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Difference between expected and actual long-term service in India: A study on old age residents' homes

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Abstract

While India is experiencing a significant demographic shift towards an aging population, the adequacy and quality of healthcare services catering to the specific needs and demands of this demographic remain inadequately understood. This study aims to explore the intersection of elderly healthcare services, quality of care, and the role of assistive devices and technology in improving the accessibility and affordability of long-term care (LTC) services. This cross-sectional study spanned a period of 3 months from November 2023 to January 2024 and the data collected was studied using a thematic method involving the categorization of survey responses to identify recurrent themes. A total of sixty elderly people aged 60 and above took part in the survey. The socio-demographic analysis of the study participants provides insights into various characteristics, including age distribution, gender, educational level, occupation before retirement, source of income, marital status, and number of children among the elderly residing in old-age homes. The study highlights the growing demand for services, the diversity of needs among the elderly, and gaps in the delivery of expected care services. The role of technology emerges as a potential solution to improve access and affordability in LTC, which offers avenues to enhance independence, reduce care requirements, and increase staff productivity.

Keywords: Aging, assistive technologies, demographic shift, medication, social and emotional support.

Introduction

The global demographic landscape is transforming profoundly with the elderly population aged 60 and above projected to outnumber young children, marking a phenomenon known as "age-quake". One out of every six people worldwide is estimated to be aged 60 or older by 2050, compared to one in eleven in 2019 (World Population Prospects 2019). In India, this demographic shift is even more pronounced, with the elderly population growing at a rate three times faster than the global average and is expected to reach 20.8% of the population by 2050. This shift is driven by factors such as declining fertility rates, decreasing infant mortality, and increasing longevity. Interstate variations are evident with southern states and some northern states like Punjab and Himachal Pradesh showing a higher share than the national average of aged population in 2021 when compared to central and northeastern states (India Ageing Report 2023).

While there is increasing recognition of the need for LTC services in India, the actual provision of such services is still evolving and faces various challenges related to the quality and quantity of infrastructure, funding, and existing cultural and societal norms. As the population ages, the demand for LTC services in India is expected to rise. Family-based care has been predominant in India, where elderly individuals are often cared for by their family members, particularly in rural areas. However, with rapid urbanization and modernization, there is a shift towards nuclear families and increased participation of women in the workforce, reducing the feasibility of family-based care. (Ugargol & Bailey 2018). The expectations for LTC services include the provision of assisted living facilities, nursing homes, palliative care centers, and home healthcare services.

The Indian government has launched several programs to support older adults. The National Action Plan for Welfare of Senior provides a comprehensive plan of action aimed at enhancing the welfare and well-being of senior citizens including financial security, access to food, healthcare, and dignity of life (Ministry of Social Justice and Empowerment 2020). The National Programme for Health Care of the Elderly (NPHCE), administered by the Ministry of Health, focuses on providing accessible, affordable, and high-quality LTC services tailored to the needs of the ageing population. Additionally, Rashtriya Vayoshri Yojana has been introduced to provide physical aids and assisted living devices for senior citizens in the below poverty line (BPL) category, addressing specific disabilities such as low vision, hearing impairment and locomotor disabilities. The Integrated Programme for Senior Citizens provides social welfare support including old-age pensions, subsidized food and transport, lower income tax, and higher savings interest rates. The Indira Gandhi National Old Age Pension Scheme extends social benefits to impoverished households with elderly members aged 60 and above. It offers monthly pensions without requiring any contribution from the beneficiaries, ensuring financial support for the elderly in need whereas the Pradhan Mantri Vaya Vandana Yojana provides insurance and pension schemes for post-retirement income.

Population aging is recognized as one of the four global demographic “megatrends” impacting various sectors like employment, financial systems, housing, transportation, and social welfare. While India is experiencing a significant demographic shift towards an aging population, the adequacy and quality of healthcare services catering to the specific needs and demands of this demographic remain inadequately understood (Meiners et al., 2011). While evidence of the growing elderly population is clear, there is limited insight into the provision of high-quality care

aligned with their needs. This gap affects the development of targeted policies and interventions to ensure that healthcare services meet the unique needs of the ageing population sustainably and inclusively (Meiners et al., 2012). Thus, this study aims to address the critical gap in understanding the challenges and needs in providing quality healthcare for India's aging population.

Aims

The study aims to study the following:

1. Investigate the demand for care services and the actual level of those services delivered among different age groups, genders, and elderly with different medical conditions,
2. Explore the efficacy of integrating assistive technology for enhancing the delivery of care services and identify obstacles and strategies for effective implementation.

