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Do Where People Interact Matters to Social Capital? Comparative Analysis of Middle- and High-Rise Public Housing

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Abstract. As a growing country, the challenge of providing affordable housing has grown over recent years. Public housing has emerged as a leading government initiative to provide better housing alternatives, especially for low incomes. However, due to the limited land availability, public housing development has shifted from middle- to high-rise housing type. Previous studies have shown that high-rise living can have detrimental effects on low-income residents, especially regarding their social capital. This study explores the interactional spaces within both housing types, their social capital, and whether the former influences the latter. Quantitative analysis was conducted on 255 respondents in middle- and high-rise public housing for low incomes in the Jakarta Special Region, Indonesia. The results indicated some similarities as well as differences in both housing styles. Respondents in both housing types mostly interacted in corridor areas, even though the percentage was higher for the high-rise case. Moreover, both cases lacked frequency of participation in civic activities and a number of known neighbours known. However, the middle-rise case shows a better situation for both social capital indicators. Furthermore, it was found that interactional spaces appear to influence their social capital, and the effects were varied for both middle- and high-rise and each social capital indicator. This study concludes that the intensity of interaction within a particular space does not necessarily translate to better social capital.

Keywords: Public housing, social capital, interactional spaces, social interaction, high-rise housing

1. Introduction

Public housing has long been one of the prominent ways for the Indonesian government to provide affordable housing for low incomes. In terms of ownership, there are two types of public housing: owned (Rusunami[1]) and rented (Rusunawa[2]). Traditionally, Rusunawa consisted of a middle-rise housing type with five stories of living units. However, since 2015, local governments in the Jakarta Special Region have shifted the development from middle- to high-rise Rusunawa as the standard form of public housing provision for low-income.

The lack of economic capital drives low incomes to depend on their social capital (Browne-Yung et al., 2013; Falk & Kilpatrick, 2000; Mullenbach et al., 2022). Social capital is the interconnected network of relationships within a community that generates advantages for its members (Brisson & Usher, 2005; Leonard, 2004). Social capital is mainly fostered through social interaction, such as those with neighbors (Szreter & Woolcock, 2004; Won & Lee, 2020). The policy changes from developing middle- to high-rise Rusunawa may negatively impact residents' social interaction, ultimately decreasing their social capital.

The built environment can influence both social capital and interaction in general (Mazumdar et al., 2018; Tang et al., 2022), including building design. Vertical housing, in particular, has been associated with a negative influence on residents' social interactions, as proven by

[1] Abbreviation for "Rumah Susun Milik" or can be understood as Public Housing that can be owned/purchased.
[2] Abbreviation for "Rumah Susun Sewa" or can be understood as Rented Public Housing.

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previous studies in international cases (Evans et al., 2003; Forrest et al., 2002; Gifford, 2007; Kalantari & Shepley, 2021). Studies have also highlighted differences between middle- and high-rise housing. For instance, Nazarpour and Norouzian-Maleki (2021) found that residents in middle-rise housing foster better social interaction than those in high-rises[3]. Following that, Choi and Kong (2007, as cited in Gu, 2020) reported that different building configurations (whether rectangular, L-shape, or straight) have varying effects on residents' social ties, which may be relevant given the different building configurations of middle- and high-rise Rusunawa. Additionally, the high-rise was known to have a lower ratio of public space or park compared to the middle-rise housing (Park et al., 2018; Schebella et al., 2019; Azizi & Malek-Mohammadnezhad, 2008; as cited in Nazarpour & Norouzian-Maleki, 2021), which can influence spontaneous social interaction (El-Darwish, 2022; Huang, 2006).

In the Indonesian context, there have been limited discussions on high-rise public housing that can be found (Malik & YOSHIDA, 2021; Ridwana et al., 2018; Van & Hardi, 2017). The relatively recent development of high-rise public housing might explain the scarcity of available research. These studies found similar results, showing that social interaction and space are closely related. Furthermore, even in the case of middle-rise Rusunawa, only some studies explore the relationship between space and social interaction and capital. For example, Bunawardi et al. (2016) discussed the type of social interaction and the diversity of social demographics in different space configurations. In addition, Wijayanti et al. (2019) also highlight the importance of spaces as the nexus of civic activities to foster social capital. However, the relationship between space, social interaction, and capital is still rarely explored.

