EVALUATION OF USER BEHAVIORAL PATTERNS RESPONDING TO INTERNAL SOCIAL SPACES OF ELDERLY CARE RESORTS

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Abstract: This study investigates user behavioral patterns in the internal social spaces of elderly care resorts in Sri Lanka, contrasting them with the more common concept of elderly homes. Focusing on the local elderly community who reside in these resorts, the research explores how interior design and architecture impact their behavior and activities. Through case studies on three major elderly care resorts in Colombo, the study examines how elements like spatial arrangements, furniture placement, color psychology, and wayfinding methods contribute to the physical and mental well-being of elderly users. The research highlights the potential differences in responses between educated older individuals and other user groups, emphasizing the importance of designing spaces that cater to the diverse needs and preferences of the elderly. By identifying key elements that influence user perception and behavior, this study aims to contribute valuable insights for designers in creating more effective and accommodating spaces for elderly residents.

Keywords: *Elderly Care Resorts, User Behavioral Patterns, Interior Architecture, Social Spaces, Elderly Well-being*

1. Introduction

Atul Gawande discusses society's tendency to overlook the needs of the elderly, resulting in institutions that fail to make life meaningful for them in their frailty. He emphasizes that the focus often lies on societal goals such as freeing up hospital beds and reducing family burdens, rather than improving the quality of life for the elderly(Gawande, 2023). Architectural spaces, including interior design, furniture, and activities, can significantly influence the mental well-being of elderly individuals. This impact is relevant in both Sri Lankan and international contexts. As the elderly population grows rapidly, the need for adequate housing and welfare services increases. A survey conducted with elderly individuals revealed that many lack proper care from their children, who are often too busy to provide the necessary support. In traditional family structures worldwide, elderly people typically expect their married children to care for them. However, the concept of specialized housing has emerged as a solution to meet the needs of the elderly. Between 2013 and 2022, fifty-one studies focused on the impact of living environments on elderly lifestyles. Building on these studies, the current research aims to shift from the traditional notion of "elderly people's homes" to promoting "elderly vacation homes" or resorts. This new approach seeks to create a space for the elderly in society, ensuring they are respected and honored. The research underscores the importance of creating supportive and enriching environments for the elderly. It suggests that by reimagining elderly care facilities as vacation resorts, society can provide better care and improve the overall well-being of elderly individuals (Zairul, 2023).

1.1 RESEARCH OBJECTIVES
In many foreign countries, elderly resorts are common, but in developing nations like Sri Lanka, particularly those in the lower tiers, the concept is not well-established. Promoting nursing homes in the 21st century can be seen as society neglecting its responsibilities and social obligations.

Table 01: Research Objective Explanation

1.	Examine the **Relationship between Spatial Design and User Behavior**	Conduct a preliminary study of how the elderly use shared social spaces, identifying their behavior patterns and the positive and negative qualities of these spaces.
2.	Investigate the **Role of Interior Design in Promoting Well-being**	Assess the impact of interior design on the mental well-being and development of elderly residents in social environments.
3.	Identify **Barriers and Challenges in Spatial Planning**	Examine spatial plans from the users' perspective to identify barriers and challenges in implementing effective strategies for aged care facilities.

1.2 RESEARCH QUESTIONS
This research explores the intersection of spatial and interior design in elderly care resorts, aiming to enhance the well-being and experiences of older residents. Three key questions guide this study.
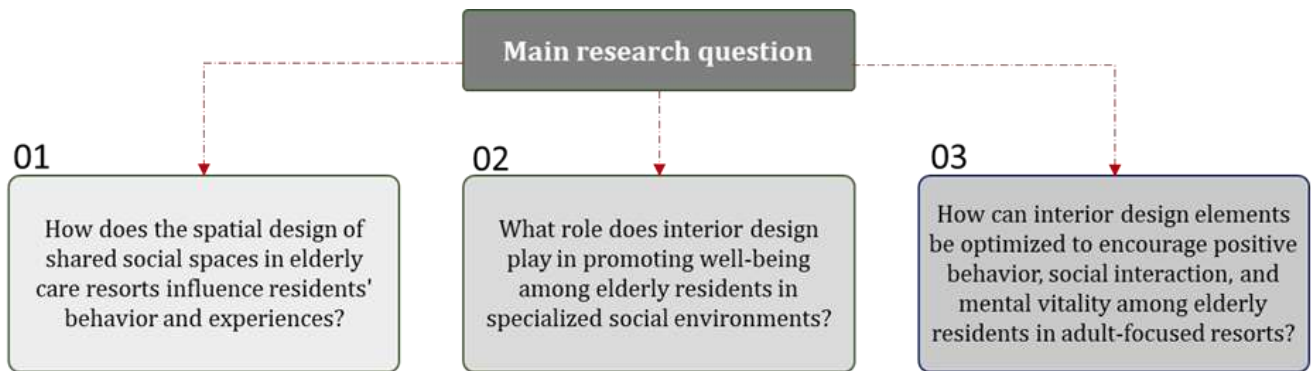

Figure 01: Three main research question explanation

Addressing these questions, the research seeks to uncover insights that can inform the creation of more supportive and enriching environments for elderly individuals in care settings.

1.3 SCOPE AND LIMITASTION
This study focuses on examining how interior design influences user behavior in shared social spaces within elderly care facilities. It seeks to identify and address weaknesses in existing facilities through interior architecture, emphasizing spatial arrangements, furniture layout, color psychology, and wayfinding methods. Specifically, the study explores shared areas like lobbies, dining rooms, and activity rooms where elderly residents interact socially. It considers user preferences, functionality, social engagement, and psychological impact to understand how design elements affect behavior and well-being.

Table 02: Research Scope Explanation [design metrices]

SCOPE	Design matrices	focused shared social areas	LIMITASTIONS	
	1. spatial arrangements	lobby areas, dining rooms, activity rooms		**1. Generalizability** **2.** Individual Differences **3.** Contextual Factors **4.** Timeframe
	2. furniture arrangement			
	3. color psychology			
	4. wayfinding methods			

Despite these limitations, the study aims to provide valuable insights into how interior design can enhance elderly care environments, informing future design practices to better support the needs of aging populations.

1.4 ETHICAL CONSIDERATION
To protect the privacy and dignity of elderly participants, the research excludes their facial photographs and avoids disclosing personal information. This decision aligns with ethical standards and respects social norms, aiming to prevent potential breaches of privacy rights. The project's primary focus is to study elderly behavior within retirement home interiors across three specific resorts, ensuring the research is conducted ethically and respectfully.

2. Literature Review

In this review delves into the historical evolution, current nature, and interior design of nursing homes, emphasizing the relationship between design and user experience. It examines the general characteristics of elderly care facilities and the behavior patterns of their residents, presented in detail under several sub-topics.

2.1 HISTORY OF ELDERLY CARE HOUSES
Elderly care homes, also known as Elderly Homes or Assisted Living Homes, are classified into seven categories. Historically, these homes have played a crucial role in providing care and support to older adults, evolving from ancient civilizations to modern society. Today, there is a shift towards creating these homes as holiday homes, enhancing the living experience for elderly residents (University of Rochester Medical Center, 2023).
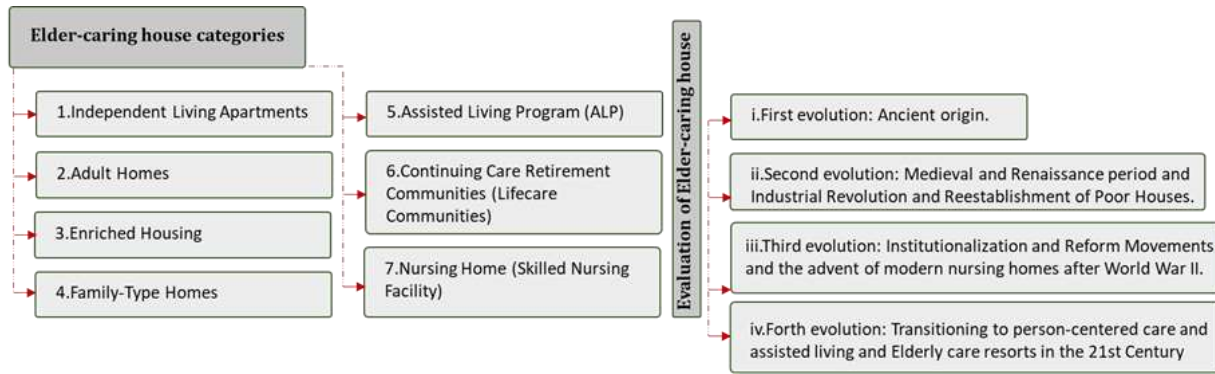
Figure 02: Seven Elder Care House Categories explanation (Source: (University of Rochester Medical Center, 2023))

a. First evolution: Ancient origin.
The historical evolution of elderly care homes, also known as Elderly Homes or Assisted Living Homes, can be categorized into six main phases. Initially, ancient civilizations like the Greeks, Romans, and Chinese recognized the need for elderly care. Shelters such as the "xenodochium" in Rome were established, and Chinese society practiced "filial piety," emphasizing respect and care for the elderly within family units (Wendy Wen Li,Smita Singh,C. Keerthigha, 2021).

