IJAAR PUBLISHING®

International Journal of Advanced Academic Research | ISSN: 2488-9849
Vol. 10, Issue 6 (June, 2024) | www.ijaar.org

THE ROLE OF ARCHITECTURAL DESIGN IN ENHANCING THE WELL-BEING OF AGING POPULATION IN MAKURDI, BENUE STATE

Eke Happiness[1], Ukaegbu Chikadibia Chinonye[2] & Ogugua Kelechi Kingsley[3]
[1,2] Department of Architectural Technology, Nigerian Army College of Environmental Science and Technology
[3] Department of Quantity Surveying, Nigerian Army College of Environmental Science and Technology

ABSTRACT

As the global population continues to age, addressing the needs and well-being of aging population becomes an imperative task for nations across the world, including Nigeria. The aging population in Nigeria is increasing, presenting challenges related to housing and public spaces. This research paper aims to investigate the role of architectural design in enhancing the well-being of the aging population and creating age-friendly environments in Makurdi, Benue State. The study focuses on accessibility, inclusive design, and their impact on the well-being of elderly individuals. The study explored existing literature, case studies were conducted and communities where engaged in the findings. Architectural interventions that promote inclusivity and address the specific needs of elderly individuals within the Benue context were recommended. This paper proposes a design model and practical recommendations for policymakers, urban planners and architectural interventions that foster a more inclusive and supportive environment that will enhance the well-being of the elderly in Makurdi, Benue State.

Keywords: Well-being, Aging population, Architectural Design, Age Friendly Environments

Eke, H., Ukaegbu, C. C., & Ogugua, K. K. (2024). The Role of Architectural Design in Enhancing the Well-Being of Aging Population in Makurdi, Benue State. *International Journal of Advanced Academic Research, 10*(6), 224-240. DOI: 10.5281/zenodo.13770537

I. INTRODUCTION

Aging, as defined by the Oxford Advanced Learner's Dictionary, is the progression of advancing in age (Oxford Advanced Learner's Dictionary, A.S. Hornby, 6th ed). Aging is now a worldwide occurrence and a matter of policy garnering attention from governments around the globe. In Africa, nations are encountering demographic and epidemiological shifts, presenting distinctive policy challenges and information requirements (Egunyomi 2012).

The increase in number of older adults during the last few years has impacted more importantly on the political, economical, and social capacity of societies in both developed and developing regions. The percentage of older persons aged 60 years and above make up 12.3% of the planetary population, and by 2050 that percentage is expected to nearly double. Sub-Saharan Africa, which has the smallest percentage of elderly and which is aging more slowly than the developed regions, is protrusive to see the absolute magnitude of its older population grows by 2.3 times between 2000 and 2030 (United Nations 2019) Population growth poses various social and economic challenges, yet implementing the right set of policies can empower society to address these challenges proactively.

As of recent years, Africa, including Nigeria is witnessing a demographic shift with an increasing aging population and efforts are being made to integrate global best practices into local contexts to address the specific needs of seniors. The increasing number of the elderly in Nigeria are, among others, ascribed to the crude fatality rate that is gradually declining (Adebowale, Atte, & Ayeni, 2012). Aging in Nigeria is increasing against the concomitance of socioeconomic hardship, rapid urbanization, changing family structures, shifts in intergenerational relationships and widespread poverty (Adebanjoko & Ugwuoke, 2014).

The changing global demographics have significant implications for designing living environments for older adults. With evolving needs and standards, interior designers and architects face exciting challenges and opportunities to create innovative solutions that enhance seniors' well-being and longevity. Various design philosophies, such as accessible, universal, and rehabilitative design, aim to address these needs. However, design practitioners must evaluate the effectiveness of each approach for individual users. Collaborating with caregivers, they should develop strategies to help the elderly compensate for physical and mental health declines. (Kopec D. 2012)

II. AIM AND OBJECTIVES

The aim of this research is to investigate how architectural design can enhance the well-being of the aging population in Makurdi Benue State, with a focus on accessibility, inclusive design, and age-friendly environments. The outlined objectives are:

i. To pinpoint the primary challenges faced by the elderly in utilizing and accessing the built environment.
ii. To review existing architectural interventions for aging populations globally and their applicability in Makurdi Benue State.
iii. To propose practical architectural design model and interventions that promotes inclusivity and meets the needs of the elderly in Makurdi, Benue State.

III. LITERATURE REVIEW

The review of existing literature will delve into demographic trends related to aging in Nigeria, the importance of age-friendly environments, and the role of architectural design in

meeting the needs of the elderly. It will also examine global best practices and successful case studies of age-friendly architecture.

3.1 Aging Population Trends in Nigeria:

The older population in Sub-Saharan Africa is anticipated to increase significantly, surging from 46 million in 2015 to 147 million by 2050 (WHO 2007) Nigeria boasts the largest elderly population in African and ranks 19th globally, with the number of individuals aged 65 and above reaching 9.4 million in 2022 (Mbam et al., 2022) and expected to climb to 26 million by 2050 (Akintayo-Usman & Usman, 2021). The shift in population structure brings forth various implications for the well-being of the elderly, underscoring the importance of focusing on healthy aging (Rao et al., 2015).