Following that, as previously mentioned, previous studies have discussed high-rise housing and its social consequences, including how middle- and high-rise housing styles differ in shaping residents' social capital. However, these studies were primarily focused on how physical features (such as elevators, building configuration, or public space) affect social interaction/capital without incorporating the influence of the residents' socio-demographics, including their length of stay in such housing.

To address this gap and contribute to the existing body of knowledge, this study investigates the interactional spaces and social capital within both Middle- and High-Rise Public Housing and whether the former impacts the latter in the Indonesian context. This study aims to answer two main research questions: (1) *Are there differences in where the residents interact with their neighbours and their social capital for both middle- and high-rise Rusunawa?* (2) *Do where people interact to influence their social capital?*

2. Methods

This study is based on primary data collected from Rusunawa Pesakih/Daan Mogot, which initially consisted of middle-rise buildings but had additional high-rise blocks constructed as part of Corporate Social Responsibility (CSR) initiatives starting in 2018. After data cleaning, the sample comprised 255 respondents: 168 from the high-rise Rusunawa (16-story buildings) and 87 from the middle-rise Rusunawa (5-story buildings). Rusunawa Pesakih Daan Mogot was chosen as the research site because it contains two different multi-story housing types located in the exact location and, shares some public facilities (such as the Grand Mosque) and reduces bias when comparing the situation of its residents.

Alongside the general information on the household characteristics (e.g., age, gender, education, and occupation), residents' interactional spaces and social capital were also

[3] For the context of students, and how social interaction in different housing type can influence their residential satisfaction.

collected. As social capital is fostered over time (Chaskin & Joseph, 2011; Lancee, 2010), the resident's length of stay in the Rusunawa was also asked.

When investigating how space influences social interaction, most studies focused on the space, such as through space syntax (e.g., El-Darwish, 2022; Ridwana et al., 2018) or person-centred mapping in a short timeframe, as demonstrated by Bunawardi et al. (2016). However, social capital is rooted in the individual and then influenced by the surroundings, including the built environment. Therefore, an approach which focused on the individuals was preferred, such as the study done by Nguyen et al. (2020), in which this study adopted the methodologies from. While not necessarily discussing social capital, they focused on each individual's social activities to gain a deeper understanding of how they interact in various locations/spaces. As social capital is developed over time, this approach fits this study as focusing on the individuals rather than space discovers important information, such as where the respondents mostly interact with their neighbours over long periods. To do so, the respondents were asked about their primary location for daily interactions[4] over the past six months.

Scholars often adopt the three different aspects of social capital: norms, trust, and networks, as described by Putnam (1993). Echoing Putnam, this research uses *participation in civic activities* (the frequency of participating in neighbourhood-scale activities such as cleaning public housing and attending meetings or religious events) as a proxy for norms, *willingness to lend items* and *receiving help* (confidence level of getting help from neighbours in a time of need) from neighbours to measure trusts level, and the *number of known neighbours* to indicate networks level. This approach has also adopted from several previous studies (Muzayanah et al., 2020; Nakano & Washizu, 2021).

Numerous studies have shown that low-income individuals tend to possess strong "bonding" social capital compared to the other types[5] (Flint & Kearns, 2006; Yang et al., 2018). Therefore, feelings of community (residents' sense of belonging/acceptance) were included to reflect their bonding level. In addition to that, field observation also observed social interaction, such as residents conversing or just sharing space with each other for individual activities in public places. All questions concerning social capital were asked on a 10-point Likert scale.

[4] Interaction refers to short/long conversations between the neighbors, working/doing activities together.
[5] bonding social capital are fostered within similar / homogeneous group. The other type consists of bridging (with different group) and linking (with institutional or government / vertical relationship) (Szreter & Woolcock, 2004).