b. Second evolution: Medieval and Renaissance period and Industrial Revolution and Reestablishment of Poor Houses.
During the Medieval and Renaissance periods, religious institutions took on the responsibility of elderly care, providing shelter through monasteries and convents. The Renaissance period saw the creation of charitable almshouses to alleviate poverty and provide for the elderly (Gilleard, 2002). The Industrial Revolution led to the establishment of poorhouses, though living conditions were often inadequate (Wendy Wen Li,Smita Singh,C. Keerthigha, 2021).

c. Third evolution: Institutionalization and Reform Movements and the advent of modern nursing homes after World War II.
The late nineteenth and early twentieth centuries saw a shift towards institutionalization, with almshouses being replaced by specialized institutions like hospitals and sanitariums. This period also saw the rise of reform movements and early advocacy organizations (Mariana Marinho Davino de Medeiros, Talita Malini Carletti, Marcela Baraúna Magno, Lucianne Cople Maia, Yuri Wanderley Cavalcant, 2020).Post-World War II, modern nursing homes emerged, influenced by medical advancements, increased government regulation, and social security programs (Phillips, 1986). In recent times, the focus has shifted to person-cantered care and assisted living, aiming to balance necessary care with fostering personal choice and independence (Res. J. B., 2020).

d. Forth evolution: Transitioning to person-centered care and assisted living and Elderly care resorts in the 21st Century
In the 21st century, elderly care has further evolved into the concept of elderly care resorts. These resorts provide a variety of accommodations and facilities designed to offer a comfortable and safe living environment. Enhanced personal care services, comprehensive medical care facilities, and a focus on social activities and recreation are hallmarks of these modern resorts (Abdul Kareem , Sweety Jamgade, 2021) (Res. J. A., 2016) (Ranthilaka Gedara Ariyawansa,Rasanjalee Perera,H. E. S Priyanka, 2021). Additionally, these resorts emphasize the importance of nutritious meals, catering to specific dietary needs and preferences (Teggart, 2022). These advancements reflect the significant developments in elderly care, transitioning from traditional homes to more dynamic and supportive environments.

2.2 THE NATURE OF ELDER CARING RESORT INTERIOR DESIGN
The interior design of elder care resorts focuses on creating comfortable, functional, and supportive environments for older adults who need specialized care or choose to live in retirement communities. The design prioritizes the unique needs and preferences of elderly individuals to ensure a safe and enriching living environment. Key aspects of this design approach include (Ann Petermans,Anna Pohlmeyer, 2014).

Table 03: Research Finding Explanation

	Design metrics	Finding Explanation
01	Spatial arrangements (Lindquist, 2007)	Elder care resorts prioritize spacious and accessible layouts to meet seniors' mobility needs. Open floor plans with wide corridors and doorways facilitate easy movement and reduce accident risks. Communal spaces and private living areas are strategically placed to encourage social interactions while maintaining privacy (Lindquist, 2007).
02	Furniture arrangement (Mathilde Vandenberghe-Descamps, Hélène Labouré, Chantal Septier, Gilles Feron, Claire Sulmont-Rossé, 2018) (Thompson, 2023)	Furniture in elder care resorts is arranged for comfort and functionality, featuring ergonomic and easy-to-use designs. Common elements include chairs with lumbar support, adjustable beds, and handrails to enhance safety and mobility (Mathilde Vandenberghe-Descamps, Hélène Labouré, Chantal Septier, Gilles Feron, Claire Sulmont-Rossé, 2018) (Thompson, 2023).

| 03 | Color psychology (astorn gardens, 2020) | In elder care resort design, color choices are crucial. Soft, soothing colors create a calming atmosphere and reduce stress while contrasting colors enhance visual clarity and aid in wayfinding. Avoiding bright or harsh colors maintains a serene and welcoming ambiance (astorn gardens, 2020). |
| 04 | Wayfinding methods (Caspi, 2014) | Wayfinding in elder care resorts is crucial, using clear visual and tactile signage to indicate room numbers, common areas, and emergency exits. Color-coded paths or symbols help make navigation intuitive, especially for residents with cognitive impairments (Caspi, 2014). |

- Comfort : Ensuring that the spaces are cozy and pleasant for residents.
- Functionality : Making sure that the layout and features of the space are practical and easy to use.
- Supportiveness: Providing design elements that aid in the physical and mental well-being of the residents.

In summary, spatial arrangements, furniture design, color psychology, and wayfinding are critical in elder care facility design. These elements promote well-being, independence, and social engagement, enhancing the quality of life for residents.

2.3 THE NATURE OF SHARED SOCIAL SPACES IN ELDERLY CARE RESORTS

Social spaces in aged care homes are designed to promote interaction, engagement, and a sense of community among residents, enhancing their well-being and quality of life. Key elements of these spaces are thoughtfully selected and decorated. A table can be arranged to understand these features better.
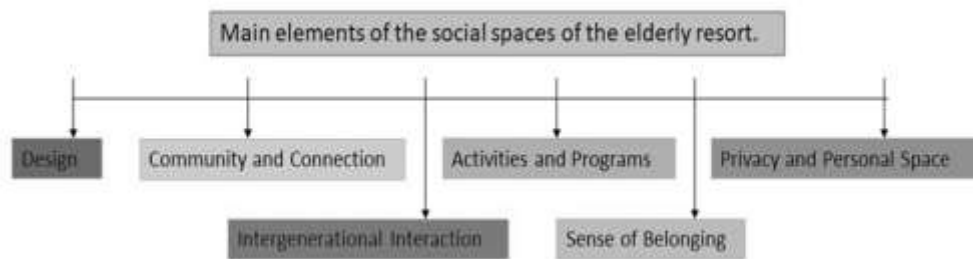

Figure 03: Main elements of the social spaces of the elderly resort.

Social spaces in elder care homes are essential for fostering community, offering social interaction and meaningful connections to enhance residents' happiness and quality of life. The study of interior spaces and behavior patterns in these facilities reveals the evolution of elder care, highlighting the importance of personalized, supportive environments. Modern elder care resort design emphasizes safety, accessibility, comfort, and attractive social spaces to promote well-being and social engagement among residents.

3. Methodology

3.1 RESEARCH APPROACH

The research employs a mixed methods approach, combining qualitative and quantitative data collection methods such as observation, surveys, and interviews. This approach aims to gather comprehensive insights into user behavior patterns and cognitive processes in nursing homes and aged care facilities. A cross-sectional approach is utilized to capture a snapshot of user experiences and behaviors within these environments.
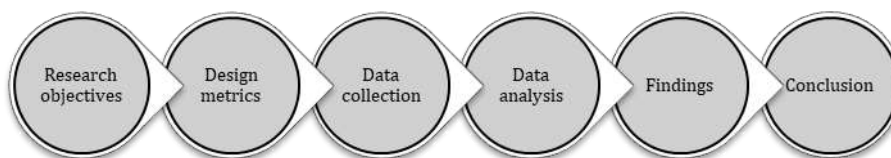

Figure 04: Research Design Steps

a. Research design: Selection of elderly resorts
To collect data effectively in elder care environments with and without shared social spaces, it's crucial to select a diverse sample of facilities based on location, size, type, and design. Obtain ethical approval from relevant authorities before conducting observations, surveys, and interviews to understand resident behaviors and experiences comprehensively. Standardize data collection methods to ensure consistency and reliability across facilities, while prioritizing participant confidentiality. Analyzing these findings will provide valuable insights into how shared social spaces impact resident well-being and social interaction, guiding improvements in elder care facility design and resident care practices.

b. Research design: Data collection method explanation
In this research design mainly focuses on three steps to collect data. There is chart for easy identification of the steps

Table 04: Research Design steps [data collection stage]

First step
• Observation Structural observation of shared social spaces should document user behaviour patterns, including spatial layout, furniture arrangement, lighting, colour schemes, and area features. Note all behavioural patterns, such as user interactions, activity levels, and space usage.
Second step
• Survey After observations, prepare a survey questionnaire based on literature and research objectives, covering user perception of interior design, satisfaction, social interaction, well-being, and behaviour patterns. Administer the survey to a representative sample of elderly residents in nursing and retirement homes, using a percentage scale for responses.
Third step
• Interview Semi-structured interviews were conducted with elderly residents in homes and resorts, selected based on presentation propensity and health. Participants answered open-ended questions about their experiences, preferences, and behaviour in social spaces, focusing on the impact of interior design. Interviews were recorded with ethical permission for future analysis.

c. Research design: Data analysis method explanation
All collected data will be analyzed using quantitative analysis, qualitative analysis, and data integration.

Table 05: Research Design steps [data analysis stage]

First step
• Quantitative analysis. Survey data analysis began with descriptive statistics, correlation, and inferential analysis to identify patterns in interior design elements, user behaviour, and perceptions. These quantitative findings are crucial for achieving the research objectives.
Second step
• Qualitative analysis. The qualitative data will be used to outline and categorize user experiences, perceptions, and behaviors, providing detailed examples to demonstrate quality.
Third step
• Data integration. To understand the effects of interior design on user behaviour, quantitative and qualitative findings will be compared, ensuring the validity and reliability of the results. The study will highlight any limitations or challenges and suggest areas for future research. Combining both data types will provide a comprehensive understanding of interior architecture based on user behaviour patterns.