State of research

LTC refers to the services and support aimed at assisting the elderly who are either experiencing or at risk of a significant loss of their physical, mental, and social capabilities. The fundamental goal of LTC is to help these individuals sustain a level of functional ability that aligns with their basic human rights and dignity. It includes assistance for activities of daily living (ADLs) like getting dressed, cooking, taking shower, and instrumental activities of daily living (IADLs) like taking medication and other medical support. Given the rising demand for LTC services, enhancing the delivery of LTC involves strategic investment in the sustainability and efficiency of economic resources for the delivery of quality care services to the elderly population.

Delivery of Quality LTC

Studies highlight the growing need for LTC services worldwide. In China about 60% of adults required home care services and more than one-third of them required psychological support (Zeng et al. 2021). However, it only accounted for 20% of the services provided by the community. Similarly in Australia, though the government has expanded the number of operational aged care places, the demand for informal caretakers is expected to increase by 160% between 2001 and 2031 but supply is expected to rise by less than 60% (Productivity Commission, Australian Government 2008). Older women (32% of women aged 65 or over) exhibit a greater likelihood of requiring such assistance compared to men (19%). Moreover, individuals with lower income and educational attainment levels demonstrate heightened demand for such care services (European Commission, 2022).

The ageing population is becoming increasingly diverse in terms of their backgrounds, care needs, preferences, and wealth, posing challenges for policymakers to meet community expectations. Factors such as age, gender, family structure, living arrangement, career history, educational level, medical condition, and financial status determine the level of demand for these services. Aging individuals face health challenges and significant life changes, which can lead to loneliness and isolation (Meiners, 2014). Thus, the demand for LTC also stems from their social and emotional needs. (MacLeod et al. 2018; Abdi et al. 2019; Devkota et al. 2023, Wenjing and Shen 2023). A study conducted in Hassan city, Karnataka, India showed that despite financial security from personal income, many faced familial rejection leading to depression, adjustment issues due to loss of a partner, and lack of social connections in old age homes (Vanitha 2014; Tripathi 2014). Therefore, older people need care and support in three main areas: social activities and

relationships, psychological health, physical health and activities (Abdi et al. 2019; Toquero 2021; Huang et al. 2022; Gonnord et al. 2023).

Although older adults face aging-related difficulties, they often value their independence and prefer to manage health challenges on their own. However, inadequate professional support and lack of knowledge about coordinating care disrupt these efforts (Abdi et al. 2019). High reliance on home care can also impact the work attendance of their children compared to those receiving institutional care (Gautun and Bratt 2016). Therefore, systematic and structured care services in nursing homes and care centers is the need of the hour (Gautun and Bratt 2016; Sumini et al. 2020; Zeng et al. 2021). The care services received in such communities have been shown to significantly improve the health and well-being of older people. The residents' sense of feeling at home within old age homes also increases their overall satisfaction and comfort. The residents have expressed contentment with the living space, the building, recreational activities, diet, health check-ups, staff attitudes, and the relationship with management (Vanitha 2014; Shnoor and Isaaq 2020).

In many undeveloped and developing countries, care systems are inefficient and inadequate. In Iran, most of these institutions are repurposed from elderly care facilities and lack adequate standards to address the psychological, social, and physical needs of older individuals (Ghavaraskhar et al. 2018). Indian old age homes have succeeded in providing social and emotional support, improving quality of life in terms of health and safety, but often fall short in offering psychological services alongside medical care (Gupta 2014; Bhore 2015; Denny and Vidya 2023). LTC services are labor-intensive and require customized services resulting in relatively smaller productivity gains than in other service sectors. Shortage of staff and inadequately trained also

pose a major challenge. In countries like Japan and South Korea, the growth in LTC workers is insufficient to keep pace with the rising elderly population, and the majority of caregivers are female, often working unpaid (International Labor Organization, ILO). Increasing caregiver pay has been shown to enhance care quality, as seen in the UK's Direct Payments scheme, where better pay led to improved caregiver selection, personal attention, scheduling, and service consistency.

Role of Assistive Devices and Technology in Enhancing the Delivery of LTC Services

Emerging technologies have the potential to address the challenges faced by older people, ranging from portable aids like canes and walkers to structural modifications such as grab bars and ramps. Wearable sensors and assistive robotics, including exoskeletons, are becoming more affordable and can help address mobility needs (Majumder et al. 2017; Lukasik et al. 2020). Wearable devices like smartwatches can monitor vital signs and connect to AI-based systems to detect early health issues and prevent deterioration (Shajari et al. 2023).

