

Exploring the Condition of Wards in Malaysia Hospital Buildings

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Abstract

Hospital buildings condition necessitated the findings of this study especially the state of the wards in the hospital buildings. The objective of this study is to examine the conditions of the wards in the hospital buildings, and proffer recommendations to various stakeholders for enhancement. A quantitative approach was used where the condition of the hospital wards was ranked respectively by the participants were physicians, psychologists, dentists, veterinarians, medical doctors, medical officers, nurses, and other hospital buildings professional users constitute the sample stratum. Statistical Package for the Social Sciences (SPSS) version 25 was used to analyse the data; descriptive and inferential such as reliability, validity, and ranking. The salient finding is that polluted ventilation, faulty ceiling lamps, faulty fire alarms, faulty wall (wall finishes/painting) and faulty window handles, were the condition of wards that were ranked highest (slightly bad) and merely affected. This implies that there is the need to use a better maintenance management approach to avert further decline in the condition of the hospital wards. Also, the research findings states that hospital buildings conditions and components of wards could be in the good state at all times using a holistic approach that will reduce more wards component depreciations for quality services outputs for the users. The wards conditions in the hospital buildings could be greatly improved by using proper strategies and maintenance management plans. Most of the studies about hospital building wards had focused on thermal comfort, but there is a paucity of studies that investigate the hospital buildings' condition of wards with low number in respondent active participation. Despite the constant rise in maintenance costs, there are numerous complaints and critiques of hospital buildings reported in the media. The lack of proper consideration for maintenance management and weaknesses in Malaysia hospitals has led to the deterioration of hospital buildings and reduced healthcare services. The study was being able to highlight some beneficial qualities and were also highlights some weaknesses of wards condition in the Malaysian hospital buildings which can tentatively be curtailed so users can be comfortable and satisfied.

Keywords: Building Deterioration, Healthcare Services, Maintenance Management, Maintenance Costs, Organization

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1.0 INTRODUCTION

A hospital building is one of the most complicated buildings to manage. The hospital organization's corporate goals give the structure a strategic position. Thus, the condition of a hospital building is important as it significantly affects both the environment and the wellbeing of its users (Abd Rani et al., 2015). Consequently, any inadequate healthcare facilities will negatively impact the hospital's ability to accomplish its main goals. The state of the hospital facilities has an impact on how satisfied or unsatisfied the patients are. Hospital buildings are primarily made to house patients, who typically have a variety of health issues that place unique demands on the indoor environment. At the same time, the workforce, and the patient in hospital buildings have to work, and take their treatments in a comfortable and secure atmosphere.

Hospital buildings are among the most energy-intensive of all business or residential building types as a result of these requirements (Yuan et al., 2022). For a hospital building to operate at its best over its lifetime, maintenance management is necessary. Even if they are new hospital buildings, maintenance management is required, they cannot stay brand-new for the entirety of their useful lives due to the limited lifespan of building materials and other components. Buildings require a lot of resources, including labour, energy, and materials (Olanrewaju et al., 2018).

The objective of this study is to investigate the maintenance management of hospital building in Malaysia with respect to the state of the wards with the goal of enhancing performance. The media and academic papers are full of complaints and concerns about how many hospitals buildings components in Malaysia are in poor conditions and not functioning as expected (Boo, 2020a; Boo, 2020b; Olanrewaju et al., 2019 and Tan, 2018). And, this had led to building components collapse, fire outbreak, leakages, and others. In addition, these can be traced to repeated flaws and improper buildings management planning, the application of maintenance management encountered several difficulties in Malaysia (Ismail et al., 2016). However, a lot of the issues stem from subpar management techniques. This study does a thorough literature review. The goal of the literature is to offer general descriptions of hospital building maintenance procedures.

