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STATUS OF FUNCTIONAL ABILITIES AMONG ELDERLY WOMEN RESIDING IN AN OLD AGE HOME: A PILOT STUDY

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Abstract

Objective: To assess the functional status of elderly women living in an old age home by evaluating their physical performance, cognitive function, and psychological well-being.

Design: Cross-sectional observational study.

Method: The study evaluated 46 elderly female residents at Apnaghar Old Age Home, Agartala, India. Functional status was assessed using the Short Physical Performance Battery (SPPB), hand grip strength (Camry EH101 Dynamometer), cognitive function (Mini-Cog™), and psychological well-being (WHO-5 Well-being Index). Demographic data and social support patterns were also analysed.

Results: Participants (mean age 70.37±5.93 years) showed moderate physical function with a mean SPPB score of 8.217±0.917. Hand grip strength averaged 13.998±1.891 kg, trending toward the lower end of the normal range. The cognitive assessment revealed a mean Mini-Cog™ score of 3.239±0.874, with 71.73% scoring at the threshold of normal cognitive function. Psychological well-being scores (WHO-5 mean: 67.91±10.98) indicated generally positive mental health, though 43.47% scored in the lower ranges (44-60). Notably, 84.78% were illiterate, 91.30% were previously housewives, and 76.08% voluntarily chose institutional care. Social support analysis revealed that 43.47% received no visitors.

Conclusion: The findings indicate moderate functional capabilities among institutionalized elderly women, with opportunities for improvement in physical and cognitive domains. The results emphasize the need for targeted interventions considering the sociocultural context of institutional care in India, mainly focusing on maintaining functional independence and enhancing social support systems.

Keywords: Elderly women, institutional care, functional status, cognitive function, psychological well-being, geriatric assessment

Introduction

The aging process is often associated with a decline in physical, cognitive, and psychological functioning. Physical capabilities, including mobility, balance, and sensory perception, typically diminish with age, leading to an increased risk of falls and difficulties in daily activities (Handing et al., 2023; Yang et al., 2023). Cognitive functions such as memory, processing speed, and executive function show similar decline patterns, affecting information recall, multitasking abilities, and decision-making processes (Fadalla et al., 2024; Gonzales et

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al., 2022). Psychologically, aging might increase susceptibility to anxiety, despair, and social isolation, affecting emotional well-being and self-perception (Gaviano et al., 2024). Such decline results from reduced cellular repair capacity, which is affected by genetic, environmental, and lifestyle factors (Handing et al., 2023b). However, maintaining physical, mental, and social functions is crucial for older adults to preserve independence, enhance well-being, and achieve a fulfilling life (Tóth et al., 2025; Ahmadi et al., 2025). The global demographic shift toward an ageing population presents significant challenges for healthcare systems and social support structures. Projections indicate that by 2030, individuals aged 60 and above will constitute 16.67% of the global population (Grinin et al., 2023). In India, the elderly population is expected to reach 13.1% by 2031 (Mishra, 2023b).

This demographic transition has particular implications for traditional care systems for the elderly in India. Traditionally, India's joint family system provided needful support and care for older adults in their old age. However, urbanization, migration, and socioeconomic changes have weakened these systems, leaving many without adequate care (Menezes & Thomas, 2018; Dhillon et al., 2016). Consequently, many older adults are compelled to seek institutional care due to financial insecurity, neglect, social isolation, and bereavement (Aisyah & Saputra, 2024; Patir, 2023). While institutional care addresses some basic needs of these elderly inmates, elderly residents often experience physical frailty, cognitive decline, and psychological distress (Khezrian et al., 2017; Liu et al., 2022). These conditions often lead to disabilities and dependence on others for daily activities (Ye et al., 2021). Elderly individuals in care facilities are particularly vulnerable to physical and mental health decline due to limited physical activity, social isolation, and the emotional impact of family separation (Agbangla et al., 2023; Sedlackova et al., 2024). However, women in old age homes face additional susceptibility to functional decline due to health challenges arising because of post-menopausal hormonal changes, including increasing their risk of osteoporosis, cardiovascular diseases, depression, and anxiety (British Menopause Society, 2023; Meeta et al., 2020; Menezes & Thomas, 2018b; Sedlackova et al., 2024b). Regular assessments of physical and mental capabilities are essential to understand the decline in overall functional status. Early detection of decline enables timely interventions, which can significantly improve the well-being and independence of older adults (Agbangla et al., 2023b; Sulandari et al., 2024)