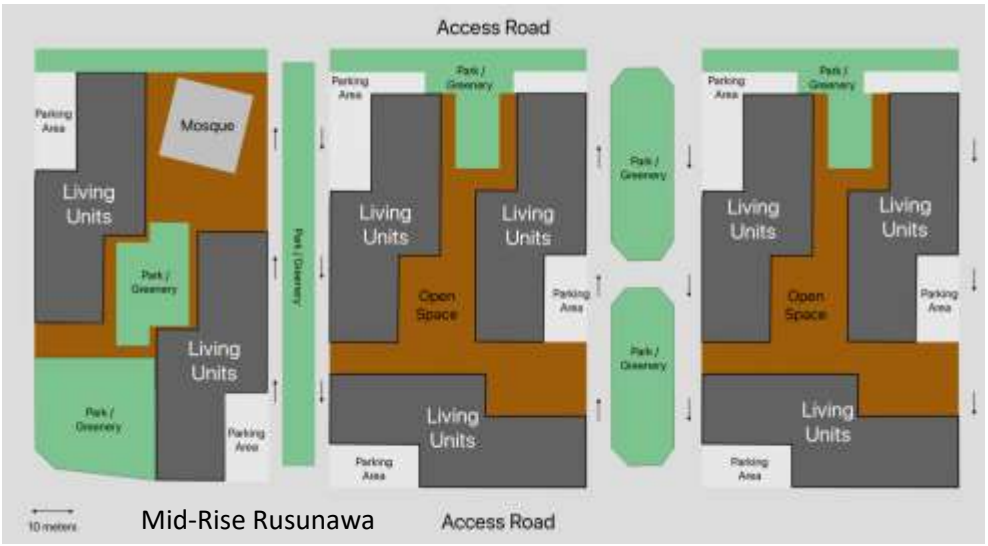

Figure 2.1. Site and floorplan/space configuration for both Rusunawa (Author's Illustration, 2023)

Figure 2.2. Rusunawa Pesakih. (The first two pictures from the left are middle-rise; the rest are high-rise.) (Private documentation, 2023)

3. Result and Discussion

3.1. Sociodemographic and Interactional Spaces of the Residents

Table 3.1 illustrates significant differences in sociodemographic distribution between the two types of Rusunawa. For instance, middle-rise respondents (MR) generally stayed longer than high-rise respondents (HR). Furthermore, both respondents mostly had monthly incomes below Rp4,800,000, which is below the minimum wage of the Jakarta Special Region. As for their education levels, HR residents generally have higher education, with the majority having junior high as their highest level of education. Notably, despite educational differences, most respondents from both types of Rusunawa had informal or no occupation.

Table 3.1. Sociodemographic of the respondents (Author, 2023)

Variable	Middle-Rise	High-Rise	Significant difference?[6]
Age (means)	49.16 (St.dev: 14.66)	42.02 (St.dev: 11.57)	Yes
Length of stay (means)	7.908 (St.dev: 1.35)	2.8024 (St.dev: 0.61)	Yes
Married	95.4%	92.3%	No
Male	31%	30.4%	No
Female	69%	69.6%	
Income Under Rp4.800.000	97.7%	91.7%	No
Rp4.800.100 - Rp6.000.000	2.3%	6.5%	
More than Rp6.000.100	0%	1.8%	
Junior high school or lower	68.9%	28.6%	Yes
Senior high school	27.6%	64.9%	
Bachelor or higher	3.4%	6.5%	
No occupation	43.7%	51.7%	Yes
informal	34.5%	28.6%	
entrepreneur/small business	10.3%	6%	
formal	11.5%	13.7%	

The architectural design was different for the two building types. The middle-rise Rusunawa was constructed with a semi-outdoor layout, featuring open voids on each floor that enabled the residents to interact with their neighbors from various floors, including those in the lobby area. In contrast, the high-rise Rusunawa adopted the enclosed two-aisle corridor style typical to many high-rise buildings, limiting visibility and interaction to a single floor.

