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A STUDY ON SOCIAL SPACE TYPOLOGY FOR VERTICAL LIVING

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Abstract

Vertical living has been widely adopted worldwide as a strategy to address land scarcity and promote sustainable land use. However, despite its prevalence, the need for well-designed social spaces in high-rise environments remains largely similar to that in landed housing. The lack of comprehensive research on the typologies and characteristics of social spaces in vertical living presents a critical gap, particularly in understanding how such spaces contribute to community well-being and healthy living. This study aims to investigate the role and typologies of social spaces in high-rise residential developments, focusing on their contribution to social interaction and neighbourhoods' integration. A qualitative methodology was employed through a systematic review of scholarly articles, complemented by case studies of selected high-rise housing projects. The analysis highlights key design treatments and spatial characteristics that foster social interaction, inclusivity, and a sense of belonging among residents. Findings indicate that well-integrated social spaces not only enhance community cohesion but also contribute to residents' overall quality of life. This research provides valuable insights for architects, designers, and industry stakeholders, offering guidelines for designing effective social spaces that can strengthen the liveability and sustainability of vertical housing developments.

Keywords: vertical living, social space typologies, characteristics of social space

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INTRODUCTION

As urban populations grow, vertical living has become essential for sustainable land use, with projections estimating a demand for 34,000 new dwellings annually by 2030. While vertical housing reduces land conversion, it often lacks the social spaces typical of horizontal living, raising concerns about declining social interaction, which is vital for community well-being (Mahdavinejad et al., 2012). Scholars emphasize the need for well-designed social spaces in vertical housing to sustain community cohesion (Pandelaki et al., 2018; Ruiz-Tagle, 2013). This study examines social space typologies in vertical housing and their role in fostering vibrant urban communities.

BACKGROUND ISSUES

Vertical housing, particularly high-rise apartments, has become a dominant urban solution due to land efficiency and density demands. However, the absence of adequate communal spaces frequently leads to reduced interaction, isolation, and weakened social cohesion, a problem made more evident during the COVID-19 pandemic. Limited opportunities for cultural exchange, recreation, and shared experiences further erode neighborhood bonds. Social withdrawal in such environments is often linked to residents' limited control over interactions within confined settings (Rubin et al., 2009). Addressing these issues requires prioritizing inclusive and well-integrated social spaces in vertical developments. Research objectives:

1. To develop a case study on social space design in Malaysian vertical housing.
2. To identify key characteristics of social spaces in vertical living.
3. To classify typologies of social space design in vertical housing.

LITERATURE REVIEW

(Abdullah et al., 2022) analyzed numerous scholarly articles highlighting the importance of social space in high-rise housing. Their study pointed out a lack of research on the typologies and characteristics of social spaces that can foster integrated and thriving neighborhood communities. Similarly, Huang (2006), Nor Azriyati Wan Abd Aziz et al. (2014), (Sullivan et al., 2004) and (Coley et al., 1997) identified design treatments and characteristics of social space relevant to high-rise housing.

This study concludes that several features can influence social interaction, including the hierarchical structure of space, physical security, opportunities for socialization, socio-cultural behaviors, support for community needs and activities, and improved accessibility. Many studies confirm a close link between socioeconomic status and social interaction patterns in residential areas (Askew, 2019); (Masram et al., 2019); Shepherd, 2018; (Rostam et al., 1997). Moreover, (Deo*, 2021) noted that factors such as unmanaged

environments, pollution, congestion, and indifferent or unfriendly neighbors also affect the quality of neighborhood life.

Table 1: Scholars interpretation on social space design elements and characteristics:

ITEM	AUTHOR	SOCIAL SPACE	VARIABLES
1	(Huang, 2006)	Scenic and activity spaces	Design Criteria
2	(Sullivan et al., 2004)	Greenery at social spaces	Design Criteria
3	(Coley et al., 1997)	Greenery at social spaces in a vertical neighbourhood	Design Criteria
4	(Liu et al., 2017)	Repeated visual-Social Network Theory	Design Criteria
5	(Greenbaum, 1982)	Visual connection created poor social interaction	Design Criteria
6	(Whyte, 1980)	Fascinating objects (sculpture, water fountain and others) or activities (performance, playground, mini amphitheatre and others)	Design Typology
7	(Gehl, 1987)	Three types of activities: necessary, optional, and social	Design Typology
8	(Modi, 2014)	Access, participant, individuality, adaptability, and hierarchy of spaces	Design Typology
9	(Ramdhan, 2021)	Accessibility, participant, individuality, adaptability, hierarchy spaces, footprint, views, security, and pollution	Design Typology
10	(R. Maharani, 2022); (R. T. Maharani et al., 2023)	Green space	Design Criteria
11	(Anggraeni et al., 2023)	Layout	Design Criteria
12	(Abdullah et al., 2022)	'sites', 'location' and 'neighborhoods based on social cohesion' and 'quality of vertical neighbourhood design'	Design Criteria
13	(Bakar et al., 2020)	Circulation area as social space, location.	Design Typology
14	(Siew Bee & Poh Im, 2016)	Circulation area, lift lobby	Potential Social space/ Typology
15	(Wijaya Wie & Dewi, 2019)	Location-mostly located at ground floor and difficult to access	Design Criteria
16	(Abu-Ghazze, 1999)	Nodal spaces are most suitable	Design Criteria

RESEARCH METHODOLOGY

This study examines design thinking as a response to contemporary challenges in vertical housing, particularly the lack of interactive spaces. The monotonous nature of vertical housing often restricts social contact, resulting in less engaging living environments. Accordingly, this research aims to enhance social quality through a thoughtful design approach.

The study follows a three-phase structure: data collection, analysis, and synthesis. A mixed-methods approach was employed, combining both quantitative and qualitative methods (Ishtiaq, 2019; Creswell, 2014; Mackiewicz, 2018). Data collection involved questionnaires and precedent analysis to evaluate social interaction in tall buildings (Groat & Wang, 2013).

- Questionnaire: Conducted via Google Forms with 53 flat dwellers, focusing on their social interaction patterns.
- Precedent Analysis: Examined Pangsapuri Desa Datuk Hajah Hasnah and Pangsapuri D'Summit (Johor) to identify issues related to social spaces and interaction.

The analysis phase employed descriptive statistics to interpret questionnaire data (Kaur & Stoltzfus, 2018; Sethi, 2017). Precedent studies were then examined using descriptive variables such as accessibility, participation, adaptability, hierarchy of spaces, footprint, views, security, and pollution to assess the effectiveness of social spaces.

ANALYSIS AND FINDINGS

The study began with a questionnaire distributed to vertical housing residents to assess their living conditions and social interactions. A Google Form survey was conducted with 53 respondents, yielding valid and reliable data (Amalia et al., 2022). The questionnaire explored occupants' behaviours, their relationship with neighbours, and the availability and effectiveness of social spaces. Additionally, precedent analysis was used to examine existing vertical housing projects, identifying both successful design elements and limitations. (R. T. Maharani et al., 2023b).

Key Findings

- Limited Neighbour Interaction: 60% of respondents do not know their neighbours due to busy schedules and a lack of necessity for interaction.
- Existing Social Relationships: 22% reported strong relationships with their neighbours.
- Lack of Social Activities: 85% indicated that their buildings do not facilitate any social activities, while 16% acknowledged that sports activities provide some opportunities for interaction.

- **Location of Social Interactions:** Most social interactions occur in public facilities such as parking lots, pools, gyms, shops, and food courts, though these spaces do not necessarily encourage participation due to personal boundaries.
- **Need for Dedicated Social Spaces:** 81.8% of respondents believe that social interactions would significantly improve if dedicated social spaces were integrated within housing blocks.

These findings highlight the importance of intentional social space design in fostering community engagement in vertical housing. Future developments must incorporate well-planned communal areas to enhance neighbourhoods' interactions and overall social well-being.