The objective of this study is to assess the status of functional abilities by evaluating physical performance and strength, cognitive function, and psychological well-being using standardized assessment tools, including the Short Physical Performance Battery (SPPB), Camry EH101 Handheld Dynamometer, Mini-Mental Cognitive Test (Mini-Cog^{TM}) and World Health Organization Brief Well-being Index (WHO-5 Well-being Index), of elderly women residing in Apnaghar Old Age Home in Agartala, Tripura, India. These assessments may provide valuable insights into the physical, cognitive, and psychological aspects of aging among study groups, enabling tailored interventions to support the unique needs of these elderly women in care facilities.

Methodology

Study Design and Setting

This cross-sectional observational study was conducted at Apnaghar Old Age Home in Agartala, Tripura, India, between 26th October 2024 and 26th November 2024. The study protocol adhered to the Declaration of Helsinki guidelines and received approval from the Manipur University institutional ethics committee, Canchipur, Imphal, Manipur.

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Study Population and Sampling

The study population was selected based on specific criteria: female residents aged 60 years and above who could stand and walk independently, were willing to participate in all assessments, and had the cognitive capacity to provide informed consent. Bedridden residents who required walking assistance experienced acute illness during the assessment, or had severe visual or hearing impairments affecting test administration were excluded. From an initial pool of 50 eligible residents, 46 participants met the inclusion criteria, with four residents excluded due to bedridden status or walking assistance requirements.

Ethical Considerations and Safety Measures

Ethical considerations were prioritized throughout the testing process. Participants were briefed on the purpose of the tests, and written consent was obtained in participants' preferred language, ensuring voluntary participation with the right to withdraw, maintaining privacy during assessments, and protecting data confidentiality through coding. A staff member was present to assist participants, particularly during physical tests, to prevent falls or injuries.

Assessment Tools and Procedures

Physical Performance Assessment

Short Physical Performance Battery (SPPB) *(Guralnik et al., 1995; De Fátima Ribeiro Silva et al., 2021)*

The Short Physical Performance Battery (SPPB) is a standardized tool used to assess lower extremity function in older adults. It includes three tests: a balance test, a walking speed test, and a chair stand test. In the balance test, participants stood in three positions—side-by-side, semi-tandem, and tandem—for ten seconds each, with scores recorded based on the duration of balance. We recorded the time participants walked a predefined four-meter distance at their usual gait speed. The chair stand test required participants to rise from a seated position five times without using their arms, with the time recorded. Each component is scored from zero to four, resulting in a composite score ranging from zero to twelve. The SPPB is objective, valid, and reliable, with high sensitivity and specificity in detecting mobility limitations and predicting all-cause mortality. It is widely used in clinical and research settings to evaluate physical performance in elderly populations, including women in the Indian context.

The SPPB, test was conducted in a well-lit, spacious area with non-slip flooring, assessed three sequential components: balance tests (including side-by-side, semi-tandem, and tandem stands for 10 seconds each), gait speed (timed 4-meter walk with two trials), and chair stand test (five repetitions of rising from a seated position). Each component was scored from 0-4 points, yielding a total score range of 0-12.

Hand Grip Strength Measurement

Calibrated Camry EH101 Handheld Dynamometer (Calibrated Camry EH101 Handheld Dynamometer) (Huang et al., 2022)

The CAMRY EH101 Handheld Dynamometer is a device used to measure handgrip strength, an important indicator of overall muscle strength and health. It is standardized, objective, and reliable, with validation studies comparing it to the gold standard Jamar dynamometer3. The CAMRY dynamometer is easy to use and provides accurate measurements, making it suitable for assessing muscle strength in elderly women in India

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Hand grip strength was measured using a calibrated Camry EH101 Handheld Dynamometer, with participants seated, their elbow flexed at 90 degrees, and their wrists in neutral position. Three trials were conducted with the dominant hand, allowing 30-second rest intervals, and the highest value was recorded in kilograms.