Following that, both types of Rusunawa have similar facilities. The ground floor of each building served as the location for public housing management offices and several commercial units, where residents could run small businesses such as food stalls and shops selling daily necessities. However, the middle-rise Rusunawa has far more commercial units than the high-rise ones. The same contrast applied to the park and open spaces, with the high rise having a lower ratio of square meters per person compared to the middle rise, affirming the findings of Nazarpour and Norouzian-Maleki's study (2021).


Mid-rise:
Foodstalls


Mid-rise:
Greenery / park


High-rise:
Foodstalls


High-rise:
Greenery / park

[6] The differences between two sample groups were checked through t-test statistical analysis.

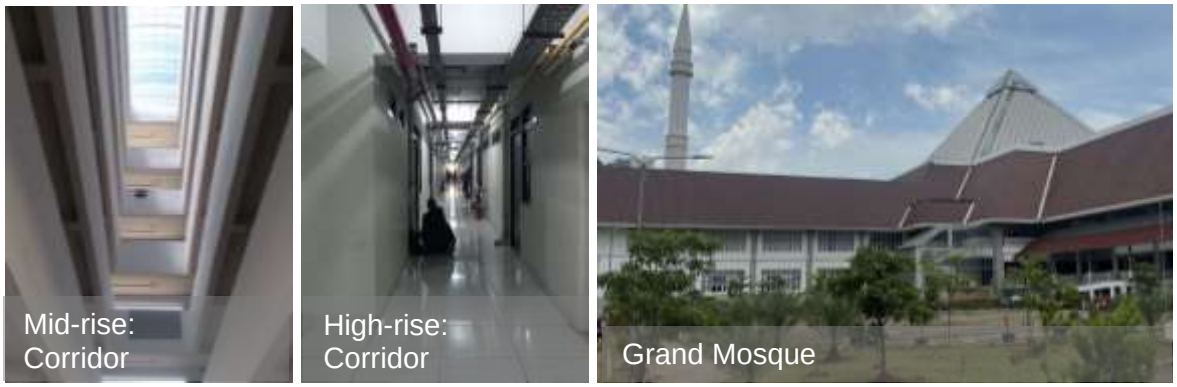

Figure 3.1.1. Building situation for both Rusunawa (Private documentation, 2023)

Regarding the interactional spaces, several spaces were frequently used for social interaction. The detailed distribution can be seen in Figure 3.1.2 (*Others* refer to spaces such as parking areas, security posts, etc.). The *p*-value for Pearson Chi-square value was significant at 0.001, indicating pattern differences in place of interaction between the two types of Rusunawa.

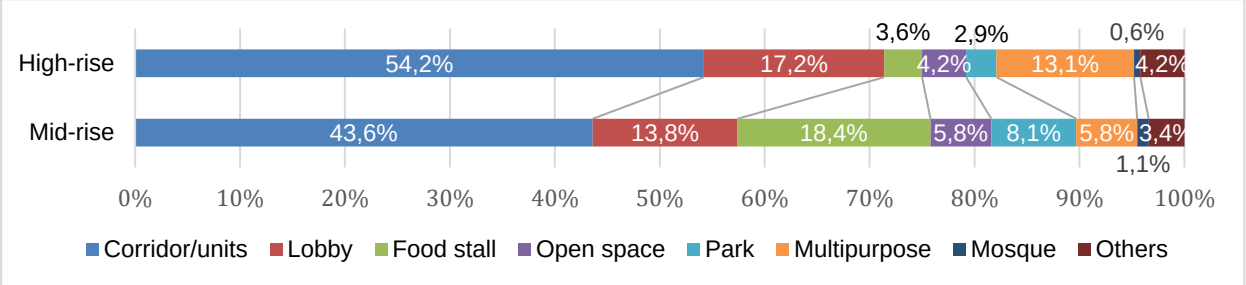

Figure 3.1.2 Interactional places (Pearson Chi-square value: 0.001) (Author, 2023)

Although not specifically designed for interactional spaces, corridor areas emerged as the primary nexus of interaction, consistent with several prior studies (Bunawardi et al., 2016; Nguyen et al., 2020; Ridwana et al., 2018). However, HR showed a higher proportion of interactions in corridor areas compared to their counterparts. The nature of high-rise housing abolished private outdoor spaces like terraces (Karsten, 2015) and replaced them with corridors that are no longer considered outdoor. The practicality of accessing outdoor space was also hindered as residents must share elevators, often resulting in longer wait times (Van der Burgt & Gustafson, 2013). In addition to that, respondents also mentioned occasional minor criminal activities, which led to a decrease in elevator usage.

