and language abilities, which is likely due to differences in access to educational resources and cognitively stimulating environments. Religion also exhibits a negative correlation with memory, suggesting that memory performance varies across religious groups, possibly due to cultural and religious practices that impact cognitive engagement.

Table 4

Shows the analysis of Intervention on Mild Cognitive Impairment in Control and Experimental Groups.

Variables	Testing condition	Control Group (n=30) Mean(S.D)	't' value	Experimental Group(n=30) Mean(S.D)	't' value
MCI	Pre-Testing	72.86(8.28)	0.40@	68.13(9.62)	5.96**
	Post-Testing	73.06(7.05)		72.60(8.25)	

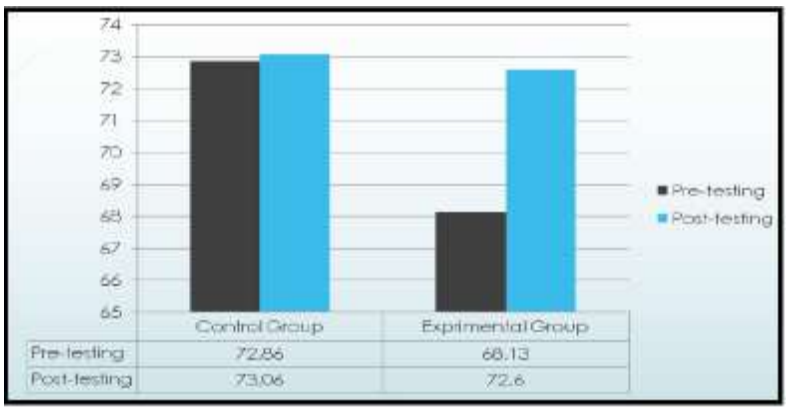
Further, the results related to the intervention were analysed and presented in Table 5. The above table represents a comparison of cognitive performance between participants with Mild Cognitive Impairment (MCI) in both the control and experimental groups. The data includes mean cognitive scores from pre- and

post-testing, along with the corresponding standard deviations (S.D.) and 't' values for statistical analysis. The purpose of this comparison is to assess the effectiveness of Cognitive Stimulation Therapy (CST) in improving cognitive function among older adults with MCI, compared to the control group that did not receive the intervention. The table highlights changes in cognitive scores over time, as well as the statistical significance of these changes, particularly within the experimental group.

This strong statistical significance suggests that Cognitive Stimulation Therapy had a positive and meaningful impact on their cognitive status, resulting in improved cognitive performance following the intervention.

Figure 2

Means of Pre-Post testing of Cognitive Functioning in Mild Cognitive Impairment Groups.



The bar graph presents the pre-test and post-test scores for two groups: the Control Group and the Experimental Group, both consisting of individuals with Mild Cognitive Impairment (MCI). The post-test score for the Experimental Group shows a more substantial increase, demonstrating a significant enhancement in cognitive function following CST. This contrast highlights the effectiveness of the intervention, with the Experimental Group showing a much greater improvement than the Control Group.

Table 5

Shows the analysis of Intervention on Domain-Wise Mild Cognitive Impairment in Control and Experimental Groups

Variables	Testing condition	Attention	Memory	Fluency	Language	Visuo-spatial	MMSE -on ACE-R
		M (σ)	M (σ)	M (σ)	M (σ)	M (σ)	M (σ)
MCI	Control Group (n=30)	14.86 (2.30)	15.53 (3.9)	67.2 (2.94)	22.13 (2.61)	13.06 (2.89)	19.80 (1.89)
	Experimental Group(n=30)	14.46 (2.23)	15.60 (3.6)	68.6 (2.74)	20.26 (4.0)	11.00 (3.85)	19.33 (2.37)

Discussion

This study was designed to assess the efficacy of Cognitive Stimulation Therapy (CST) in improving cognitive function among older adults with Mild Cognitive Impairment (MCI) and to examine how various socio-demographic factors influence cognitive performance in this population.

The results indicate that CST had a positive effect on cognitive performance in individuals with MCI. Participants in the experimental group who received CST demonstrated significant improvements in memory, attention, and language domains, with robust gains in memory (mean = 22.20, SD = 2.67). In contrast, the control group showed patterns consistent with age-related cognitive decline, underscoring the protective effect of CST.

These findings support previous research (Knapp *et al.*, 2006; Khan *et al.*, 2014), which demonstrates the utility of CST in slowing cognitive deterioration. The results also align with studies demonstrating that CST can stimulate neuroplasticity and support cognitive maintenance through structured, mentally engaging activities (Carbone *et al.*, 2022; Behfar *et al.*, 2023). Furthermore, benefits observed in the normal cognition experimental group—especially in memory and attention—suggest that CST may also help preserve function in ageing adults without existing impairment.

Domain-specific analysis revealed the most significant improvements in memory, followed by attention, language, and visuospatial abilities. These findings are consistent with the nature of CST, which uses reality orientation, semantic tasks, and socially interactive activities to target multiple cognitive domains. This multi-dimensional approach allows CST to address the broad pattern of decline commonly observed in MCI and early dementia.

Notably, the MMSE scores remained stable in the experimental group, indicating that CST helps in maintaining global cognitive functioning over time, even in the absence of significant changes on screening measures.

The study also examined the relationship between cognitive performance and various factors, including age, education, gender, marital status, locality, and family structure. As expected, cognitive scores declined with increasing age, with the sharpest decline observed in individuals aged 80 and above. This underscores the importance of early intervention. Interestingly, participants with only primary education scored the highest, suggesting that even minimal formal education may help build cognitive reserve and confer resilience against decline. This supports the cognitive reserve hypothesis and aligns with findings from Lalitha and Aswartha Reddy (2021).

Contrary to initial expectations, rural participants out performed their urban counterparts on several cognitive domains. This may be explained by lifestyle factors such as physical activity, strong community bonds, and reduced stress, all of which are known to protect against cognitive decline. Participants from nuclear families scored slightly higher than those from joint families, possibly due to more individualised attention and less complex caregiving dynamics. Similarly, marital status showed an unexpected pattern: participants who were widowed performed slightly better than those who were married or separated. This may reflect

adaptive coping mechanisms or lifestyle changes following bereavement that encouraged greater cognitive engagement.

Gender did not significantly influence cognitive outcomes in this sample, supporting studies that show limited differences in cognitive ageing between men and women (Hyde, 2016; Jäncke, 2018), although the influence of socio-cultural gender roles warrants further exploration.

Although not the primary focus, the study also touched on the role of life stressors in cognition. Prior research (Rosnick *et al.*, 2007) has demonstrated that the nature and perceived impact of life events, such as financial strain or illness, can influence cognitive functioning. While not directly measured here, these findings highlight the potential value of integrating stress management and emotional support into cognitive health interventions.

Conclusion

This study reinforces the value of CST as an effective, low-cost, non-pharmacological intervention for improving or maintaining cognitive function in older adults with MCI. It also demonstrates the nuanced influence of socio-demographic factors on cognitive outcomes, suggesting the need for tailored intervention strategies. The findings call for broader implementation of CST in geriatric care and emphasise early detection and intervention, especially for high-risk groups.

References

Agrigoroaie, R., & Tapus, A. (2018, August). The outcome of a week of intensive cognitive stimulation in an elderly care setup: a pilot test. In *2018, 27th IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN)* (pp. 814-819). IEEE.

Alaves, G. (2020). *Remember to Color: How Coloring Impacts Elderly Mental Health and Working Memory*—University of North Florida.

Alladi, S., Shailaja, M., Mridula, K. R., Haritha, C. A., Kavitha, N., Khan, S. A., ... & Kaul, S. (2014). Mild cognitive

impairment: Clinical and imaging profile in a memory clinic setting in India. *Dementia and geriatric cognitive disorders*, *37*(1-2), 113–124.

Ally, B. A. (2012). Using pictures and words to understand recognition memory deterioration in amnestic mild cognitive impairment and Alzheimer's disease: a review. *Current Neurology and Neuroscience Reports*, *12*, 687–694.

Bahar-Fuchs, A., Clare, L., & Woods, B. (2013). Cognitive training and cognitive rehabilitation for persons with mild to moderate dementia of the Alzheimer's or vascular type: a review. *Alzheimer's research & therapy*, *5*, 1–14.

Behfar, Q., Richter, N., Kural, M., Clemens, A., Behfar, S. K., Folkerts, A. K., ... & Onur, O. A. (2023). Improved connectivity and cognition due to cognitive stimulation in Alzheimer's disease. *Frontiers in aging neuroscience*, *15*, 1140975.

Brucki, S. M. D., & Nitrini, R. (2008). Cancellation task in very low educated people. *Archives of Clinical Neuropsychology*, *23*(2), 139–147.

Carbone, E., Piras, F., Pastore, M., & Borella, E. (2022). The role of individual characteristics in predicting short-and long-term cognitive and psychological benefits of cognitive stimulation therapy for mild-to-moderate dementia. *Frontiers in aging neuroscience*, *13*, 811127.

Choi, H.J., Lee, DY, Seo, EH, JO, MK, Sohn, BK, Choe, YM, Byun, MS., Kim, JW., Yoon, JC, Jhoo, JH, Kim, KW, Woo, JI (2014). A normative study of the digit spar in an educationally diverse elderly population, *Psychiatry Investing,* 11(1) 39-43.