These technologies enhance the independence of the elderly, potentially reducing the level of care required and increasing staff productivity. Wireless technologies in LTC facilities have been shown to increase staff productivity, improve responsiveness of the delivery of care services, and monitor the health of the patients (Javaid et al. 2023). These technologies have the potential to support older people in various aspects of their lives, from social interactions to mental health management (World Health Organization, WHO). Additionally, advancements like 5G are expected to enhance user experience by enabling real-time data transfer and processing. Technology also aids in social and emotional support, helping elderly individuals stay connected

with families and improve their mood. However, adoption barriers exist, including concerns about over-dependence, privacy, and awareness of available technologies (Borghouts et al. 2022).

The existing literature predominantly examines various aspects related to aging in old age homes, including quality of life, satisfaction levels, and challenges associated with ageing, as well as the role of assistive technology. However, there is a gap in understanding how age, gender, and medical conditions affect the demand for LTC services. Further research is needed to explore these factors and overcome adoption barriers. Addressing these gaps is essential for enhancing our understanding of the diverse needs of older adults and informing the development of targeted interventions and policies to improve LTC services. This study aims to bridge the gap by examining how demographic factors influence experiences in old age homes.

Methodology

This section outlines the methodology of the study, covering (i) Study design and participants, (ii) Questionnaire design, (iii) Data Collection, (iv) Inclusion and Exclusion criteria, and (v) Tools of Analysis

Study design and participants

This exploratory study investigates the current and expected care services and the role of assistive devices in old age homes in Bangalore, Karnataka. It examines experiences and service levels over a three-month period (November 2023 to January 2024). Data was collected from 15 old age homes, involving 60 participants aged 60 and above.

Questionnaire design:

The structured questionnaire, consisting of 18 questions, explores elderly residents' experiences, challenges, and financial conditions. It includes multiple-choice, Likert scale, and open-ended questions in three sections: socio-demographic information, services at old age homes, and use of assistive technology. The first section covers demographic details including age, gender, education, pre-retirement profession, sources of income post-retirement, marital status, number of children, and familial connections, while the second assesses service types, expectations, and satisfaction. The third section examines technology use, its benefits, challenges, and recommendations for improving LTC services.

Data Collection:

The primary data was collected through a survey questionnaire which was sent out to the targeted old age homes. Participants were informed about the study's purpose, confidentiality, and their rights. Post-collection, the data was cleaned to address missing values and illogical responses.

Inclusion Criteria:

Participants were required to be aged 60 or older and residing in old age homes in Bangalore. The participants were assured of confidentiality of their information and only those participants who were willing to share their insights were included. Only those participants who possessed the capacity to comprehend and respond meaningfully to the survey questions were included.

Tools of Analysis:

The study employs a range of independent variables, including age, gender, marital status, health conditions, and types of care services. Dependent variables include the demand for care services, satisfaction levels, and the benefits received, as well as the challenges faced by the elderly.

Quantitative analysis was done using tools such as Microsoft Excel and R programming, for thorough sorting, categorization, and visualization to identify patterns and trends in LTC.

Results

Socio-demographic characteristics:

The socio-demographic analysis of the study participants reveals key characteristics, including age distribution, gender, educational level, occupation before retirement, source of income, marital status, and the number of children among the elderly residing in old age homes (Appendix A). Over 40%, are aged 70 and above, with a notable proportion exceeding 75 years. Women represent 53.33% of the participants, predominantly in the 70-75 age group, while men are more commonly in the 75-80 age group. Most residents are educated, with 43.3% holding a Bachelor's degree and 20% a Master's degree. While the higher proportion of women among recipients of care services aligns with findings from prior studies, higher demand for care services among individuals with higher educational levels contradicts the previous results.

Most participants were engaged in private work (41.67%) or homemaking (18.33%) before retirement. After retirement, social security benefits are the primary income source for 80% of the residents, followed by other sources like bank deposits, family business or assets, and real estate. The survey reveals varied family structure among the residents of old age homes. In terms of family structure, nearly half of them are married, one-third are widowed and a smaller proportion are unmarried or divorced. A substantial proportion of residents have two (33.33%) or three (23.33%) children. Those with no children or fewer children are inclined to reside in old age homes, with only around 11% of them having four or more children, highlighting the role of familial support. On a positive note, 85% of the respondents are in contact with their family

members while the rest are not. The prevalence of regular contact with their family members suggests the choice to reside in old age homes may often be influenced by external factors rather than a lack of familial connection. It is plausible that the decision is driven by constraints such as limited time and resources for unpaid care at home, compounded by the increasing demands on the time and attention of the elderly. This might have necessitated alternative care arrangements for older adults despite their continued desire for familial connection.

