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Assessing Housing Conditions in Indonesia and Its Association with Health and Well-being

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Abstract: Despite the growing evidence indicating the effect of housing conditions on health and well-being, there is no tool to assess and remediate the housing conditions in Indonesia related to health and well-being. This study aims to assess housing conditions in Indonesia and their association with the health and well-being of the occupants by using questionnaires. Participants in this study were residents living in Greater Jakarta. The number of participants was 197 people with mostly live in non-apartment houses. It was found that most of the houses in Greater Jakarta were healthy in terms of housing density since overcrowding is not an issue where most of the participants at least have one bedroom for a maximum of two people. However, having full-time ventilation is encouraged to have a better thermal environment in a tropical country like Indonesia. In conclusion, this study provides valuable insights for related stakeholders to improve housing conditions in Indonesia, considering the occupants' health and well-being.
Keywords: Housing and neighbourhood quality, health and well-being, perceived housing conditions, perceived neighbourhood conditions, residential satisfaction

1. Introduction

The Central Statistics Agency of Indonesia (BPS) in 2022 calculated that 34.39% of Indonesian houses are rated below adequate housing standards as they are too crowded, built with low-quality building materials, or lack access to basic services. Poor housing conditions can negatively impact health and well-being. For instance, overcrowding can boost infectious diseases including tuberculosis, respiratory diseases, diarrhoea, and mental health issues such as stress and sleep disturbances (WHO, 2018).

Despite the growing evidence indicating the effect of housing conditions on health and well-being, there is no tool to assess and remediate the housing conditions in Indonesia related to health and well-being. The government has some housing development programmes to address housing problems including new residential development and improving the quality of existing houses but there is no evidence that the programmes have met the people's needs in terms of health and well-being.

Therefore, assessing housing conditions related to health and well-being is needed to support policymakers by giving them reliable data for evaluating the outcomes of their completed programmes, and translating research into better housing conditions regarding health and well-being (Keall et al., 2010).

This study aims to assess health-related housing conditions in Indonesia and their association with the health and well-being of the occupants based on a comprehensive assessment tool. The objectives of this study are:

- To assess characteristics of housing and neighbourhood quality related to health and wellbeing.

- To investigate the association between the characteristics of housing and neighbourhood quality and occupants' health and well-being in the form of their perspective and satisfaction with their housing conditions
- To investigate whether socio-demographic factors and housing status are associated with housing and neighbourhood conditions.

2. Literature Review

2.1 Housing and neighbourhood quality: Residential health and well-being

Inadequate housing is likely to affect the health of occupants. For example, dampness inside the housing may develop and exacerbate respiratory conditions such as asthma (Krieger & Higgins, 2002) and extremely cold temperatures increase the risk of cardiovascular disease (Moghadamnia et al., 2017). On the other hand, health and well-being can benefit from housing modifications in both direct and indirect ways. An improvement in ventilation promotes healthier indoor temperatures that benefit social outcomes (United States Environmental Protection Agency, 2023).

Since poor-quality housing can trigger multiple diseases in residents, setting up housing quality indicators is a useful method of assessing housing quality (Goodman, 1978). However, housing quality is not solely determined by structural stability; it also depends on factors such as neighbourhood and housing location, architectural elements, indoor environment, and gradual maintenance (Chohan et al., 2015). Housing and neighbourhood satisfaction are determining factors of housing conditions that have impacts on the quality of life of the occupants (Salleh, 2008).

Evaluating the quality of housing and neighbourhood permits those involved in building including policymakers and researchers to assess the state conditions of both new and existing houses and offer suggestions for improvement (Sinha et al., 2017).

2.2 Housing conditions in Indonesia

Urbanisation in Indonesia increased from 49.9% in 2010 to 55.9% in 2019 and is projected to reach 66.6% by 2035 (Central Bureau Statistics of Indonesia/BPS, 2020). This urbanisation has led to a rising number of backlog and poor living conditions for many people. According to the Central Bureau Statistics of Indonesia (2020), 15.5 million households or 38.9% of urban areas remain have poor housing conditions, some of which may be overcrowded.

Concerning these problems, one of the main initiatives in Indonesia's National Medium-Term Development Plan, which aims to reduce the backlog to five million units, is housing building in urban areas. The government's efforts nowadays to fulfil the need for livable housing consist of new residential developments and improving the quality of existing houses (Ministry of Public Works and Housing of Indonesia, 2020).

However, it was reported that sometimes it is not possible to run according to the target in practice because there are obstacles such as the lack of understanding of the community regarding good housing and the housing development is not supported by national incentives. Therefore, it is fundamental to assess housing conditions in Indonesia to help the government develop housing programmes based on people's needs and evaluate the effectiveness of their programmes.