Chung, C. S., Pollock, A., Campbell, T., Durward, B. R., & Hagen, S. (2013). Cognitive rehabilitation for executive dysfunction in adults with stroke or other adult non progressive acquired brain damage. *Cochrane Database of Systematic Reviews*, (4).

Corbett, A., Owen, A., Hampshire, A., Grahn, J., Stenton, R., Dajani, S., ... & Ballard, C. (2015). The effect of an online cognitive training package in healthy older adults: an online

randomized controlled trial. *Journal of the American Medical Directors Association*, *16*(11), 990–997.

Dasgupta, J., Lockwood Estrin, G., Summers, J., & Singh, I. (2023). Cognitive enhancement and social mobility: Skepticism from India. *AJOB neuroscience*, *14*(4), 341–351.

Eekhof, L. S., Van Krieken, K., Sanders, J., & Willems, R. M. (2021). Reading minds, reading stories: Social-cognitive abilities affect the linguistic processing of narrative viewpoint —frontiers *in Psychology*, *12*, 698986.

Fernandes, M. A., Wammes, J. D., & Meade, M. E. (2018). The surprisingly powerful influence of drawing on memory. *Current Directions in Psychological Science*, *27*(5), 302–308.

Ferrario, A., & Demiray, B. (2024). Understanding reminiscence and its negative functions in the everyday conversations of young adults: A machine learning approach. *Heliyon*, *10*(1).

Greene, J. D., & Hodges, J. R. (1996). Identification of famous faces and famous names in early Alzheimer's disease: Relationship to anterograde episodic and general semantic memory. *Brain*, *119*(1), 111–128.

Holt, N. J., Furbert, L., & Sweetingham, E. (2019). Cognitive and affective benefits of coloring: two randomized controlled crossover studies. *Art Therapy*, *36*(4), 200–208.

Hyde, J. S. (2016). Sex and cognition: gender and cognitive functions. *Current opinion in neurobiology*, *38*, 53–56.

Jäncke, L. (2018). Sex/gender differences in cognition, neurophysiology, and neuroanatomy. *F1000 Research*, *7*.

Kumar, M., Muhammad, T., & Dwivedi, L. K. (2022). Assessing the role of depressive symptoms in the association between social engagement and cognitive functioning among older adults: analysis of cross-sectional data from the Longitudinal Aging Study in India (LASI). *BMJ open*, *12*(10), e063336.

Kuo, C. Y., Huang, Y. M., & Yeh, Y. Y. (2018). Let's play cards: Multi-component cognitive training with social engagement

enhances executive control in older adults. *Frontiers in Psychology*, *9*, 2482.

Lakhan, R. & Ekundayo, O. (2015). National Sample Survey Organization survey report: An estimation of prevalence of mental illness and its association with age in India. *Journal of Neurosciences in Rural Practice.* 6. 51–54. 10.4103/0976 3147. 143194.

Lalitha, K. (2015). Role of interventions in improving Memory performance in the Aged. *International Journal of Business Intelligence & Innovations*, Spl. Vol. ISSN 23484705. 69–75.

Lalitha, K., & Reddy, A. (2021). Life Review as a determinant of Memory Performance Among older adults. *Quest Journals Journal of Research in Humanities and Social Science,* 9 (7), pp 69–75.

Langa, K.M., & Levine, D.A. (2014). The diagnosis and management of mild cognitive impairment: a clinical review. *Jama*, *312*(23), 2551-2561.

Mekala, S., Alladi, S., Mridula, K. R., & Kaul, S. (2008). Dementia diagnosis in illiterates: Adaptation and usefulness of a global cognitive screening test-Addenbrooke's Cognitive Examination Revised (ACE-R). *Annals of Indian Academy of Neurology*, *11*.

Nascimento Silva, R., Afonso, S. V., Felipe, L. R., Oliveira, R. A., Martins, L. J. P., & de Souza, L. A. P. S. (2021). Dual-task intervention based on trail making test: Effects on Parkinson's disease. *Journal of Bodywork and Movement Therapies*, *27*, 628-633.

Pais, R., Ruano, L., P. Carvalho, O., & Barros, H. (2020). Global cognitive impairment prevalence and incidence in community dwelling older adults—a systematic review. *Geriatrics*, *5*(4), 84.

Petersen, R. C., Caracciolo, B., Brayne, C., Gauthier, S., Jelic, V., & Fratiglioni, L. (2014). Mild cognitive impairment: a concept in evolution. *Journal of internal medicine*, *275*(3), 214–228.

Polcher, A., Wolfsgruber, S., Peters, O., Frölich, L., Wiltfang, J., Kornhuber, J., ... & Wagner, M. (2022). A comparison of

operational definitions for mild cognitive impairment. *Journal of Alzheimer's disease*, *88*(4), 1663-1678.

Pratyaksha Pandit, Reema Kumari & Prabhakar Mishra (2022). Non-Pharmacological Treatment of Cognitive Impairment-An Overview *Int. J. of Adv. Res.* 10 (Dec). 188–193] (ISSN 2320-5407).

Reddy B, Venkata & Gupta, Arti & Lohiya, Ayush & Kharya, Pradip. (2013). Mental Health Issues and Challenges in India: A Review. *International Journal of Scientific and Research* Publications. 3. 1–3.

Rosnick, C. B., Small, B. J., McEvoy, C. L., Borenstein, A. R., & Mortimer, J. A. (2007). Negative life events and cognitive performance in a population of older adults. *Journal of Aging and Health*, *19*(4), 612–629.

Shaikh, S., Kumar, S., & Muragod, A. (2014). Effect of cognitive rehabilitation for mild cognitive impairment in the geriatric population with early onset hypertension pretest-posttest design. *Indian Journal of Health Sciences and Biomedical Research*, *7*(1), 33–38.

Sheetal, S., & Mathew, R. (2024). Cognitive Stimulation Therapy in Dementia–Are We Sufficiently Stimulated?. *Annals of Indian Academy of Neurology*, *27*(1), 9–10.

Weil, M. P., Katz, M., & Hilsenroth, M. J. (2017). Patient and therapist perspectives during the psychotherapy termination process: The role of participation and exploration. *Psychodynamic psychiatry*, *45*(1), 23-43.

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Retirement and beyond: navigating the challenges and the subsequent negotiations retired men of Kashmir make in their lives

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ABSTRACT

This study, which aims to delve into the personal experiences of retired men in Kashmir, is deeply intimate. It explicitly highlights the visible and hidden hurdles these men face in their daily lives. The paper is grounded in 12 oral narratives gathered over time with retired men in Kashmir, as they navigate life after retirement. The current study reveals that retired men in Kashmir face a range of challenges post-retirement, including financial instability, social isolation, and a sense of loss of self. It also reveals that many turn to heightened religious practices, partly driven by concerns about ageing, sickness, and death, as a coping mechanism for the uncertainties of post-retirement life.

Keywords : Retirement; Older Men; Adjustment; Religiosity; Satisfaction, Anxiety

Since the dawn of human civilisation, individuals have traversed through several stages in their life course. From early childhood to later life, each stage encompasses diverse experiences, significantly creating a complex web of social life (Orenstein and Lewis 2022). For a person employed in the formal sector, an additional stage, "retirement," marks the life course transition from active working life. As a significant aspect of working life, retirement, with its economic implications and psychological dimensions, creates a complex social fabric that shapes the experiences and outcomes of retirees (Fadila*et al.,* 2016; Mukku*et al.,* 2018). Retirement is a significant life course transition, involving crucial changes to an individual's social and economic well-being. It marks a new stage in the life course, necessitating the reorientation of daily routines and adjustments to the social circle (Kubicek*et al.,* 2011). It signifies distancing oneself psychologically and behaviourally from the workplace. Retirement involves confronting new expectations, roles, and challenges, all of which have the potential to impact a person's quality of life (Wang *et al.,* 2014).

In India, the retirement age varies widely across states and professions (Acharya, 2023), reflecting the country's regional autonomy and the diversity of professional industries. Among the states, the age varies between 58 and 60 years, depending wholly on the discretion of the states—for instance, Kerala: 56 years, Jammu & Kashmir: 60 years, and Andhra Pradesh: 62 years (Jose *et al.,* 2021; The Economic Times, 2022). Additionally, within various professions, such as the armed forces, police forces, academia, and the legal profession, the age of retirement varies considerably depending on the individual's rank, service, and institutional regulations within each profession. However, in certain professions, such as the judiciary and teaching, which require specialised skills and expertise, the age of retirement is usually higher (62–65 years). This initiative aims to address the shortage of skilled manpower and retain experienced professionals within

an organisation. Therefore, it can be asserted that India does not yet have a uniform retirement age nationwide and remains influenced by factors such as the nature of employment, industry, and state.

Literature review

Bosse*et al.* (1991) argue that retirement, as a significant life course transition, often leads to social and psychological transformations with substantial repercussions on an individual's physical and psychological well-being (Portnoi, 1981). Studies such as those by Henning *et al.* (2016) and Hansson (2017) have shown that retirement does not significantly impact the well-being of the majority of people. However, a significant body of research suggests that the influence of retirement may diverge both between and within individuals.It is generally said that people who hold top bureaucratic positions often face significant challenges after retirement. Various studies (Wang *et al.,* 2014; Haybroek *et al.,* 2015; Earl *et al.,* 2015) report diversity in the retirement experience, highlighting the problems faced by many older workers after retirement. This diversity in experiences underscores the need for a nuanced understanding of retirement and its effects on individuals.