Care Services in Old Age Homes

The findings reveal that the most prevalent diseases among the residents are arthritis, cardiovascular problems, Parkinson's disease, hearing and eyesight problems, Alzheimer's, kidney and digestive problems, high blood pressure, diabetes, cholesterol, etc. Arthritis diabetes and heart problems are more common among females, while hearing problems and Alzheimer's disease have a notable occurrence among males. The overall prevalence of health issues appears higher among females in the survey. Similarly, the prevalence of disease across the age categories also varies significantly. Elderly aged 80 and above mostly suffer from Parkinson's, dementia and Alzheimer's. On the other hand, heart problems and diabetes are more common in the 75-80 age group. The proportion of residents who suffer from one or more diseases increases with age. About 56% of people aged 60-65 reported of prevalence of disease as opposed to 78% people in the age group of above 80. Around 60-65% of people between the age group 65-80 reported health issues.

Broadly, the difficulties faced by the elderly are categorized into four domains: Domestic Life, Physical Health, Mental Health, and Social Communication. Around 60% reported issues in physical health followed by 45% suffering in social communication, 36.7% in domestic life, and 26.7% in mental health. Only 1.7% of them responded with difficulty in all four categories.

Notably, 15% reported difficulties in both social communication and physical health, and 5% in all social, mental, and physical health. While difficulty in physical health is reported across all age groups, social communication is a major issue for those aged 75 and above, and issues in managing daily life are faced by people below 70 years of age. While the existing literature shows the high prevalence of depression and anxiety among the residents, the mental health issues reported in the survey were very low. Almost half of the residents reported problems in social communication which suggests the need for fostering social interaction and connection within these environments. Social communication plays a crucial role in promoting overall well-being and quality of life for older adults, as it fosters a sense of belonging, companionship, and emotional support.

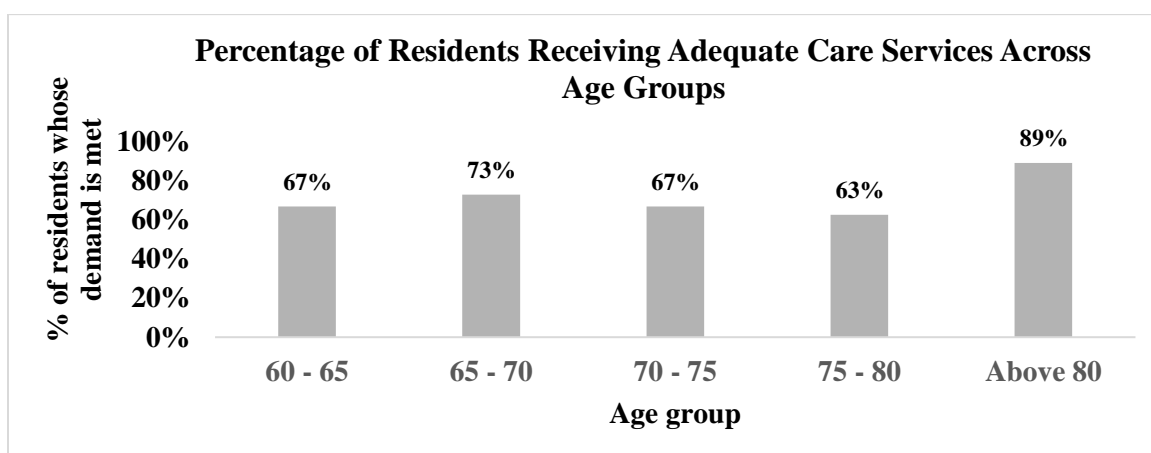
Table 1. The proportion of residents receiving different care services (number [%])

Gender	Assistance in daily activities	Guidance on Dietary Requirements	Medical Support and Medications	Provision of Assistive Devices	Social and Emotional Support	Total
Female	24 (75.00)	15 (47.00)	20 (62.50)	14 (44.00)	11 (34.00)	32 (100)
Male	20 (71.00)	10 (36.00)	21 (75.00)	10 (36.00)	11 (39.00)	28 (100)
Total	44 (73.3)	25 (41.7)	41 (68.3)	24 (40)	22 (36.70)	60 (100)
Age Group						
60 - 65	3 (33.33)	3 (33.33)	6 (66.67)	3 (33.33)	3 (33.33)	9
65 - 70	9 (81.81)	3 (27.27)	8 (72.72)	3 (27.27)	3 (27.27)	11
70 - 75	10 (66.70)	4 (26.70)	7 (46.70)	5 (33.30)	5 (33.30)	15
75 - 80	13 (81.30)	8 (50.00)	12 (75.00)	5(31.30)	6 (37.50)	16
Above 80	9 (100)	7 (77.78)	8 (88.89)	8 (88.89)	5 (55.55)	9
Grand Total	44	25	41	24	22	60