Understanding care concepts helps designers create supportive environments. Elderly care resort design emphasizes safety, accessibility, comfort, and social spaces to foster community and positive behavior.

4. Selection of Elderly Care Resorts

Selecting elderly care resorts involves choosing accommodations and services for seniors needing daily assistance, and providing a comfortable and enriching environment to ensure their well-being and quality of life.

4.1 CASE STUDY 01: SITE ANALYSIS: CASE A

Figure 05: case study 01 site analysis explanation chart

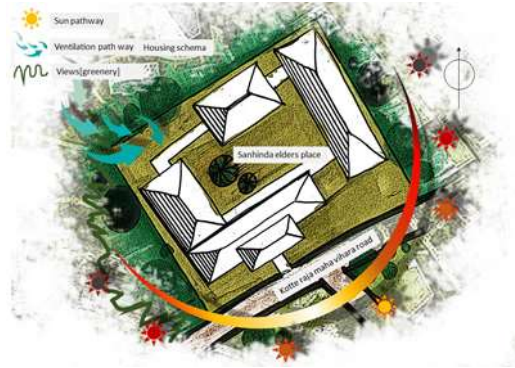a. Orientation, Natural Lighting, and Natural Ventilation

Figure 06: Case A: site analysis

The north-facing elder's resort allows ample morning sunlight, enhancing beauty and ambiance throughout the day. The site's abundant plants ensure fresh air circulation and a well-ventilated environment. The study tracks the sun's movement and wind patterns to optimize natural light and ventilation, designing buildings to minimize energy consumption. It also incorporates existing and proposed greenery for psychological benefits and shaded outdoor spaces. These elements create a well-designed environment that improves the well-being and comfort of residents at this elderly place.

4.2 CASE STUDY 02: SITE ANALYSIS: CASE B

Figure 07: case study 02 site analysis explanation chart

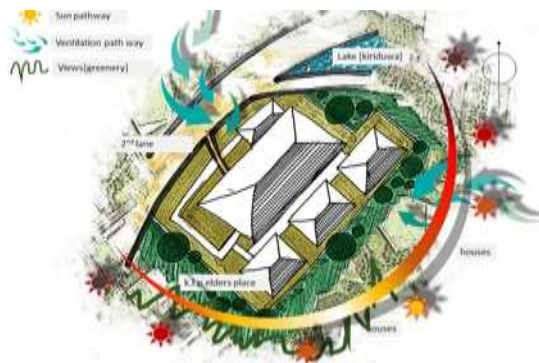a. Orientation, Natural Lighting, and Natural Ventilation

Figure 08: Case B: site analysis

The nursing house offers a tranquil setting with its location in a less crowded area next to the Battaramulla Traffic Police and behind a commercial complex. The proximity to amenities and services enhances convenience. The facility overlooks a large lake, providing scenic beauty and a serene atmosphere, with green plants contributing to a refreshing environment. The south-facing direction ensures morning sunlight, though shading mechanisms may be needed.

4.3 CASE STUDY 03: SITE ANALYSIS: CASE C

Figure 09: case study 03 site analysis explanation chart

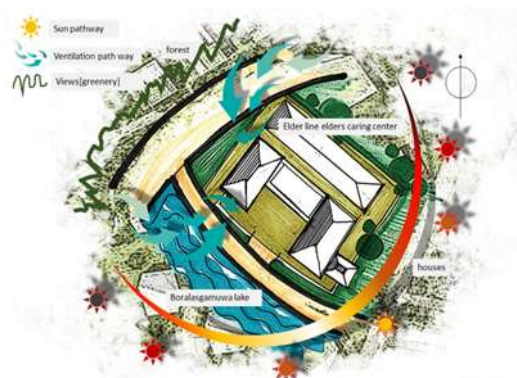a. Orientation, Natural Lighting, and Natural Ventilation

Figure 10: Case C: site analysis

The nursing home near Boralasgamuwa reservoir offers a scenic and tranquil environment, enhanced by the presence of a large lake and abundant greenery, creating a refreshing ambiance with walking paths. The west-facing orientation allows ample morning sunlight, which is managed through shading devices and strategic window placement to maintain a comfortable temperature. Despite its proximity to the main road, the facility is set back, ensuring a peaceful and quiet living space for residents. The modern Traditional design incorporates contemporary aesthetics and functional elements, providing a comfortable, visually appealing environment that contributes to the well-being of the residents.

5. Data Collection

This research assesses operations and resident experiences across three privately operated elderly care facilities: Case A, Case B, and Case C : through a mixed-methods approach. It combines qualitative interviews, quantitative surveys, and firsthand observations conducted on different days and under varying weather conditions to capture comprehensive insights. The study focuses on facility features, amenities, and resident feedback, with organizing committees at each home playing a key role in facilitating data collection aligned with their specific goals. By analyzing operational practices, policies, and service quality, the research aims to provide informed recommendations for enhancing the design and functionality of spaces tailored to elderly populations.

a. User identification experiment
To effectively study elderly residents, it is important to introduce oneself and encourage open conversations to ease discomfort. The study examines the impact of internal architecture on residents. To gather honest feedback, friendly methods will be used, and health and behavior will be observed in three small-sized models. This approach aims to obtain reliable and valuable information.
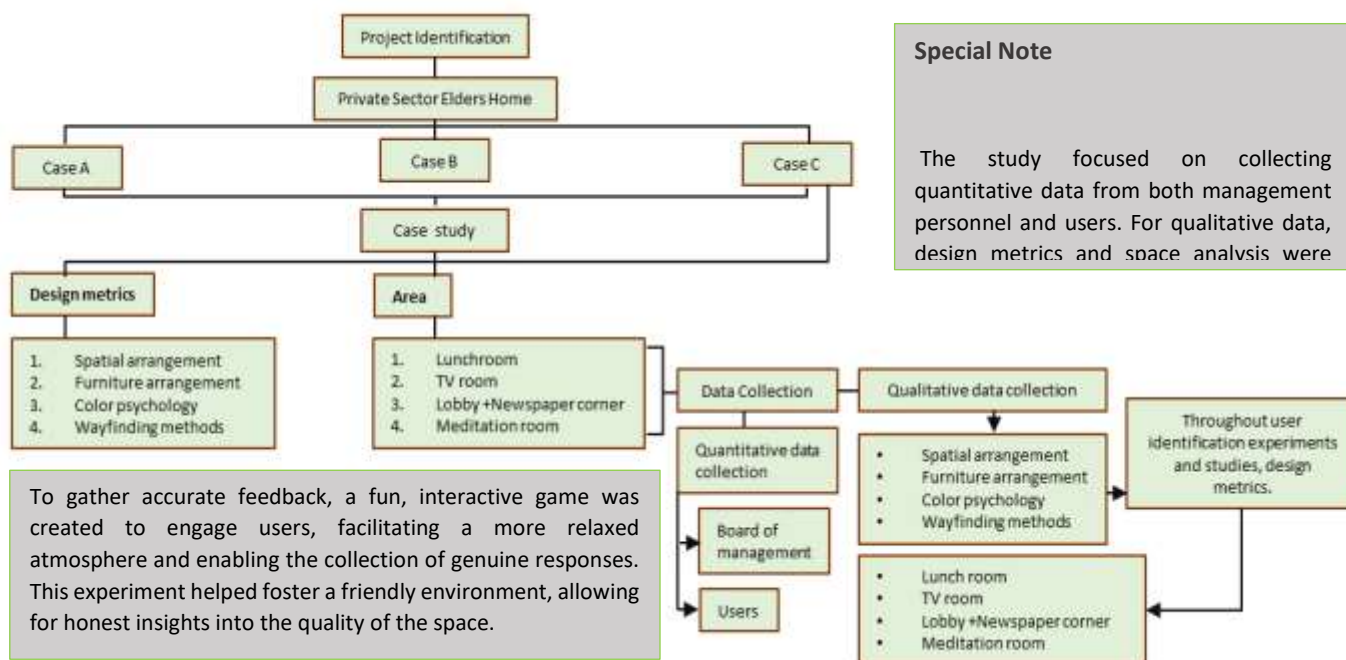
Figure 11: Project Organization Chart

Table 06: Project Organization Chart Explanation

Data collection [aims]
• The project aims to evaluate and gain insights into the operations and resident experiences of three privately operated elderly homes.   • The primary focus is on data collection feedback via targeted questionnaires.
Organizing Committees
• Each of the three selected elderly homes has its own organizing committee managing operations.   • The organizing committees are composed of key individuals who manage the respective homes.   • Their involvement is crucial for providing insights into the homes' processes, policies, and resident experiences.
Data Collection Process
• The researcher will work with the organizing committees to secure permissions and cooperation for data collection.   • Questionnaires will be provided to the organizing committees, ensuring alignment with each home's goals.   • While not all committee members may be involved in data collection, the project aims to gain insights by studying the homes' ongoing processes and operations.