In contrast, MR displayed more interactions in open spaces and parks than HR. MR expressed that the open spaces in middle-rise Rusunawa were spacious, whereas HR did not mention the same statement about their open space. The relatively more extensive and inviting open spaces likely contributed to the increased interactions for MR. Following that, low incomes were known for having small businesses like food stalls and selling necessities (Korsunova et al., 2022). Due to differences in the availability of commercial units in both types of Rusunawa, the proportion of interactions in food stalls was significantly higher in the middle-rise one (18.4% compared to 3.6%).

Even though they have shared common facilities such as the Grand Mosque, it was used mainly by the high-rise residents. The mosque was closer to the high-rise Rusunawa, and the middle-rise Rusunawa already had its own (figure 2.1). However, almost no interactions were

happening in the mosque, as the residents mainly spent their time there for praying activities only. Therefore, it can be understood that shared facilities did not affect the social interaction of the respondents from both Public Housing.

3.2. Influences of Interactional Spaces on Social Capital

Figure 3.2.1 shows the levels of social capital in both types of Rusunawa. The percentages on the figure indicate the proportion of respondents in each Rusunawa who answered '7' or above for each social capital indicator. Notably, both *participation in civic activities* and the *number of known neighbours* show lower percentages compared to other indicators of social capital for both respondents. Civic activities in Rusunawa typically involve communal cleaning, monthly meetings, and religious activities such as weekly prayers. However, vertical housing in general (both middle- and high-rise) faces challenges related to the opportunities for spontaneous interaction due to the lack of a semi-private terrace area (Modi, 2014), which could lead to lower participation in larger-scale activities.

Nonetheless, respondents demonstrated high trust, such as willingly lending their belongings to neighbours, even if they did not know them well. Moreover, respondents strongly believe their neighbours would assist them in need. Most respondents felt accepted and belonged to the community, irrespective of their low civic participation and the number of neighbours they knew. These aspects showcased one of the features of low-income social capital, where individuals are willing to help others and have faith in reciprocal assistance, even though they do not know each other.

Regarding the different Rusunawa types, although both respondents lacked the same social capital indicators, the Mann-Whitney tests indicated significant differences with p-values of 0.003 and 0.022, respectively, with MR residents reporting better situations in both indicators. One possible explanation was that the nature of high-rise Rusunawa makes it more challenging for residents to get to know one another, as they are often limited to interactions with neighbours on the same floor. Building configuration also influences social capital, with rectangular-shaped (the case for the middle-rise Rusunawa) having a better effect than others (Choi and Kong, 2007, as cited in Gu, 2020). Interestingly, despite HR exhibiting higher interactions in multipurpose rooms designed to hold civic activities, they had lower participation levels.