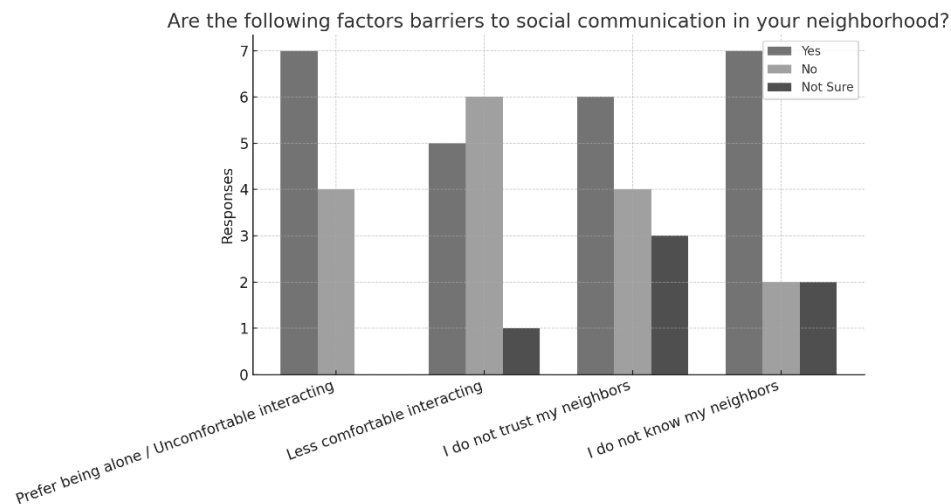


Figure 1: Barriers to Social Interaction

Respondents were asked about barriers to social interaction, such as preferring solitude, lack of time, cultural or language differences, distrust, lack of need, unfamiliarity with neighbours, and unfriendly attitudes. Most respondents disagreed with these statements, indicating generally positive attitudes toward social interaction. They showed willingness to communicate, build relationships, and engage with neighbours when opportunities are provided, supporting the potential for a healthy community.

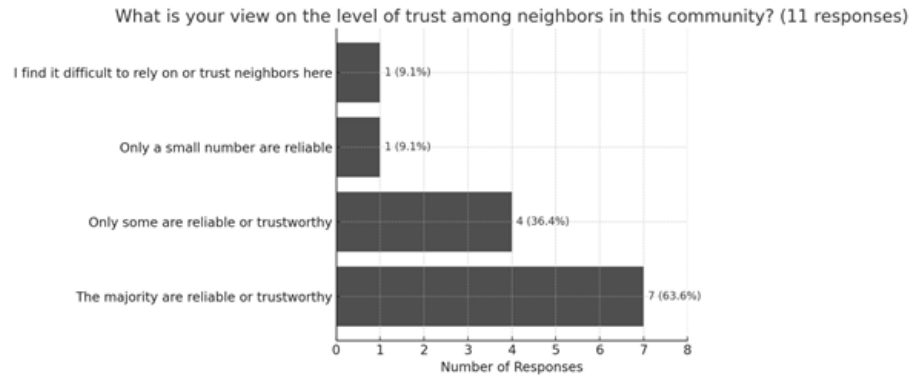


Figure 2: Level of trust among the community

About 63.6% of respondents felt their neighbours could be trusted or relied upon, while 36.4% believed some could be trusted. Only 9.1% reported trust issues with neighbours.

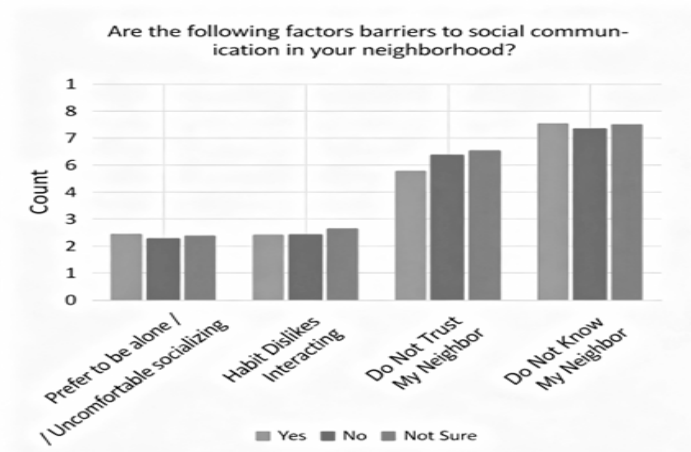


Figure 3: Factors that prevents involvement in community activities

The highest ‘No’ responses were for “Do not know my neighbours,” indicating most do not view unfamiliarity as a major barrier, though some still see it as an issue. Overall, perceptions of social barriers varied, but most respondents felt these factors were not significant, with long working hours identified as a key limitation that social spaces should address. This suggests that the social space which should be provided for the people should respond to the limitation due to long working hours.

From the list below, choose 2 Types of Communal facilities (Social Space) that you prioritize When buying a house.