Table 07: User Identification Experiment Steps Explanation

Step 01	In the initial step, participants receive 16 questions and 16 sheets of paper about three house models, with five prizes offered for participation.
Step 02	In the second step, each participant is assigned one of three colors and selects a house model. This step assesses their color perception and identifies any potential color blindness.
Step 03	Next, the roof of the chosen house model is removed, and participants freely select questions to answer, excluding professional inquiries. Personal information is collected separately during this process.

Participants start by receiving basic study information and filling out a questionnaire to provide personal details. They then engage in a fun activity with three house models to ease any professional pressure. After selecting a model, they answer a spontaneous question, providing genuine feedback. Responses are recorded verbally to capture authentic experiences. Participants also share insights from past social space experiences. The session ends with a friendly discussion, gathering suggestions for improvements.

Table 08: data collection details

Case Studies: Data Collection Details: Case A	
Interviews Conducted: 10 • **Respondents:** 1. 6 elderly residents (3 males, 3 females). 2. 3 employees. 3. 1 management staff. • **Recruitment:** Respondents were selected through purposive sampling, ensuring diverse perspectives. Consent was obtained via the organizing committee. • **Sampling Technique:** Purposive sampling.	Questionnaires: • Distributed: 15. • Collected: 12 (80% response rate). • Recipients: Elderly residents within the care home.
Case Studies: Data Collection Details: Case B	
Interviews Conducted: 12 • **Respondents:** 1. 8 elderly residents (4 males, 4 females). 2. 2 employees. 3. 2 management staff. • **Recruitment:** Similar to Case 1, respondents were identified and recruited with the assistance of the organizing committee. • **Sampling Technique:** Stratified sampling to ensure representation of key groups.	Questionnaires: • Distributed: 20. • Collected: 18 (90% response rate). • Recipients: Elderly residents.
Case Studies: Data Collection Details: Case C	
Interviews Conducted: 8 • **Respondents:** 1. 5 elderly residents (2 males, 3 females). 2. 2 employees. 3. 1 management staff. • **Recruitment:** Participants were selected based on availability and willingness to participate. • **Sampling Technique:** Convenience sampling.	Questionnaires: • Distributed: 10. • Collected: 8 (80% response rate). • Recipients: Elderly residents.

In total, 30 interviews were conducted across the three case studies, involving a diverse range of participants, including elderly residents, employees, and management staff. The recruitment strategies—purposive, stratified, and convenience sampling were carefully selected to ensure inclusivity and representation of various perspectives. Additionally, 45 questionnaires were distributed, with a high overall response rate of **84.4%**, indicating significant engagement and willingness of participants to share their feedback. The focus on elderly residents as primary recipients of the questionnaires ensured that the data reflected their direct experiences with the internal social spaces.

This comprehensive approach to data collection provided a robust foundation for both quantitative and qualitative analysis, enabling the study to capture a nuanced understanding of how internal spaces impact the well-being and behavior of residents within elderly care homes.
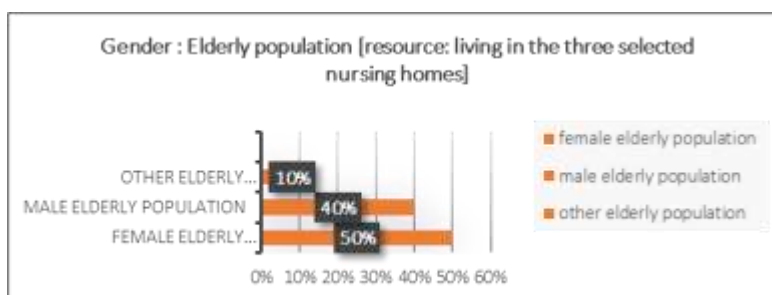
6. Data analysis

6.1 QUANTITATIVE ANALYSIS AND FINDINGS
The quantitative data collected through questionnaires were analyzed using descriptive statistics to identify trends and patterns. The analysis included demographic factors such as gender, age, and occupation, along with user reactions to various aspects of the internal social spaces. This approach provided comprehensive insights into the level of satisfaction among elderly residents, focusing on elements such as accessibility, lighting, and communal area usage.

a. Gender: Elderly Population
The method collects data on the gender distribution of residents in selected senior resorts, detailing the number of male and female occupants. [resource: living in the three selected elders' resort]

Chart 01: Personal information chart explanation [Gender]

Gender : Elderly population [resource: living in the three selected nursing homes]

OTHER ELDERLY... 10%
MALE ELDERLY POPULATION 40%
FEMALE ELDERLY... 50%

■ female elderly population
■ male elderly population
■ other elderly population

0% 10% 20% 30% 40% 50% 60%

Examining gender distribution in senior resorts provides insights into elderly demographics and potential gender imbalances. This data helps tailor services and amenities to better meet the specific needs and preferences of male and female residents, ultimately improving the quality of care in senior living communities.

b. Age: Elderly Population
The method collects data on the age demographics of residents in selected senior resorts, detailing their age ranges and distribution. [resource: living in the three selected elders' resort]

Chart 02: Personal information chart explanation [Age]
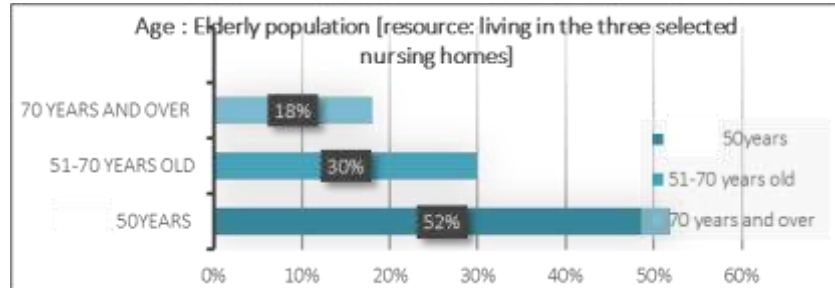
Analyzing age distribution in senior resorts provides insights into resident age groups and trends, helping researchers understand senior preferences and needs at different life stages. This data allows for tailored services and programs to better support varying resident needs, ensuring inclusive and supportive environments in senior living communities.

c. Occupation: Elderly Population
The method gathers information on the various occupations of residents in selected senior resorts, detailing their diverse professional backgrounds. [resource: living in the three selected elders' resort]

Chart 03: Personal information chart explanation [occupation]
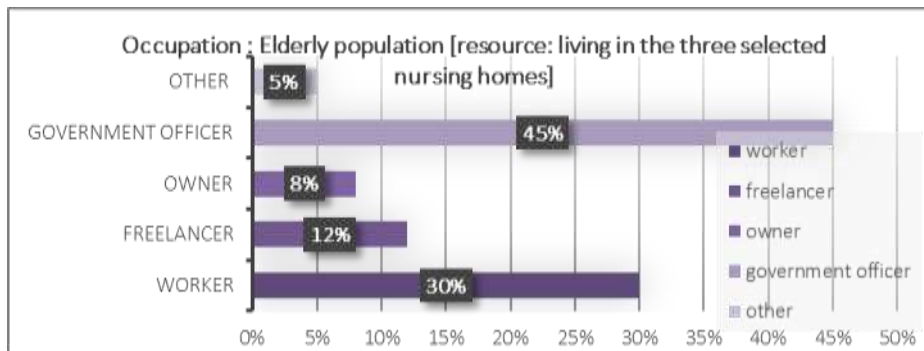
Examining occupational distribution in senior resorts reveals residents' work experiences and skills. This data helps tailor services and activities to their interests and needs, fostering community and mutual support. It enables the creation of an inclusive, enriching environment where residents can share their expertise, ensuring a well-rounded living experience for all.
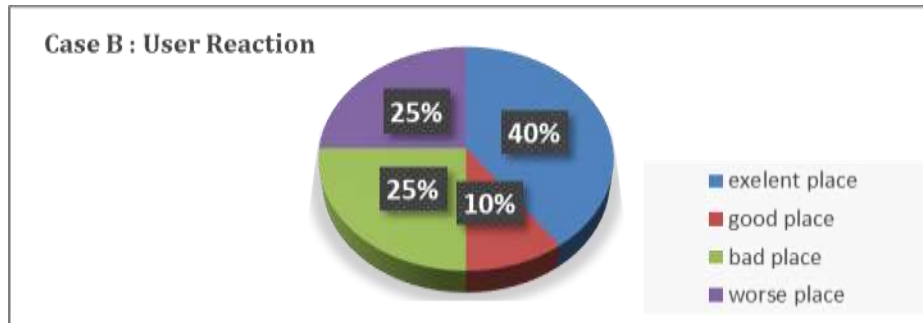
d. User reaction: case A