Cognitive Assessment

Mini-Mental Cognitive Test (Mini-Cog™) *(Seitz et al., 2014)*

The Mini-Cog™ is a brief cognitive screening tool designed to detect cognitive impairment in older adults. It consists of a three-word recall test and a clock drawing test. We read three unrelated words to the participants and asked them to repeat them immediately. They were then instructed to draw a clock, placing all numbers correctly and setting the hands to a specific time (e.g., 10 past 11). After a short delay, participants were asked to recall the three words from the initial step. Scoring was based on correct word recall and clock drawing accuracy, with scores ranging from zero to five points. The Mini-Cog™ is standardized, objective, and has been shown to have high sensitivity and specificity in various healthcare settings. It is a quick and reliable tool for assessing cognitive function in elderly women, including those in the Indian context.

Cognitive function was assessed using the Mini-Mental Cognitive Test (Mini-Cog™) in a quiet, well-lit room. This test included word registration, clock drawing, and delayed word recall. Scoring allocated one point per correctly recalled word and two points for accurate clock drawing, with total scores ranging from 0-5 points.

Psychological Assessment

World Health Organization Brief Well-Being Index (WHO-5 Well-Being Index) *(Heun et al., 2001)*

The WHO-5 Wellbeing Index is a short questionnaire used to assess psychological wellbeing. It consists of five questions that measure positive mood and overall wellbeing. The WHO-5 is standardized, objective, and has been validated in various populations, including elderly women. It is a reliable tool for assessing psychological wellbeing in the Indian context, providing valuable insights into the mental health of elderly women.

Psychological well-being was evaluated using the WHO-5 Well-being Index, administered in participants' preferred language. Five statements were read aloud five positively worded statements regarding their emotional well-being over the past two weeks (e.g., "I have felt cheerful and in good spirits") along with response options explained using a visual scale. Responses were recorded on a 6-point Likert scale ranging from 0 ("At no time") to 5 ("All of the time"). The sum of the responses was multiplied by 4, yielding a final score from 0 to 100, where higher scores indicated better well-being.

Data Collection Protocol

Data collection followed a structured protocol over four weeks, with physical performance tests conducted in weeks 1-2 and cognitive and psychological assessments in weeks 3-4. A minimum 24-hour gap was maintained between different assessments. Testing environments were carefully controlled, with physical tests conducted in open spaces with safety provisions and cognitive/psychological tests in private rooms.

Statistical Analysis

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Data analysis employed descriptive statistics, including means, standard deviations, medians, modes, ranges, and frequency distributions, analysed using MS Excel 2021. Confidence intervals were set at 95%. Given the small sample size and the study's exploratory nature, further statistical analysis was not performed. Study findings were shared with facility administration to inform care improvement strategies.

Results

Table 1. Characteristics of the study participants (n=46)

Variable	***Mean ± SD or n (%)***
Age (in years)	70.37 ± 5.93
Sex	
Male	0(0)
Female	46(100)
Educational level	
Literate (just able to read and write)	7(15.21)
Up to HSLC	0(0)
Up to SSLC	0(0)
Graduate	0(0)
Post-Graduate	0(0)
Illiterate	39(84.78)
Previous occupation	
Unemployed	4(8.69)
Housewife	42(91.30)
Marital Status	
Single	4(8.69)
Married	0(0)
Divorced	28(60.86)
Widowed	14(30.43)
Separated	0(0)
Number of Children	
01−02	17(36.95)
03−04	9(19.56)
05−06	2(4.34)
Nil	18(39.13)
Employment of children	
Working abroad	0(0)
Working in Kerala	0(0)
Working in another state	2(4.34))
Unemployed	44(95.65)

