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HOUSING QUALITY INDICATORS: A SYSTEMATIC REVIEW

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ABSTRACT

A wealth of studies has demonstrated the significance of adequate or quality housing on occupant's productivity, performance, comfort and health. However, insufficient data on the conditions of existing housing stocks and a lack of consensus measures of housing quality hinder housing developments from achieving residential needs. Due to the lack of quality indicators, the quality of housing is not often assessed. Therefore, this paper presents a systematic review using the PRISMA protocol to provide an overview of the housing quality indicators that can be employed to evaluate housing quality. The review consisted of 62 studies investigating 66 housing quality indicators. Each fall into one of eight categories, namely 1) dwelling unit architectural design characteristics and features; 2) user comfort; 3) housing site location and neighbourhood; 4) building services; 5) construction quality and stability; 6) economic aspect; 7) building maintenance; or 8) sustainability. The results show that investigating housing quality indicators is a growing research field where adequate ventilation was the most critical indicator of a quality home. Since the identified indicators are essential determinants of a quality house, architects and engineers can integrate these features at the design and construction stages in upgrading the conditions of dwellings while satisfying occupant's comfort and quality of life. Further, governments can develop housing quality standards or regulations using these indicators to improve the quality of new housing constructions.

Keywords: *Health; Housing; Quality Indicators; Satisfaction; Systematic Review.*

1. INTRODUCTION

Housing quality is a complex concept that is contextual without a static meaning and varies according to different user groups (Sengupta and Tipple, 2007). Quality housing does not confine itself to structurally stable but also depends on housing location and neighbourhood, indoor living environment, architectural design features, and housing maintenance (Chohan, et al., 2015). According to Lawrence (1995), quality housing should have a proper interrelation between architectural, economic, demographic, political and ecological factors. Moreover, housing and neighbourhood satisfaction are

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critical indicators of housing quality, which affect occupants' quality of life (Salleh, 2008). Stats NZ (2018) refers housing quality "to the degree to which housing provides a healthy, safe, secure, and resilient environment for individuals, families, and to live in and to participate within community activities" (pg.7). Furthermore, to produce a quality house, four elements interact with each other, including housing habitability, housing functionality, social and cultural sustainability, and environmental sustainability. Housing habitability and environmental sustainability are related to the physical structure of a house, which are also influenced by occupants' behaviour and activities. Housing functionality and social and cultural sustainability are related to inhabitant's interactions with families and their neighbourhood.

Maintaining quality and adequate houses are critical in improving inhabitants' health, comfort, satisfaction, safety and security. Poor quality dwellings can trigger multiple diseases to residents, including infections, injuries, chronic diseases and psychological problems (Evans, et al., 2000, Krieger and Higgins, 2002, Zock, et al., 2002). Establishing housing quality indicators is an effective way to measure housing quality (Goodman, 1978). Quality indicators are usually described with housing statistics, performance and quality standards. Housing quality indicators are "measurement and assessment tools designed to allow potential or existing housing schemes to be evaluated based on quality rather than simply of cost" (Housing Corporation England, 2008). However, indicators need to be evaluated according to some rational principles. The indicators can be used to assess the condition of housing, together with occupants' safety, health and comfort in an indoor living environment (Brkanić, 2017). However, it is vital to periodically review housing quality indicators to measure its effectiveness with changing technological, economic, climate, and social environments (Sinha, et al., 2017).

Evaluation of housing quality enables construction stakeholders, policymakers and research organizations to evaluate the conditions of existing and new houses and then provide some recommendations/ improvements (Sinha, et al., 2017). Secondly, it guides homeowners, tenants, and council agents to make an informed decision on housing management. However, there are no studies have involved in conducting systematic reviews on housing quality indicators. Therefore, it is vital to investigate all the housing quality indicators that lead to improved housing conditions and resident's comfort, satisfaction, and health. This paper analyses and evaluates research articles focused on housing quality indicators that have been developed to assess housing quality or inhabitant's health, comfort or satisfaction. The identified quality indicators can be used to assess the quality of detached houses, semi-detached houses or apartments. However, when assessing the quality, it is required to use indicators that are applicable only to the specific type of housing.