Chart 04: Data analysis [quantitative]: case A
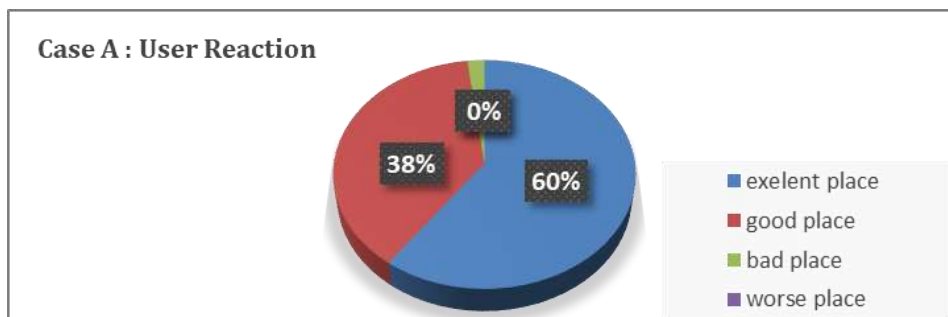
The opinions of both the elderly residents and the employees working in the institution regarding all the data explored in Case Study 1 are presented in a table. The findings reveal positive user reactions, indicating that the factors studied in this space, such as accessibility, lighting, and communal area usage, are perceived to be of high quality by both the residents and staff. This feedback from Case Study 1 highlights the effectiveness of the design and operational elements in meeting the needs and expectations of its users.
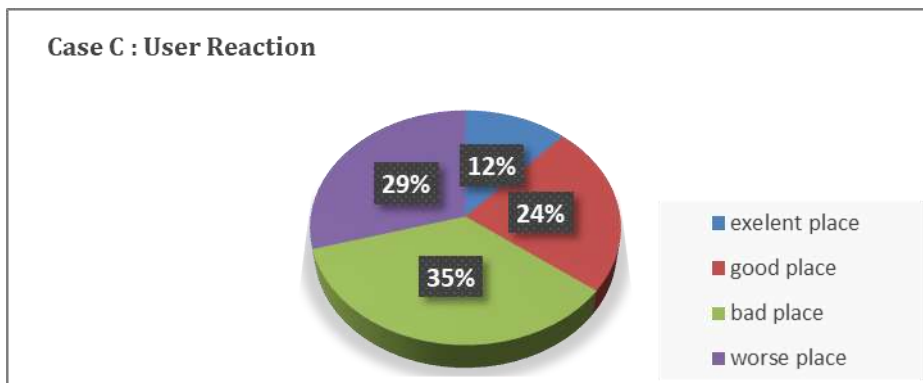
e. User reaction: case B

Chart 05: Data analysis [quantitative]: case B

Among the data explored in Case Study 2, specific challenges and problematic aspects were identified, as captured through user reactions. The opinions of elderly residents and employees working at the resort, gathered through questionnaires and interviews, are summarized in a table. These findings reveal issues related to factors such as accessibility, lighting, or communal area functionality. Both residents and staff emphasized these areas of concern, which impact the overall experience and usability of the internal spaces. Addressing these challenges could significantly enhance the living environment and operational efficiency of the resort. internal social spaces.

f. User reaction: case C

Chart 06: Data analysis [quantitative]: case C

The third elderly resort, examined in Case Study 3, revealed several challenges compared to the other two resorts. User reactions, gathered through questionnaires and interviews with elderly residents and employees, highlighted significant problem areas. These findings, summarized in tables, pointed to issues such as inadequate accessibility, insufficient lighting, and limited functionality of communal spaces, which negatively impacted the overall experiences of both residents and staff. Residents reported dissatisfaction with comfort and usability, while employees noted operational difficulties caused by design shortcomings.

The feedback emphasized the need for improvements, including better spatial layouts, enhanced lighting, and more functional communal spaces, to foster a supportive and efficient environment. This analysis highlights the importance of tailoring designs to meet the specific needs of residents and employees, ensuring a higher quality of life and work within the facility.

6.2. QUALITATIVE ANALYSIS AND FINDINGS

6.2.1 CASE A: lunch room
This chapter presents data from residents of three selected elderly homes, gathered using the described method. The study examined these facilities to understand the residents' experiences, preferences, and demographics, offering a comprehensive view of their living arrangements and needs.
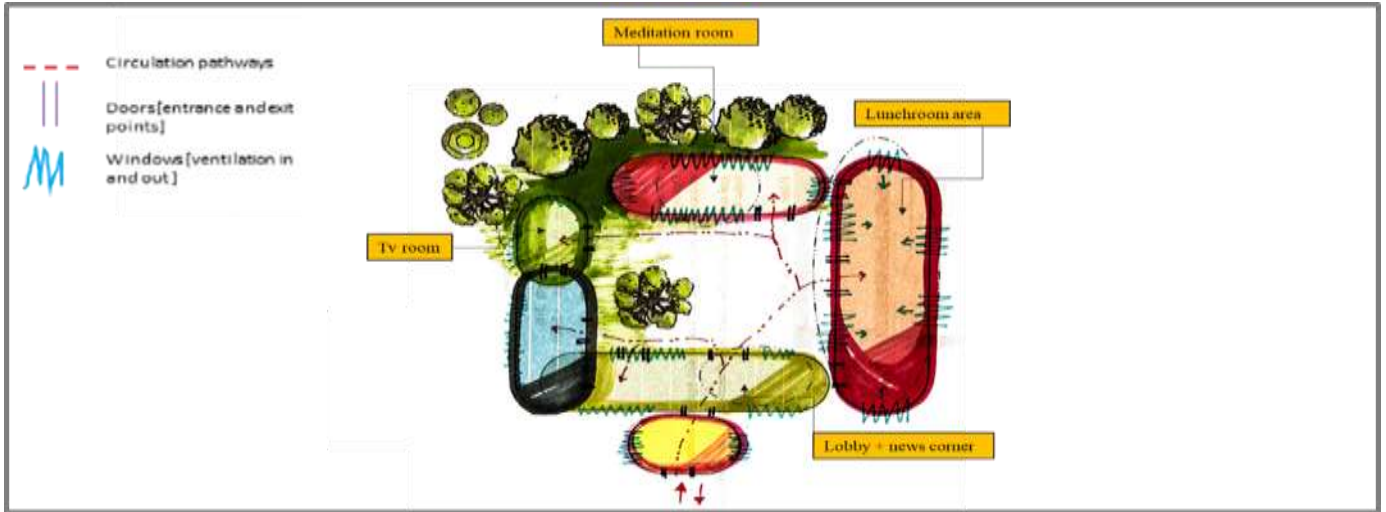
Figure 12: case A. Special arrangement bubble diagram.

a. Design Matrices, [According to Spaces]
Here is an outline created to show how the selected spaces are located based on the interior design of case A. Efforts have been made to give a rough understanding of how to enter, exit, and ventilate the space.

Table 09: Lunch room: Special arrangement positive and negative qualities

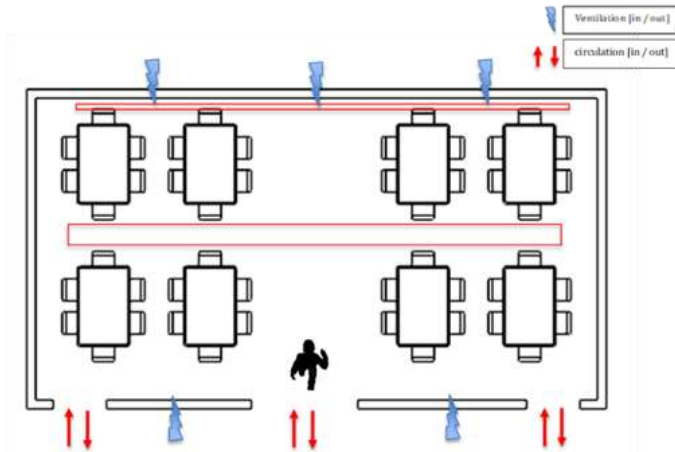| Case No	Space type	Design matrices	Positive qualities	Negative qualities
A	Lunch room	Spatial arrangement	• Natural ventilation • 48 capacity	• Less space • Difficult circulation [spatially wheel chairs]
Note: Case A features a lunch room with both positive and negative aspects. The positive factors include windows and doors designed to facilitate natural ventilation and light. The negative aspects are highlighted in red on the plan. The chart summarizes the positive and negative elements of this area.				

Figure 13: Special arrangement positive and negative points marks

Figure 14: Positive / negative qualities: lunch room

Table 10: Lunch room: Furniture arrangement positive and negative qualities

Case No	Space type	Design matrices	Positive qualities	Negative qualities
A	Lunch room	Furniture arrangement	• 6 elders, can eat together. • Furniture arranged for easy interaction.	• Plastic furniture may cause falls. • Furniture blocks circulation pathways.
Note: The furniture arrangement in this elder's resort reveals both positive and negative aspects, with favorable and unfavorable points identified.				

Figure 15: Lunch room furniture arrangement

Figure 16: Lunch room furniture arrangement: plastic table and chair [damro]arrangement

Table 11: Lunch room: color psychology, positive and negative qualities

Case No	Space type	Design matrices	Positive qualities	Negative qualities
A	Lunch room	color psychology	• Good lighting. • The color palette creates a homely feel.	• Daytime glare affects the area. • Poor night lighting hinders work, especially for color-blind.
Note: In Case A, sunflower yellow is used in the dining room to brighten the space. However, the intense reflection of natural sunlight on these walls can cause discomfort and eye strain during the day. The 3D images below show how sunlight impacts the color and ambiance.				