The transition to retirement could be a significant factor in the development of various mental health problems (Segel-Karpas *et al.,* 2018). The consequences may vary from individual to individual. For many, retirement brings about various adjustment problems.A person's self-image is diminished with the loss of power and legitimacy. A reduction in income leads to increased pressure on resource allocation and adjustment. However, it is essential to recognise that retirement also presents opportunities for a positive adjustment. There is a substantial possibility of a shift in power dynamics in favour of the earning members of the family. It is generally stated that retirement may increase adjustment problems for an individual (Wang, 2007). As a person retires, there is a strong possibility of a change in the quality of life, and hence, a person becomes more vulnerable to strain and depression. However, with

the proper support and coping strategies, many retirees can successfully navigate this transition.

While this may be partially true, a large number of people experience depression upon retiring from their work (Shiba *et al.,* 2017). Retired men often seek ways to cope with stress and live a happy life. There is a tendency among some of them to resort to aggressive behaviour to give vent to the discontent they confront daily. However, it is essential to note that healthier coping strategies are available, such as engaging in religious activities. Many people prefer to engage with religious institutions as a coping strategy to relieve their stress levels. There is an implicit belief that old age activates concerns regarding death and the essence of life, concerns that are allayed by active religious involvement. A study conducted by Glamser (1988) reported that over one-third (37%) of respondents stated that religious involvement became more important after retirement. This may be because religiosity is associated with increased life satisfaction and a reduction in psychological distress (Ellison *et al*., 1998, 2011; McIntosh *et al*., 2011). This highlights the potential for religious involvement to provide comfort and relief during the retirement transition.

In the context of Kashmir, retirees' increased level of involvement in religious activities is driven by the challenges they experience in terms of maladjustment, illness, social isolation, and the associated anxiety emanating from the combination of these issues, as well as by the existential threat of approaching death. After spending their productive years in environments focused on efficiency and rationality, they now find themselves grappling with the loss of organic relationships, such as those with colleagues and the workplace community, as they transition into this new phase of life. The constant anxiety caused by various issues, ranging from maladjustment to isolation and the threat of death, makes them more engaged in religious activities.

Additionally, Durkheim (1912) maintained that "religion promotes social integration by safeguarding individuals from egoism

and anomie." In old age, religion becomes key to a happy life. Manning (2013) reported that many problems of old age are alleviated by involvement in religious beliefs, prayers, and faith in God. Religious activity and life satisfaction after retirement have a positive relationship (Pappathi, 2007). Retired men, who often find themselves alienated, adhere to religious institutions for social support and relief from psychological stress. There are also adjustment issues among various retired personnel, as they struggle to adopt appropriate conduct in response to changes in their social status, responsibilities, roles, and social networks (ibid).

Retirement in Kashmir

At the regional level in Kashmir, retirees may experience the same problems **as** those analysed above. However, the unique circumstances of the region have contributed to heightened complexities in their experiences. These circumstances, stemming from the persistent situation in the valley, have impacted the psychological well-being of retirees, leading to increased levels of anxiety, stress, and depression. A study conducted in Kashmir (Dar *et al.,* 2018) focused on the level of stress experienced by retired men and concluded that retirement is likely to result in various psychological issues. The study also highlighted the coping strategies adopted by older retirees to prevent the development of mental health issues at an early stage.

Although various studies on retired older adults exist at the national level, there is a dearth of data specific to Kashmir. Some studies have been conducted (Dar *et al.,* 2018; Hussain *et al.,* 2020), but they have primarily focused on the mental and overall health status of retired personnel. These studies have broadly adopted a quantitative approach to assess levels of stress and satisfaction after retirement in Kashmir. In this context, the present paper will explore the experiences of older men in Kashmir after retirement from a qualitative perspective, as qualitative analysis enables a deeper understanding and documentation of their life transitions.

Although older men in general experience numerous problems, retirees are particularly vulnerable to psychological and social challenges, as the abrupt separation from work makes it difficult for them to adjust to new social contexts.

Aim of the study

The study aims to explore the lived experiences of retired men in Kashmir, with a specific focus on the challenges they face after retirement. It goes beyond financial considerations to examine the psycho-social issues that arise in the form of maladjustment, social isolation, illness, and increased religiosity, driven by the anxiety stemming from the challenges associated with retirement.

Method

In line with the study's aim, a qualitative research approach was employed to document the experiences of retired men as they navigate life after retirement in Kashmir. The study was conducted in the Pulwama district of the Union Territory of Jammu and Kashmir, where in-depth, face-to-face interviews were held with 12 retired male personnel who experienced considerable challenges following retirement. A convenience sampling technique was employed, involving the selection of participants who were readily accessible and willing to participate. The rationale for this sampling method was based on the exploratory nature of the study and the challenges associated with identifying and accessing a broader pool of retired individuals willing to share their personal experiences.The study deliberately excluded female retirees in Kashmir, as no significant variations were observed in their lives post-retirement. Despite being employed in professional sectors, women in Kashmir tend to remain socially engaged, maintaining strong connections both at the workplace and at home. After retirement, they experience less social dislocation than men, which justifies their non-inclusion in the study.

The data collection for the study spanned nearly three months and continued until data saturation was achieved. While collecting data from the first ten participants, repetitive patterns in responses

indicated data saturation. To ensure thoroughness, two additional participants were interviewed; however, their responses also reflected the same themes. This led the researcher to conclude the data collection phase.

The study was conducted at times and locations convenient to participants aged 60 and above. Each interview lasted approximately 40–45 minutes and was conducted in the respondents' preferred language. The interviews were digitally recorded in the Kashmiri language and later transcribed into English.

Subsequently, the data were analysed using Braun and Clarke's (2006) thematic analysis technique, which involved familiarisation with the data, identifying initial codes, searching for themes, reviewing and refining themes, defining and naming them, and ultimately producing the report. Pseudonyms were used in place of respondents' real names to ensure confidentiality. The findings were organised in alignment with the study's aims and presented in the form of narrative accounts.

Table 1

Demographic Information of the Respondents

Respondents	Age	Marital Status	Occupation prior to retirement
1	64	Married	Teacher
2	68	Married	Lecturer
3	70	Widower	Police officer
4	64	Married	Bank Manager
5	69	Widower	Handicraft Officer
6	72	Married	Civil Servant
7	70	Married	Teacher
8	64	Widower	Professor
9	65	Married	Engineer
10	63	Married	Inspector (Electric)
11	67	Married	Teacher
12	64	Married	Driver

Source : Field study

Results and discussion

After analysing the data and after careful consideration of the underlying objectives of the study, five major themes were generated, viz. maladjustment, social isolation, illness, anxiety and religiosity. These themes provided the structural basis for reporting the findings and constructing the discussion around the broader socio-psychological implications of retirement among men in Kashmir.

A. Maladjustment

Adjustment after retirement is one of the first steps towards active aging (Nimrod, 2007). From reshaping routines (Barnett *et al.,* 2012) to managing leisure time, retirees embark on a journey of adaptation and accommodation, seeking to optimise their well-being and embrace the opportunities that retirement offers. Maladjustment after retirement encompasses a multifaceted process, often involving significant lifestyle changes that accompany leaving the workforce. It is influenced by the availability of resources, such as wealth, income, and social support systems (Fadila*et al.,* 2016). It encompasses emotional, psychological, and social struggles (Mukku *et al.,* 2018) that retirees may experience as they transition from a structured work routine to a more unstructured lifestyle. Retirees may experience considerable variations in adjusting to retirement and may also experience anxiety and depression (Osborne, 2012). Such processes may emerge due to the profound sense of isolation that often accompanies retirement. Retired individuals often find themselves disconnected from the work culture, the structure and direction that once governed their lives, thereby making them feel aimless and lost (Yemiscigil *et al.,* 2021). The perceived sense of isolation and loneliness leads to maladjustment, and hence demands lifestyle changes to cope with retirement issues effectively. However, this transition is not smooth for everyone. While some retirees find the transition relatively smooth and straightforward (La Rue *et al.,* 2022), a considerable number experience problems. While remaining

focused and following structured routines at the workplace, retirees experience significant pressure in adjusting to the changing social milieu. They experience disconnection from the social networks they were part of during their working careers (Hagani *et al.,* 2006). This shift can lead to the experience of isolation and loneliness, as they struggle to develop new sources of connection and fulfilment outside of their former professional environment. Against this backdrop, Ghulam Mohammad narrated, *'I feel frustrated and bored at home now, as if everything has gone.' Since my colleagues are no longer with me, I experience a sense of loss and a kind of loneliness. The absence of purpose and direction that my work once provided has left me feeling uncertain about everything. The peaceful environment of home that I once craved now weighs heavily upon me. Every activity requires adjustment, and every interaction holds growth potential, as the ease of adjustment increases over time.*

Ali Mohammad shares a similar experience."*When I retired, I was excited about the prospects of being free from the busy and routine work schedule. Throughout my service record, I had worked hard for days on end, with the thought in mind that after retirement, I would be able to relax and enjoy. However, as time passed, I found that I hadan adjustment problem with my new lifestyle. It is challenging to spend time doing nothing. It seems to me that I am stuck in a place that does not belong to me, and it is not easy to accept the reality that I am in a new phase of life. I have to try and find ways to adjust and keep moving".*

Maladjustment after retirement restricts the ability and possibility of retirees to be creative and competent enough to contribute to society. (Fadila *et al.,* 2016). Any disruption concerning adjustment issues within families can lead to mounting pressure on relationships. If left unaddressed, these pressures can escalate, potentially leading to the fragmentation of the family unit.