Nigeria holds the position of the most populous country in Africa and ranks as the seventh-largest country globally. With a population estimate exceeding 206 million in 2020, the country is anticipated to surpass 401 million by 2050, positioning it as the third most populated country globally (UN 2019) Life expectancy at birth is recorded at 54.81 years, a 0.58% increase from 2019 (Fonseca et al., 2020). The population growth rate has seen a 2.58% increase since 2019 and it is projected that by 2050, 10% of the total population will be aged 60 and above.

The aging population in Nigeria is experiencing significant growth, primarily attributed to decreasing fertility rates and rising life expectancy (UN 2019). The United Nations estimates that by 2030, the population of individuals aged 60 and above in Nigeria will reach 25 million (UN 2019). This demographic shift presents a pressing need to address the challenges faced by the elderly and create age-friendly environments that cater to their unique needs.

3.2 Importance of Age-Friendly Environments:

Environmental psychology is a scientific discipline that intricately examines the interactions between individuals and the environments in which they reside and work, delving into the multifaceted dynamics that shape these relationships. To comprehend the influence of the physical environment on users, it is essential to collectively consider both the human environment and its surroundings. This holistic approach allows for a comprehensive understanding of the intricate dynamics at play between individuals and their external surroundings (Altaf et al., 2018) Different geographical, social, and cultural environments impact older adults' ability to sustain various activities, social interactions, and personal identities. Place attachment refers to the emotional, cognitive, and behavioral bonds individuals or groups form with specific socio-physical settings. Balancing basic needs (security, safety, and stability) with higher-order needs (exploration, stimulation, and environmental mastery) is essential for place attachment. This balance is linked to individual outcomes of autonomy and well-being, highlighting its importance for overall health and satisfaction in older adults (Bond et al., 2007). The significance of the relationship between individuals and their surroundings becomes paramount due to the fact that a substantial portion of our lives is spent within the constructed environment. Understanding and exploring this connection is crucial for gaining insights into the impact of the built environment on human experiences and well-being. The built environment serves as the backdrop for our lives, encompassing the spaces where we reside, evolve, acquire knowledge, and engage in work. Given that a predominant share of our time is devoted to activities within this constructed realm, it plays a central role in shaping our experiences and influencing various aspects of our daily routines. Consider, for instance, outdoor spaces such as parks or gardens. Despite being crafted from natural elements, these environments undergo deliberate redesign

by human hands, reflecting a fusion of nature and human ingenuity in the pursuit of creating purposeful and aesthetically pleasing settings. The configuration of spaces holds sway over the psychological responses of elderly individuals, subsequently influencing their attitudes and behaviors. This intricate interplay underscores the importance of purposeful design in fostering positive experiences and behavior among the elderly population. Environmental psychology offers a contemporary perspective for comprehending human behavior within the realm of architectural design, presenting a fresh and nuanced approach to exploring the intricate dynamics between individuals and their built environment.

Environments tailored for the elderly necessitate meticulous design, considering the specific needs and safety concerns of this demographic. This is imperative as the environment plays a pivotal role in shaping human attitudes and behaviors, particularly among the aged population. Thoughtful and purposeful design becomes a key factor in promoting a supportive and conducive atmosphere for the well-being of older individuals. Environmental psychology can play a crucial role in crafting supportive surroundings for individuals facing challenges stemming from physical, psychological, ailments, accidents, as well as the stress and tension associated with the demands of day-to-day lifestyles. By understanding the intricate interplay between people and their environments, tailored designs can be implemented to enhance the well-being and resilience of individuals navigating various life challenges. This awareness becomes particularly vital in centers that accommodate the elderly, as the built environment can exert a profound influence on the aging process and the overall quality of life. Recognizing this influence underscores the importance of purposeful and considerate design in these settings to positively impact the well-being and experiences of the elderly residents (UN 2019).

Age-friendly environments are crucial for ensuring the well-being and quality of life of the aged. The WHO Age-Friendly Cities drive highlights the importance of creating inclusive and supportive environments that enables the elderly to remain independent and actively engaged in their communities (WHO 2007). Age-friendly surroundings do not only enhance the friendly involvement of the elderly but also contribute to better physical and mental health outcomes (Chaudhury et al., 2014).

3.3 Architectural Design for Aging Populations:

When designing for the elderly, it is crucial to consider elements that support independence, autonomy, and health. According to (Perpetua et al., 2018) building design should include features that enable spontaneous social interactions, provide spaces for relaxation and psychological restoration, allow control over personal comfort, facilitate connections with nature, and incorporate meaningful changes and sensory variability. These aspects contribute significantly to the well-being of older adults in interior environments (Boyden 1971).

The notion of good health has evolved to include mental well-being, acknowledging the intricate connection between physical and mental aspects in defining an individual's overall health. (Day, K., Carreon, D., & Stump, C. 2000) state that "Design is regarded as a therapeutic resource to promote the well-being and functionality among people with dementia". Architects and planners should incorporate strategies for stress reduction and promoting relaxation into the design of built environments, particularly when envisioning living spaces tailored for the elderly. This involves thoughtful consideration of elements that contribute to a calming and supportive atmosphere, aligning with the specific needs and well-being of older individuals. In the meticulous design of indoor environments for the elderly, topics such as lighting, biophilic design, and colour theory demand careful attention. these

elements play integral roles in shaping the atmosphere, comfort and overall well-being of older individuals within living spaces. Several elements that can be taken into consideration include:

3.3.1 Arrangement of Space: Spatial organization encompasses various aspects, including the separation of spaces and the connection between outdoor and indoor environments. Thus involves the thoughtful arrangement and relationship between different areas within a design space. The arrangement of social or public spaces in relation to one another is a crucial aspect of spatial organization. It involves the thoughtful design of how these spaces interact and connect, influencing the overall flow and dynamics within a given environment. Spatial organization not only aids independence and arouse curiosity but is also crucial for the effective functioning of spaces. Ensuring that rooms are organized in a sequence from public to private contributes to a logical and purposeful flow within the environment, enhancing both usability and privacy consideration.