2. METHODOLOGY

According to Moher, et al. (2009), a systematic review is a "review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyze data from the studies that are included in the review" (p. 264). In a systematic review, the relevant studies were systematically searched and evaluated based on inclusion and exclusion criteria with a peer review protocol and have a well-defined strategy of choosing research articles with a quality assessment process that is not included in the traditional reviews (Uman, 2011). Compared with a traditional literature review, a systematic review follows more

reproducible, explicit, rigorous and auditable methodologies to provide an answer to a specific research question rather than providing a summary or overview of a topic (Oates and Capper, 2009).

Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) was followed to guide the current systematic review to facilitate the systemic review's reproducibility, comparability, and transparency. After establishing the research question, the review was conducted following four steps (refer Figure 1). These included: 1) the identification of articles, 2) the screening of relevant articles, 3) the application of eligibility criteria, and 4) the inclusion of articles identified and a synthesis of the findings.

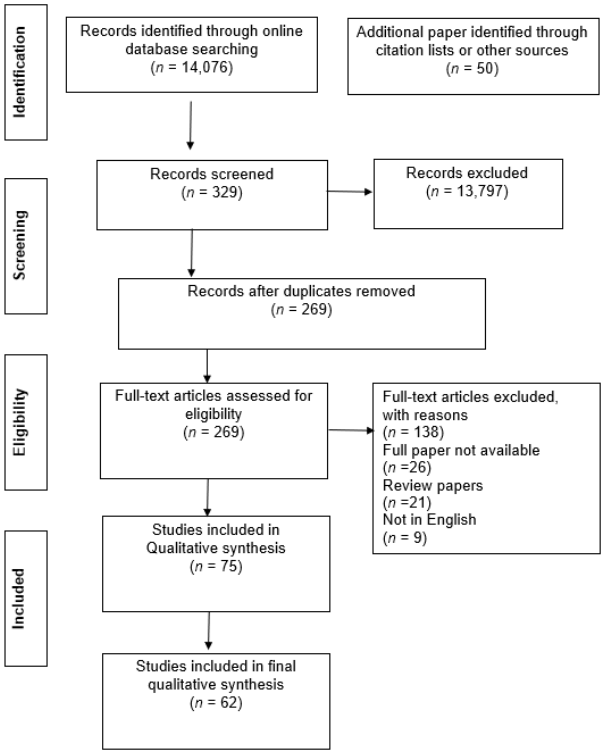

Figure 1: PRISMA flow-chart summary of search strategy and results

In the identification stage, a systematic search of scholarly electronic databases including Scopus, Web of Science, Google Scholar and Engineering Village was conducted from October 2019 and December 2019. The search terms were "(hous* OR indoor) AND (Quality) AND (indicators OR parameters)". The same search terms were used in each database. Scopus was selected because it is the world largest abstract and citation database of peer-reviewed literature, including journals, conference proceedings, and books in essential subject fields ranging from engineering, science, medicine, arts, and humanities. Web of Science is also one of the leading databases, with multidisciplinary articles. This fully covers over 12,000 highly acclaimed impact journal around the world including the subject arears of life sciences, health sciences, physical sciences and social sciences. Engineering Village is a comprehensive database that contains the most authoritative engineering studies available to provide answers to existing questions. This covers the subject areas of physical sciences and life sciences. Google Scholar is a search engine that offers an extensive search for scholarly literature.

The initial database search produced 14,076 records. A further 50 records were identified through citation lists and other sources. Therefore, finally, 14,126 records were included in the screening process. The focus of the screening state was on the relevance of the articles and the duplicate removal. In total, 13,797 records were excluded during the title and abstract screening process as they were not relevant to the housing quality indicators. After further removal of duplicates, a total of 269 records remained. The eligibility stage involved a further checking of the relevancy of articles by exercising four inclusion and exclusion criteria. Firstly, only peer-reviewed journal articles and conference proceedings that presented housing quality evaluation criteria to assess housing quality were selected without limiting to a year of publication. According to Stats NZ (2019), dwelling energy efficiency features along with occupants' health, well-being, comfort, satisfaction, and security represent the quality of dwellings. Therefore, the studies that focused on investigating the parameters that influence occupants' satisfaction, health, comfort, well-being, security, and housing energy efficiency are also included in the current review. Secondly, the publications on housing design and construction features that not associated with quality indicators were excluded as the research aims to ascertain the parameters of quality housing. Thirdly, book chapters and dissertations were not included because those were not peer-reviewed. Review or discussion papers were also excluded as those consisting of secondary data. The studies published in the English language were only included since researchers could not understand other languages. Any discrepancies between the authors were resolved through discussion until an agreement was reached. Finally, the eligibility assessment resulted in a total of 75 publications.