Source: Author's calculation

Given the difficulties associated with ageing, the old age homes offer services such as assistance in daily activities, medical support, social and emotional well-being, guidance on dietary requirements, provision of assistive medical devices, etc. 73.30% of the total participants reported that they get assistance in daily activities, with slightly higher proportion from females (75.00%) compared to males (71.00%). 68.3% reported receiving medical support and medications and 41.7% received guidance on dietary requirements. Similarly, 40% have provision of assistive devices and 36.7% receive social and emotional support. Among those aged 60-65, only 33.33% required daily assistance while the proportion increases in subsequent age groups, reaching 100% for those above 80. On the other hand, there is an increase in the proportion of residents getting guidance on dietary requirements after 75 years, increasing substantially from 28% to 64% on average. Medical support and medications are utilized by 66.67% of those aged 60-65 and remain consistently high across other age groups, reaching 89% for those aged 80 and above. The provision of assistive devices and social and emotional support is greater among those aged 80 and above. Despite high proportion of residents receiving care in physical activities, medical and dietary support, they lack the provision of assistive technology, social and emotional support.

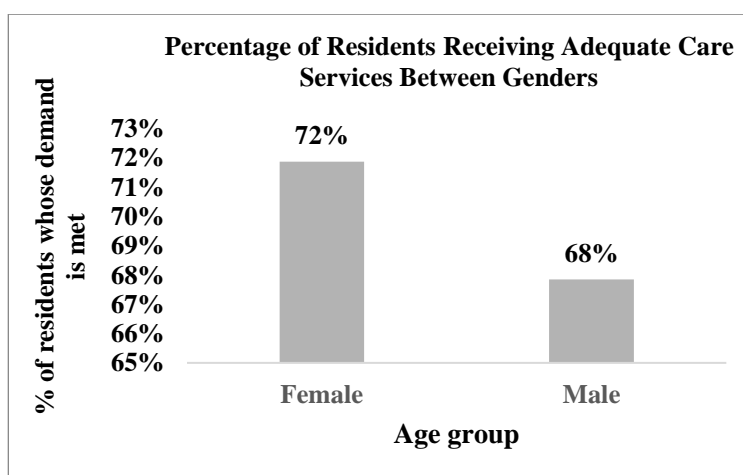
Figure 1. The proportion of residents whose demand is met at old age homes across different age groups



Source: Author's calculation

The result suggests that the majority of respondents across all age groups expressed satisfaction with the services provided in the old age home. Notably, in the above 80 age group, a significant 89% stated that the services meet their demands. Among those aged 60-65 and 70-75, 67% reported that the services meet their demands, while 33% indicated otherwise. In the 65-70 age group, 73% were satisfied and in the 75-80 age category, 63% expressed satisfaction. Overall, the majority, accounting for 70%, are content with the services, while 30% indicate dissatisfaction. Similarly, 72% of females and 68% of males were satisfied with the service. Despite the high proportion of residents reporting that they are satisfied with the existing care services, such provision alone is not enough to improve their well-being as there is a discrepancy between the actual care provided and the number of residents seeking those services. Particularly, the provision of social and emotional support is lesser than the number of residents reporting the need for those services.

Figure 2. The proportion of residents whose demand is met at old age homes based on gender



Source: Author's calculation

Those whose demands were not met specified a range of expectations from the care center. Among these expectations, residents expressed a desire for access to trained healthcare professionals who

can provide specialized medical care and support tailored to their individual needs. This includes not only medical treatment but also assistance with managing specific medical conditions and access to necessary medical devices and equipment to support their health and well-being. Furthermore, residents emphasized the importance of better-quality food and nutrition within the facility, as well as access to a varied and balanced diet that meets their dietary preferences and requirements. Residents also expressed general expectations related to the overall infrastructure and cleanliness maintenance of the care center. This encompasses factors such as well-maintained facilities, clean and hygienic living spaces, and a safe and comfortable environment conducive to their well-being.

Use of Assistive Technology in Care Services

Assistive technology (ATs) in old age homes plays a pivotal role in enhancing the overall quality of life for the elderly. It can be broadly categorized into four categories: (1) Personal Health Management, (2) Physical and Social Support, (3) Mobility aids, and (4) Sensory aids. Personal health management devices include glucose and blood pressure monitoring systems, automatic pill dispensers, and wearable devices such as smartwatches and wristbands to track the health of the elderly. Physical and Social Support includes devices such as adjustable beds, grab bars, raised seats, communication apps, etc. Similarly, mobility aids include walking sticks, wheelchairs, crutches, prosthetic devices, and sensory aid devices including hearing and visual aids.