- The spatial organization should be designed to encourage resident participation rather than discourage wandering. This involves creating a layout that supports engagement and movement, fostering an environment where residents feel empowered to actively participate in their surroundings.
- Considering the challenges older individuals may face in remembering things, it is ideal to maintain a simple circulation between rooms. This straightforward design enhances ease of navigation and contributes to a more user-friendly environment for seniors.
- Limit entrances and exits: Restricting the numbers of entrances and exits can contribute to a more controlled and secure environment which helps simplify navigation for individuals, particularly for older adults.
- Circulation layout such as L-shaped, H-shaped, or square-shaped configurations, contribute to improved spatial orientation. These will provide clear and distinct pathways, enhancing ease of navigation and understanding of the space for individuals, particularly those who may face challenges in spatial awareness.
- Incorporating various colors, textures, and materials can play a significant role in reducing confusion, delineating different rooms, and aiding in way finding. This design strategy assists individuals in easily identifying spaces and directions within the environment.

3.3.2 Engaging Sensory experience: Another crucial design element to consider for elderly individuals is sensory experience. This encompasses various elements such as color, texture, light, materials, and sound. Creating an ideal sensory experience is not a one-size-fits-all solution; it varies based on the individuals, the specific environment, and the context of use.

3.3.3 Ecosystem and Scenery: Studies have shown that exposure to nature and well-designed natural spaces can mitigate cognitive decline in aging individuals, encourage socialization, reducing feelings of isolation, promote physical exercise and overall health. Incorporating nature into architectural spaces has proven benefits for mental health and cognitive function, especially in aging individuals. Architects should prioritize addressing the functional challenges of each room space as an integral aspect of overall planning. This approach aims to enhance the health, fitness, and learning abilities of older individuals. Exposure to greenery and natural landscapes has been linked to stress reduction, improved mood and enhanced overall well-being. Gardening creates a sense of involvement and encourages friendly interaction

3.3.4 Interaction: Humans are inherently social beings, driven to act, progress, and perform through interaction with other individuals and the surrounding environment in which we reside. This social engagement is fundamental to our well-being and functioning. When we talk about interaction we talk about space and space is a constant presence that envelops our existence. What can be seen, sampled, and the nature of its scene characteristics rely upon ones' view of the limited spaces characterized by components of structure.

Architectural design plays a pivotal role in creating age-friendly environments. Universal design principles, which emphasize the design of products and spaces that are accessible to people of all ages and abilities, are integral to promoting inclusivity for the elderly (Preiser et al., 2020). Design features such as level entrances, wider doorways, handrails, and well-lit spaces are essential components of age-friendly architecture (Oladunjoye & Obanor 2017).

3.4 Global Best Practices in Age-Friendly Architecture:

Several countries have successfully implemented age-friendly architectural design practices. For instance, the Netherlands' "Dementia Village". (Pedro, et al., 2020) exemplifies a community specifically designed to cater to the needs of persons with dementia, promoting autonomy with engagement (Van Boekel et al., 2017). Additionally, Japan's "Universal Design" approach focuses on creating barrier-free spaces that accommodate the elderly and individuals with disabilities (Wada & Wada, 2019). These examples serve as valuable references for implementing similar practices in Nigeria.

IV. METHODOLOGY

This research project employs a case study methodology (Stjelja, 2013). In this study a multiple case study design has been employed, where the use of multiple cases replaces the traditional quantitative research approach of control or comparison groups" (Stjelja 2013).

4.1 CASE STUDIES

TAFTA ON RIDGE

Background

TAFTA on Ridge, located at 51 East Street in Overport, Durban, KwaZulu-Natal, South Africa, is a facility operated by The Association for the Aged (TAFTA). This organization provides a range of services to support elderly individuals, promoting their independence and well-being. The facility caters to both independent and frail individuals, offering various types of housing suited to different levels of need. Residents have access to meals, organized activities, 24-hour nursing care, and weekly visits from a doctor. These services aim to enhance the quality of life for the elderly by ensuring their physical and emotional needs are met.