2.3 Housing and neighbourhood indicators

Housing type (e.g., apartment units or detached houses), housing quality and indoor environment (dampness, temperature, etc.), housing density, and neighbourhood noise have all been linked to poor physical and mental health in the built environment (Guite et al., 2006). The neighbourhood quality concerning the physical characteristics of the surroundings (such as abandoned buildings and green spaces), perceived neighbourhood issues (such as insecurity), and a lack of social opportunities have all been linked to poor mental health (Araya et al., 2006). In line with Bond et al. (2012) and Huebner et al. (2022), the indicators of housing conditions that are associated with health and well-being can succinctly be grouped into socio-demographic and housing status factors, housing factors, and neighbourhood factors.

3. Methodology

The online questionnaire survey was chosen as an assessment tool since it is a simple and effective tool to help people measure their housing conditions and communicate the issues and trends. As the questionnaires were developed for an empirical study on health-related living conditions, the survey concentrated on questioning the residents. The objective measurement was conducted by asking socio-demographic characteristics of the participants, their housing status, and the physical attributes of their housing and neighbourhood. For subjective measurement, participants were asked to score their housing conditions based on their perspective and satisfaction with their living environment.

3.1 Participants and Procedure

Participants in this study were residents who live in a property in Greater Jakarta, the capital city of Indonesia, considering Greater Jakarta is an urban area with the largest population with low occupancy rate in Indonesia because of the rapid urbanisation that occurs in the city (RPJMN, 2020-2024). To collect the data from the participants, ethical approval has been provided by the UCL Research Ethics Committee.

The invitation letter and information sheet for participation in this study were initially sent to five online messenger groups of participants. The potential participants in the groups were then asked to send the invitation letter to their relatives and friends continuously. Since the targeted participants were Indonesian, all the sections in the questionnaire were translated into the Indonesian language including the invitation letter and information sheet before being sent.

In this survey, all participants were questioned about the subjective and objective of housing and neighbourhood conditions. They were also asked about their physical and mental health conditions in the past two weeks to know whether the participants considered to have a long-standing illness or disability. Participants should complete all sections to finish the questionnaire to prevent unanswered data.

3.2 Questionnaire development

To assess the health-related living conditions of the residents, the questionnaire consisted of housing and neighbourhood aspects (Bond et al., 2012; Huebner et al., 2022). The housing aspect was assessed based on factors including housing density, thermal environment, indoor air quality, hygiene, and lighting environment. The neighbourhood aspect was assessed based on the environmental conditions and social interaction.

Using a combination of specially designed questions and an adjustment of existing questionnaires, the questionnaire was divided into four sets of variables:

- Socio-demographic factors and housing status

- Characteristics of housing and neighbourhood quality
- Perceived housing and neighbourhood conditions
- Residential satisfaction

Socio-demographic factors in this study included gender, education, household income and employment status (fixed or irregular income). Participants were asked to describe their housing and neighbourhood conditions by answering 5 Likert-scale questions based on their perspectives. For example, thermal comfort was described by the participants as whether it was “very uncomfortable”, “uncomfortable”, “neutral”, “comfortable”, and “very comfortable” where “very uncomfortable” was coded as 1 and “very comfortable” as 5.

A pilot survey was performed on the 4th of July 2023 to 20 Indonesian students in London assessing their houses in Greater Jakarta. Content validity was tested using Pearson’s Correlation Coefficient two-tailed test with a 95% confidence interval and 18 degrees of freedom.

3.3 Method of Analysis

The collected data was analysed by using univariate and bivariate analysis. The univariate analysis was performed by using descriptive statistic analysis to identify the distribution of each set of variables. It was also used to describe the socio-demographics and housing conditions of the participants. A bivariate analysis was conducted to identify whether there is an association between the physical housing conditions of the participants and their health and well-being. A bivariate analysis was carried out by using the Chi-Square test with a 95% confidence interval. A Chi-square test was performed to analyse the association between the four sets of variables.

4. Results and Discussions

Participants in this study predominantly lived in South Jakarta (43.9%). Most participants were female (68.4%) and university graduates (87.7%). Participants who earned 2,600,000 IDR to 5,200,000 IDR per month tended to live in rented houses while participants with income above 5,200,000 IDR per month almost had even distribution regarding the status of ownership preferences.

4.1 Characteristics of housing and neighbourhood quality in Indonesia

Based on the Chi-square test, it is reported that housing density is associated with the housing type and ownership status (p-value = 0.01) where apartment residents are more likely to have more than or equal to one bedroom for one person than non-apartment residents. Since this study tried to measure the housing density based on the number of people and bedrooms, it can be assumed that people who live in apartments tend to have adequate housing size because they are mostly single or live alone.