Table 2. Types of assistive devices being utilized by different age categories (number (%))

Type of Assistive Device	60-65	65-70	70-75	75-80	Above 80	Total
Sensory	2 (22.22)	3(27.27)	4(26.67)	5(31.25)	5(55.56)	19 (31.67)
Mobility	2(22.22)	3(27.27)	3(20.00)	7(43.75)	9(100.00)	24(40.00)

Personal Health Management	5(55.56)	6(54.55)	8(53.33)	11(68.75)	7(77.78)	37(61.67)
Physical and Social Support	1(11.11)	3(27.27)	5(33.33)	6(37.50)	7(77.78)	22(36.67)
Total	9	11	15	16	9	60

Source: Author's calculation

The usage of ATs exhibits significant variations across different age categories. Generally, personal health management devices are the most widely used, followed by mobility aids, physical and social support devices, and sensory aids. The use of personal health management devices remains relatively consistent, with 56% usage in the 60-65 age group and 78% among those aged 80 and above. Conversely, physical and social support devices demonstrate substantial variation, with only 11% of those aged 60-65 relying on them compared to 79% in the 80 and above age group. Mobility devices show a notable increase with age, reaching full adoption in the above-80 age group. The use of sensory aid devices also shows a consistent rise with age, with 56% usage in the above-80 age group. On the other hand, the usage of ATs does not vary greatly between males and females. Although females tend to use slightly more than males, the overall adoption rate remains relatively similar.

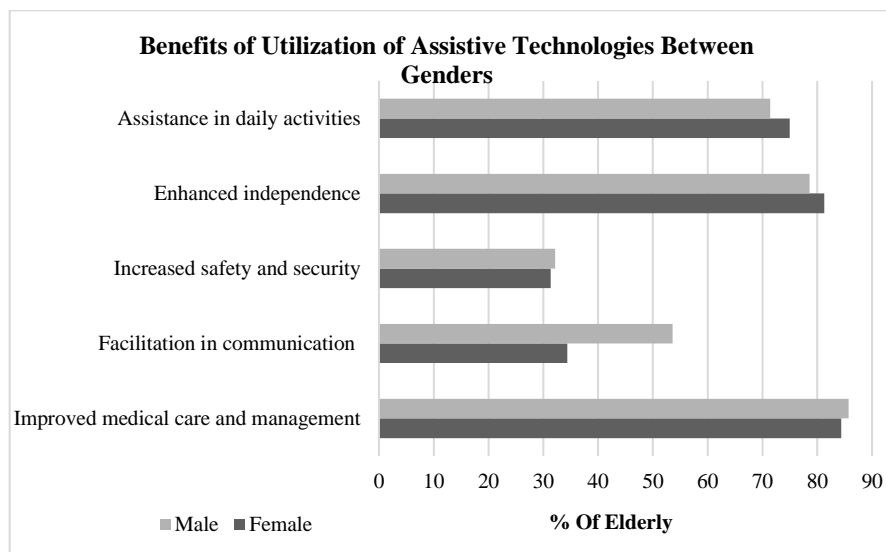
Table 3. Types of assistive devices being utilized by different gender (number (%))

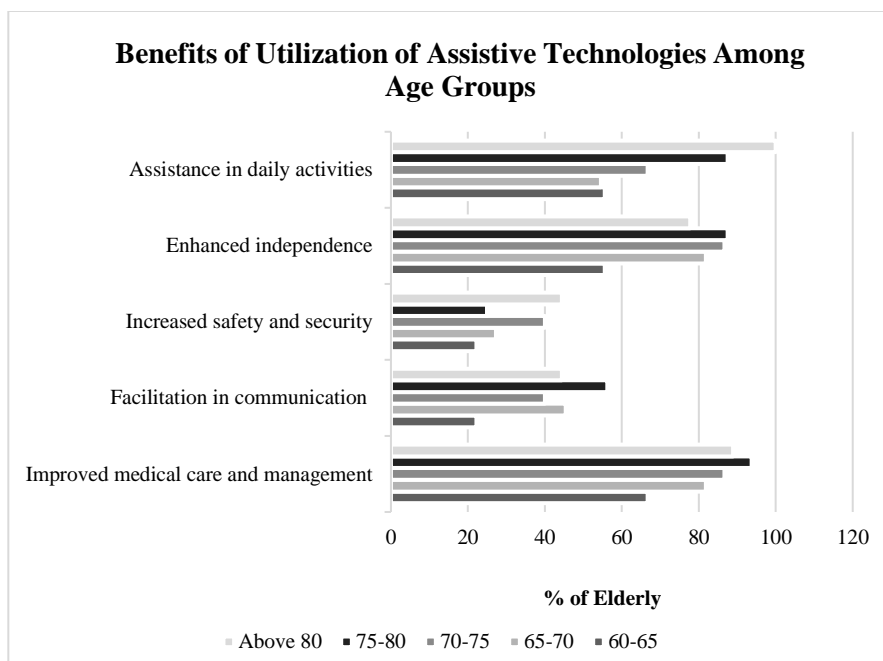
Type of Assistive Device	Female	Male	Total
Sensory	11(34.38)	8(28.57)	19 (31.67)
Mobility	12(37.50)	12(42.86)	24(40.00)
Personal Health Management	21(65.63)	16(57.14)	37(61.67)
Physical and Social Support	12(37.50)	10(35.71)	22(36.67)
Total	32	28	60