B. Social Isolation

After a person retires, an overwhelming sense of isolation often seems to envelop their personality. Since the work culture

and the associates no longer accompany the retiree (Yemiscigil *et al.,* 2021), a sense of loneliness pervades every aspect of their lives. (Garg, 2019). Retirees find themselves disconnected from the social networks thatthey once relied on for support and companionship (Kauppi *et al.,* 2021). The work culturethat helped them maintain a sense of purpose and overcome the feeling of isolation is no longer accessible after retirement. The development of a collective and cooperative spirit often comes to an end after retirement due to a lack of intimate social connections with colleagues (Kauppi *et al*., 2021; Guthmuller *et al.,* 2023). Apart from this, the lack of work-related activities further exacerbates the feeling of social isolation among retirees. The disconnection caused by isolation can be problematic for the elderly, particularly for widows, who, on account of the lack of a spouse, experience a double burden of social isolation and the loss of a spouse. (Garg, 2019). Against this backdrop, Mohammad Ayoob narrated, "*Retirement did not turn out to be what I had expected.I am experiencing a feeling of disconnection, as if I ambeing cut off from the world. It seems to me that I am all alone in this world.I feel restless all the time with no one to talk to, as all my family members are busy with their ownlives.*

Another older Retiree, Ghulam Hassan, narrated, 'After I retired, I expected much free time to spend with my family and friends, but I never realised *that many of my friends are still working and my kids have their own lives. My routine work at the office had provided me with a sense of structure that I never appreciated until it was gone. I found myself all alone at home, with the feeling of isolation increasing day by day.*

Social isolation can further perpetuate fear among retirees, fear of ageing and mortality. Retirees may feel increasingly vulnerable and uncertain about what lies ahead; such feelings lead to cognitive strategies to overcome the anxiety of death and dying.

C. Illness/Health issues

Retirement is a significant life transition, often accompanied by various issues that require individuals to make thoughtful adjustments (Wetzel & Huxhold, 2016). It often involves a loss of social position, loneliness,and decreased access to resources and support (Bedaso *et al.,*2021). It is argued that retirement itself is not the issue; rather, it is the underlying factors associated with retirement that pose challenges, including declining health (Lee *et al.,* 2010) and inadequate income, which eventually leads to mental health issues (Guo*et al.,* 2016). Studies conducted across the valley have found that retirement can have a detrimental effect on the mental health and well-being of older men in Kashmir (Hussain *et al.,* 2020).Since retirement is a significant life event (Socci *et al.,* 2021), resulting in social and psychological transformations, it has a profound impact on people's subjective well-being and quality of life (Abramowska-Kmon*et al.,* 2021; Odone *et al.,* 2021). The health status of a person before and after retirement varies depending on several factors, including lifestyle choices and individual circumstances. Typically, a person experiences better health before retirement, which may be due to the performance of daily responsibilities and other work-related tasks, or it may be due to a busy work schedule that requires them to remain active. However, after retirement, a person experiences less physical activity and more free time. This sedentary behaviour, which most retirees undergo, leads to various health problems such as weight gain, cardiovascular issues and other health issues (WHO, 2002). Apart from this, the sudden shift in lifestyle and routine can lead to a feeling of disconnectedness and loss, impacting the mental health of a person. Against this backdrop, Wali Mohammad narrated, '*I was posted in the electric department as sub-inspector. Last year, I retired, and since then, I have been mostly inactive, spending most of my time sitting at home and engaging in less physical exertion. Nowadays,I am experiencing multiple health ailments like high blood pressure and increased levels of cholesterol, which require regular check-ups and*

medication. Moreover, I am also suffering from arthralgia and arthritis; these issues have made my life sedentary, as it is prettytricky for me to move around and engage in daily household tasks.

Similarly, Rashid Mir narrated, '*Before my retirement, I was an active person, passionate about working hard and fulfilling my duties. I was always on my feet, ready to do anything. I was known for my efficiency and precision at work. However, all of that changed after my retirement. Now, I no longer have the same daily routine. I mostly stay at home, sitting more and moving less. I have started to experience pain in my joints, and it is now quite difficult for me to climb stairs or do things that require physical exertion. My body has lost much of its strength, and sometimes I struggle to do even the simplest tasks.*

Retirement can have a profound impact on a person's life(Portnoi, 1981). It alters a person's financial status and also results in the loss of significant social connections (Odone *et al.,* 2021), as well as changes in the purpose and structure of daily life.

D. Anxiety

Since retirement is often predicted as a time of relaxation, leisure, and liberation from an active working life (De Paula Couto *et al.,* 2022), it is also accompanied by complex issues. The transition to retirement often leads to apprehension and uncertainty about various aspects of the post-retirement phase. Concerns about financial stability (*fearabout the drastic reduction of income*), (Guo *et al.,* 2016) loss of identity (*loss of work culture network and authority*), health issues (*experience of various ailments*) (Lee *et al.,* 2010; Behncke, 2009), and loneliness (Bekhet *et al.,* 2012) weighs heavily on them, leading to higher depression and the development of anxiety about the future course of action among the retirees. Additionally, retirees, after achieving almost everything in their lives, and when nothing seems left, they experience the ultimate reality that all people eventually have to confrontthe reality of death. Such consciousness of approaching death and the religious belief of undergoing an accounting of all their deeds provides further

impetus to the development of anxiety among them. Against this backdrop, Rashid narrated, "*I feel cut off from society, from the way I used to spend my life. What I lack is not just companionship, but everything from income to my identity; everything seems to collapse, and with it, my optimistic nature is also gone. I have become obsessed with various issues likemy monthly income,which is now drastically reduced, the authority that I commanded, and the physical downfall. Such phenomena have made me anxious and apprehensive; a kind of anxiety has engulfed my existence, and I am scared about my future, about various other things that I do not want to discuss.*

Nazir shares a similar experience*: uncertainty has engulfed my entire existence, and I find no peace or comfort anywhere. I have become obsessed with trying to predict the unpredictable and to control the uncontrollable. Retirement,which I had thought of as a time of relaxation, turned out to be a cycle of fear and anxiety.*

E. Religiosity

Retirement marks a significant transition in a person's life, often accompanied by challenges such as social isolation (Garg, 2019), illness (Hussain *et al*., 2020), maladjustment (Osborne, 2012), and the associated anxiety stemming from the combination of these issues. In response to such issues, an increase in religiosity is observed among retirees. In their attempt to become social and cope with the anxiety that retirement manifests, religiosity is seen to offer refuge from the overwhelming experience of anxiety and other hard-to-adjust issues of retirement (Ellison *et al.,* 2011). In Kashmir, retireesare often seen taking lead positions in (masjids), gatherings of a religious nature (Condolence, death ceremonies) and other issues, to maintain the sense of organic living which they believe has been lost post-retirement. Additionally, their involvement in local religious affairs of the society is not only about finding solace, but about maintaining and demonstrating their work culture authority. They view involvement in religious affairs asa way of alleviating the anxiety associated with ageing issues, existential crises (Balboni *et al.,* 2007), and the ultimate

process of giving an account of one's deeds. Such situations make them more involved and engaged in religious activities.

Against this backdrop, Bashir narrated, '*Not only the fear of existential threat but fear of dying makes me more engaged in religious activities. After my retirement, I experienced a profound shift in perspective. I began to participate in every death ceremony that takes place in our village. By staying present for others in times of loss and grief, I try to build a strong network of support so that when my time of death comes, I feel the same care and love from people.*

A similar situation is narrated by Rasool, "*After retirement, a person most of the time feels lonely and perceives nothing more important than practising religion, as it is the only thing that makes them feel connected and helps them alleviate the uncertainties of life. As the realisation of retirement issues intensifies, retirees may struggle with feelings of helplessness and vulnerability, particularly if they perceive themselves as incapable of influencing the circumstances surrounding their eventual death. Such things make them more engaged in religious affairs.*

When the challenges of retirement manifest in the form of anxiety developed through isolation, maladjustment and other issues and begin to interfere with the normal operations of life, individuals feel an intense urgency to engage in religious activities to find solace, and confront the realities of retirement. They become more involved in religious practices as part of their effort to integrate socially and alleviate the anxiety associated with retirement issues.

