

Impact of designed exterior-built environment on enhancing the well-being and quality of life of the elders; A case of wellness sanctuaries in Sri Lanka

Anjana Amaraweera^{1#}, Malthi Rajapaksha², and M. N. R. Wijetunge³

*1*Student - Department of Architecture, FBESS, General Sir John Kotelawala Defence University *2*Senior Lecturer Gr II - Department of Architecture, FBESS, General Sir John Kotelawala Defence University *3* Associate Professor - Department of Architecture, FBESS, General Sir John Kotelawala Defence University

#<anjanaamaraweera123@gmail.com>

Abstract –Twenty first century resulted with the rapid urbanization and the population ageing as major key phenomena related to the elderly living in cities. The concept of the elderly home was born as a result of the significance of the modern concepts and variations occurred on the lifestyles of the younger population. The crucial need of identifying the responsiveness of the exterior environments of the wellness sanctuaries with related to the enhancing process of the well-being and the quality of life of the elders in the present scenario. The research focuses on identifying the effectiveness of the well-designed exterior environments of the elderly homes to the process of maximizing their well-being in the final chapter of their lives. The architectural attributes regarding the exterior façade and the exterior landscape will be taken to consideration with reviewing the deep study on literature to flow up the study. Approach will be taken from the three case studies with the observations, structured questionnaire and semi structured interviews. The study analysed case studies to identify neglected attributes in elders' living spaces and suggest improvements. Elders' perspectives highlighted the need for consideration of exterior environments. The study highlighted the relationship between humans and nature, and confirmed the importance of architecture in solving these issues. This study will support future decision-making in designing for elders, as Sri Lanka ranks first in South Asian population aging.

Keywords – Population ageing, Quality of life, Well-being, Active ageing, built environment response

I. INTRODUCTION

Population aging is a global demographic megatrend affecting health, medical advancements, economic and social developments, and sustainable development. In 2019, the world's older population reached 703 million, with Eastern and South Eastern Asia having the largest number of senior citizens (Amarasekara,2013). Population ageing is a key demographic problem of the twenty-first century, with one in every nine people being an elder 60

years or older. By 2050, this number is predicted to increase to one in every five, and senior citizens are expected to surpass minors in 2047 for the first time in history (UNFPA,2014). The World Health Organization has developed the WHO Age-friendly Cities Framework, which identifies challenges and barriers to enhance senior citizens' wellbeing. The Global Age-friendly Cities Guide aims to create a framework for developing inclusive cities, addressing the challenges faced by senior citizens (Menike, 2015).

Architecture, as an applied art, can create meaningful spaces for healing lonely individuals in their later stages of life. Previous research has focused on the relationship between indoor environments and maximizing the well-being of elderly residents. However, there is a lack of research on the relationship between exterior environments and elderly communities.

Relationships between nature and outdoor environments are therapeutic for senior citizens, as they have high thermal comfortability in their homes. Elderly people have a strong desire for fresh air and sunshine, and enhancing the quality and comfortability of their inner spaces can improve the comfort of elderly homes. However, the ability to engage in nature and outdoor environments becomes difficult with age, making the exterior environment crucial for the well-being of elderly individuals.

A. Objectives

1. Conducting a deep study on case studies which are related to healing architecture and elderly homes.
2. Assetting the design principles to maximize the wellbeing on elderly homes
3. Applying to the scenario with architectural aspects.

B. Aim

Analysing the contribution of architectural aspects and design principles to maximize the human wellbeing on

wellness sanctuaries which are specially designed for senior citizens.

II. METHODOLOGY AND EXPERIMENTAL DESIGN

First of all, a deep critical review of literature will be done to have clear understanding about the certain parameters of healing architecture according to the topic followed with the case studies to select different context to investigate the problem. In addition, qualitative data will be taken through observations and interviews will be done with purposive sampling with the help of doctors, nurses or attendants, elders, care takers and the visitors of the patients.

The literature review highlights the importance of designed exterior environments in enhancing the well-being and quality of life of elderly residents. This study focuses on architectural attributes that improve the well-being of elders, focusing on two main factors: architectural attributes and social attributes. The study will use a list of architectural parameters from the literature review and semi-structured interviews to assess the exterior environments of elders' homes.