Physical Environment

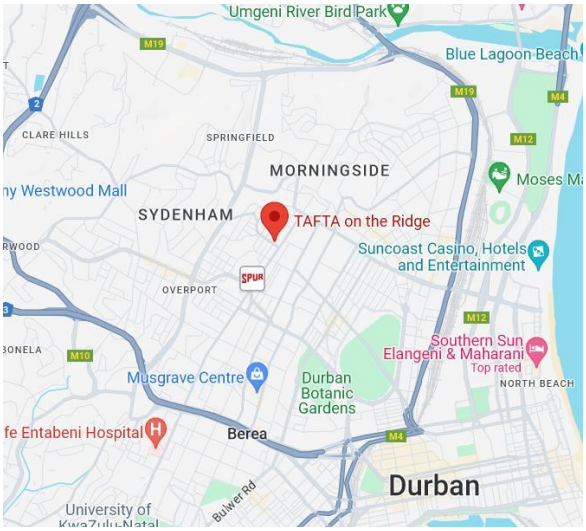


Figure 1:TAFTA on Ridge is situated in a largely residential suburban area at 51 East Street Overport, in Durban, KwaZulu-Natal, South Africa (Adapted from Google Earth, 2024)

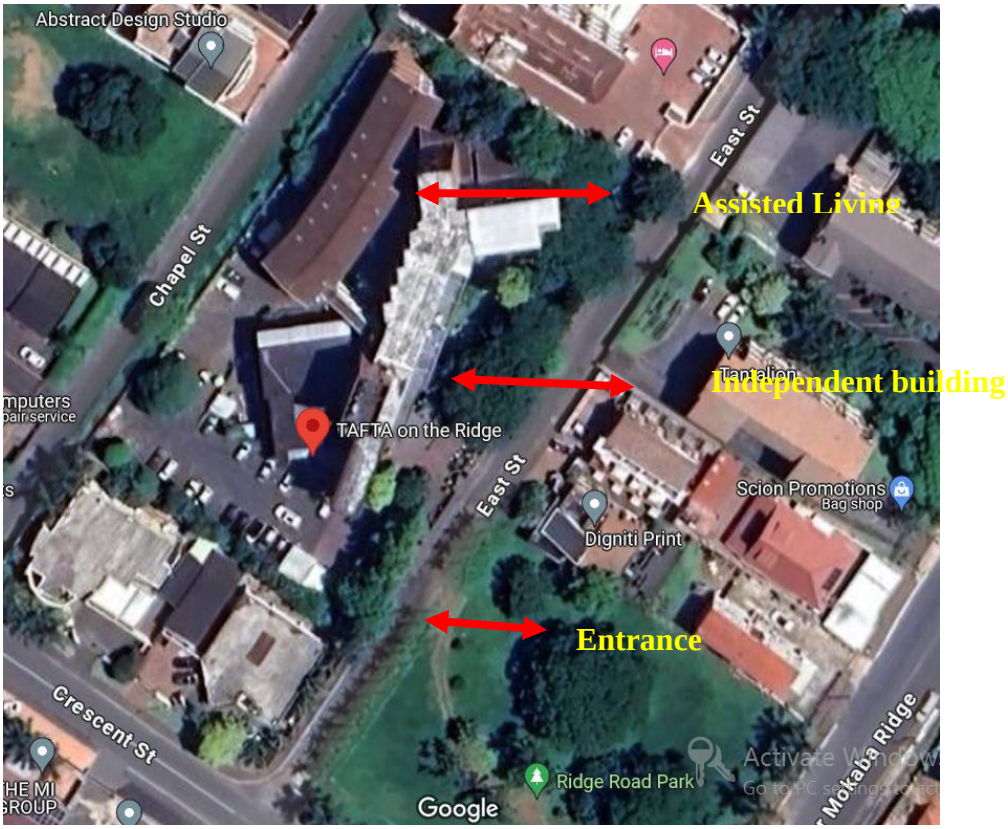


Figure 2: The facility is comprised of two buildings, housing assisted living and independent living, that are linked by a circulation bridge. (Adapted from Google Earth, 2024)

Location and Surroundings

TAFTA on Ridge, located at 51 East Street in Overport, Durban, KwaZulu-Natal, South Africa.

- **Proximity to Amenities:** The facility is situated in a primarily residential area with convenient access to public parks, convenience stores, public transport routes, and a shopping center less than a kilometer away. The close proximity to these amenities has been positively received by residents who often walk to nearby convenience stores and occasionally to the shopping center and engage in social activities.
- **Green Spaces:** TAFTA on Ridge includes a lush garden area that provides a serene environment for residents. This garden is located in front of the 'independent living' block, offering a space for relaxation and interaction with nature.

Schedule of Accommodation

TAFTA on Ridge is a five storey building with the following accommodation schedule:

- **Individual Bedrooms:** **159**
- **Communal Space:** **25**
- **Treatment spaces:** 1
- **Administrative Spaces:** **5**
- **Services and Stores:** **8**

Interacting with nature

Efforts have been made to enhance the connection with nature within the facility.

- **Incorporation of Greenery**
  - **Potted Plants:** Greenery has been introduced through potted plants in some single-loaded corridors, which also feature windows for ventilation and light. Although minimal, these plants help to soften the environment.
  - **Gardens:** The building includes a lush garden located in front of the 'independent living' block. This side of the building hosts the majority of the greenery, with a few additional trees in the parking lot, providing a visual connection with nature for that portion of the facility.
- **Communal Areas and Rooms**
  - **Ground Floor Lounge:** The communal lounge on the ground floor has the closest connection with the garden, opening directly onto it.
  - **Residential Rooms:** Individual residential rooms above the lounge overlook the garden, offering residents a view of the greenery.
- **Natural Ventilation and Air Quality**
  - **Ventilation Challenges:** Long double-loaded corridors hinder opportunities for natural ventilation, leading to poor air quality in some areas. This issue is particularly problematic where incontinence is a concern, as it can result in unpleasant odors.
  - **Natural Elements Concentration:** While natural elements are concentrated on one side of the facility, the adjacent block without garden views does benefit from the surrounding topography and suburban environment, incorporating both natural and built elements in the distance.
  - **Aviary**
  - **Communal Garden Feature:** The communal garden includes an aviary designed to enliven the space and allow residents to interact with birds. This feature has been positively received by both residents and staff.