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Nature of admission to the old age home	
Voluntary	35(76.08)
Forced by children	7(15.21)
Placed by relatives/others	4(8.69)
Duration of stay in the old age home	
Less than 1 year	8(17.39)
1-2 years	6(13.04)
2-3 years	7(15.21)
3-4 years	9(19.56)
More than 4 years	16(34.78)
Source of income	
Old age pension	0(0)
Own earnings	0(0)
Support from children	0(0)
Support from a relative	0(0)
Dependent on an old age home	46(100)
Do you suffer from any disease for a long time?	
Yes	2(4.34)
No	44(95.65)
Number of visitors you have	
1-2	24(52.17)
2-3	2(4.34)
Nil	20(43.47)

Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

*SD: Standard deviation

Participant Demographics

The study population comprised 46 elderly women with a mean age of 70.37 years (SD = 5.93). Most participants (84.78%) were illiterate, with a small proportion (15.21%) having basic literacy skills. The majority (91.30%) had been housewives, while 8.69% reported no previous employment. Marital status analysis revealed that 60.86% were divorced, 30.43% were widowed, and 8.69% were single. Regarding children, 39.13% had no children, while 36.95% had one to two children. A significant finding was that 95.65% of participants' children were unemployed.

The institutional residence patterns showed that 76.08% of participants had voluntarily chosen to live in the facility, while their children placed 15.21% and 8.69% by relatives. Duration of stay varied, with 34.78% residing for more than four years. All participants depended entirely on the facility for their basic needs. Visitor frequency analysis revealed that 52.17% received one to two visitors, while 43.47% received no visitors.

Table 2*: Descriptive Statistical Analysis of Short Physical Performance Battery (SPPB), Mini-Cog ™, World Health Organization Brief Well-Being Index (WHO-5 Wellbeing Index) and Hand Grip Strength Scores.*

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Parameter	*Mean*	*Standard Deviation (±SD)*	*Median*	*Mode*	*Range Value*	*Minimum Value*	*Maximum Value*	*Confidence Level (95%)*
SPPB Score	8.217	± (0.917)	8	8	4	7	11	0.272
Mini-Cog ™ Score	3.239	± (0.874)	3	3	3	2	5	0.26
WHO-5 Well-Being Score	67.91	± (10.98)	66	60	36	52	88	3.26
Hand Grip Strength (in kg)	13.998	± (1.891)	13.635	13.42	8.23	11.13	19.36	0.562

Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

***Table 3**: Distribution of Participants Based on Their Performance in the Respective Tests (SPPB, Mini-Cog ™, WHO-5 Wellbeing Index and Hand Grip Strength)*

Short Physical Performance Battery (SPPB)	***No. of Participants (%)***	***Mini-Cog ™***	***No. of Participants (%)***	***WHO-5 Well-Being Index Score***	***No. of Participants (%)***	***Hand Grip Strength (kg)***	***No. of Participants (%)***
7	7(15.21 %)	2	5(10.86 %)	44−60	20(43.47 %)	11−15	41(89.13 %)
8	28(60.86 %)	3	33(71.73 %)	64−80	19(41.30 %)	16−20	5(10.86 %)
9	7(15.21 %)	4	0(0 %)	84−100	7(15.21 %)	**Total**	**46(100 %)**
10	2(4.34 %)	5	8(17.39 %)	**Total**	**46(100 %)**		
11	2(4.34 %)	**Total**	**46(100 %)**				
Total	**46(100 %)**						

Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

Functional Status Assessment

Physical Performance

*Based on the findings from this study as on **(table 2 & 3)** and the established performance groups from Welch et al. (2020), the Short Physical Performance Battery (SPPB) scores for the elderly women at Apnaghar Old Age Home can be interpreted as follows:*

The mean SPPB score was 8.217 (SD = 0.917), indicating moderate physical function. Score distribution showed that 60.86% of participants scored 8, while 15.21% each scored 7 and 9. A smaller proportion (8.68%) achieved scores of 10-11, suggesting higher physical capability.