The study examines the impact of designed exterior environments in elderly living homes on their well-being and overall life cycle. The goal is to provide essential facilities, safety, comfort, and freedom for the elderly, allowing them to live their lives to the fullest and alleviate their regrets. The research is based on three case studies in Kandy city, each with an exterior environment for recreational activities. The selected case studies were chosen due to easy accessibility and safety during the COVID-19 pandemic. Case studies assessed exterior environments of elders' homes using architectural attributes and semi-structured interviews to identify social attributes for enhancing well-being through exterior environments.

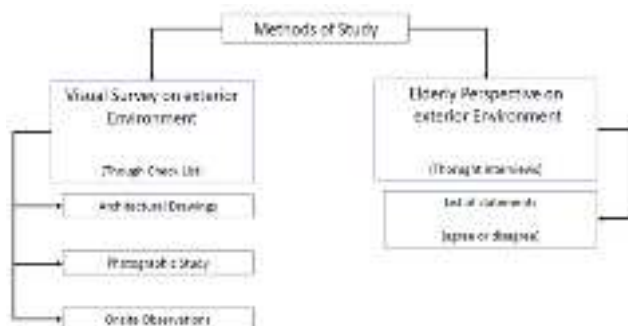


Figure 2: Methods of analysis diagram

The study assessed case studies on the impact of exterior environments on elders' wellbeing and quality of life. It focused on architectural attributes and social attributes,

analysing data through observations, structured questionnaires, and semi-structured interviews. The analysis aimed to identify the effectiveness of well-designed exterior environments in enhancing the wellbeing of elderly residents. The comparison of case studies was made to determine the most relevant factors for enhancing well-being.

III. RESULTS

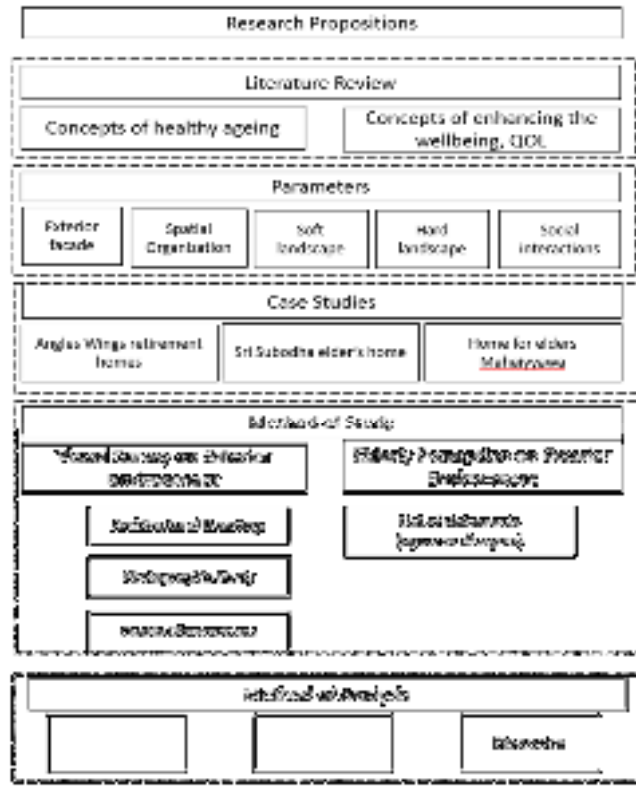


Figure 1:

Comparative analysis of visual survey results

Table 1: Comparative analysis of visual survey results case 1

Attributes	Case study 01 (Angel Wings elders' home)
Architectural attributes on the landscape of the exterior environment	
Pathways & pavements	Entrance and the pathways maintained on a single level with low slopes to make easy accessibility and secure the safety of the elders.
Sheltered spaces	A shelter was created the exterior façade in the front elevation through the help of extension of flat slab. A shelter which was created from the canopies of trees in the edge of the site in the front boundary.
Seating arrangements	There was absence of seating arrangements regarding the outdoor spaces. The edge of the front boundary where it has a natural shelter can be utilized with the seating arrangements.
Greeneries	There were greeneries in the edges of the front boundary.