In the final stage, a methodological quality assessment of each article was undertaken. The methodological quality of all 75 articles were measured using the "Standard Quality Assessment Criteria for Evaluating Primary Research Papers" (Kmet, et al., 2004). This tool comprises ten criteria to measure the quality of research articles (Appendix A). A scorer assigns "yes" = 2, or "partial" = 1, or "no" = 0 for each criterion, depending on the degree to which each criterion was met. A criterion not applicable to specific research was marked as "n/a" and were excluded from the summary score calculation. A summary score was calculated by summing the total score attained across ten items and divided by the overall possible score (i.e., 20 – (number of "n/a" x 2)). The summary score range between 0 and 1, with higher scores indicating higher quality article.

The summary score of 75 studies was ranged between 0.2 and 0.85 (refer Table 1).

Table 1: Quality Assessment of the studies included in the review

Normalized score	Number of articles
0.1 – 0.2	0
0.2 – 0.3	3
0.3 – 0.4	4
0.4 – 0.5	6
0.5 – 0.6	9
0.6 – 0.7	28
0.7 – 0.8	20
0.8 – 0.9	5
0.9 - 1	0

The study used a normalized score of 0.5 as the threshold value because it is the average value between the highest (0.85) and the lowest (0.2) normalized values. A summary score of 82% of the papers is above 0.5. This indicates that the quality of the articles reviewed to ascertain housing quality indicators are relatively high. According to the quality assessment, 62 articles are within the quality range, which is included in the final analysis.

3. RESULTS

The authors designed a data extraction form to review housing quality indicators. The extracted information comprised of publication classification, publication year, the country where the research was conducted, publication source and dwelling type. The statistical analysis was performed using Microsoft Excel.

3.1 PUBLICATION PURPOSE OF THE REVIEWED ARTICLES

In the current systematic review, studies could be divided mainly into two categories; studies that developed housing quality evaluation criteria or studies that used existing quality indicators for different applications, including to assess housing quality directly or to evaluate occupants' comfort, satisfaction, security or health or to measure the energy efficiency of dwellings. Therefore, Figure 2 depicts the different categories of studies used to develop the housing quality indicators in the current review.

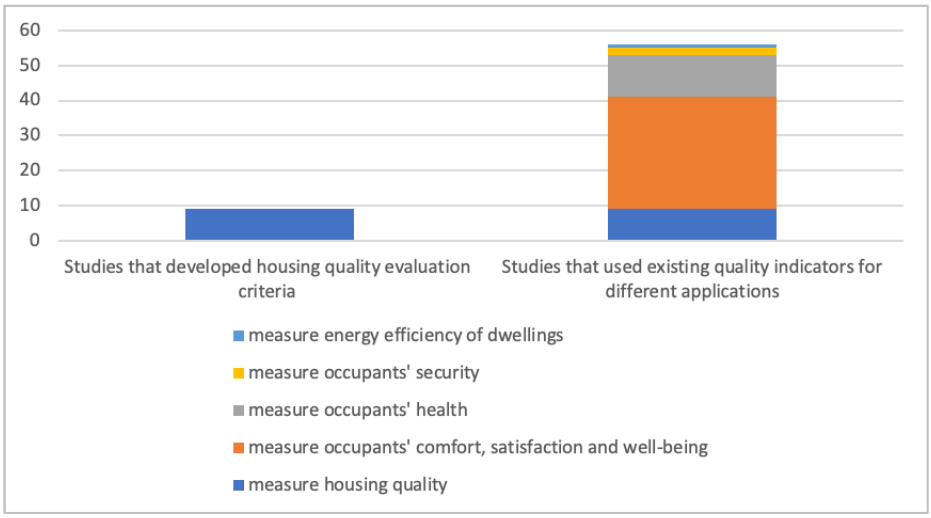

Figure 2: Classification of the studies in the review

As shown in Figure 2, around two-thirds of the studies in the current review used existing quality indicators for different applications (i.e. measure housing quality, housing energy efficiency, and occupants' comfort, satisfaction, well-being, security, and health). However, only a few studies have developed housing quality evaluation criteria to determine the quality of dwellings by attaining the inputs from housing experts.