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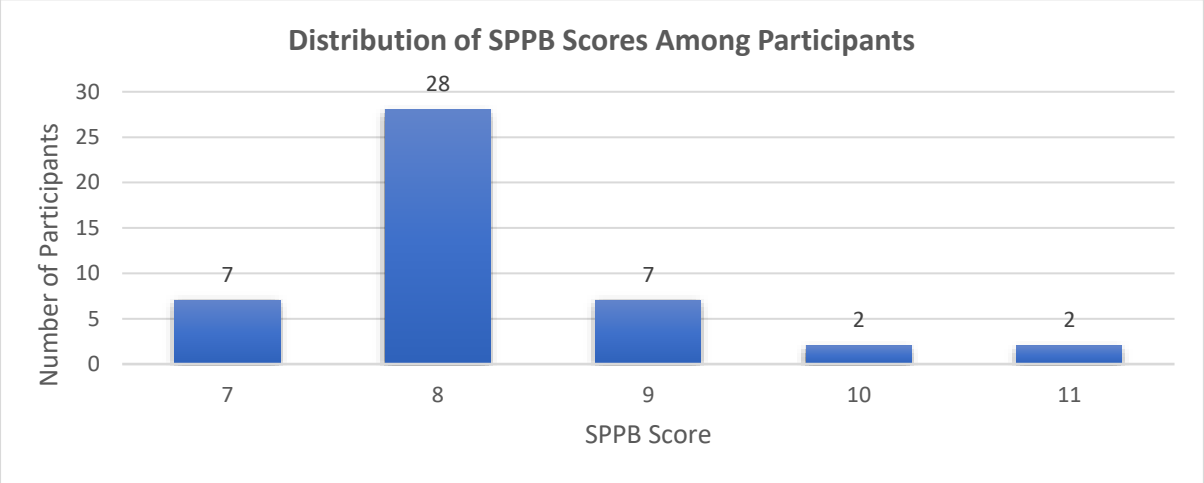
Figure 1: Graphical representation of distribution of participants by SPPB scores



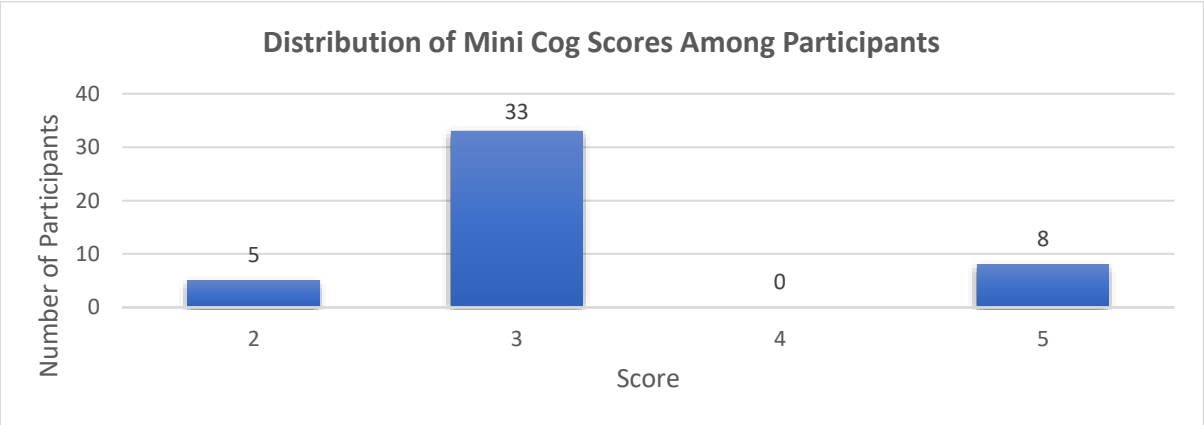
Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

Cognitive Function

*Based on the findings from this study as on **(table 2 & 3)** and the established performance cut-off points from Filho and Lourenço (2009), the Mini-Cog TM scores for the elderly women at Apnaghar Old Age Home can be interpreted as follows:*

Mini-Cog™ assessment revealed a mean score of 3.239 (SD = 0.874). The majority (71.73%) scored 3, while 17.39% scored 5, indicating better cognitive function. Notably, 10.86% scored 2, suggesting potential cognitive impairment risk.