Discussion

This study intended to investigate the lived experiences of retired men in Kashmir. The study emphasises the challenges that retired men in Kashmir undergo and the concurrent development of anxiety among them, eventually leading to their increased religious involvement. Regarding the study's outcomes, significant issues were observed among retirees, including maladjustment, isolation, declines in health conditions, and insecurity due to

reduced income. Retirees in Kashmir were observed to experience significant difficulties in adjusting to the social environment. Usually, they experience stress and anxiety at home. They feel cut off from the social networks that they were part of during their working career. This shift can lead to feelings of isolation and loneliness at home, which can have a significant impact on their physical and mental well-being. These results are consistent with the findings of (Hagani *et al.,* 2006; Osborne, 2012; Fadila *et al.,* 2016; Hansson *et al.,* 2017) who highlighted significant adjustment problems, isolation and disruption of social network post-retirement, leading to stress and depression. Such challenges were seen to disrupt their 'art of living', therefore impacting their overall health and well-being. Additionally, the present study highlighted that retirees experience increased religiosity after retirement (60 years and above). This is due to the anxiety of an existential threat of approaching death, as well as the need to maintain social connectedness and a sense of belonging, and to overcome the issues that retirement manifests. Such findings were also highlighted by studies conducted by Koenig (2012) and Balboni *et al.* (2007), who noted that religious involvement provides social support and a sense of belonging to older adults, helping them overcome feelings of loneliness and isolation. However, these findings are in contrast to a study conducted by Glamser (2008), who highlights a decrease in religiosity after retirement, particularly in religious attendance, due to health problems. This difference in religiosity can be attributed to cultural factors among countries or differences in the practice of religious beliefs. While a pattern of increased religious engagement was observed in the narratives, attributing this solely to fear psychosis or existential anxiety may oversimplify the phenomenon. It is equally plausible that the increase in religiosity is influenced by greater availability of time, prevailing cultural expectations, or individual spiritual inclinations. The idea that religiosity functions primarily as a coping mechanism for psychological distress, though evident in some accounts, should

not be generalised without broader empirical evidence.Therefore, the association between religious involvement and coping should be understood as a potential trend rather than a causally established relationship. Future studies with more diverse and representative samples, as well as comparative or longitudinal designs, would be essential to explore this linkage more robustly and to distinguish empirically grounded findings from context-specific rhetoric.

Conclusion

As daily routines shift and work responsibilities fade, a new phase of life begins quietly for retired men. Since retirement marks a significant life transition, it involves substantial changes in a person's roles and responsibilities, which in turn impact their overall life course. It is generally assumed that retirement has no significantimpact on the well-being of people. However, various studies indicate that individuals' experiences with retirement vary significantly. Some may experience more free time to spend with their loved ones, while others may face adversities and obstacles that impact their physical, mental, and emotional well-being. As a person retires, there is a strong possibility of alteration in the quality of life, and hence, a person is more likely to experience stress and depression. Although retirement is often perceived as a period of great relaxation, the realities faced by retirees in Kashmir are daunting. Adjustingto life after retirement can pose varied challenges for retired men in Kashmir, particularly for widowers. Retirees often experience an existential crisis, characterised by feelings of social isolation, financial instability, declining health status, and difficulty adjusting to a new lifestyle. By focusing on the narratives of retired men in Kashmir, we gain a manifest understanding of their lives after retirement. The experiences shared by Kashmiri retirees paint a grim picture of reality, highlighting the profound impact on their health and well-being after retirement. However, many retirees in Kashmir have made use of their faith to mitigate the challenges that retirement

brings forth, especially the issue of adjustment, social isolation, illness and their associated anxiety. Understanding these challenges and the need for effective interventions can help enhance their overall well-being, providing a more sophisticated and fulfilling post-retirement phase that offers hope for a positive transition.

References

Acharya, M. (2021). What is the retirement age in India? Cleartax. https://cleartax.in/s/retirement-age-in-india.

Ashforth, B. (2001). Role transitions in organisational life: An identity-based perspective. Mahwah: Lawrence Erlbaum. https: //doi: 10.2307/3560250.

AP issues ordinance raising retirement age of government employees from 60 to 62. (2022, January 31). The Economic Times (2022). https://economictimes. indiatimes. com

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology,* 3(2), 77–101.

Behncke, S. (2009). *How does retirement affect health*? IZA – Institute of Labour Economics

Balboni, T. A., Vanderwerker, L. C., Block, S. D., Paulk, M. E., Lathan, C. S., Peteet, J. R., &Prigerson, H. G. (2007). Religiousness and Spiritual Support Among Advanced Cancer Patients: Associations with End-of-Life Treatment Preferences and Quality of Life. *Journal of Clinical Oncology*, *25*(5), 555–560.

Bedaso, T. S., & Han, B. (2021). Work after retirement impacts the mental health and behaviours of the elderly in Addis Ababa. *Health Psychology Open*, 8(1), 2055102921996189. https://doi:10.1177/2055102921996189.

Barnett I, GuellC, Ogilvie D (2012). The experience of physical activity and the transition to retirement: a systematic review and integrative synthesis of qualitative and quantitative evidence. *Int J BehavNutr Phys Act* 9(1):97

Bosse R, AldwinCM, Levenson MR and Workman-Daniels K (1991). How stressful is retirement? Findings from the normative ageing study. *Journal of Gerontology* 46, P9–14.

Dar, S.A., Iliyas, I., Dilawar, T., & Rahman, T. (2018). A Descriptive Study on Perceived Levels of Stress, Coping and Their Correlation in Retirees of Kashmir Valley. *Journal of Psychiatry*, 21(3). https://doi.org/10.4172/2378-5756.1000443

Durkheim, E., (1912). *The Elementary Forms of the Religious Life,* London: George Allen & Unwin Ltd.

De Paula Couto, M.C.P., Ekerdt, D.J., Fung, H.N. Hess, T.M. & Rothermund, K. (2022). What will you do with all that time? Change in leisure activities after retirement are determined by age-related self views and preparation, *Acta Psychologica,* 231, 103795.

Earl, J.K., Bednall, T.C., & Muratore, A.M. (2015). A matter of time: Why some people plan for retirement and others do not. Work, *Aging and Retirement*, 1(2), 181–189. http://doi:10.1093/workar/wau005.

Ellison, C. G., & Levin, J. S. (1998). The religion-health connection: Evidence, theory, and future directions. *Health education & behavior*, 25(6), 700–720. http://doi: 10.1177/109019819802500603.

Ellison, C. G., &Henderson, A. K. (2011). 1. Religion and Mental Health: Through the Lens of The Stress Process. In *Toward a sociological theory of religion and health* (pp. 11–44). Brill.

Fadila, D. E. S., &Alam, R. R. (2016). Factors affecting adjustment to retirement among retirees' elderly persons. *Journal of Nursing Education and Practice,* 6(8). https://doi.org/10.5430/jnep.v6n8p112.

Garg, A. (2019, July 17). Tackling loneliness in retirement. *The Times of India*. https://timesofindia.indiatimes.com/blogs/the-brand-called you/tackling-loneliness-in-retirement/

Guthmuller, S., Heger, D., Hollenbach, J., & Werbeck, A. (2023). *Retirement and loneliness* (No. 1048). Ruhr Economic Papers.

Glamser, F. D. (1988). The impact of retirement upon religiosity. *Journal of Religion & Aging,* 4(1), 27-37.

Guo, Y. Q., Zhang, C. C., Huang, H., Zheng, X., Pan, X. J., & Zheng, J. Z. (2016). Mental health and related influencing factors among the empty-nest elderly and the non-empty-nest elderly in Taiyuan, China: a cross-sectional study. *Public Health*, *141*, 210–217.

Hussain, S. S., Jan, M., &Vaida, N. (2020). Psychological Well-BeingOf Retired Persons And Its Relation To Socio-Demographic Variables. *Journal of Interdisciplinary Cycle Research*, *XII*(X).

Hansson, I., Buratti, S., Thorvaldsson, V., Johansson, B., & Berg, A. T. (2017). Changes in Life Satisfaction in the Retirement Transition: Interaction Effects of Transition Type and Individual Resources. Work, Aging and Retirement, 4(4), 352–366. https://doi.org/10.1093/workar/wax025.

Henning, G., Lindwall, M., & Johansson, B. (2016). Continuity in well-being in the transition to retirement. GeroPsych. https://doi:10.1024/1662-9647/a000155

Hagani, N., Clare, P. J., Luo, M., Merom, D., Smith, B. J., & Ding, D. (2024). Effect of retirement on loneliness: a longitudinal comparative analysis across Australia, China and the USA. *J Epidemiol Community Health*.

Heybroek, L., Haynes, M., & Baxter, J. (2015). Life Satisfaction and Retirement in Australia: A Longitudinal Approach. Work, *Aging and Retirement,* 1(2), 166–180. https://doi.org/10.1093/workar/wav006.

Jose, J., &Sekher, T. V. (2021). Retirement age for government employees in Kerala: time for reconsideration? *Demography India,* 50(1), 99-110

Kauppi, M., Virtanen, M., Pentti, J., Aalto, V., Kivimäki, M., Vahtera, J., & Stenholm, S. (2021). Social network ties before and after retirement: a cohort study. *European journal of ageing,* 18(4), 503–512. https://doi.org/10.1007/s10433-021-00604-y

Koenig, H. G. (2012). Religion, spirituality, and health: The research and clinical implications. *International Scholarly Research Notices*, *2012*(1), 278730.https://doi:oi: 10.5402/2012/278730.

Kubicek, B., Korunka, C., Raymo, J. M., &Hoonakker, P. (2011). Psychological well-being in retirement: The effects of personal and gendered contextual resources. *Journal of occupational health psychology*, 16(2), 230. https://doi:10.1037/a0022334

Lee J, & Smith JP. (2010). Work, retirement, and depression. *Population Ageing* 2: 57–71.