Buffer zone	There was an absence of buffer zone in the design.
Elements	Elements which are create by the elders were places in the front façade of the elderly home. Elements such as grown plants were maintained by the elders were willing to engage with the outdoor activities.
Materiality usage	The material usage of the outdoor spaces was well concerned. Non slippery, easiness of maintenance materials was used to secure the safety and easy accessibility of the elders.
Architectural attributes on the exterior façade of the elderly home	
Door- window proportions and placements	Ground floor consists with the common spaces where they do gather with every one and the door and the windows are placed accordingly. There is a lack of consideration provided on the upper floor because only two windows were placed in the front façade and it is not sufficient to grab the daylight or ventilation to indoor spaces. But still the rooms are fond of opening which is considerably place to take the maximum advantage of the surrounding nature.
Eves and extension of slabs	Extension of the flat slab of the upper floor was taken advantage of providing shelter in the front façade. Other than that, there is an absence of taking advantages of the eves.
Corridors	The elderly home design was converted in a single building which was functioned as a hotel, there were no corridor space in the design.
Verandas	No verandas were observed in the design regarding the exterior façade.
Views and vistas capturing	Common lobby catches the views of the front spaces of the design and the views of the landscapes of the Hanthana hills were captured in the rear. Apart from that the openings and the windows on the bedrooms were placed to catch the scenic beauty of the surrounding context which is fond of greeneries.
Materiality usage	Non-slippery materials which do have easy maintenance were applied in the exterior environment of the design.

Sheltered spaces	Accommodation buildings of male and female elders were sheltered through the extension of flat slabs. Each and every pathway were sheltered from the canopies of the trees. Rear garden of the elderly home was fond of natural shelters.
Seating arrangements	There were no seating arrangements provided in the exterior environment even they do have the ability of providing the facility to the natural sheltered spaces.
Greeneries	Greeneries were fond of each and every space in the elderly home.
Buffer zone	The need of the buffer zone was fulfilled through the fence which was created in the front boundary of the site through plants with similar scale and growing medium.
Elements	Elements were placed in the central courtyard and maintained by the elders who are daily engaging with the outdoor environment.
Materiality usage	Material usage of the spaces were concerned during creating pathways and other spaces through providing variations. Combination of the material were well considered while providing transitional spaces.
Architectural attributes on the exterior façade of the elderly home	
Door-window proportions and placements	Each and every building of the elderly home design were placed according to the consideration of the sun path and the wind direction. Each and space are visible through openings and windows where it always visible greeneries and comfort the indoors to avoiding the heat stresses by taking the maximum advantage from the outdoors. Each and every room was consisted with two windows and a single door where it catches the daylight and breeze and ventilate the spaces.
Eves and extension of slabs	Eves and float slabs were extended to a sufficient distance to create shelters with the indoor and outdoor spaces.
Corridors	The corridor spaces were often observed in the design and it was full functioned in day today activities where elders hang around and express their feeling and communicate among them. Simply corridors were functioned as gathering space and relaxing space where the elders take their chairs out of the rooms and feel the greeneries by staying on the corridors.
Verandas	Verandas were commonly seen in the built spaces and it functions as gathering space.
Views and vistas capturing	Each and every opening which were created by the windows and doors of the built spaces in the design were taken advantage of providing views in to greeneries and the picturesque landscape views.
Materiality usage	Deviation of materials can be seen through the transitional spaces. Non- slippery materials which have easy maintenance were included in the design.

Table 2: Comparative analysis of visual survey results case 2

Attributes	Case study 02 (Sri Subodhi elders' home)
Architectural attributes on the landscape of the exterior environment	
Pathways & pavements	Entrance pathways was slightly sloped ramp with the absences of handrails. Other pathways were maintained on a single level with slightly maintained slopes.