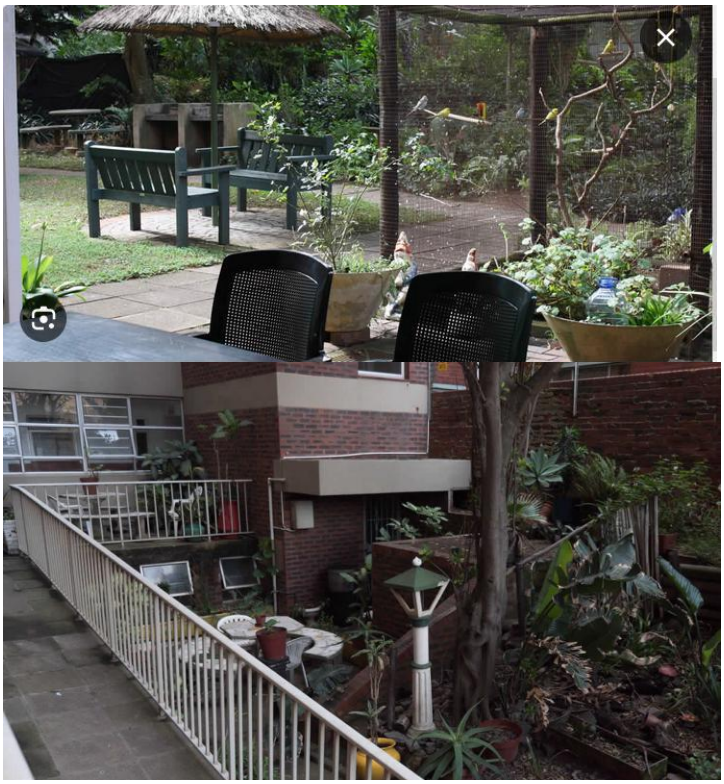


Figure 3: The lush garden within the site that is accessed through the communal lounge and is overlooked by the residential rooms. (Adapted from Google Earth, 2024)

Window view to the outdoors

Windows and apertures are present in different areas throughout the structure. Nonetheless, not all areas with the potential for outside views have windows. Additionally, certain windows that do open to the external environment offer unstimulating views, such as those in rooms facing the inner side of the building, resulting in a compact atrium devoid of invigorating elements.



Figure 4: The compact atrium. (Adapted from Google Earth, 2024)

According to [4], a window can serve as a retreat for reflection and relaxation, offering the added benefit of an outdoor view when seating is incorporated. This is particularly significant for the elderly, who may not always have the energy to go outside; visual stimulation through the window can help prevent feelings of isolation. In this specific facility, some rooms have

windows that provide substantial views of the surrounding environment and furniture arrangements that facilitate this connection.



Figure 5: A resident in the assisted living block. The furniture and room configuration allow her a pleasant view without necessarily getting out of bed. (Omarjee, J 2013)

- **Lighting**

Residents had mixed opinions about the lighting. Some felt it was adequate, while others thought it was insufficient. However, there was a general consensus that more natural lighting would have been preferable. Lighting issues were primarily encountered in the double-loaded corridors, which relied entirely on mechanical lighting. These corridors were often dim and unpleasant due to their lack of connection with the outside environment and limited potential for natural light, especially when residents kept their room doors closed. Although these corridors ended with a window, the natural light it provided was not enough to illuminate the long hallways, making the use of artificial lighting inevitable.

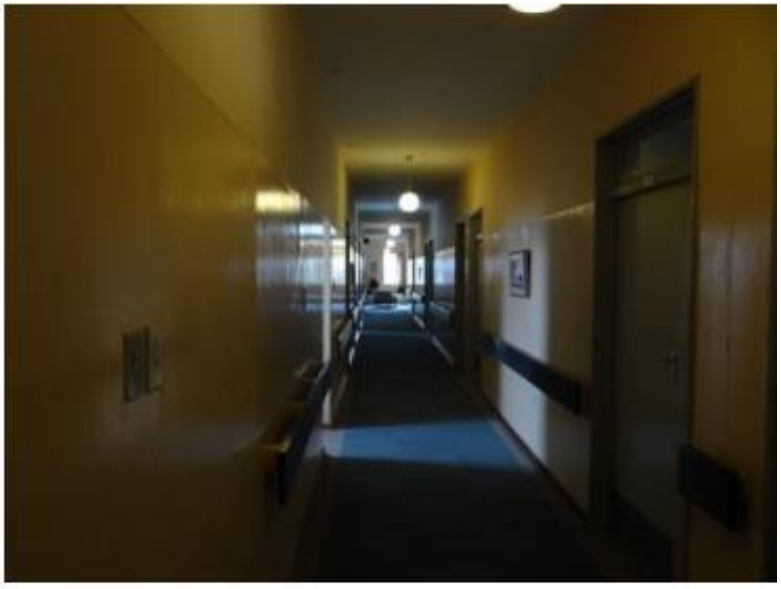


Figure 6: The double-loaded corridors that are primarily artificially lit. Natural light is present when residents leave their room doors open. The hallway terminates with a small window. (Omarjee, J 2013)

CENTER FOR PARENTAL CARE OF THE OLD AND VULNERABLE (CEPCOV)

Background

Center for Parental Care of the Old and Vulnerable (CEPCOV) is a privately owned Retirement Home, established in 2006 but was fully commissioned on the 10th of December, 2012.