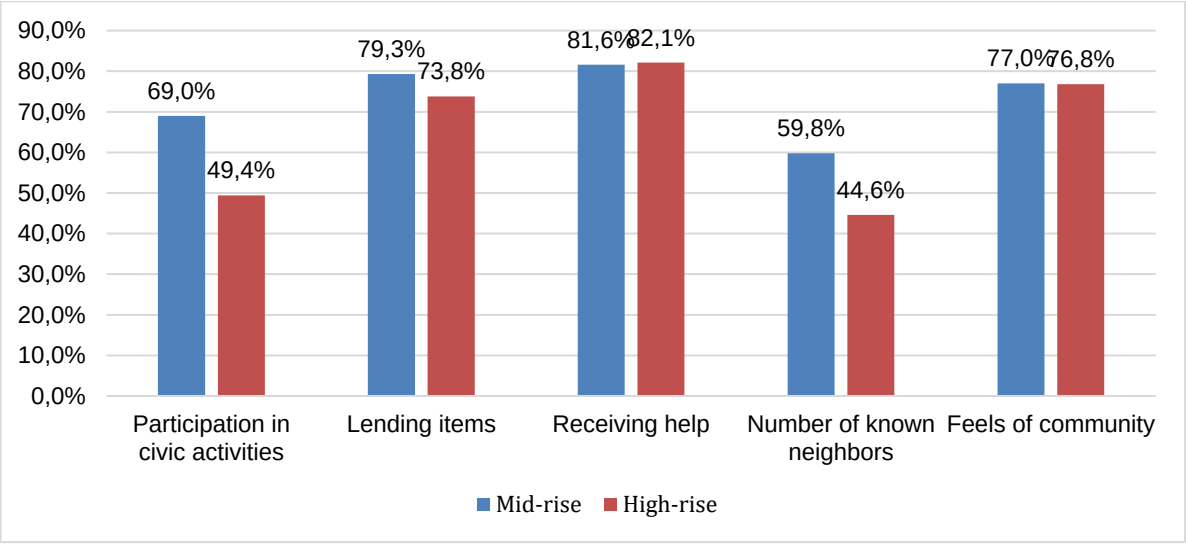

Figure 3.2.1 Social capital mid- and high-rise. (Author, 2023)

Finally, the data were analysed through a binomial logistic Regression with the four social capital indicators as dependent variables (the *confidence level of receiving help* was excluded as there was no significant variable). For sociodemographic factors, having no occupation was set as the reference category for *occupation*. Regarding interactional spaces, *corridor areas* were selected as the reference category. Following that, food stalls, open spaces, and parks were grouped into one category labelled *public place*, while multipurpose rooms, mosques, and other locations were grouped under *others*. This grouping was done due to the limited number of samples interacting in these places, which could introduce bias in the regression analysis.

Table 3.2.1 shows the results of the regression analysis. Both Cox & Snell's and Nagelkerke's R-squares were higher for MR, indicating a better fit of the data to the regression model than HR. However, this difference might be attributed to the smaller sample size. A smaller size means fewer variants, which might result in a better R-square. Subsequently, sociodemographic and interactional places demonstrated varying influences on social capital indicators for both MR and HR.

For instance, sociodemographics influence MR's participation in civic activities more than HR. In contrast, it has more effect on the *number of known neighbours* for HR than MR. Concerning the length of stay, it positively impacted *participation in MR's civic activities but negatively impacted* HR's feeling of community. This implies that the longer MR stays in Rusunawa, the more likely they are to participate in neighbourhood communities, while the longer HR stays in Rusunawa, the less likely they are to develop a strong sense of belonging to the community.

Table 3.2.1 Parameter estimates of social capital indicators (Author, 2023)

	Participation		Lending items		Known neighbors		Feels of Community	
	MR	HR	MR	HR	MR	HR	MR	HR
Cox & Snell R Square	0.364	0.099	0.097	0.130	0.284	0.191	0.248	0.144
Nagelkerke R Square	0.512	0.133	0.151	0.190	0.384	0.255	0.376	0.218
Age	-	-	-	-	-	-	-0.087* (0.917)	-
Gender	-	-	-	-	-	-1.066* (0.344)	-	-1.114* (0.328)
Income	-1.706* (0.182)	-	-	-	-	0.765** (2.150)	-2.025* (0.132)	-
Education	1.173* (3.233)	-	-	0.564* (1.757)	-	-	-	-
Occupation *Ref: no occupation*								
Informal	-	-	-	-	-	-	-	1.645* (5.179)
Entrepreneur	-	-	-	-	-	-	-	-
Formal	-	-	-	-	-	-	-	-
Length of stay	1.323** (3.756)	-	-	-	-	-	-	-0.900* (0.407)
Floor level								

Place of interaction *Ref: Corridors*								
Lobby	-	-	-	-	-	-	-	1.748* (5.745)
Public space	-	-	-	-	2.129* (8.408)	1.741** (5.704)	-	-
Others	-	0.973* (2.647)	-1.681* (0.186)	-	-	1.248* (3.485)	-	-

*: significant at 95%; **: significant at 99%; -: not significant.
The number shown in the bracket is the odds ratio.