Table 3: Comparative analysis of visual survey results case 3

Attributes	Case study 03 (King George elder's home)
Architectural attributes on the landscape of the exterior environment	
Pathways & pavements	Every pathway of the elderly home was maintained on a single level.
Sheltered spaces	Common gathering spaces of the design were sheltered through flat slabs. Majority of the outdoor engaging areas such as gardening spaces were sheltered through natural shelters.
Seating arrangements	There were seating arrangements placed on each and every outdoor space where the elders engage with exterior environment.
Greeneries	Considerable number of greeneries were seen in the mostly engaging outdoor spaces of the elders.
Buffer zone	Even though there was a crucial need of a buffer zone, it was still bounded with a fence in the front boundary. Sides and the rear ends of the site was buffered through the boundary walls.
Elements	Elements which were maintained by the elders were placed near the fence. Each of them was placed among the seating arrangements.
Materiality usage	Majority of the spaces of the outdoors were consisted with the cement carpet floor which is non slippery. Garden spaces were filled out with the natural soil surfaces.
Architectural attributes on the exterior façade of the elderly home	
Door-window proportions and placements	Each and every window and doors were proportionately positioned with the purpose of taking the advantage of daylight and ventilation.
Eaves and extension of slabs	There was an absence of taking advantage of the eaves and extended roofs.
Corridors	There were no corridors observed with in the exterior of the built spaces in the design.
Verandas	Male and female accommodation buildings were consisted with verandah spaces which they use as gathering spaces in their schedules.
Views and vistas capturing	
Materiality usage	Each and every element and the space of the design was done with the concrete and the materials which are used in the spaces supports to the well-functioning and enhance the quality of the space.

IV. DISCUSSION AND CONCLUSION

The global population's aging has led to a need for understanding the factors to consider when designing elderly homes in both outdoor and indoor environments. Elders in Sri Lanka often seek care and support from these homes, as they struggle with loneliness and disabilities. Despite being converted from older buildings, these homes often lack consideration for enhancing the quality of outdoor spaces. A critical review literature explored the effectiveness of well-designed exterior environments in maximizing the well-being and quality of life of elderly residents. Key findings from the study include deviations in architectural attributes and the need for better design considerations in elderly homes.

The study focuses on the experiences of elders in their homes, identifying factors and opportunities for improvement. Improvements in accessibility, natural elements, and seating arrangements can encourage elders to engage with the outdoors and improve their mental health.



Figure 3: Parameters of the assessment

Greenery, such as horticultural therapy, can refresh their mindsets and provide views and vistas. Engaging in outdoor activities, such as gardening, can also provide spiritual healing and therapy. Elders' satisfaction levels are significantly higher when they have access to greeneries and views.

Natural shelters, greeneries, and outdoor gathering spaces have been praised globally for their aesthetic value. Scientists have discovered the connection between nature and human wellbeing, particularly for elders. Experiences of nature promote healthy aging, reduce stress, and foster positive emotions and interactions. Additionally, they provide opportunities to interact with animals.

Horticultural therapy, such as gardening, is a common leisure activity that enhances physical and mental health. Doctors recommend activities like growing plants, sowing seeds, watering, harvesting, and making flower arrangements. The research identifies the contribution of architectural attributes to the exterior environment and the effectiveness of well-designed environments in enhancing wellbeing and quality of life.