3.2 CHRONOLOGICAL DISTRIBUTION OF THE REVIEWED ARTICLES

The systematic review revealed the extensive use of housing quality indicators in the last five years to measure dwelling quality or occupants' life quality (comfort, satisfaction, health and safety), as shown in Figure 3. While 26% of the studies (16 articles) were

conducted in the five years between 2010 and 2014, around 40% (25 articles) were carried out in the five years between 2015 and 2019.

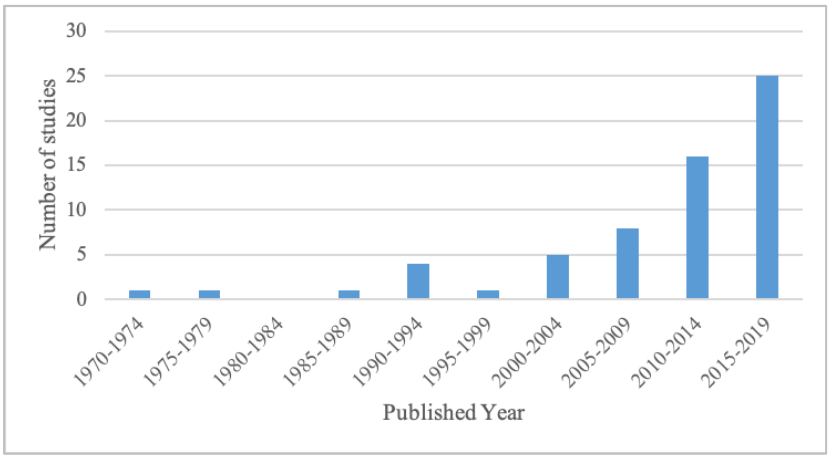

Figure 3: Chronological distribution of reviewed articles

3.3 Geographical Distribution of Identified Articles

The final 62 articles covered 33 different countries from four different income economies[5], as shown in Figure 4. Of these, 32 (52%) were conducted in high-income economies (HI) (52%). Nevertheless, only 2% of the studies were conducted in low-income economies. Since these low-income countries struggle with poor housing quality issues, it is essential to conduct research in ascertaining housing quality indicators to identify what constitutes a quality house in low-income countries.

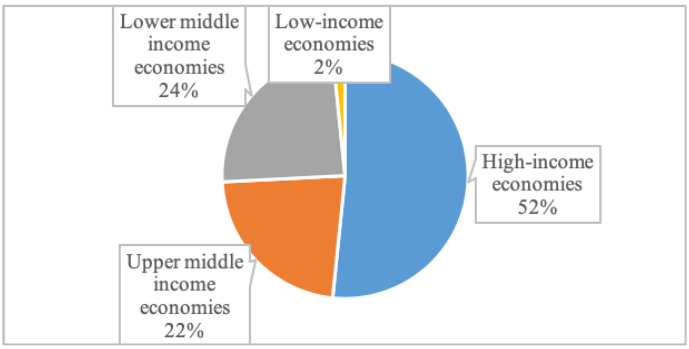

Figure 4: Review articles by different income economies

3.4 Housing Quality Indicators

Analysis of findings in the reviewed articles suggested that housing quality can be divided into eight categories namely;

1. **Dwelling unit architectural design characteristics and features (25%)** - Measure the quality of adopted architectural design features and standards
2. **User comfort (22%)** - Measure the indoor environment parameters that make occupants comfortable and healthy

[5] Use Gross National Income (GNI) per capita data in U.S. dollars to group the economies. High-income > $12,235, Upper-middle income $3,956-$12,235, Lower-middle income $1,005-$3,955, Low-income <1,005

3. **Housing site location and neighbourhood (20%)** - Measure the condition, as well as the security of housing neighbourhoods and proximity to main amenities
4. **Building services (15%)** – Measure the design, installation and operation of principal utilities in a dwelling
5. **Construction quality and stability (9%)** - Measure the quality and stability of structural work and non-structural related work
6. **Economic aspects (4%)** - Measure commercial aspects of dwellings that account for housing quality
7. **Building maintenance (3%)** - Measure the acceptable standard and technical performance of building elements
8. **Sustainability (2%)** - Measure the adaptation of sustainable measures in housing construction to reduce environmental impacts of dwellings

These eight sets of categories together contained 66 housing quality indicators, as shown in Table 2.