1.1 Background of the Study

Healthcare facilities building provide a range of functions, which often change over time, and therefore, flexibility and adaptability are essential characteristics to facilitate future re-configuring for various functions such as medical aspect, hospital building maintenance management, financial aspect and others. On existing hospital building sites, fast construction, generally taking advantage of off-site manufacturing is preferred, to minimize disruption to the hospital. Other important design requirements for many healthcare buildings include noise and vibration control in sensitive areas such as operating theatres buildings. Numerous healthcare buildings require a high level of servicing and therefore the distribution and integration of services within the structure are important design considerations.

It is regarded as one of the most important requirements for raising occupant happiness and comfort levels in the indoor environment (Yuan et al., 2022). Due to the health subdivision's commitment to purchasing and operating environmentally friendly healthcare facilities, many schemes must meet specific environmental requirements. The improvement of health through the prevention, identification, treatment, amelioration, or cure of disease, injury, physical or mental disability, and other situations of this nature in humans is one of the main goals of the healthcare sector. There are three different categories of healthcare: primary care, secondary care, and tertiary care. The main care physician for health issues is often a general practitioner or internist. Any civilization must prioritize healthcare and hospital infrastructure since they are so important. Better access to healthcare has enhanced Malaysians' quality of life (Olanrewaju et al., 2019).

Hospital buildings are constructed to create a setting that can assist and encourage patient recovery and make it possible for medical staff to do their tasks efficiently. A loss of value for hospitals and clients arises from failing to deliver these essential services (Olanrewaju et al., 2021). Users of hospital buildings in Malaysia cited problems with fire outbreaks and physical deterioration. It has been recommended as a result to conduct in-depth research to examine the maintenance management practices of hospital buildings in Malaysia (Olanrewaju et al., 2018). Building maintenance management seeks to ensure that facilities run as efficiently as possible while remaining within budget, using the fewest amount of time, and offering top-notch service (Olanrewaju et al., 2022a).

2.0 LITERATURE REVIEW

Hospitals are physical structure-based establishments that do not often move (Olanrewaju et al., 2021). The term "building user" refers to a person, group of people, or organization that is concerned with the functionality and condition of the building. Performance of the building and tenants' actions both have an effect on one another. Building defects are graded according to their severity to determine how well they perform (Olanrewaju et al., 2022b). Users' worries regarding the maintenance work could be the outcome. Clients frequently offer feedback in the form of complaints; thus, it is essential to avoid issues by employing proactive maintenance methods (Wong et al., 2022). When designing for maintenance, it is important to take into account a variety of factors, including maintenance accessibility, indoor management, thermal comfort, visual monitoring, the location of a building's components, performance assessment management, BIM (Building Information Modelling) competency, energy performance, building deterioration, visualization management, disaster management, lean management, failure localization, and infrastructure visualization (Abideen et al., 2022).

Long and continuous cracks in the walls, beams, columns, ceilings, and flooring can be found in hospital wards. The breadth and direction of the cracks in the walls also vary (Yagi et al., 2022). Hitherto, given that construction materials and components are subjected to a range of weather conditions over long periods of time, it is essential to comprehend how sunlight, heat, humidity, and other environmental variables affect the materials' properties as well as their colour and gloss. Thus, it is critical to comprehend these characteristics when assessing the building's performance.

Moreover, lowering the standard of quality, safety, time, cost, functionality in operational and maintenance activities can have a negative impact on hospital building maintenance management (Che-Ghani et al., 2023; Sadatsafavi et al., 2017; Sarbini et al., 2021; Salleh et al., 2016). In addition, according to (Abd Rani et al., 2015), there are some factors that affect the performance of hospital buildings, which are age of the hospital building, hospital building surrounding, managerial resources invested, actual occupancy and labour sources for implementing maintenance work either in-house or outsourced in the hospital buildings.