Figure 17: case 01. Lunch room color psychology: natural sunlight affects inside of the lunch room [10.00am]

Figure 18: used colors: sunflower yellow / vermilion brown

Figure 19: table cloth: orange color

Table 12: Lunch room: wayfinding methods

Case No	Space type	Design matrices	Note:
A	Lunch room	wayfinding methods	• In Case A, nameplates are the primary navigation method, helping individuals identify specific locations. The corridors serve as pathways, allowing easy location of destinations using these nameplates.

Figure 20: way finding method 01: name board

Figure 21: way finding method 02: wall pitchers

Figure 22: on site hand sketch fore wayfinding system

b. Design Matrices, [According to user behavior]
This chapter examines how elderly residents adapt and use a primarily dining space to meet their needs, highlighting its transformation for different occasions and purposes. Observations show that the space changes to accommodate various activities and requirements.
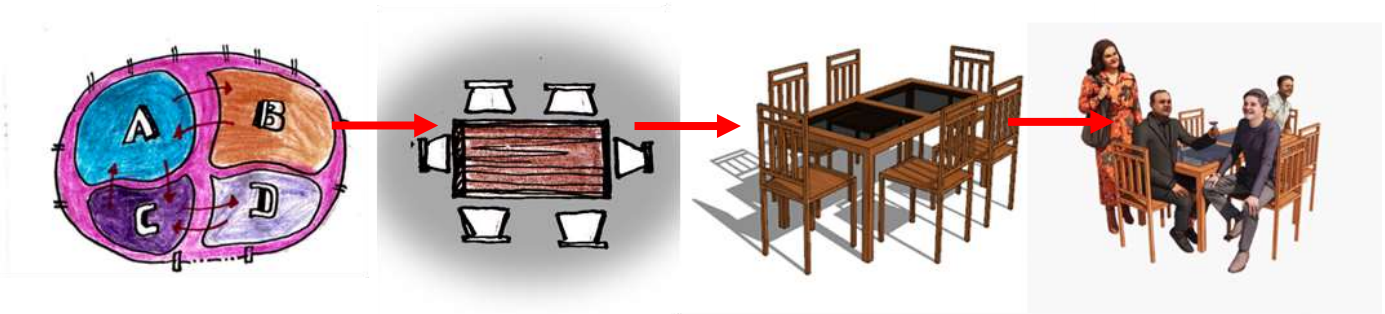

Figure 23: user behavioral pattern explanation chart by author

The 6-person seating arrangement, designed for dining, uses plastic chairs for easy movement but lacks security considerations. Often, couples or two people use the six chairs for dining, while elderly couples prefer dining individually. When visitors come, the chairs are repurposed for other activities. The dining area features two main tables that groups can use for various activities.

6.2.2. CASE B: TV room
Case B focuses on a television room designed for elderly residents, offering ample lighting, ventilation, and easy accessibility with two main entrances. Its spacious layout promotes freedom of movement, and its location off the main lobby provides natural light and scenic views, enhancing the overall atmosphere.
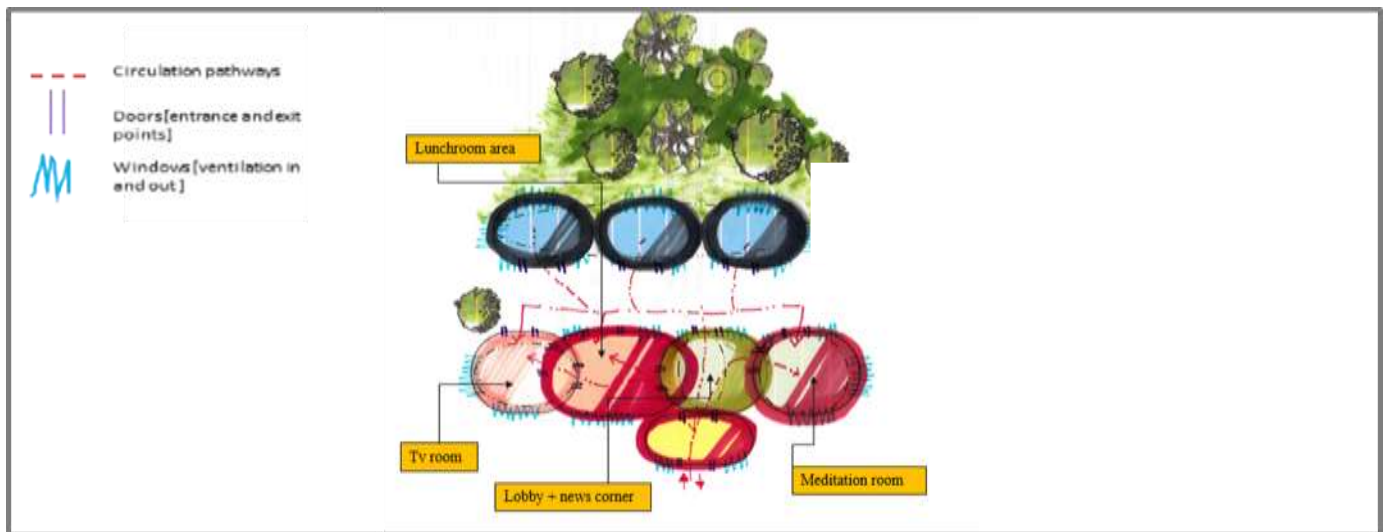

Figure 24: case B. Special arrangement bubble diagram.

a. Design Matrices, [According to Spaces]
Here is an outline created to show how the selected spaces are located based on the interior design of case B. Efforts have been made to give a rough understanding of how to enter, exit, and ventilate the space.

Table 13: TV room: Spatial arrangement, positive and negative qualities

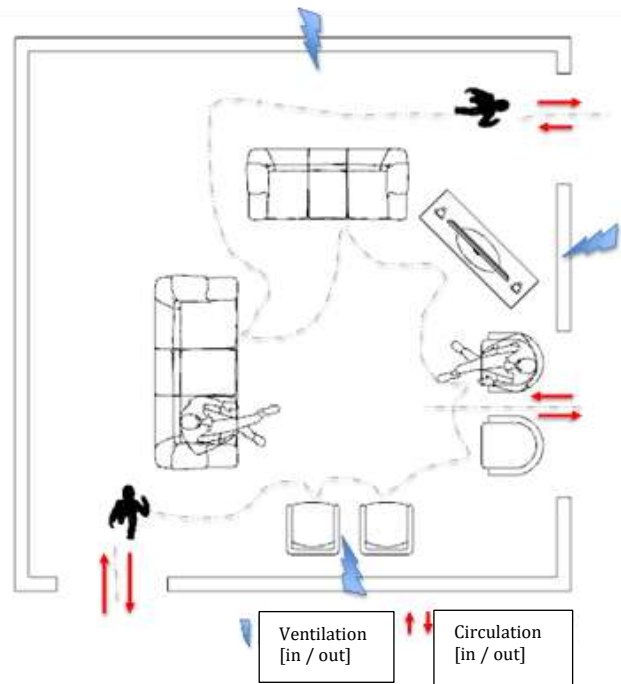| Case No	Space type	Design matrices	Positive qualities	Negative qualities
B	TV room	Spatial arrangement	• Gets natural daylight. • Has natural ventilation.	• Circulation system not wheelchair-friendly. • TV location poorly positioned for some seating arrangements.
Note: To optimize the space, careful color coordination and furniture design are essential. Calming colors and comfortable furniture create a relaxing ambiance. Overall, the TV room in Case B is well-planned and user-friendly, catering to residents' needs and providing a pleasant environment for viewing.				

Figure 25: Tv room: Special arrangement positive and negative points

Figure 26: Tv room: day time image by author

Table 14: TV room: Furniture arrangement positive and negative qualities

Case No	Space type	Design matrices	Positive qualities	Negative qualities
B	TV room	Furniture arrangement	• Universal comfortable furniture arrangement. • Effective communication due to round furniture arrangement.	• Poor circulation, wheelchair access limited. • Poor TV view angles,
Note: The study examines the furniture arrangement in the TV room to understand how it influences users' experiences. By analyzing the layout, the goal is to highlight positive aspects and address any negative factors, offering insights into how the design impacts user perceptions.				

Figure 27: Tv room furniture arrangement

Figure 28: Tv room: furniture arrangement [picture by author]

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Table 15: TV room: color psychology positive and negative qualities

Case No	Space type	Design matrices	Positive qualities	Negative qualities
B	TV room	color psychology	• Wall color enhances lighting in the TV room. • Wall and floor tile colors enhance the warm look.	• Darkens after 2:00pm without artificial lighting. • Circulation needs improvement for wheelchair access.
Note: This study examines the impact of the color palette in the TV room on its users, focusing on both positive and negative effects. It provides insights into how the colors affect the space and aims to enhance the user experience while addressing any concerns with the current palette.				

Figure 29: Tv room color psychology [Color palette]

Figure 30: Tv room color psychology [Color palette: wall and floor]

Table 16: TV room: wayfinding methods

Case No	Space type	Design matrices	Note:
B	TV room	wayfinding methods	• Wayfinding relies on nameplates to help elderly residents navigate the facility. The corridors act as guiding pathways, allowing easy access to destinations, ensuring a smooth and comfortable experience for the residents.