Table 2: Key housing quality categories with associated indicators

Housing quality category	Housing quality indicators	Number of reviewed articles	Country
Dwelling unit architectural design characteristics and features (C1)	Crowding (number of people per room)	23	HI, UMI, LMI
	Well-designed passive lighting	19	HI, UMI, LMI, LI
	Average household size	15	HI, UMI, LMI
	Space and quality of bath and toilets	14	HI, UMI, LMI
	Functional space design for kitchen performance	12	HI, UMI, LMI
	The content of dampness, moisture and fungi	10	HI, UMI, LMI
	Number of rooms in the dwelling	7	HI, LMI
	Space and quality of the bedrooms	6	HI, UMI, LMI
	Age of dwelling	3	HI, LMI
	Staircase size for smooth movement and emergency purpose	1	LMI
User comfort (C2)	Adequate Ventilation	29	HI, UMI, LMI, LI
	Acoustic comfort (Measures for sound insulation)	25	HI, UMI, LMI, LI
	Thermal comfort	24	HI, UMI, LMI
	Indoor Air Quality	18	HI, UMI, LMI
	Passive and total lighting comfort	11	HI, UMI, LMI, LI
	Odour in the dwelling	8	HI, UMI,
Housing site location and neighbourhood (C3)	Access to nearby hospital	18	HI, UMI, LMI, LI
	Availability and access to public transport	17	HI, UMI, LMI, LI
	Access to a nearby school	17	HI, UMI, LMI
	Access to grocery stores and restaurants	15	HI, UMI, LMI

Housing quality category	Housing quality indicators	Number of reviewed articles	Country
	Neighbourhood safety and privacy	14	HI, UMI, LMI
	Noise generated by neighbourhood or street	13	HI, UMI, LMI
	Sufficient car parking	13	HI, UMI, LMI
	Access to a nearby public park	11	HI, UMI, LMI, LI
	Neighbourhood plants and green areas	11	HI, UMI
	Cleanliness and pleasant of the surroundings	9	HI, UMI, LMI
	Distance to main roads & railways	8	HI, UMI, LMI, LI
	Well-designed spaces and roads around the housing	7	HI, UMI, LMI, LI
	Quality of landscaping	4	HI, UMI, LMI
	Quality of open spaces	4	HI, LMI
	Access to the place of worship	4	UMI, LMI
	Radon concentration	3	HI
	Space for exercise	3	HI
	Supply and security of pavements	3	HI, UMI
	Maintenance by the local authorities	3	UMI, LMI
	Access to bank	1	LMI
	Outdoor odour and air quality	1	LI
	Nearby pollen concentration	1	HI
Building services (C4)	Design of the gas supply system	3	HI, LMI
	Design of the water supply& storage system	17	HI, UMI, LMI
	Design of sewage drainage system	11	HI, UMI, LMI
	Design of the electrical wiring system	10	HI, UMI, LMI
	Availability of garbage disposal and recycling facilities	10	HI, UMI, LMI
	Availability of sanitation facilities	6	HI, UMI, LMI
	Design and availability of the heating system	4	HI
	Installation of fire alarm and sprinkler systems	2	HI
	Design of stormwater and wastewater disposal system	2	LMI
	Design and availability of the air-conditioning system	1	HI
	Use of quality and durable building materials	11	HI, UMI, LMI

Housing quality category	Housing quality indicators	Number of reviewed articles	Country
Construction quality and stability (C5)	Quality of construction workmanship - Structural (foundations, walls, roof)	11	HI, LMI
	Quality of construction workmanship - non-Structural (floor finishes, painting, pipe, doors & windows)	6	HI, UMI, LMI
	Use of quality fittings and fixtures	3	HI, LMI
	Use of advanced building and construction technology	2	LMI
	Consideration of seismic loads in structural design	2	HI, LMI
Economic aspects (C6)	Tenure (ownership) status	6	HI, UMI, LMI
	Affordability (housing expenses-to-household-income ratio)	3	HI, LMI
	Interest rates and mortgage availability	1	HI
Building maintenance (C7)	Provision for structural maintenance	4	LMI
	Provision for MEP service maintenance	4	LMI
	Provision for non-structural maintenance	3	LMI
	Provision for appliances maintenance	2	LMI
	Provision for pest control	1	LMI
Sustainability (C8)	Use of recyclable building material	3	HI, LMI
	Use of eco-friendly building material	2	LMI
	Use of energy-saving design features	1	LMI
	Adoption of onsite renewable source of energy (i.e., wind and solar)	1	LMI