La Rue, C. J., Haslam, C., & Steffens, N. K. (2022). A meta-analysis of retirement adjustment predictors. *Journal of Vocational Behavior*, 136, 103723.https://doi.org/10.1016/j.jvb.2022.103723

Manning, L. K. (2013). Navigating hardships in old age: Exploring the relationship between spirituality and resilience in later life. *Qualitative health research*, 23(4), 568–575. http://doi:

McIntosh, D. N., Poulin, M. J., Silver, R. C., & Holman, E. A. (2011). The distinct roles of spirituality and religiosity in physical and mental health after collective trauma: a national longitudinal study of responses to the 9/11 attacks. *Journal of Behavioural Medicine*, 34, 497–507. Doi. https://doi.org/10.1007/s10865-011-9331-y

Mukku, S.S.R., Harbishettar, V., &Sivakumar, P.T. (2018). Psychological morbidity after job retirement: A review. *Asian journal of psychiatry*, 37,58-63. http://doi.org/10.1016/j.ajp.2018.08.003

Orenstein, G. A., & Lewis, L. (2022). Erikson's stages of psychosocial development. In StatPearls [Internet]. StatPearls Publishing.

Nimrod, G. (2007). Expanding, reducing, concentrating and diffusing: Post retirement leisure behavior and life satisfaction. *Leisure Sciences*, *29*(1), 91–111.https://doi.org/10.1080/01490400600983446.

Osborne, J. W. (2012). Psychological effects of the transition to retirement. *Canadian Journal of Counselling and Psychotherapy*, *46*(1), 45–58.

Odone, A., Gianfredi, V., Pietro Vigezzi, G., Amerio, A., Ardito, C., D'Errico, A., Stuckler, D., & Costa, G. (2021). Does retirement trigger depressive symptoms? A systematic review and meta-analysis. *Epidemiology and Psychiatric Sciences,* 30. https://doi.org/10.1017/s2045796021000627

Pappathi, K. (2006). *Aging: Scientific perspectives and social issues*. A.P.H. Publishing Corporation, Ansari Road, Darya Ganj, New Delhi, 110–002.

Portnoi, V. A. (1981). The natural history of retirement: Mainly good news. *JAMA*, *245*(17), 1752-1754.

WHO (2002).Physical inactivity a leading cause of disease and disability, warns WHO https://www.who.int/news/item/04-04-2002-physical-inactivity-a-leading-cause-of-disease-and-disability-warns-who

Socci, M., Santini, S., Dury, S., Perek-Bia³as, J., D'Amen, B., &Principi, A. (2021). Physical activity during the retirement transition of men and women: A qualitative longitudinal study. *BioMed Research International*, *2021*(1), 2720885. https://doi.org/10.1155/2021/2720885

Segel-Karpas, D., Ayalon, L., & Lachman, M. E. (2018). Loneliness and depressive symptoms: the moderating role of the transition into retirement. *Aging & mental health*, *22*(1), 135–140. https://doi:10.1080/13607863.2016.1226770

Shiba, K., Kondo, N., Kondo, K., & Kawachi, I. (2017). Retirement and mental health: Does social participation mitigate the

association? A fixed-effects longitudinal analysis. *BMC Public Health*, 17, 1-10. https://doi.org/10.1186/s12889-017-4427-0

The Elementary Forms of Religious Life (Oxford World's Classics): Translated by Carol Cosman. ISBN 0-19-954012-8.

Wang, M. (2007). Profiling retirees in the retirement transition and adjustment process: examining the longitudinal change patterns of retirees' psychological well-being. *Journal of Applied Psychology*, 92(2), 455. https://doi:10.1037/0021-9010.92.2.455

Wang, W. C.,Wu, C. Y., & Wu, C. C. (2014). Free time management makes for a better retirement: A case study of retirees' quality of life in Taiwan. *Applied Research in Quality of Life,* 9, 591–604. http://doi:10.1007/s11482-013-9256-4

Wetzel M, HuxholdO. (2016). Are leisure activity and health interconnected after retirement: educational differences? *Advances in Life Course Research* 30: 43–52.

Yemiscigil, A., Powdthavee, N., & Whillans, A. V. (2021). The Effects of Retirement on Sense of Purpose in Life: Crisis or Opportunity? *Psychological science*, *32*(11), 1856–1864. https://doi.org/10.1177/09567976211024248

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Retirement Financial Behaviour among Tribal Communities in Bodoland: Age and Psychological Determinants

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ABSTRACT

This cross-sectional study examines age-related differences in retirement goal clarity, attitude toward retirement, and retirement financial behaviour among 641 working individuals (431 males and 210 females) of three age groups: Young Adults (18–39 years), Middle-Aged Adults (40–49 years), and Older Adults (50 years and above), residing in Bodoland Territorial Region (BTR), a socio-economically disadvantaged area in Northeast India. Validated scales were used to assess Retirement Goal Clarity (RGC), Attitude Toward Retirement (ATR), and Retirement Financial Behaviour (RFB). The data were analysed using one-way ANOVA, along with Pearson correlation and multiple linear regression to explore relationships and predictive patterns. Findings revealed significant age-related differences in retirement preparedness among tribal populations in Bodoland, with younger adults exhibiting notably lower levels of clarity in retirement goals, less favourableattitudes toward retirement, and reduced engagement in financial planning activities, compared to their older counterparts. Correlation analysis further revealed that RGC and ATR were both positively associated with RFB, with

RGC showing a notably stronger relationship. Regression analysis also confirmed that both psychological variables significantly predicted RFB, with RGC emerging as the more influential predictor. These findings suggest that psychological and behavioural readiness for retirement develops progressively with age, likely influenced by increasing financial responsibilities and proximity to retirement. However, the consistently lower engagement among younger adults signals a missed opportunity for early intervention. From a policy perspective, these findings underscore the urgent need to introduceculturally sensitive, retirement-focused financial literacy programmes tailored to the unique socio-economic context of tribal regions. These programs should take into account the cultural nuances and specific needs of tribal communities, as they could significantly enhance long-term retirement outcomes. Adopting a life-course approach, beginning with awareness and planning in early adulthood, could foster more proactive financial behaviour, inspiring potential changes in policy and practice.

Keywords : Retirement Goal Clarity, Attitude Toward Retirement, Retirement Financial Behaviour, Age Differences, Bodoland Territorial Region

Retirement represents a significant turning point in an individual's life, signalling the end of regular employment and the beginning of financial reliance on personal savings, pensions, or other forms of income. In recent years, this transition has become increasingly important in the Indian context due to rising life expectancy, changing family structures, and a shift in retirement systems from employer-backed defined benefit plans to individual-centred defined contribution schemes. This change places greater responsibility on individuals to actively plan for their financial security after retirement. However, recent findings suggest that many Indians are not fully prepared, as nearly two out of five Indians have yet to begin planning for retirement (Max Life Insurance India Retirement Index Study 3.0, 2023).

Existing studies have emphasised demographic factors such as age, income, education, and gender as key drivers of retirement planning behaviour (Joo & Pauwels, 2002; Hershey, 2004; Moorthy *et al.,* 2012). However, more recent work highlights the importance of psychological factors such as retirement goal clarity and attitude towards retirement. These psychological factors, which often play a more immediate role in shaping financial behaviour, refer to an individual's understanding of their retirement goals and their emotional disposition towards retirement. For instance, individuals who have clear, well-defined retirement goals are more likely to engage in planning and saving (Stawski *et al*., 2007; Hershey *et al*., 2010). Similarly, positive attitudes toward retirement are associated with proactive financial decisions, although these attitudes alone may not always lead to action (Ajzen, 1991; Rachlin, 1995).

While much of the research on retirement planning in India has focused on urban populations, there is a noticeable lack of attention to the experiences of marginalised groups such as the Scheduled Tribes. These communities often face unique challenges, including economic backwardness, geographic isolation, limited access to financial services, and low literacy rates. Studies by Dutta and Sarkar (2019) and Singh and Singh (2023) highlight the low literacy levels among tribal communities, while Nayak (2013) and Sadhu (2022) report limited saving and investment behaviours despite efforts toward financial inclusion.Tribal communities in Assam's Bodoland Territorial Region (BTR) are especially vulnerable, yet they are often overlooked in bothacademic research and policy discussions concerning financial preparedness for old age.

Addressing this research gap, the present study investigates whether there are significant differences in retirement goal clarity, attitudes toward retirement, and retirement financial behaviour among different age groups. Additionally, it seeks to investigate the relationship between psychological factors and retirement

financial behaviour and to assess how effectively retirement goal clarity and attitude toward retirement predict retirement financial behaviour. In doing so, the study not only advances gerontological scholarship but also has the potential to influence policy and practice significally. By addressing retirement preparedness at the grassroots level, particularly among underserved populations, this work contributes to strengthening economic security and social well-being in old age. Additionally, it aims to offer insights into how psychological constructs influence retirement financial behaviour in socioeconomically disadvantaged settings, with implications for policy and community-level interventions.

Objectives of the study:

1. To examine whether there are significant differences in retirement goal clarity, attitudes toward retirement, and retirement financial behaviour among different age groups, including young adults, middle-aged individuals, and older adults.
2. To examine the relationship between psychological factors and retirement financial behaviour.
3. To assess how effectively retirement goal clarity and attitude toward retirement predict retirement financial behaviour.

Methodology

Research Design and Data Collection

This research employs a quantitative research methodology, utilising primary data collected through structured surveys. Data was collected using a combination of personal interviews and mailed questionnaires to ensure broader reach and participation. The target population comprises working individuals aged 18 and above residing in the Bodoland Territorial Region, Assam.

Sampling Procedure

A purposive sampling strategy was employed, with a particular focus on Kokrajhar District, selected due to its status as the administrative headquarters of the BTR. Given its central role,

Kokrajhar attracts individuals from across all four districts of the region, making it a suitable and representative site for data collection.