REFERENCES

- National Center for Chronic Disease Prevention and Health Promotion, Division of Population Health, 2018. *Health-Related Quality of Life (HRQOL)*. [Online]
Available at: <https://www.cdc.gov/hrqol/concept.htm>
- Ahmad Ridzwan Othman, F. F., 2015. *Influence of Outdoor Space to the Elderly Wellbeing in a Typical Care Centre*. [Online]
Available at: <https://www.sciencedirect.com/science/article/pii/S1877042815000579>
- CHRIS PARKER, S. B. K. M., 2004. *Quality of life and building design in residential and nursing homes for older people*. [Online]
Available at: <https://www.cambridge.org/core/journals/ageing-and-society/article/abs/quality-of-life-and-building-design-in-residential-and-nursing-homes-for-older-people/03BD3A0294E8D5B7D1E59F784232D523>
- Christine Stephens, J. M. M. B., 2014. *Healthy ageing from the perspective of older people: A capability approach to resilience*. [Online]
Available at: <https://www.tandfonline.com/doi/abs/10.1080/08870446.2014.904862>
- David A. Kindig, M. P., Bridget C. Booske, P. & Patrick L. Remington, M. M., 2010. *Mobilizing Action Toward Community Health (MATCH): Metrics, Incentives, and Partnerships for Population Health*. [Online]
Available at: https://www.cdc.gov/pcd/issues/2010/jul/10_0019.htm
- David R. Phillips, O.-L. S. A. G. O. Y. K. H. C. C., 2004. *Factors influencing older persons' residential satisfaction in big and densely populated cities in asia: A case study in Hong Kong*. [Online]
Available at: <https://link.springer.com/article/10.1007/s12126-004-1009-0>
- David R. Phillips, O.-L. S. A. G. K. H., 2005. *The impacts of dwelling conditions on older persons' psychological well-being in Hong Kong: the mediating role of residential satisfaction*. [Online]
Available at: <https://www.sciencedirect.com/science/article/abs/pii/S0277953604005519>
- Gharaveis, A., 2020. *A systematic framework for understanding environmental design influences on physical activity in the elderly population: A review of literature*. [Online]
Available at: <https://www.emerald.com/insight/content/doi/10.1108/F-08-2018-0094/full/html>
- Jenkinson, C., 2022. *quality of life*. [Online]
Available at: <https://www.britannica.com/science/mental-hygiene/International-organizations>
- Jianxi Feng, S. T. X. C., 2017. *The impact of neighbourhood environments on quality of life of elderly people: Evidence from Nanjing, China*. [Online]
Available at: <https://journals.sagepub.com/doi/abs/10.1177/0042098017702827>
- Kathleen Connellan, P. K. M. G. M. [D. R. C. D. A. R. L. M., 2013. *Stressed Spaces: Mental Health and Architecture*. [Online]
Available at: <https://journals.sagepub.com/doi/abs/10.1177/193758671300600408>
- Lee Sookyoung, D. A. M. A. B. H., 2007. *Health Supportive Design in Elderly Care Homes: Swedish Examples and their Implication to Korean Counterparts*. [Online]
Available at: <https://koreascience.kr/article/JAKO200717338765014.page>
- Lingling Wang, Y. Z. F. W. L. D. P. E. S. L., 2021. *The Influence of the Built Environment on People's Mental Health: An Empirical Classification of Causal Factors*. [Online]
Available at: <https://www.sciencedirect.com/science/article/abs/pii/S2210670721004571>
- Lyon, C., 2017. *Humanist Principles, Sustainable Design and Salutogenics: A New Form of Healthcare Architecture*. [Online]
Available at: <https://onlinelibrary.wiley.com/doi/abs/10.1002/ad.2153>
- Mohammed, A. B., 2021. *Sustainable design strategy optimizing green architecture path based on sustainability*. [Online]
Available at: <https://www.tandfonline.com/doi/full/10.1080/16874048.2021.1990572>
- MS, R. O. H., 2008. *Effects of Therapeutic Gardens in Special Care Units for People with Dementia*. [Online]
Available at: https://www.tandfonline.com/doi/abs/10.1300/J081v21n01_07
- Oxley, H., 2009. *Policies for Healthy Ageing*. [Online]
Available at: <https://www.oecd-ilibrary.org/content/paper/226757488706>
- Pirret, L., 2017. *Colours of recovery : healing the mind through a journey of community connections and architectural spaces*. [Online]
Available at: <https://researchbank.ac.nz/handle/10652/4470>
- Post, M. W., 2014. *Definitions of Quality of Life: What Has Happened and How to Move On*. [Online]
Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4257148/>
- Qun Jin, B. W. S. N. A. O., 2017. *Ubi-Liven: A Human-Centric Safe and Secure Framework of Ubiquitous Living Environments for the Elderly*. [Online]
Available at: <https://ieeexplore.ieee.org/abstract/document/7815225>
- Schallock, R. L., 2004. *The Concept of Quality of Life: What We Know and Do Not Know*. [Online]
Available at: https://www.researchgate.net/publication/8674818_The_Concept_of_Quality_of_Life_What_We_Know_and_Do_Not_Know

Takemi Sugiyama, C. W. T. S. A., 2008. *Associations Between Neighborhood Open Space Attributes and Quality of Life for Older People in Britain*. [Online]
Available at:
<https://journals.sagepub.com/doi/abs/10.1177/0013916507311688>

WHO, 2022. *Ageing*. [Online]
Available at: https://www.who.int/health-topics/ageing#tab=tab_1

WHO, 2022. *WHOQOL: Measuring Quality of Life*. [Online]
Available at: <https://www.who.int/tools/whoqol>

WHO, 2022. *Why Should Cities Become More Age-Friendly?*. [Online]
Available at: <https://extranet.who.int/agefriendlyworld/why-become-more-af/>

XING, C. W., 2015. *KAWABA SANCTUARY: EXPERIENTIAL LIVING FOR THE JAPANESE ELDERLY*. [Online]
Available at:
<https://scholarbank.nus.edu.sg/handle/10635/221677>