Figure 31: Tv room way-finding method: name boards

Figure 32: Tv room way finding method: name board and wall lines shows to the place where elders want to go

b. Design Matrices, [According to user behavior]

This study explores how elderly residents adapt and interact with the TV room, enhancing user behavior through customization to meet their needs. Initially designed for entertainment, the space evolves into a versatile environment that supports leisure, social interactions, and various activities. By observing these adaptations, we gain insights into how the design fosters positive behavioral patterns, allowing the room to cater to the dynamic preferences and requirements of its elderly occupants. This adaptability highlights the importance of thoughtful design in creating spaces that resonate with user behavior and promote well-being.

The existing seating arrangement in the TV room is less than ideal due to the poorly positioned TV unit, causing discomfort for elderly residents and potentially hindering their movement. At times, users adjust the seating arrangement for better comfort, as some elders cannot see the TV unit properly.
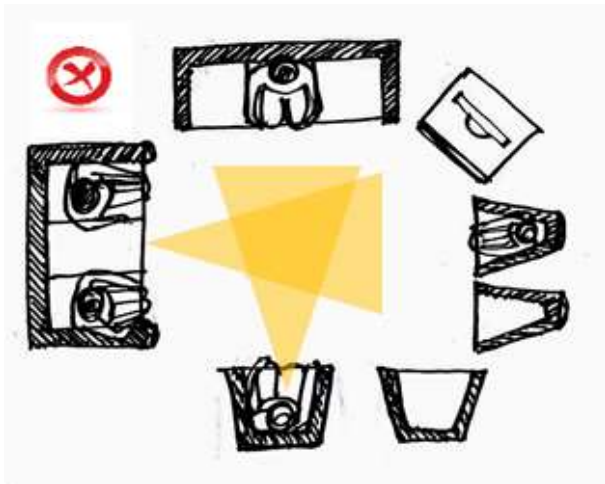
Figure 33: existing seating arrangement sketches by author

Figure 34: User behavior patterns sketches by author

6.2.3 CASE C: Lobby area + newspaper reading area
The space is thoughtfully designed to meet the needs of the elderly, with accessible layouts ensuring effortless movement and well-positioned entrances and exits for convenience. Adequate ventilation systems and strategically placed windows maintain a fresh and comfortable atmosphere. Each room is purposefully arranged to support functionality, fostering a harmonious and enjoyable living environment where residents can thrive.
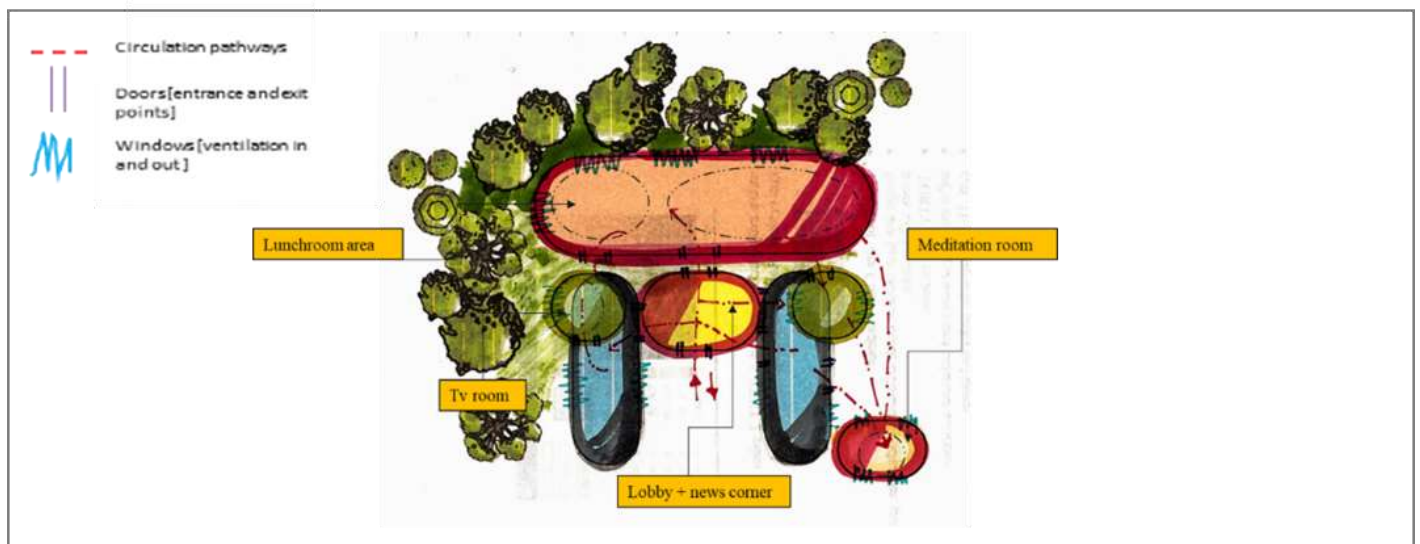

Figure 35: case C, Special arrangement bubble diagram.

a. Design Matrices, [According to Spaces]
Here is an outline created to show how the selected spaces are located based on the interior design of case C. Efforts have been made to give a rough understanding of how to enter, exit, and ventilate the space.

Table 17: Lobby area + newspaper reading area: Spatial arrangement, positive and negative qualities

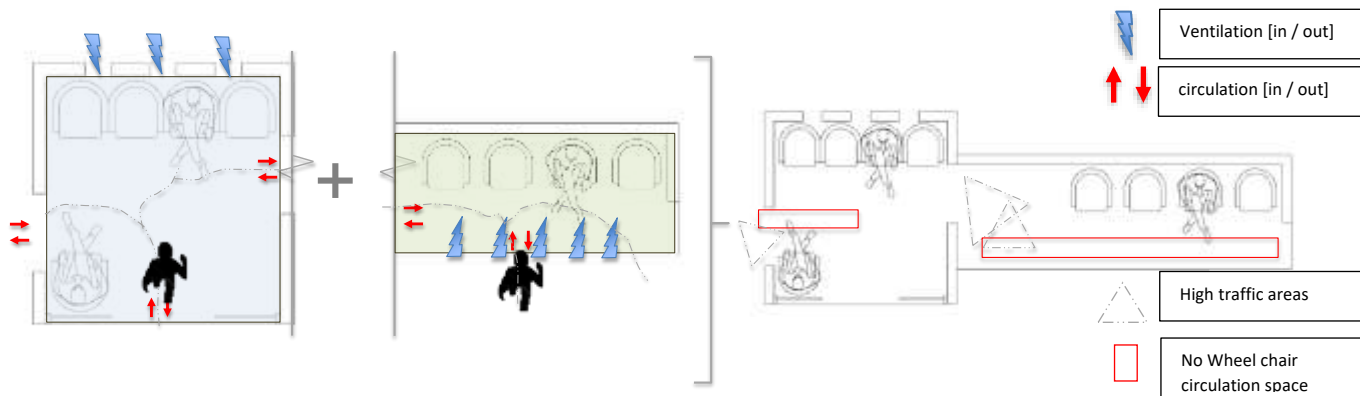| Case No	Space type	Design matrices	Positive qualities	Negative qualities
C	Lobby area + newspaper reading area	Spatial arrangement	• Has natural ventilation. • Has good natural and artificial lighting.	• Circulation system not wheelchair-friendly. • Doors and entrances cause high traffic.
Note: The lobby and newspaper corner provide a warm and welcoming environment but have minor drawbacks, such as occasional overcrowding during peak hours, which reduces personal space, and overwhelming natural light that may affect those sensitive to brightness. Improving seating arrangements and offering adjustable lighting can enhance comfort and overall resident experience.				

Figure 36: case C. Newspaper reading area.