They run in-and-out services for the elderly. The in-services are for Senior Citizens living in the facility while the outpatients are not admitted to the facility but they visit periodically for check-ups and medical care when there is a need.

Physical Environment

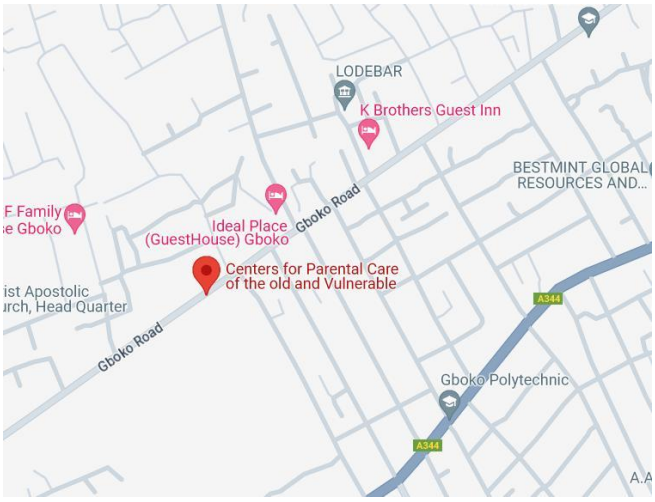


Figure 7: Center for Parental Care of the Old and Vulnerable (CEPCOV) situated at No 21. Yiman Ashaver Street, Judges Quarter Layout, Gboko Road, Makurdi, Benue State. (Adapted from Google Earth, 2024)

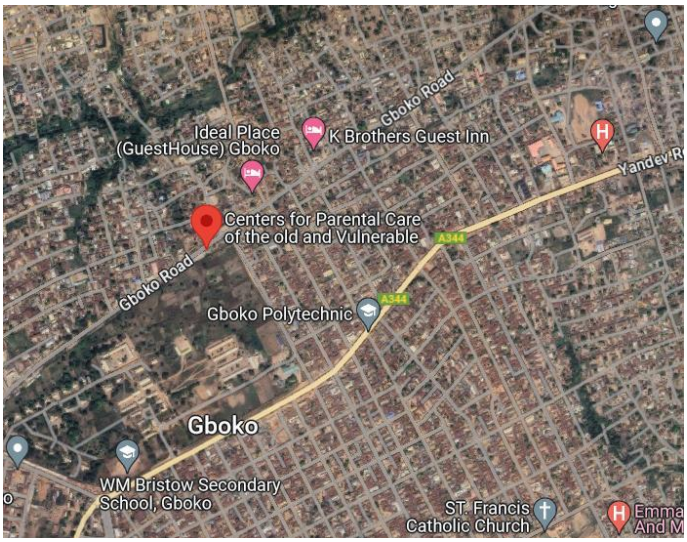


Figure 8: The building is a single unit building (bungalow) Adapted from Google Earth, 2024)

Surrounding Area:

- **Residential Setting:** The facility is located in a residential neighborhood, which provides a quiet and peaceful environment ideal for the elderly and vulnerable residents.

- **Access to Amenities:** The area is well-connected with essential services such as healthcare facilities, markets, and public transportation, ensuring that residents and visitors can easily access necessary amenities.
- **Community Integration:** Being in a residential area helps integrate the center with the local community, fostering a sense of belonging and support for the residents.
- **Natural Environment:** The surroundings have little green spaces, contributing to a serene atmosphere conducive to the well-being of the residents.

Schedule of Accommodation

Center for Parental Care of the Old and Vulnerable (CEPCOV) is a single unit building (bungalow) with the following accommodation schedule:

- Individual Bedrooms: 8
- **Communal Space:**
  - Reception 1
  - Main Dining Room 1
  - Lounge 1
  - Salon 1
- **Services and Stores:**
  - Kitchen and store 1
  - Laundry 1
  - Large Store 1

Lighting

Lighting is a critical aspect of the design at CEPCOV, with efforts focused on both natural and artificial sources to ensure a comfortable living environment.

Natural Lighting:

- **Large Windows:** The facility is designed with large windows to maximize natural light, creating a bright and inviting atmosphere for residents.

Artificial Lighting:

- **Corridor Lighting:** Artificial lighting is used in corridors to maintain adequate illumination, especially in areas where natural light is insufficient.



Figure 9: Corridor that is primarily artificially lit. Natural light is present when residents leave their room doors open. (Author, 2024)



Figure 10: Picture showing one of the views of the facility Center for Parental Care of the Old and Vulnerable (CEPCOV), Makurdi (Author, 2024)

IV. DATA DEDUCTIONS

TAFTA is genuinely committed to providing the highest quality care for its residents, who generally approve of the building. Staff note that the building emphasizes practicality over luxury, with concerns about lighting and accessibility raised by both residents and staff. Residents specifically dislike the communal unisex toilets, preferring more privacy. While the location is appreciated, residents wish for better community integration and views of

social activity. Though social spaces exist, their placement and design could be improved. Overall, the building has significant potential for enhancement.