Figure 2: Graphical representation of distribution of participants by Mini-Cog TM score



Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

Psychological Well-being

*Based on the findings from this study as on **(table 2 & 3)** and the established guidelines from Topp et al. (2015) for the WHO-5 Well-being Index, the scores for the elderly women at Apnaghar Old Age Home can be interpreted as follows:*

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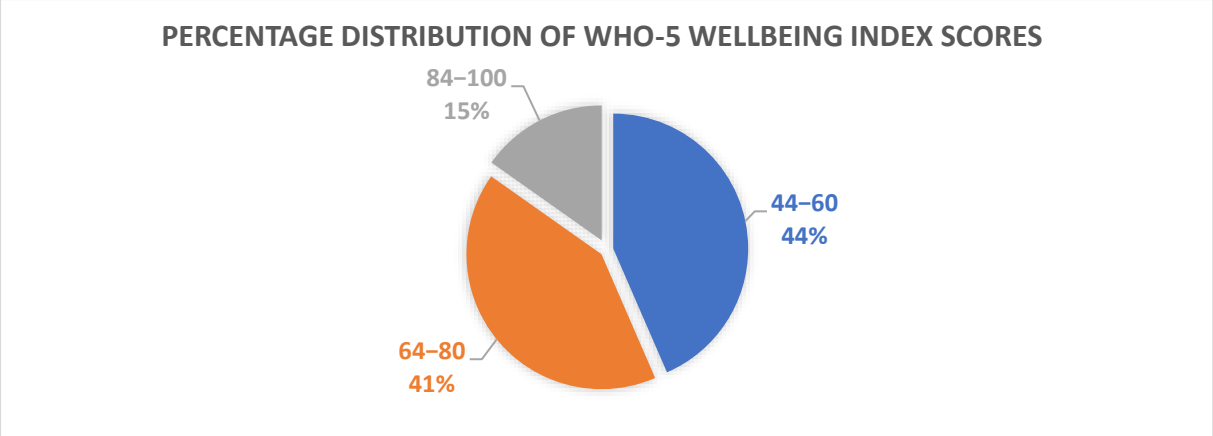
The WHO-5 Well-being Index showed a mean score of 67.91 (SD = 10.98), with scores ranging from 52 to 88. Distribution analysis revealed that 43.47% scored between 44-60, 41.30% between 64-80, and 15.21% between 84-100, indicating generally positive psychological well-being despite institutional living conditions.

Figure 3: Graphical representation of distribution of participants by WHO-5 Wellbeing Index



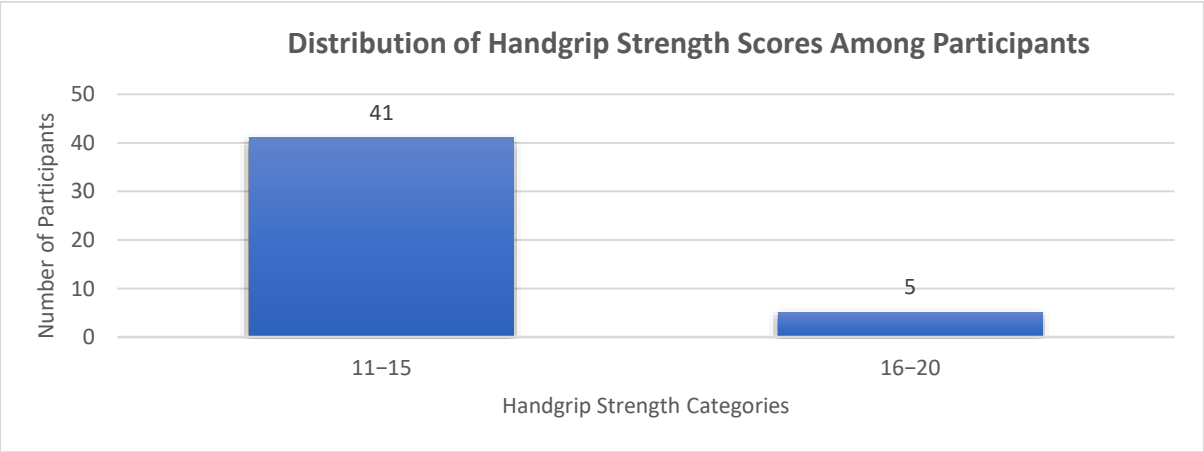
Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