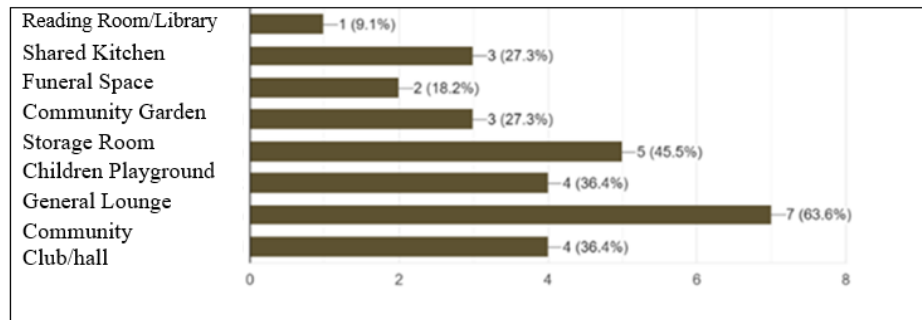


Figure 4: Social Spaces provision that influence housing choice

The respondents were asked to choose 2 types of shared spaces preferred in housing choice and 7 (63.6%) chose shared general lounge as the most preferred followed by storage space 5 (45.5%), kids play area and club house 4 (36.4%), community kitchen, community garden 3 (27.3%) and reading /library 1 (9.1%).

It shows that the respondents feel that it is necessary to provide shared resting area for the community as the internal spaces are limited for that activity to be carried out. It seems that community garden and community kitchen have less preference as they can be something new and require proper management to have it functional. The library remains the least favourable as perhaps reading is not part of Malaysian culture.

What are the suitable and potential locations for social spaces as interaction spaces in your neighborhood: (You can choose more than one option)

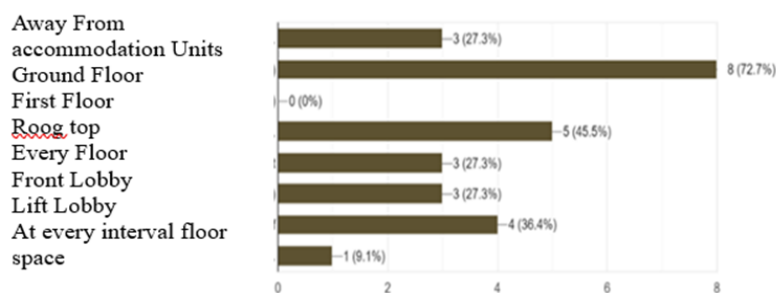


Figure 5: Potential Placement of Social Space

The respondents were asked in Section 5 (Question 1: What is the appropriate and potential social space placement as a social interaction space in your neighbourhood). 72.7% agreed that the most suitable location is at ground floor area, while 45.5% said the rooftop area. 36.4% said the lift lobby is the suitable location for social space while 27.3% choose the frontage of the apartment and at every floor level. However, only 9.1% choose the social space to be located at a certain intermediate level.

What are the criteria for appropriate social spaces in your neighborhood: (You can select more than 1 option).

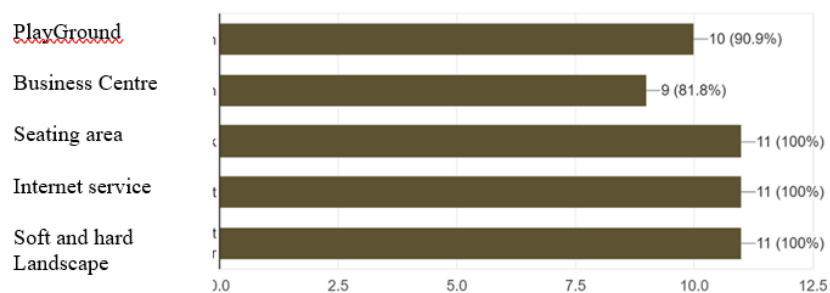


Figure 6: Social Space Criteria

When asked on the Social Space Criteria, the respondents equally agree that Social Space Criteria should be as follows: 1) Equipped with Playground, 2) Equipped with business premises, 3) Seating Areas, 4) Internet facilities and 5) Soft and Hard landscape.

Majority of the respondents (81.8%) think that the social interaction among neighbours will increase if the social spaces are provided within the housing blocks.

From the list given, choose 2 Facilities that can be the main factors in housing choice.