Note: HI - High Income economies, UMI - Upper Middle-income economies, LMI - Lower Middle-income economies, LI - Low Income economies

Dwelling unit architectural design characteristics and features

The highest number of articles (51 articles) reported housing unit architectural design and features related quality indicators in the review. This criterion described housing design features that constitute a quality house. This category comprises ten housing quality indicators. Under this category, "the number of people per room" (23 studies) and "well-designed passive lighting" (19 studies) are found to be the most significant indicators to measure the quality of housing since the majority of the studies mentioned these two quality indicators. Household crowding is one of the key contributing factors for occupant's health, including respiratory diseases (Murray, et al., 2012, Taksande and Yeole, 2016), depression and sleep disorders (Suglia, et al., 2011). In addition, well-designed passive lighting affects occupant's visual comfort as it allows them to obtain the required natural daylighting to the indoor environment (Frontczak, et al., 2012). The concentration of dampness and moisture is another important indicator of housing quality, which directly affects resident's respiratory health, such as asthma and pneumonia (Karvonen, et al., 2015, Park, et al., 2018).

User comfort

In the current review, around 22% of publications described quality indicators related to resident's comfort. There are six housing quality indicators in this category, as shown in Table 3. The contribution of all these six indicators to housing quality is high since these directly affect housing occupant's comfortability. "Adequate ventilation" is the uppermost reported indicator under this category because an adequate ventilation system is essential for a house in maintaining good indoor air quality. Likewise, thermal comfort, acoustic comfort, visual comfort and indoor air quality are also imperative to improve indoor environmental quality. According to the WHO, the indoor temperature should be maintained between 18^0C and 21^0C to achieve a healthy indoor environment (Science Media Centre, 2008). Indoor air quality is another critical aspect of user comfort. Biomass fuel usage, tobacco smoking, lead base products, and exposure to volatile organic compounds are the leading causes of poor indoor air quality (Wimalasena, et al., 2021). These will increase indoor PM (Particulate Matter), CO (Carbon Monoxide), NO_x (Nitrogen Dioxide), SO_2 (Sulfur Dioxide) and VOC (Volatile Organic Compound) concentrations, which will negatively impact occupant's respiratory health. Acoustic and visual comfort are another two indicators of a quality house as this trigger both physical and psychological health problems, including injuries, visual loss, headache, sleep disturbance and annoyance (Arif, et al., 2016).

Housing site location and neighbourhood

Housing site location and neighbourhood is the third-highest reported housing quality category comprises 22 quality indicators. In the review, around 19% of the studies outlined location and neighbourhood associated housing quality indicators. Neighbourhood quality refers to the quality of the surrounding environment of a house where it is located (Aliu and Adebayo, 2010). Moreover, according to Erdogan, et al. (2007), occupant's satisfaction is positively influenced by various social and environmental living conditions in traditional and modern neighbourhoods. . People consider these factors when making their housing choices. Salleh (2008) reported that some private developers are highly profit-oriented and give less attention to housing neighbourhood facilities and the environment. But when a housing neighbourhood does not fulfil residential desires and aspirations, then inhabitants feel dissatisfied. Therefore, neighbourhood quality and safety are vital factors in evaluating the quality of a house.

Building services

Building services is the fourth highest reported housing quality category, and it contains ten quality indicators. This category mainly measures housing quality through the quality of main utilities, including water, gas, electricity, heating, air-conditioning and fire. If these systems are not functioning properly, occupants feel discomfort and result in spoilage microbes such as bacteria and mould with an unpleasant odour (Cox-Ganser, et al., 2009). Governments are responsible for providing reliable access to utilities to all housing occupants under a responsible regulatory framework (International Labour Organisation, 2021). Moreover, design features of housing sanitary facilities, garbage disposal, and waste and stormwater disposal systems also decide the quality of a house. However, in the world around 2 billion people still do to have basic sanitary facilities such as toilets or latrines (World Health Organization, 2019).

Construction quality and stability

Construction quality and stability is the fifth-highest reported quality category. According to Page and Gordon (2017), structural stability is essential for a house to reduce structural defects and damages caused by structural failures. The stability of a dwelling mainly depends on the structural quality with the use of advanced construction technologies and durable and quality building materials (Aliu and Adebayo, 2010). Zainal, et al. (2012) found that defective construction, inadequate waterproofing, and uneven floors caused serious housing quality problems, including injuries. However, only 9% of the studies reported construction quality and stability related quality indicators.