TAFTA on Ridge was noted for its suboptimal natural light. Interestingly, many residents did not perceive the light quality as poor, though they agreed that more natural lighting would be beneficial. Sheila Rice mentioned that some residents complained about inadequate lighting due to their deteriorating vision.

CEPCOV is doing its best in providing a quality care for the elderly and vulnerable, who in their words are better than their homes. They run in-and-out services for the elderly. The in-services are for Senior Citizens living in the facility while the outpatients are not admitted to the facility but they visit periodically for check-ups and medical care when there is a need. Residents complain about narrow lobbies and inadequate recreational area for outdoor activities.

All residents interviewed from the two case studies were completely satisfied with the color schemes used in their homes. Colors have a psychological effect on people by triggering moods and emotions. They can be calming or stimulating, help foster concentration, or provide orientation. Interestingly, all the homes achieved a harmonious balance between calming and stimulating colors. (https://www.keim.com/colour-psychology/ KEIM. Beautiful colours for healthy living)

V. ANALYSIS AND DISCUSSION

Most elderly individuals interviewed emphasized the importance of improving architecture in housing and street design to better suit their needs. They strongly advocated for integrating the elderly into the community instead of isolating them. Many highlighted the necessity of creating environments that foster interaction between generations, promoting a symbiotic relationship between the elderly and younger people. This integration can be achieved through thoughtful architectural design that encourages communal activities and shared spaces, ensuring that both generations benefit from and contribute to each other's well-being.
However, there is a general consensus among elderly individuals interviewed in old-age and retirement homes that their immediate architectural environment would benefit from incorporating more functions that facilitate physical activity and easy socialization with the wider public. They also strongly believe that including gardens and courtyards with planting, trees, and water features is highly favorable. These elements are not only aesthetically pleasing but also have a revitalizing effect, contributing to their overall well-being and quality of life.

VI. CONCLUSION

The research investigate how architectural design can enhance the well-being of the aging population in Makurdi Benue State, The review of existing literature delved into demographic trends related to aging in Nigeria, the importance of age-friendly environments, and the role of architectural design in meeting the needs of the elderly. It unpacked the physical and social impacts of ageing and contextualised various needs and issues related to the elderly. Thereafter it investigated the manner architecture can contribute to fostering care for the elderly. Two case studies were investigated and explored architectural environments that function as a platform for caring for the elderly.

VII. RECOMMENDATION

The above conclusions can only be meaningful if they are truly addressed. Hence recommendations will be made based on the conclusions to aid the design of modern buildings that can aid the well-being of the elderly. Instead of creating separate house plans for different life stages, such as distinct plans for the elderly and young couples, today's designers aim to accommodate all stages and lifestyle changes within a single design. This approach ensures that "retirement house plans" are also suitable for younger generations, potentially eliminating the need to move later. By incorporating a few thoughtful features throughout the home, universal access for all individuals is achieved (Mascord https://houseplans.co/articles/planning-for-retirement-house-plans-for-seniors). Designing house plans to double for both the young and the elderly, consider the following list of age-in-place design elements.

- **One-storey designs or single-level designs**

As a person ages, walking up and down stairs becomes increasingly difficult. This is one of the challenges older individuals face.

- **Wheelchair accessibility throughout the home, particularly in the bathrooms.**

Showers should be designed without a curb, walk-in tubs are ideal for the elderly. Additionally, all transitional spaces must be wide enough to accommodate wheelchair movement. Ideally, all open spaces should measure at least 1.5m x 1.5m to allow for turning. Corridors should be as wide as possible, with a minimum width of 1.2m, unobstructed. Finally, a seat in the shower is beneficial for the elderly.

- **Non-slip.**

Falling is a significant concern for the elderly. Age-in-place homes should feature non-slip surfaces and grab bars in the shower and other areas prone to spills.

- **Open-concept layout.**

A combined kitchen, dining, and living area is generally easier for those in wheelchairs to navigate. Fewer twisting lobbies provide more room to maneuver, and furniture can be rearranged as needed over time. Additionally, open-floor plans allow individuals to monitor their surroundings using lines of sight rather than relying on hearing, which tends to diminish with age.

- **Bright, practical/functional lighting.**

While a young person might consider reading in dim light a romantic activity, this could be unbearable (or simply impossible) for an aged individual. Age-in-place house plans should incorporate ample daylight and task lighting to ensure bright illumination for any detail-oriented task a person may be undertaking.

CONFLICT OF INTEREST:

No conflict of interest

ACKNOWLEDGEMENT

This work is sponsored by Tertiary Education Trust Fund (Tetfund) for Institutional Based Research

REFERENCES

Adebanjoko, A., & Ugwuoke, O. W. (2014). Poverty and the challenges of insecurity to development. European Scientific Journal, 10(14), 361–372.

Adebowale, S. A., Atte, O., & Ayeni, O. (2012). Elderly wellbeing in a rural community in North Central Nigeria, sub-Saharan Africa. Public Health Research, 2(4), 92–101. doi:10.5923/j.phr.20120204.05

Akintayo-Usman, N. O., & Usman, S. O. (2021). Comparative analysis of ageing in Nigeria and United Kingdom using life course approach: the implication for the Nursing profession in Nigeria. *Pan African Medical Journal*, *38*(1).