Age Group Classification

A total of 641 working individuals (431 males and 210 females) participated in the study. Standardised scales were used to measure the key constructs: Retirement Goal Clarity (5 items), Attitude Towards Retirement (4 items), and Retirement Financial Behaviour (8 items). For analysis, respondents were categorised into three age groups: Young Adults (18–39 years), Middle-Aged (40–49 years), and Older Adults (50 years and above). This categorisation was done based on life-stage distinctions used in retirement research (Hershey & Mowen, 2000; Noone *et al.*, 2010). Young adulthood (18-39 years) typically represents the early working years, characterised by career exploration, limited financial resources, and a lower prioritisation of long-term financial goals, such as retirement planning. Middle-aged (40-49 years) is associated with greater income stability, more financial obligations, and a stronger focus on future financial planning. Older adults (50 years and above) generally reflect the pre-retirement phase, wherein individuals begin active planning for retirement, considering its proximity. Such classification is also consistent with the life-course approach to retirement planning, which recognises the evolving nature of retirement preparedness across age groups (Topa *et al.*, 2009). This framework is beneficial in identifying age-specific intervention needs in underserved populations.

Statistical Analysis

Data was analysed using one-way ANOVA to identify differences across age groups, with Welch's correction applied where assumptions of homogeneity of variance were violated. Pearson correlation analysis was conducted to explore associations among the variables, and multiple linear regression was used to assess the predictive power of psychological predictors, attitude towards retirement and retirement goal clarity on retirement financial behaviour.

Measures

The retirement financial behaviour construct was developed by adapting items from two established scales: the Retirement Planning Behaviour (RPB) scale by Moorthy *et al.* (2012) and the Retirement Savings Behaviour (RSB) scale by Jacobs-Lawson and Hershey (2005). An EFA was conducted to refine and validate the measurement items.All items weremeasuredwith a five-point scale (1=strongly disagree to agree 5= strongly agree). As a result of EFA, an 8-item scale was established to provide a robust measure of behaviour related to retirement planning and saving.This unified factor is referred to as "retirement financial behaviour (RFB)". This construct aims to comprehensively assess proactive retirement financial behaviour, including planning and saving, to capture an individual's preparedness for retirement.Retirement goal clarity construct was measured using a five-item scale developed by Tomar *et al.* (2021), with responsesrecordedon a 7-point Likert scale. Moreover, attitude towards retirement was assessed using a scale adapted from (ibid), with responses recorded on a 7-point Likert scale. All scales demonstrated acceptable internal consistency, with Cronbach's alpha values exceeding the threshold of 0.70. Specifically, the reliability coefficients were 0.882 for RFB, 0.874 for RGC and 0.724 for ATR. Descriptive statistics for all the scale items are presented in Table 1.

Table 1

Descriptive Statistics of Items

Item	Statements	Mean	Median	Standard deviation
RGC1	I set specific goals regarding how much I will need to save for my retirement.	4.496	5.000	1.879
RGC2	I think a great deal about the quality of life I want to lead after retirement.	4.491	5.000	1.902
RGC3	I have a clear vision of how my life shall be after retirement.	4.401	5.000	1.934
RGC4	I have set clear goals for gaining information about retirement.	4.248	4.000	1.938

RGC5	I have discussed retirement plans with my spouse, friends, and significant others.	4.070	4.000	1.879
ATR1	Retirement will enable me to pursue my unfulfilled dreams.	4.246	4.000	1.706
ATR2	I look forward to retirement.	3.963	4.000	1.926
ATR3	I am worried about my life after retirement.	3.789	4.000	1.954
ATR4	I expect that being retired will make me feel useless.	2.803	2.000	1.659
RFB1	I am concerned about my financial preparedness for retirement.	3.148	4.000	1.272
RFB2	I am confident that I will have a decent standard of living in my retirement.	3.304	3.000	1.177
RFB3	At present, I rate my financial preparation for retirement as good.	3.147	3.000	1.182
RFB4	Made meaningful contributions to a voluntary retirement savings plan.	3.011	3.000	1.213
RFB5	Compared to my peers, I have saved a substantial amount for retirement.	2.888	3.000	1.132
RFB6	Accumulated substantial savings for retirement.	3.009	3.000	1.170
RFB7	Made a conscious effort to save for retirement.	3.429	4.000	1.156
RFB8	Based on how I plan to live my life in retirement, I have saved accordingly.	3.161	3.000	1.187

Note : *RGC= Retirement Goal Clarity, ATR =Attitude Towards Retirement, RFB= Retirement Financial Behaviour*

Results and Discussion

Normality

Although initial test using Shapiro-Wilk and Levene's tests showed that the assumptions of normality and equal variances were not fully met for the variables: retirement goal clarity (RGC), attitude towards retirement (ATR), and retirement financial behaviour (RFB), the decision to proceed with One-Way ANOVA is methodologically sound according to Central Limit Theorem and use of Welch's ANOVA. According to the Central Limit Theorem, as sample size increases (typically $n > 30$), the sampling

distribution of the mean approaches normality regardless of the original population distribution (Lumley *et al.*, 2002; Field, 2013). Given that the sample sizes in each group were sufficiently large, ANOVA remains robust against violations of normality. However, since the assumption of equal variances was significantly violated, Welch's ANOVA was used instead of the traditional ANOVA. Welch's test is a more robust method that adjusts for unequal variances and varying group sizes, making it a suitable and reliable choice in such cases (Welch, 1951; Ruxton, 2006).

Age Group Differences in RGC, ATR, and RFB

To examine whether retirement goal clarity (RGC), attitude toward retirement (ATR), and retirement financial behaviour (RFB) differ across age groups : Young Adults (18–39 years), Middle-Aged (40–49 years), and Older Adults (50 years and above), one-way ANOVA was conducted for each variableamong the sample of 641 respondents. Using one-way ANOVA guided by Kim (2017), the analysis compares the mean scores for all three groups across each agegroup, allowing us to assess significant differences based on age groups. We employed Levene's test in validating ANOVA by assessing the homogeneity of variance assumption, which ensures that the variances across groups are approximately equal. However, Levene's test indicated that the assumption of homogeneity of variances was violated ($p < .05$), so Welch's robust test was also conducted, which confirmed a significant effect.

Table 2

ANOVA Results by Age Group

Variable	Young Adults (M)	Middle-Aged (M)	Older Adults (M)	F-value	d f (between)	d f (within)	p-value
RGC	4.068	4.821	4.934	20.521	2	638	0.00**
ATR	4.302	4.535	4.838	14.819	2	638	0.00**
RFB	2.951	3.488	3.591	35.352	2	638	0.00**

Note: *Young Adults (n = 423), Middle-Aged Adults (n = 121), Older Adults (n = 97). "All p-values are significant at p < .01 (**). RGC Retirement Goal Clarity, ATR =Attitude Towards Retirement, RFB Retirement Financial Behaviour "*

The ANOVA. Results are presented in Table 2. A one-way ANOVA revealed a statistically significant difference in retirement goal clarity among the age groups, $F(2,638) = 20.52$, $p<0.001$, attitude towards retirement across age groups, $F(2, 638) = 14.82$, $p<0.001$ and similarly retirement financial behaviour significantly differed among the groups, $F(2, 638) = 35.35$, $p<0.001$. .Since ANOVA was significant for all variables, Post hoc comparisons using Tukey's HSD Test were conducted to examine which groups differ.

For retirement goal clarity, Older Adults (M = 4.93) reported significantly higher goal clarity than both Middle-AgedAdults (M = 4.82) andYoung Adults (M = 4.06), as indicated in Table 2. Middle-aged adults also reported significantly higher RGCs than younger adults. This trend suggests that as individuals age, they tend to focus more on retirement. This is likely due to proximity to retirement age and a growing awareness of retirement needs.

In terms of attitude toward retirement, older adults (M = 4.84) demonstrated significantly more positive attitudes toward retirement than both Middle-Aged Adults (M = 4.53) and Young Adults (M = 4.30), and Middle-Aged individuals also scored significantly higher than young adults. Here, the attitude towards retirement is seen to increase with age.

For retirement financial behaviour, Young Adults (M= 2.95) reported significantly lower engagement compared to both Middle-Aged Adults (M = 3.49) and older adults (M = 3.59). Middle-aged adults also reported significantly higher RFB than Young Adults.

Relationship between psychological variables and retirement financial behaviour

Table 3

Pearson Correlation matrix among RGC, ATR, and RFB

Variables	Pearson Correlation (r)	Sig. (2-tailed)
RFB & ATR	0.310**	0.00
RFB & RGC	0.726**	0.00
ATR & RGC	0.263**	0.00

Note : *All correlations are statistically significant at p < .01 (**)*
RFB = Retirement Financial Behaviour; ATR = Attitude Toward Retirement; RGC = Retirement Goal Clarity.

Pearson correlation analysis was conducted to investigate the relationships between psychological variables (retirement goal clarity and attitude towards retirement) and retirement financial behaviour, as shown in Table 3. RGC showed a strong, positive correlation with RFB ($r = 0.726$, $p<0.001$), and ATR had a moderate positive correlation ($r = 0.310$, $p<0.001$), suggesting that individuals with a clearer understanding of their retirement goals and more positive attitudes toward retirement tend to exhibit better financial behaviour. Additionally, ATR andRGC were positively but weakly correlated ($r = 0.263$, $p< .01$), indicating some alignment between attitudes and clarity of goals regarding retirement.