They also stated that many organizations fail because of bad planning by the management as a result of lack of framework and guidelines. Also, there are complaints of poor performance of hospital buildings by the users, (Wong et al., 2021; Jesumoroti et al., 2022; Sarbini et al., 2021; Mong et al., 2019; Ali et al., 2016). Furthermore, thermal comfort and indoor environmental quality are influenced by the dynamics of indoor environmental variables, human occupancy, and building operational parameters (Ramos et al., 2015). To increase thermal comfort inside the building, the system might be improved still further to cool the naturally ventilated ward space (Rahman et al., 2021). Enhancing environmental comfort benefits to patients as well as healthcare professionals (medical doctors, nurses, and administrative/executive staff) (Tinner et al., 2018; Jamshidi et al., 2020).

A relaxing thermal setting enhances healing and preserves patients' wellness (Alfa & Öztürk, 2019). This is because if natural ventilation is inefficient, this will lead to an accumulation of internal heat gains from the huge number of residents and equipment in the wards and still air in most locations (Lan et al., 2017). The relationship between sound and thermal comfort in hospital wards was investigated in a Chinese study. The findings demonstrated that the effects of sound and temperature on general comfort are nearly equivalent and stronger than those of humidity (Yuan et al., 2022). In order to increase thermal comfort in naturally ventilated hospital wards, particularly in tropical climate conditions, a unique study needs to be done (Rahman et al., 2021).

The majority of the results were higher than these non-residential Malaysians criteria, which show the necessity for particular guidelines for hospital wards in Malaysia and tropical areas (Khalid et al., 2019). There is a need for research to identify the thermal comfort needs of various in-patient ward residents in all climatic areas, and the tropics in particular (Khalid et al., 2018). Maintenance management of building types are as follows; preventive, corrective, conditional preventive, systematic preventive, and predictive

maintenance; but thermal entails building components in the wards heating, cooling and ventilations; also, wards conditions relatively tied into clinical aspect which are incorporated.

2.1 Hospital Buildings Wards Conditions

Most of the study about hospital building wards had focused on thermal comfort, but their paucity of study which investigate the hospital buildings condition of wards in terms of buildings components. The data for the hospital buildings ward conditions was generated based on the extensive literature reviewed for hospital buildings ward components. There are numerous factors that contribute to the escalating number of building problems, and even though these factors have negative effects on maintenance management, they nonetheless exist. Building flaws, for instance, have been linked to fundamental problems such inadequate design specifications and improper construction (Jesumoroti & Khor, 2021).

To provide patients, visitors, and other users of hospital buildings like healthcare workers with a calm and safe environment that accelerates well-being and provides the utmost comfort, healthcare facilities need effective maintenance management. Building management and maintenance have become problematic due to a lack of an effective strategy. Also, there have been complaints from employers about the subpar functioning of hospital facilities (Wong et al., 2021; Sarbini et al., 2021; Mong et al., 2019; Ali et al., 2016; Mong et al., 2019). Doctors, nurses, physicians, psychologists, dentists, veterinarians, and other hospital staff members are among those who use hospital buildings; however patients were not included in this study. In the meantime, hospital facilities are built with various medical amenities, practical rooms, and readily available medical equipment to care for, treat, and protect the public's health.

Moreover, if the service provided by the employees or hospital staffs are not satisfactorily, it will result in a loss of value for hospitals and clients which arises from failing to deliver these essential services (Olanrewaju et al., 2021). Moreso, most significant group of inhabitants that hospitals must provide thermal comfort to are patients, but other groups include physicians and nursing staff, support workers (administrators, cleaners, etc.), and visitors. Sometimes, whether the patients are awake or asleep, one or more of these may share the same space. Other occupants will have more "normal" thermal requirements and expectations, but they will stay in the hospital for many more days or years than most patients. Patients may be very sensitive to abnormally high or low temperatures because they are old, sick, or have impaired thermoregulatory systems, but they will spend much longer periods of time there than most patients (Fifield et al., 2018).