Hand Grip Strength

*Based on the findings from this study as on **(table 2 & 3)** and the cut-off values for sarcopenia established by Yoo et al. (2017), the hand grip strength of the elderly women at Apnaghar Old Age Home can be interpreted as follows:*

Mean hand grip strength was 13.998 kg (SD = 1.891), with 89.13% of participants showing strength between 11-15 kg. While these values fall within normal ranges for elderly women, they trend toward the lower end of the spectrum.

Figure 4: Graphical representation of distribution of participants by Hand grip strength scores



Source: Study conducted at Apnaghar old age home, Agartala, Tripura, India (October 26th – November 26th 2024).

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Discussion

Demographic Profile and Social Context: The demographic profile of the participants highlights significant socioeconomic factors influencing institutional care in India. The high proportion of divorced or widowed women (91.29% combined) and the predominance of voluntary admission (76.08%) suggest that the facility serves as a crucial support system for women with limited alternative resources. Most residents were housewives, had no formal education, and chose to live in the home despite being married. This paints a picture of women with limited resources, navigating the changing dynamics of Indian family life.

The findings on functional status of elderly women in institutional care in Apnaghar old age home reveal a complex interplay between physical capabilities, cognitive function, and psychological well-being.

Physical Abilities: The physical function of the residents falls mostly in the middle range. Their average Short Physical Performance Battery (SPPB) score of 8.2 indicates that they manage basic movement, albeit with some difficulty. This finding is consistent with Guralnik et al.'s (2000) research, which links lower SPPB scores with an increased risk of mobility issues and falls. Similarly, Cruz-Jentoft et al. (2019) observed that older adults in care homes typically exhibit reduced physical capabilities compared to their community-dwelling counterparts. The average grip strength of around 14 kg among the residents was notably weaker than that of typical Asian elderly women, as reported by Yoo et al. (2017). This finding aligns with Rijk et al. (2016), who noted that elderly women in care homes often have weaker grip strength compared to those living independently.

Cognitive Function: The cognitive assessments provided intriguing insights. Most residents scored 3 out of 5 on the Mini-Cog test, suggesting they maintain adequate cognitive function. However, nearly 85% of these women never had formal schooling, which likely influences their performance on standardized cognitive tests, as noted by Filho and Lourenço (2009). About 11% of the residents scored below the normal range, corroborating Mungas et al. (2009)’s findings that educational background significantly impacts cognitive test results.

Psychological Well-being: The psychological well-being results were somewhat paradoxical. The average score of 68 on the WHO-5 Well-being Index is above the depression threshold identified by Topp et al. (2015). However, nearly half of the residents scored in the lower range (44-60), indicating underlying emotional challenges. This is understandable given their social circumstances—43% of the residents never receive visitors, and nearly all have unemployed children. These findings are consistent with Singh and Misra (2009), who reported that elderly individuals in Indian care homes often struggle emotionally due to family separation and the adjustment to institutional life. The importance of social support, as emphasized by Teo et al. (2021), is evident in the health outcomes of elderly populations.

Study Limitations and Future Directions

The single-centre design and modest sample size may limit generalizability. The cross-sectional nature prevents the analysis of temporal changes in functional status. Future research should consider:
Longitudinal assessment of functional status changes
Comparison with community-dwelling elderly populations
Evaluation of the effectiveness of a targeted intervention

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Conclusion

This study provides comprehensive insights into the functional status of elderly women in institutional care in India. The findings highlight the need for targeted interventions to enhance physical capability, maintain cognitive function, and support psychological well-being. The results emphasize the importance of considering sociocultural contexts in designing care strategies for institutionalized elderly women.

The observed patterns of functional status and demographic characteristics suggest that institutional care facilities in India must evolve to address their residents' physical and psychosocial needs. As India's elderly population grows, understanding these patterns becomes crucial for developing effective care strategies that promote healthy aging within institutional settings.

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Conflicts of Interest
None declared
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