Predictive role of RGC and ATR on RFB

A standard multiple regression was conducted to determine the extent to which RGC and ATR predict RFB. The overall model was statistically significant, $F(2, 628) = 377.87$, $p < 0.001$, and explained 54.2% of the variance in retirement financial behaviour ($R^2 = 0.542$).

To ensure the validity of the multiple linear regression model predicting retirement financial behaviour, statistical assumptions were assessed. The distribution of standardised residuals, evaluated through a histogram and Q-Q plot, suggested approximate normality. The plot of standardised residuals against predicted values revealed no systematic pattern, supporting both the linearity and homoscedasticity assumptions. Additionally, multicollinearity was not a concern, as Variance Inflation Factors (VIFs) were below the threshold (VIF< 1.1). The Durbin-Watson value (1.795) indicated no autocorrelation among residuals. Overall, the diagnostic results affirmed that the model assumptions were satisfactorily met.

Table 4

Multiple Regression AnalysisPredicting Retirement Financial Behaviour

Predictor	B	Std. Error	Beta (β)	T	p-value
Constant	0.912	0.121	____	7.543	0.00**
RGC	0.392	0.016	0.692	24.942	0.00**
ATR	0.121	0.026	0.128	4.601	0.00**

Note : *All coefficients are statistically significant at p< .01 (**).*
RGC = Retirement Goal Clarity; ATR = Attitude Toward Retirement.

Table 4 demonstrates that both RGC and ATR are significant predictors of RFB, with goal clarity emerging as the stronger predictor ($\beta = 0.692$, $p < 0.001$), followed by attitude towards retirement ($\beta = 0.128$, $p < 0.001$). Hence, the results revealed that a one-unit increase in retirement goal clarity is associated with a 0.392-unit increase in retirement financial behaviour, controlling for attitude towards retirement. Additionally, a one-unit increase in attitude towards retirement predicted a 0.121-unit increase in retirement financial behaviour, controlling for retirement goal clarity. This suggests that goal clarity has a more substantial effect on retirement financial behaviour than attitude towards retirement does.

Conclusion and Recommendations

This study examined the impact of age and psychological factors, specifically retirement goal clarity and attitude towards retirement, on the retirement financial behaviour of working individuals in Bodoland, Assam, making a valuable contribution to the underexplored area of financial preparedness in socio-economically disadvantaged populations. The results clearly showed that age plays a significant role in shaping retirement preparedness. Younger adults, in particular, were found to have lower levels of clarity about retirement goals, a less positive attitude towards retirement, and were hence less likely to engage in retirement-related financial behaviours. These patterns suggest that as individuals grow older, their awareness and concern about

retirement increase, possibly due to approaching retirement age, life experiences or growing financial responsibilities.

A key finding of this study is the notable association between psychological readiness and financial behaviour. While both retirement goal clarity and attitude towards retirementwere found to influence how individuals plan and save for retirement, retirement goal clarity emergedasthe stronger predictor of the two. This highlights the crucial role of psychological readiness, particularly the ability to set clear and actionable retirement goals, in fostering responsible financial behaviour. Although a favourable attitude towards retirement supports financial engagement, it is the clarity of goals that seems to drive consistent planning and saving efforts.

From a policy and practice perspective, these findings underscore the urgent need to encourage and promote early and proactive retirement planning among younger adults, particularly in tribal areas where financial literacy is often limited. Introducing culturally appropriate financial education programs, designed to be age-sensitive and rooted in community realities, can help raise awareness and develop essential retirement planning skills. Incorporating goal-setting strategies into these programs could enhance their effectiveness by helping individuals visualise and commit to long-term financial goals. Moreover, such efforts should be part of a broader life-course framework that motivates people to start planning in early adulthood, rather than postponing such decisions until later stages of life.

As India advances toward the vision of *Viksit Bharat*, ensuring equitable development across all regions and communities becomes crucial, especially when it comes to retirement security for marginalised groups. This study supports the broader national objective by exploring the psychological aspects influencing retirement financial behaviour and advocating for community-focused, integrated approaches to strengthen retirement readiness. Targeted interventions, particularly those aimed at younger adults,

may help reduce long-term financial vulnerability by encouraging early engagement with retirement planning. Achieving financially secure ageing for tribal populations requires continuous commitment through focused policies and context-specific interventions that empower individuals throughout their working lives.

Limitations

The study is limited to the Bodoland Territorial Region, specifically Kokrajhar, which may affect the generalizability of the findings to other regions with different socio-economic and cultural contexts.The absence of longitudinal data prevents an analysis of how individuals' retirement financial behaviours evolve over time and in response to life events or economic shifts.Future research could address these limitations by incorporating longitudinal data, expanding the geographic scope and integrating qualitative methods to provide a more comprehensive understanding of retirement financial behaviour.

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References

Ajzen, I. (1991). The theory of planned behaviour. *Organisational Behaviour and HumanDecision Processes,50*, 179–211. https://doi.org/10.47985/dcidj.475

Dutta, D. & Sarkar, A. Kr. (2019). "Relevance of Implementation of Financial Inclusion Among Tribal Groups of Jharkhand: A Study on Paharia Tribe", *Think India Journal*, 22(14), pp.2135–2149.

Field, A. (2013). *Discovering statistics using IBM SPSS Statistics* (4th ed.). Sage Publications.

Hershey, D.A. & Mowen, J.C. (2000). Psychological determinants of financial preparedness for retirement. *The Gerontologist*, 40(6): 687–697.

Hershey, D. A. (2004). "Psychological influences on the retirement investor." *CSA Journal: Certified Senior Advisor, 22*, 31–39.

Hershey, D. A., Henkens, K., & Van Dalen, H. P. (2010). Ageing and financial planning for retirement: Interdisciplinary influences viewed through a cross-cultural lens. *International Journal of Aging and Human Development, 70*(1), 1–38. https://doi.org/10.2190/AG.70.1.a

Jacobs-Lawson, J. M., & Hershey, D. (2005). Influence of future time perspective, financial knowledge, and financial risk tolerance on retirement saving behaviours. *Financial Services Review, 14*, 331–344. https://doi.org/10.1111/j.1468-0297.2012.02501.x

Joo, S. H., & Pauwels, V. W. (2002). "Factors affecting workers' retirement confidence: A gender perspective." *Journal of Financial and Planning, 13*(2), 1–10.

Kim T.K. (2017). Understanding one-way ANOVA using conceptnal figures, *Korean Journal of Anesthosiology,* 70(1). 22-26.

Lumley, T., Diehr, P., Emerson, S., & Chen, L. (2002). The importance of the normality assumption in large public health data sets. *Annual Review of Public Health, 23*(1), 151–169. https://doi.org/10.1146/annurev.publhealth.23.100901.140546

Max Life Insurance. (2023). *India Retirement Index Study 3.0*. Retrieved from https://www.maxlifeinsurance.com

Moorthy, M. K., Durai, T., Chelliah, L., Sien, C. S., Leong, L. C., Kai, N. Z., & Teng, W. Y. (2012). A study on the retirement planning behaviour of working individuals in Malaysia. *International Journal of Academic Research in Economics and Management Sciences, 1*(2), 54-72. http://hrmars.com/admin/pics/696.pdf

Nayak, Subhashree (2013). *Determinants and Patterns of Saving Behaviour in Rural Households of Western Odisha.* Thesis, May 90.

Noone, J.H., Stephens, C. & Alpass, F.M. (2010). The process of retirement planning scale (RPPS): development and validation. *Psychological Assessment*, 22(3): 520–531.

Rachlin, H. (1995). Self-control: Beyond commitment. *Behavioural and Brain Sciences, 18*(1), 109-121.

Ruxton, G. D. (2006). The unequal variance t-test is an underused alternative to Student's t-test and the Mann–Whitney U test. *Behavioral Ecology, 17*(4), 688–690. https://doi.org/10.1093/beheco/ark016

Sadhu, V. (2022). A study on savings and investment behaviour of tribal people of Deoghar District of Jharkhand State, India. *Zenodo (CERN European Organization for Nuclear Research)*. https://doi.org/10.5281/zenodo.7498128

Singh, B., & Singh, M. (2023). Financial literacy and its determinants among the schedule tribes: Evidence from India. *International Journal of Social Economics, 50*(12), 1804–1817. https://doi.org/10.1108/IJSE-01-2023-0008

Stawski, R. S., Hershey, D. A., & Jacobs-Lawson, J. M. (2007). Goal clarity and financial planning activities as determinants of retirement savings contributions. *International Journal of Aging and Human Development, 64*(1), 13–32. https://doi.org/10.2190/13GK-5H72-H324-16P2

Tomar, S., Kent Baker, H., Kumar, S., & Hoffmann, A. O. I. (2021). Psychological Determinants of Retirement Financial Planning Behaviour. *Journal of Business Research, 133*, 432–449. https://doi.org/10.1016/j.jbusres.2021.05.007

Topa, G., Moriano, J.A.,& Moreno, A. (2009). Psychological determinants of retirement planning: A review and model. *International Journal of Aging and Human Development*, 68(4): 231–257.

Welch, B. L. (1951). On the comparison of several mean values: An alternative approach. *Biometrika, 38*(3/4), 330–336. https://doi.org/10.2307/2332579