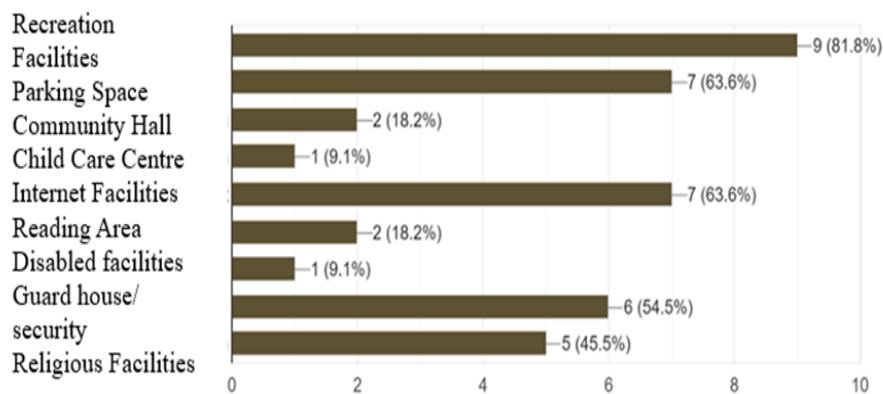


Figure 7: Main facilities that influence housing choice

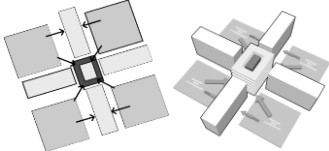
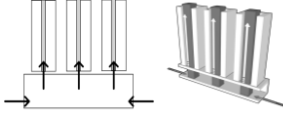
With regards to housing choice, the respondents (81.8%) prefer to buy housing units with recreational facilities, parking space and internet followed by security, religious facilities and community hall, kindergarten, and facilities for the disabled.

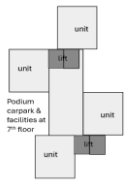
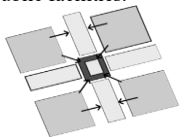
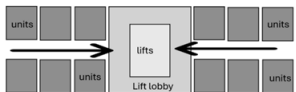
The data collected from the questionnaire were further analysed, a case studies and comparative studies are carried out on two (2) vertical housing in Johor Bahru, Malaysia.

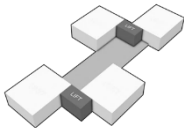


Figure 7: Condominium Datuk Hajjah Hasnah (left) and D'Summit Residence (right).

Physical observation was carried out on two (2) residential buildings of similar scale located in Johor Bahru. Datuk Hajjah Hasnah Condominium and D'Summit Residence. Although similar in scale, the residential buildings are different in the layout, facilities and foot print. The criteria are well explanatory in the table below.

CRITERIA	APARTMEN DATUK HAJJAH HASNAH	D'SUMMIT
ACCESS	The building has open access from all directions and a ground floor open parking area. 	This apartment has security access mainly through 3 guard posts. The occupants are required to use the RFID system to access and access cards for the list to the intended level. 

SYNTHESIS: Access in vertical housing is vital for inclusivity and comfort. Features like wide corridors and wheelchair-friendly lifts support mobility, while good design also improves privacy, social interaction, and overall livability.		
PARTICIPANT	When all floors are accessible, corridors, pocket spaces, and commercial areas can support planned or unplanned activities, but this also allows strangers to pass by unit frontages. 	 Private lifts with restricted access enhance privacy and security but limit participation and reduce chances for unplanned interactions.
SYNTHESIS: To make people as a participant the building design should provide a space to allow residents to create and involve activities.		
INDIVIDUALITY	Repetitive floors-1st to top floors are identical/similar. People get together in predicted areas e.g. corridors, lift, lift lobby or public facilities. 	Repetitive floors with different typologies at different blocks. 
SYNTHESIS: Layout can influence the habits of the social environment. Unique design can help people socialize even though in vertical housing		
ADAPTABILITY	Fixed floor space. Environment less adaptive to dwellings. The outdoor space available is at ground floor level and corridors to the units. 	Fixed floor space with several typologies and access to podium facilities makes it a restricted access as each unit will be able to access to certain areas only. Although the occupants are connected to the outdoors at 7th floor facilities level. Environment adaptive to dwellings
SYNTHESIS: Joint activities can make vertical housing spaces more adaptable. At D'Summit, privacy-focused layouts limit interaction, which occurs mainly in lifts and at the Level 7 facilities and garden.		
HIERARCHY OF SPACE	Open spaces are mostly at the ground floor, making them less accessible, and many remain underused due to poor management and lack of effort.	Services area at podium level accessible for all occupants and managed by the Building Management. The social spaces are limited to level 7 for privacy and security.