Regarding interactional places, most respondents had interactions in corridor areas. However, concerning social capital, some spaces were found to foster better social capital than corridor areas. For instance, the lobby, an intersection point for residents, was not designed initially as an interactional space. However, it was more likely to create a stronger *feels of community* for HR who interacted there compared to those who interacted in corridor areas.

Furthermore, HR who interacted in *other* space (such as multipurpose rooms, parking spaces, mosques, and security posts) were more likely to participate in civic/neighbourhood activities and know more neighbours than those who interacted in corridor areas. The multipurpose room was designed for social interaction and neighbourhood activities, providing opportunities for residents to exchange information about community activities, which increased participation (Modi, 2014). However, it was also quite interesting that places such as parking spaces or security posts may also have the same influences on social capital as multipurpose rooms.

Notably, public spaces (food stalls, open spaces, and parks) were the only ones that positively influenced social capital for both MR and HR. However, it was only significant for a *number of known neighbours*. Similar to the multipurpose room, these spaces were originally designed as places for interaction and were equipped with physical elements which support social interaction. For the HR case, the odds ratio (indicating the strength of influence) for interactions in public spaces was higher than in other spaces. This odds ratio was also higher for MR than HR. This means both respondents who interacted in public spaces rather than corridor areas were more likely to know more people in the neighborhood, with MR residents having a better likelihood.

Additionally, the floor level in which respondents lived was insignificant, indicating that the floor numbers within the building did not impact their social capital. Vertical housing, as opposed to detached/landed housing, is associated with various adverse effects on residents' social interactions and capital. However, this study found no significant difference in terms of effect between middle- and high-rise Rusunawa. This finding supports previous studies and further strengthens the fact that building configuration and semi-outdoor spaces are more relevant to social interaction than the number of floors (Choi and Kong, 2007, as cited in Gu, 2020; Gamera-Salinas et al., 2021)

4. Conclusion

High-rise housing and social capital have continued to become popular topics to be studied, and this study contributes to the existing body of knowledge by answering two main research questions utilizing empirical evidence in the context of middle- versus high-rise vertical housing.

First, this study asked about the differences in where the residents interact with their neighbours and their social capital for both middle- and high-rise Rusunawa. This study found

that while there were similarities and differences between middle- and high-rise Rusunawa respondents, the distinctions were more related to building configuration and facilities than the number of floors. The rectangular configuration of middle-rise Rusunawa and the better people-per-square-meter ratio of open space facilitated interactions between residents compared to high-rise housing.

Second, this study asked whether where residents interact matters to their social capital within middle- and high-rise housing for low-income. MR and HR primarily interacted in corridor areas, serving as the immediate 'public' space where neighbourhood interactions occur as residents leave their units. However, concerning social capital, other interactional spaces yielded better results. Public areas and multipurpose rooms were initially designed to facilitate various civic activities and promote social interaction. Although the number of respondents interacting in these spaces might be lower than those in corridor areas, there is a high likelihood that the former group enjoys better social capital. Consequently, this study suggests that replicating the atmosphere of public spaces within corridor areas by providing dedicated interactional spaces and incorporating green elements could help residents improve their social capital.

The most significant limitation of this study was the sample size, especially in the case of middle-rise Rusunawa. Unlike the high-rise one, the middle-rise Rusunawa Pesakih Daan Mogot had been occupied for over seven years. During those years, residents had been asked to participate in numerous questionnaire surveys. According to statements from neighbourhood leaders and public housing managers, many prospective respondents tended to avoid or refuse to be asked for interviews as they have been tired of answering similar questions for years.

Acknowledgements

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