Source: Author's calculation

These ATs contribute significantly to improving medical care and management, providing assistance in daily activities, and enhancing the independence of the elderly. However, very few were reported to have benefitted in terms of communication, safety, and security. Both male and female respondents report the benefits of ATs in a similar proportion however they are shown to increase with age. ATs provide essential assistance in daily activities, particularly for those above 80, where 100% of respondents reported receiving support. Similarly, 93.75% aged 75 -80 reported to have improved medical care and management. The consistently high percentage of respondents citing enhanced independence through ATs across age groups underscores their role in allowing older adults to maintain a greater degree of autonomy. These results highlight the existing literature emphasizing the role of ATs in promoting independence and improving health management among the residents.

Figure 3. The proportion of elderly reporting different benefits of assistive technologies





Source: Author's calculation

The challenges associated with the use of ATs include fear of overdependence, difficulty in use and accessibility, lack of awareness about the existence of ATs, lack of privacy, and affordability. Lack of awareness is a notable issue, with over 65% reporting the same across all age groups. Particularly 77.78% above the age of 80 expressed a lack of knowledge about ATs. The second most prevalent concern is the fear of overdependence, with 46.67% of respondents expressing this worry, especially among those aged 60-65. However, the concern of overdependence seems to decline with age, suggesting a potential shift in perception as individuals recognize the benefits of using ATs over time. Privacy concerns affect 38.33% of respondents, with 66.67% of those aged 60-65 reporting this challenge, and affordability of ATs is a concern for 36.67% of participants, followed by difficulty in use and accessibility reported by 35.00%.

Table 4. Challenges faced in the utilization of assistive technology by age groups (number (%))

Challenges of AT	60-65	65-70	70-75	75-80	Above 80	Total
Fear of overdependence	5 (55.56)	6(54.54)	7(46.67)	7(43.75)	3(33.33)	28(46.67)
Difficulty in use and accessibility	4(44.44)	5(45.45)	5(33.33)	5(31.25)	2(22.22)	21 (35.00)
Lack of awareness about ATs	6(66.67)	7(63.63)	11(73.33)	12(75.00)	7(77.78)	43(71.67)
Lack of privacy	6(66.67)	4(36.36)	5(33.33)	6(37.50)	2(22.22)	23(38.33)
Affordability	3(33.33)	5(45.45)	8(53.33)	4(25.00)	2(22.22)	22(36.67)
Total	9	11	15	16	9	60

Source: Author's calculation

Discussions

The findings reveal a multifaceted landscape within the old age homes. The results suggest that there is a higher prevalence of females joining the old age homes at an earlier age than the males as well as those with some pre-retirement occupation as opposed to homemakers. The findings suggest that each demographic exhibits unique health challenges and preferences for care services. For age groups 60-70 years of age, creating a setting similar to their home environment can enhance their sense of comfort and autonomy, providing them with personal space for independent activities. At the same time, it is crucial for old age homes to offer specialized care tailored to individuals with specific diseases or those requiring assistance in daily activities. This tailored approach ensures that residents receive the appropriate level of support and medical attention based on their unique health needs. Though the majority of both males and females across all age groups

have reported having care services that are adequate for them to stay at an old age home, there is still a gap in areas such as the provision of social and emotional support and the use of assistive technologies for care services.

The higher educational attainment among the residents is intriguing as higher educational levels hints at greater awareness and utilization of available care services. Another factor to consider is the economic aspect. Higher educational attainment often correlates with better economic status. Individuals with higher incomes or better financial planning might be more willing and able to pay for quality care services, including those provided in old age homes. However, higher financial dependency on social security benefits highlights the need for sustainable government support to ensure the financial stability of the elderly population. Therefore, implementing financial support programs could make quality care services accessible to individuals regardless of their educational or economic backgrounds. The finding also suggests that the choice to reside in old age homes may often be influenced by external factors rather than a lack of familial connection. It is plausible that constraints such as limited time and resources for unpaid care at home, compounded by the increasing demands on the elderly, necessitate alternative care arrangements. This highlights the importance of fostering social connections and ensuring that residents continue to feel a sense of belonging and emotional support even within institutional care settings.