SYNTHESIS: Public spaces are usually on the ground floor, but providing varied social and outdoor spaces across different levels would give residents more choice.		
FOOTPRINT	Almost similar footprint for all blocks. 2 layout typologies and public spaces on the ground floor. Potential public space at lobby area.	4 layout typologies open for hierarchy of spaces and use. D'Summit is more complex compared to Apt Datuk Hasanah.
SYNTHESIS: The shape of footprint can influence activities on Ground Floor. (Promoto et.al,2019) There are 3 zones includes Public Zones, Service Zones and Private Zones.		
VIEWS	City View which are not exclusive	Views towards new township & highway making it an active view and gives sense of place.
SYNTHESIS: External views add little to social space but can help residents connect to their surroundings, while open spaces and landscaping are more important for success.		
SECURITY	Security is loose, where anybody can enter up to the unit's front door without going through security.	Security is very tight, where it provides 3 tier security system and the individual lift eliminate the chances for strangers to reach unit front door without proper access provision/ access card. 
SYNTHESIS: Security is a key factor in housing preferences. High-security designs are seen as a luxury, while open concepts are cheaper and allow more unplanned interactions in shared spaces.		
LANDSCAPING/GREENSPACE	Developers often put little effort into landscaping and social space design. JMB or JMC should enhance amenities and upgrade ground floor pocket spaces to prevent neglect.	Level 7 landscaping with water features was designed for social interaction, but occupants rarely engage due to the lack of daily unplanned interaction spaces.
SYNTHESIS: Un planned social interaction space becomes an important part of the success of the social space. For eg. The occupants meet(unplanned) at the lift lobby on daily basis and connects at the social space (facilities level)		

Findings from Comparative Studies

The comparative study of Condominium Datuk Hajah Hasnah and other precedents shows that while potential spaces for social interaction exist, such as corridors, lift lobbies, and ground floor amenities, poor design planning leaves them underutilized. This demonstrates that providing space alone is insufficient; purposeful design is needed to foster engagement. Spatial hierarchy, layout configurations, and room arrangements also affect adaptability, security, and comfort, yet view placements were overlooked, limiting their contribution to social spaces. Furthermore, safety and pollution concerns remain critical for ensuring a supportive social environment.

Key Design Recommendations

1. Optimized Layout Configuration:
 - A condensed layout (Pandelaki & Firmandhani, 2022) enhances interpersonal communication and facilitates social activities.
 - Noise reduction measures should be implemented to minimize disturbances.
2. Enhanced Common Areas:
 - Elevators and stairwells should be designed to encourage spontaneous interactions while maintaining appropriate personal space.
3. Purposeful Social Spaces:
 - Communal areas should support activities like gardening and sports, helping residents engage with their environment.
4. Improved Security Measures:
 - Centralized monitoring of public zones within the housing blocks enhances safety, encouraging participation in social activities.
5. Integration of Green Spaces:
 - Green areas improve comfort and reduce public area pollution, such as vandalism and littering.

These recommendations emphasize the importance of thoughtful spatial design in fostering a socially vibrant, safe, and sustainable vertical living environment.

CONCLUSION AND FUTURE RESEARCH

This study underscores the need for housing layouts that encourage social interaction and community building. Compact designs with green areas and strong security can enhance engagement, but excessive density may create new challenges. Findings show that the form, permeability, and use of common spaces shape social activity, as seen in Apartment Datuk Hajah Hasnah, where minimal barriers enable user-driven adaptations. Consistent with Stavrides (2015), such spatial porosity supports shared spaces, bottom-up governance, and collective urban experiences.

Future Research Directions

1. Design Innovations for Social Interaction – Exploring architectural solutions that actively encourage community engagement in high-rise housing.
2. Impact of Green and Shared Spaces – Assessing the long-term benefits of integrated green areas on social cohesion and well-being.
3. Technology and Smart Housing Solutions – Investigating how digital tools and smart design can enhance social connectivity in vertical living.
4. Cultural and Behavioural Studies – Examining how different cultural contexts influence social space utilization in high-density housing.

By addressing these areas, future research can further refine vertical housing models, ensuring they are both functional and socially enriching.

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ETHICAL STATEMENT

This research followed the ethical standards of Universiti Teknologi Malaysia. Informed consent was obtained from all participants, and their confidentiality and anonymity were protected. Participation was voluntary, and respondents could withdraw at any time without consequence.

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