This study found that most households in this study have at least one type of ventilation to cool their houses and most of them have openable windows. Most households open the windows in the morning and more than 90 minutes to get fresh and less polluted air. The time and duration of opening the windows which dominantly occurred in residents’ window activity might be reasonable in this study due to preventing insects and polluted air from entering their houses at certain times. It was supported by the finding that most participants sometimes saw the biggest number of mosquitos from 6 pm to 12 am which is relevant to the ventilation strategy where people are most likely to open the window in the morning instead of night.

One of the housing factors associated with the presence of mould in this study was the housing age (p-value = 0.004) which was supported by the distribution of houses that were built more than 10 years ago always having visible mould in their house. This finding was relevant to the research conducted by Norbäck et al. (2017) since it is reasonable to assume that older buildings will have more dampness problems related to leakage, because of the gradual degradation of water and sewage pipes and roof material by age.

4.2 Association between housing conditions with health and well-being based on perspective and satisfaction of the residents.

The duration of people opening windows was found associated with the satisfaction of people with the thermal environment in their houses (p-value = 0.03). This finding may be relevant since people who open their windows more than 90 minutes a day have relatively good air circulation in their houses, which affects their satisfaction. In addition, it was found that housing type and ownership status were also associated with people's satisfaction in the thermal environment. This finding could prove a study conducted by Pekkonen & Haverinen-Shaughnessy (2015) that homeowners were more satisfied with their dwellings than renters because they have relatively more control over the thermal conditions than residents in rental units.

The presence of mould was found to have an association with residents' satisfaction with their indoor air quality as well (p-value = 0.001). Most people were satisfied when their house was rarely exposed to visible mould. In contrast, people who more often have mould in their houses feel more dissatisfied with their houses which leads to low mental health and vitality that was in line with (Guite et al., 2006). In terms of hygiene, the cleaning routine was associated with perceived cleanliness (p-value = 0.05) but not with satisfaction (p-value = 0.57). It was found that people who clean their houses at least once a day tend to have excellent cleanliness based on their perspective.

The perception of lighting environment is only associated with ownership status where people thought their lighting environment was relatively excellent when they owned their houses. This finding could make the conclusion that people who owned their houses were most likely content and pleased with their housing condition since they took more consideration for long-term living before buying or building their own houses which gave them a better perspective about their homes. It was relevant to research conducted by Balestra & Sultan (2013) that people took many factors beyond the physical characteristics of housing before deciding to live in the houses.

In this study, the characteristics of neighbourhood quality consisted of social interaction that occurred in the neighbourhood while the perceived neighbourhood condition was about the perspective of residents toward their environment. The perception of the neighbourhood environment and the satisfaction of the residents towards it were associated with ownership status (p-value = 0.02) where homeowners more likely thought their neighbourhood environment was excellent and satisfying than renters. In terms of social interaction, people who often interact with their neighbours mostly feel satisfied with their neighbourhood interaction (p-value = 0.001).

4.3 Limitations

There were several limitations identified in this study. The initial limitation of this study is that the participants were relatively homogeneous. Since the participants were not specified based on their income and employment status, most people who participated in

this study mostly had fixed income and owned their houses which made the result narrow to the specific group.

Secondly, participants were not asked the standardised questions related to their health and well-being due to confidentiality although the questions could provide direct answers about the association between their housing conditions and their health and well-being.

Thirdly, to objectively measure the housing conditions, participants were asked about their activity concerning the thermal and lighting environment instead of taking measured parameters such as temperature or lux level since the assessment was taken online.

5. Conclusion

Assessing housing conditions in both subjective and objective ways is fundamental to understanding comprehensively the housing conditions both by the physical characteristics and occupants' point of view. Even more importantly, considering the satisfaction and perspective of the occupants can be one of the most valuable aspects to improve their health and well-being. The result can support policymakers by providing data on housing quality in Indonesia, assessing the effectiveness of their housing programmes and regulations, improving housing conditions, and improving individual knowledge about the impacts of housing on health and well-being.

This study identified that overcrowding should be defined objectively to prevent its negative impact on occupants' health and well-being because subjective measurement can be driven by some social factors. Since the duration of opening windows was associated with thermal satisfaction and having full-day ventilation can provide a better thermal environment (Liping and Hien, 2007), some solutions are needed for people to open their windows a whole day without getting exposed to insects.

Since the sample was relatively homogeneous, it is recommended for future studies to spread the participation invitation to wider groups of people to gain an equal number of participants from different socio-demographic groups to have more variation. According to the limited data where the sample was only from one particular area, future research should analyse samples from some representative cities in Indonesia to produce broader recommendations for the whole country. Preparing ample time to have an in-person assessment is also suggested for future research to gain more accurate objective measurements regarding housing conditions in Indonesia.

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