Economic aspects

The economic aspect is another category that needs to be evaluated when measuring dwelling quality as the nature of tenure, affordability, the value or price of a house generally considered as measures of dwelling quality (Sinha, et al., 2017). According to Windle, et al. (2006), psychological health problems are more common among tenants than owner-occupiers due to tenant's weaker tenure security. However, sometimes low-income house owners have also shown a slight but notable decline in mental health due to housing unaffordability issues (Bentley, et al., 2016).

Building maintenance

Baer (1988) has demonstrated the requirement of regular housing maintenance and its direct relationship with housing quality. Building maintenances include provision for structural, non-structural, mechanical, electrical and plumbing (MEP) and appliances maintenance. The natural environment like rain, extreme hot and cold weather, wind and salt spray cause the house to weather over a period of time (Baxta, 2021). Therefore, housing maintenance avoids deterioration and make the dwelling more durable. Similarly, effective maintenance in houses/ buildings can minimize the harmful effects of housing on the environment regarding waste production, energy consumption and carbon dioxide emission (Lee and Ahn, 2018).

Sustainability

Sustainability-related design features also need to be considered as quality indicators due to the scarcity of natural resources. This category includes four sustainable design features, which reduce environmental impacts caused by the housing sector. The concept of sustainability involves improving humans' quality of life, making them live in a healthy indoor living environment with improved social, environmental, and economic conditions (Akadiri, et al., 2012). Adaptation of quality materials, designs, and insulation methods lessens the environmental impact of a house and minimises the cost of living by reducing energy consumption (Howden-Chapman, et al., 2017).

4. CONCLUSION

The quality of housing has a significant impact on occupant's health, productivity, and comfort while substandard dwellings trigger many physical and psychological health issues to the inhabitants. Using a systematic review approach, this paper has provided a state-of-the-art analysis of housing quality indicators, with a total of 62 studies published between 1970 and 2019 included in the final analysis. Analysis of the content of these 62 studies revealed that measures for housing quality is an evolving research domain with the highest interest shown in journal articles in the last five years. The analysis identified

66 housing quality indicators across eight categories: dwelling unit architectural design characteristics, user comfort, housing site location and neighbourhood, building services, construction quality and stability, economic aspects, building maintenance, and sustainability.

As with housing supply shortage and deterioration of housing conditions due to ageing and lack of maintenance, the quality of houses has become a severe problem, especially among lower and upper-middle-income economies. However, very few studies have examined housing quality indicators in lower and upper-middle countries in the current review. In contrast, the highest number of studies were conducted in higher-income economies. Nevertheless, the existing housing quality indicators described in high-income countries can also be adapted to measure dwellings' quality in upper-middle- and lower-income countries. However, when assessing the housing quality base on the subjective factors like user comfort or housing site location and neighbourhood, the countries should define the thresholds according to their housing standards. The research analysis portrays that housing quality parameters are mainly described from the perspective of housing occupants when measuring their satisfaction, comfort, health, well-being and safety in the indoor living environment (67% in the current study). In contrast, only limited studies (33%) have developed quality indicators checklists by attaining the perspectives of experts. Further research can also look at developing or updating the housing quality indicators by obtaining insights from construction, housing and health professionals.

The paper provides a state-of-the-art systematic review of literature on housing quality indicators. The insights derived from this analysis provide a full picture of the categories and indicators for a quality house and the geographical distribution of categories. Such an understanding can be used as a knowledge base for researchers to assess residents' satisfaction, comfort, safety and health in the indoor living environment. Since these indicators are essential determinants of a quality house, architects and engineers can integrate these features at the design and construction stages in upgrading the conditions of dwellings while satisfying occupant's comfort and quality of life. The identified quality indicators can also assist homeowners and tenants in making informed decisions on buying or renting a property. Moreover, governments can develop housing quality standards using these indicators to evaluate dwelling conditions because housing rating systems allow countries to enhance the quality or standard of existing and new dwellings.

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6. APPENDIX A

No	Criteria
1	Question / objective sufficiently described?
2	Study design evident and appropriate?
3	Context for the study clear?
4	Connection to a theoretical framework / wider body of knowledge?
5	Sampling strategy described, relevant and justified?
6	Data collection methods clearly described and systematic?
7	Data analysis clearly described and systematic?
8	Use of verification procedure(s) to establish credibility?
9	Conclusions supported by the results?
10	Reflexivity of the account