Figure 37: case C. Lobby area

Table 18: Lobby area + newspaper reading area: Furniture arrangement positive and negative qualities

Case No	Space type	Design matrices	Positive qualities	Negative qualities
C	Lobby area + newspaper reading area	Furniture arrangement	• Armchairs are comfortable, providing support for easy seating. • The close chair arrangement supports good communication.	• Plastic furniture may cause falls due to instability. • Tile floors make furniture slippery, causing accidents.
Note:				
This study examines the furniture layout in the newspaper reading area and lobby, focusing on how it affects the residents' experience. It aims to highlight the positive aspects that enhance comfort and interactions, while addressing any design flaws that may impact satisfaction. The goal is to understand how the arrangement influences the overall enjoyment of these spaces.				
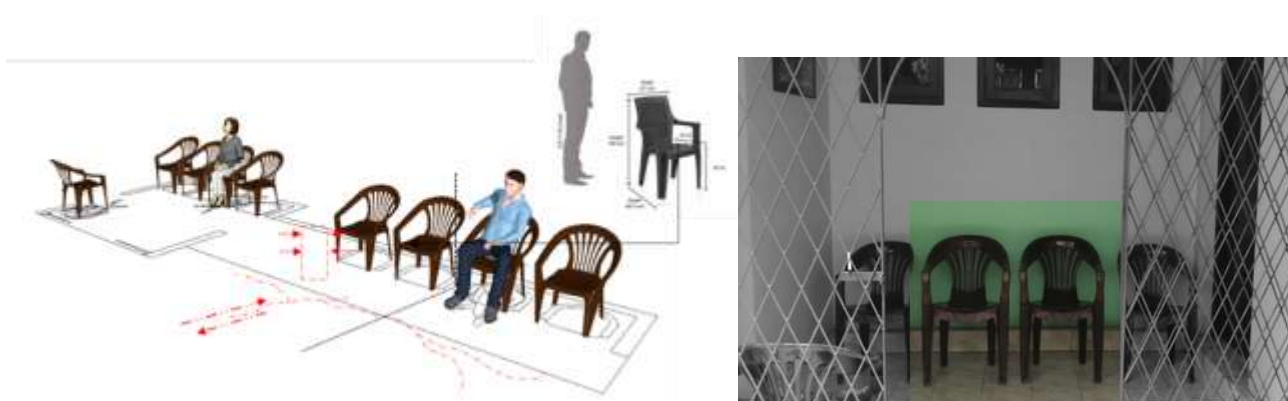
Figure 39: case C. Newspaper reading area +lobby area: furniture arrangement

Table 19: Lobby area + newspaper reading area : color psychology positive and negative qualities

Case No	Space type	Design matrices	Note:
C	Lobby area + newspaper reading area	color psychology	This section examines the color palette used in the newspaper reading area and lobby, focusing on its impact on elderly users. It highlights both the positive and negative effects of the chosen colors, aiming to enhance the overall experience by addressing potential drawbacks and ensuring a harmonious, comforting environment.

Figure 40: case C. Newspaper reading area +lobby area: color palate

Figure 41: case C. Newspaper reading area +lobby area: material color palate

Table 20: Lobby area + newspaper reading area: way finding methods

Case No	Space type	Design matrices	Note:
C	Lobby area + newspaper reading area	Way Finding Methods	In Case C, a nature-inspired wayfinding system uses greenery plants and strategic colors to guide elderly residents. Green plants serve as visual markers, while colors, such as soft blues for relaxation areas and warm tones for communal spaces, assist in navigation. This approach creates a tranquil, intuitive environment that enhances the experience and promotes well-being as residents move through the space.

Figure 42: case C. newspaper reading and lobby area: way finding method [existing used: main land mark ambarella tree]

b. Design Matrices, [According to user behavior]

In Case C, the user behavior patterns in the lobby and newspaper reading areas reveal that the furniture arrangement primarily follows a standard setup for everyday use. However, when the residents engage in specific activities, such as playing card games, the furniture layout undergoes a significant transformation. The seating arrangement is altered to accommodate the group activity, as shown in the sketches below. This shift in furniture placement highlights the flexible nature of the space and how users adapt the environment to suit their needs and activities. It demonstrates the importance of considering dynamic behavior patterns in space planning, ensuring that furniture arrangements are adaptable for various functions and promoting comfort during both regular use and group activities.

This is an existing furniture arrangement but the bad point of this arrangement is elders can communicate in a good way because of the furniture arrangement

This is elders convert previous arrangement for this it becouse playing card games
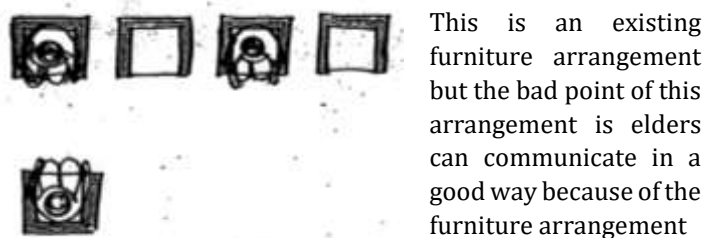
[arrangement changes by workers.]

Figure 43: case C. newspaper reading and lobby area: user behavioral patterns sketch by author
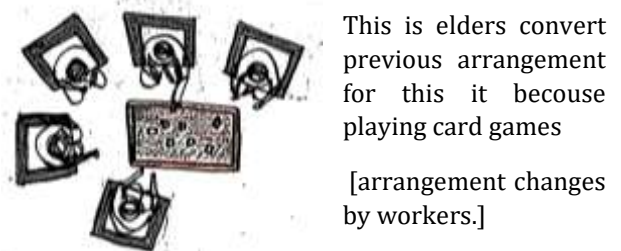
Figure 44: case C. newspaper reading and lobby area: user behavioral patterns sketch by author

6.3. QUALITATIVE DATA ANALYSIS SUMMARY

The qualitative data analysis provides a comprehensive understanding of the user behavior and experience across three case studies (Case A, Case B, and Case C). Through detailed examination of the data collected from each case, key themes, patterns, and insights emerged, offering a deep understanding of the design and functionality of the spaces studied. The analysis revealed the varying ways in which the elderly interacts with their environments, highlighting positive aspects such as comfort and ease of navigation, as well as areas for improvement like seating arrangements and circulation pathways. By comparing the findings from each case, the analysis contributes valuable insights that can inform future design improvements, ensuring spaces are more accommodating and user-friendly for the elderly.

Table 11: qualitative data analysis summary

Case /space	Design Metrix			
CASE A Lunch room	special arrangement	furniture arrangement	color psychology	way finding methods
	Efficiently laid out spaces for easy navigation and comfort. Purposeful allocation of areas for lunch, TV, reading, lobby, and meditation.	Well-organized furniture setups in each area, providing comfort and functionality.	Appropriate use of colors to create a welcoming and serene ambiance.	Clear signage directing elders to different facilities and amenities.
Conclusion [summary]	The resort boasts thoughtful spatial and furniture arrangements, combined with suitable color choices and effective wayfinding, offering a pleasant and convenient experience for its residents.			
CASE B TV room	Well-organized spaces for seamless movement and comfort. Cozy areas for specific activities like dining, TV watching, reading, and meditation.	Thoughtfully arranged furniture in each area for maximum comfort and functionality.	Soothing and calming colors in various spaces to promote relaxation and a positive atmosphere.	Clear and visible signage guiding elders to different areas for a smooth experience.
Conclusion [summary]	The resort offers well-planned spatial and furniture arrangements, with calming colors and clear wayfinding, creating a comfortable and inviting environment for its residents.			
CASE C Newspaper reading area lobby area	Thoughtfully designed spaces to ensure easy movement and comfort for elders. Specific areas designated for various activities like dining, TV, reading, lobby, and meditation.	Carefully arranged furniture in each area to provide comfort and practicality for elders.	Thoughtful selection of colors to create a welcoming and calming atmosphere for elders.	Clear and visible signage guiding elders to different facilities and amenities.
Conclusion [summary]	The facility offers well-planned spatial and furniture arrangements, along with a soothing color scheme and effective wayfinding, ensuring a delightful and relaxing experience for its residents.			

Case A offers well-planned spatial and furniture arrangements, along with a soothing color scheme and effective wayfinding, ensuring a delightful and relaxing experience for its residents.

7. Conclusion

The analysis of the three case studies highlights the importance of thoughtful design and how it directly influences the comfort and well-being of elderly residents. In Case A, a careful integration of spatial layout, furniture arrangement, color psychology, and wayfinding created an environment that prioritized both functionality and comfort. The positive feedback from residents and staff in this case suggests that when these design elements are executed effectively, they contribute significantly to the residents' quality of life.

In contrast, Case B and Case C, while demonstrating certain strengths, revealed clear gaps in critical areas such as accessibility, circulation pathways, and furniture arrangement flexibility. These shortcomings in design impacted the overall

user experience and satisfaction. For instance, in Case B, the lack of adequate seating flexibility and challenges with color coordination diminished the comfort level for residents. In Case C, while the design worked for some, the absence of clear wayfinding and efficient circulation led to confusion and discomfort for residents with varying mobility needs. **Case A**, by far, proved to be the most effective in achieving a balance between aesthetic appeal and functional design. The optimal furniture layout ensured that the space could be adapted for various activities, promoting social interaction and privacy when needed. The calming colors played a key role in reducing stress and creating a welcoming atmosphere. Moreover, the intuitive wayfinding system made navigation easier for residents, especially for those with limited mobility. The combination of these elements made **Case A** a standout example of how environment design can significantly improve the living experience for elderly individuals.

This analysis reinforces the idea that the success of elderly care environments lies not just in the aesthetic appeal but in the careful consideration of user needs—particularly in terms of accessibility, safety, and comfort. The findings from this study can serve as a guideline for future developments in elderly care facilities. Designers should focus on enhancing spatial planning, selecting appropriate furniture, considering color psychology, and providing clear wayfinding to create environments that are not only functional but also conducive to promoting the health, happiness, and independence of elderly residents.

In conclusion, **Case A** exemplifies the ideal approach to elderly care facility design, providing valuable lessons in creating environments that support the physical and emotional well-being of residents. By addressing the challenges seen in Case B and Case C, future designs can be further refined to ensure that all elderly individuals have access to environments that foster comfort, safety, and a sense of belonging. The insights drawn from this study offer an opportunity to rethink and improve how elderly spaces are designed, ensuring a higher quality of life for this important segment of the population

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