Alexander, C. (1977) A Pattern Language, Oxford University Press

Altaf Engineer; Esther M. Sternberg; Bijan Najafi (2018) August 21 Designing Interiors to Mitigate Physical and Cognitive Deficits Related to Aging and to Promote Longevity in Older Adults: A Review)

Archdaily, (2018) wed oct 30th https://www.archdaily.com/tag/aging-population. https://www.archdaily.com 904759

Bond J, Peace SM, Dittmann-Kohli F, Westerhof G. (2007) Ageing in Society. Sage, , pp 209–234.

Boyden S. (1971) Biological determinants of optimal health; in Vorster DJ (ed): Proceedings of a Conference Held in Blantyre Malawi. London, International Biology Program, April 5–12.

Chaudhury, H., Mahmood, A., & Michael, Y. L. (2014). Older adults' outdoor walking and the built environment: does gender matter? Journal of Aging Research, 2014, 634738. https://doi.org/10.1155/2014/634738.

Day, K., Carreon, D., & Stump, C. (2000). The therapeutic design of environments for people with dementia: A review of the empirical research. *The gerontologist*, *40*(4), 397-416.

Egunyomi, D.A. (2012) "The Adults and Aged: The Nigerian Situation" in Osinowo, O.O., Moronkola, O.A., and Egunyomi, D.A. (eds.), The Adults and Aged in Nigeria: Issues and Researches. Royal People (Nigeria) Ltd. p. 1.

Fonseca, K. V., Kozievitch, N. P., Berardi, R. C., & Schmeiske, O. R. (2020). Information technology macro trends impacts on cities: Guidelines for urban planners. *Handbook of smart cities*, 1-24.

Johansson, R. (2007). On case study methodology. Open house international, 32(3), 48-54.

Kingsley Chima Mbam, Cal J. Halvorsen (2022). Pubmed.ncbi.nlm.nih.gov PMID:35951349 DOI:10.1093/geront/gnab121.

Kopec D. (2007) Designs that Protect: Culturally Sensitive Designs for Long Term Care Facilities. Washington, National Council for Interior Design Qualification monograph series,.

Kopec D. (2012) Environmental Psychology for Design, ed 2. New York, Fairchild books, , pp 133–150.

Muskan Baid, Dr. Vandana Agrawal.(2022) International Journal of Research (IJR) p-ISSN: 2348-6848 e-ISSN: 2348-795X Vol. 9 Issue 01 January 2022.

Okoye, U. O. (2012). Family care-giving for ageing parents in Nigeria: Gender differences, cultural imperatives and the role of education. International Journal of Education and Ageing, 2 (2), 139–154.

Oladunjoye, O. O., & Obanor, A. I. (2017). Towards developing age-friendly communities in Nigeria: Evaluating the built environment. The Journal of Architecture, 22(6), 846-869. https://doi.org/10.1080/13602365.2017.1391492

Omarjee, J. (2013). *Care for the elderly through meaningful architecture: a proposed intergenerational mixed-use development* (Doctoral dissertation).

Oxford Advanced Learner's Dictionary, A.S. Hornby, 6th ed. Oxford University Press.

Pedro, C., Duarte, M., Jorge, B., & Freitas, D. (2020). 440-Dementia villages: rethinking dementia care. *International Psychogeriatrics*, *32*(S1), 158-158.

Perpetua Lum Tanyi, Pelser André & Peter Mbah | (2018) Care of the elderly in Nigeria: Implications for policy, Cogent Social Sciences, 4:1, 1555201, DOI: 10.1080/23311886.2018.1555201https://doi.org/10.1080/23311886.2018.1555201

Preiser, W. F. E., Ostroff, E., & Egbelakin, T. (2020). Universal design: creating inclusive environments. In T. Egbelakin & W. F. E. Preiser (Eds.), Environmental Psychology and Human Well-Being: Effects of Built and Natural Settings (pp. 85-101). Springer. https://doi.org/10.1007/978-3-030-34849-1_5

Rao, K., Micic, D., Natarajan, M., Winters, S., Kiel, M. J., Walk, S. T., ... & Aronoff, D. M. (2015). Clostridium difficile ribotype 027: relationship to age, detectability of toxins A or B in stool with rapid testing, severe infection, and mortality. *Clinical Infectious Diseases*, *61*(2), 233-241.

Stjelja, M. (2013). The Case Study Approach: Some Theoretical, Methodological and Applied Considerations.

United Nations. (2019). World Population Prospects 2019: Highlights. Department of Economic and Social Affairs, Population Division. https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf

Van Boekel, L. C., Peek, S. T., & Luijkx, K. G. (2017). Diversity in day care services for people with dementia: A scoping review. International Psychogeriatrics, 29(10), 1607-1630. https://doi.org/10.1017/S1041610217000997

Wada, M., & Wada, K. (2019). Universal design and healthy longevity in Japan: How are they related? In H. C. Li & A. W.-C. Kwan (Eds.), Ageing in Asia: Asia's Position in the New Global Demography (pp. 159-175). Rout ledge. https://doi.org/10.4324/9780203731152-10

World Health Organization. (2007). Global Age-Friendly Cities: A Guide. World Health Organization. https://apps.who.int/iris/bitstream/handle/10665/43755/9789241547307_eng.pdf

Yazdanfar, A., B. Hoseini, M. Zaroodi, 2013. Public spaces and social interactions enhancement (Case study: Kosar residential complex and Ekbatan residential complex-phase 2). Urban Management journal. No 32 Autumn & Winter, 7-22