Furthermore, the high use of personal health management devices signifies a positive approach to early health monitoring and justifies the higher proportion benefitting from better medical care and management. On the other hand, the increasing usage of mobility and sensory aids, and physical and social support underscores the pivotal role of technology in providing essential assistance to address the challenges associated with declining health in the elderly. This increasing reliance on

diverse technological solutions signifies the crucial role of assistive devices in enhancing the overall quality of life and independence for older individuals facing various health limitations. However, there is a resistance and lack of familiarity to adopt new technologies, leading to underutilization among the elderly.

Nevertheless, it is critical to note that the questionnaires were completed by the older residents with the support of the staff, which can potentially introduce bias in the results. Additionally, there is a risk of inaccurate input from the staff, possibly driven by a desire to portray the facility in a favorable light. Unintentional errors during data entry could further compound these issues, resulting in misrepresentation of the residents' perspectives and experiences.

Conclusion and Future Research

In India, the elderly population is growing three times faster than the world average, highlighting the rising demand for diverse LTC services and revealing the gaps in care delivery. Technology has the potential to enhance accessibility, affordability, independence, and staff productivity in LTC. However, adoption remains limited, particularly among the economically disadvantaged and in rural areas. Though the government has responded with various initiatives, there remains a gap between awareness and utilization of government programs aimed at supporting the elderly.

It is important to acknowledge that this study focuses on LTC services of old-age homes in Bangalore, Karnataka. Variations in service provision may exist in other regions of the state and country. The study's coverage of urban areas limits the understanding of the people in rural areas, where fewer old age homes exist and demand is lower due to traditional family structures,

community support, and limited resources. Hence, the result is not generalizable to other regions and populations. Furthermore, the study's cross-sectional design, conducted over a brief three-month period, may not capture the dynamics of services and finances over an extended timeframe. Additionally, several factors such as the elderly's physical and mental condition and their understanding of the survey's purpose might have influenced the findings. These considerations underpin the importance of future research endeavors that provide a comprehensive and diverse approach to enhance the understanding of elderly care services and financial landscapes.

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APPENDIX

A. Socio-demographic profile of the elderly in old age homes

Age group	Gender [N(%)]		Grand Total
	Female	Male	
60 - 65	7 (21.88)	2 (7.14)	9 (15.00)
65 - 70	6 (18.75)	5 (17.86)	11 (18.33)
70 - 75	10(31.25)	5 (17.86)	15 (25.00)
75 - 80	4 (12.50)	12 (42.86)	16 (26.67)
Above 80	5 (15.63)	4 (14.29)	9 (15.00)
Grand Total	32 (53.33)	28 (46.67)	60 (100)

Educational Level	Gender		Grand Total
	Female	Male	
Bachelor's degree	11 (34.38)	15 (53.37)	26 (43.33)
Doctorate Degree	5 (15.63)	2 (7.14)	7 (11.67)
High school graduate	10 (31.25)	3 (10.71)	13 (21.67)
Master's degree	5 (15.63)	7 (25.00)	12 (20.00)
No schooling completed	1 (3.13)	1 (3.57)	2 (3.33)

Occupation before retirement	Gender		Grand Total
	Female	Male	
Private work	14 (43.75)	11 (39.29)	25 (41.67)
Self-employed	2 (6.25)	8 (28.57)	10 (16.67)

Government work	4 (12.50)	6 (21.43)	10 (16.67)		
Homemaker	11 (34.38)	NA	11 (18.33)		
Other	1 (3.13)	3 (10.71)	4 (6.67)		
Source of Income	Female	Male	Grand Total		
Social Security Benefits	25 (78.13)	23 (82.14)	48 (80.00)		
Real Estate	9 (28.13)	11 (39.29)	20(33.33)		
Family Business/Asset	13 (40.63)	9 (32.14)	22(36.67)		
Bank deposits/Mutual funds	16 (50.00)	12 (42.86)	28 (46.67)		
Number of children	Marital Status				
	Divorced	Married	Unmarried	Widowed	Grand Total
1	2 (28.57)	2 (6.90)	NA	6 (35.29)	10 (16.67)
		16			
2	2 (28.57)	(55.17)	NA	2 (11.76)	20(33.33)
		10			
3	1 (14.29)	(34.48)	NA	3 (17.65)	14 (23.33)
4	1 (14.29)	1 (3.45)	NA	2 (11.76)	4 (6.67)
More than 4	NA	NA	NA	3 (17.65)	3 (5.00)
No children	1 (14.29)	NA	7 (100)	1 (5.88)	9 (15.00)
Grand Total	7	29	7	17	60
Are you in touch with your family?	Female	Male	Grand Total		
No	5 (15.63)	4 (14.29)	9 (15.00)		
Yes	27 (84.38)	24 (85.71)	51 (85.00)		
Grand Total	32	28	60		