Additionally, according to the CIBSE Handbook (2015), general wards should be heated at a target wintertime operating temperature of 22–24°C (CIBSE, 2015). Also, in the UK hospital general wards, natural ventilation is preferred (Fifield et al., 2018). It is extremely challenging and difficult to conduct field measurements in hospital wards due to management concerns about staff disturbance and patient discomfort and privacy (Khalid et al., 2018). According to Khalid et al. (2018), to calculate comfort temperature in wards, the neutral temperature is the temperature calculated by population to be neutral on the ASHRAE scale (the most prominent scale used for the assessment of thermal sensation on 7-point scale), or comfortable, neither warm nor cool on the Bedford scale, which is typically assumed to be the desired temperature (De Dear et al., 2020). In Pakistan, the earlier findings of Nimra et al. (2015); Nimra et al. (2022), the Orthopedic Wards (OW) and Emergency Rooms (ER) from each hospital were chosen as monitoring sites for wards thermal comparison due to the orthopedic treatment rooms' high risk of infection (Perez et al., 2018; Nimra et al., 2022).

The requirements of the patients and staff should be prioritized in the ward's internal environment (Reis et al., 2018). The minimal ventilation rate necessary to stop the spread of any airborne illnesses has been suggested by the World Health Organization (WHO). The recommended minimum ventilation rates are 2.5 l/s per m³ in corridors, 60 l/s per patient in normal wards, and 160 l/s per patient in airborne precaution rooms. In locations where patients are cared for, such as wards, adequate ventilation is crucial (Rahman et al., 2021). A study conducted by Shi et al. (2018) for the protection and security of patients, indicates that many hospital wards have maximum window opening size restrictions. Moreover, hospitals strive to provide the best environment and staff for patients to heal and recover as rapidly as possible (Derks et al., 2018). In addition, hospital building users must also be involved in addressing maintenance management problem; they can engage by reporting to the maintenance department or organisation. Then, the closest maintenance department can come to projecting the future of the maintenance management by using a predictive maintenance programme as shown below in Figure 1.



Figure 1 Six pillars of predictive maintenance
Source: Edms, 2020

■3.0 METHODOLOGY

The study made use of a quantitative method approach. In order to get a balanced analysis of the ward condition. The researcher sorts the responses from the hospital buildings users. Simple random sampling technique was used to select the hospital building users for easy access to data collection. With regards to the subject of enquiry, the paradigm of the research is positivism which consists of realists' ontological prescriptions and objectivists' epistemological prescriptions. In other words, how do we plan to discover the reality regarding hospital building upkeep procedures? Determining what we know and the researcher's relationship to the data are key concerns in epistemology. This study's epistemological stance was established through analysis of academic literature, official publications, and media sources, as well as through reasoning, experience, and evaluation.

Also, the research problem was viewed from a pragmatic perspective, which contended that the research problem, rather than the methodologies employed, was the most significant predictor of the research philosophy embraced. The epistemological perspectives of positivism and interpretivism were merged in this study as well because it was thought that knowledge could be acquired through both empirical evidence and reasoning. Hitherto, this research used quantitative paradigms to examine the "truth" about hospital building maintenance in order to benefit from both ontological systems (Olanrewaju et al., 2018). Theories and hypotheses can be developed through inductive investigation quite effectively. Although there has been research on hospital building maintenance in Malaysia, past studies have primarily concentrated on method rather than challenging the ontology of hospital building maintenance.

By formulating research objectives, questions, and hypotheses, ontology is not given enough consideration, which leads to a focus on maintainability rather than maintenance management, the exclusion of users, value systems, performance, comparisons, measures, and improvement challenging. Deductive reasoning, however, is also used in several parts of the research (Olanrewaju et al., 2019). The hospital buildings users (people working in the hospital) can easily attend to survey than interview because they are extremely busy based on observation, it is suggested to use quantitative approach in this regard. The study uses an inductive method, and it entails sending the survey to as many willing and reachable respondents as possible (Sekaran & Bougie, 2016).

The respondents include physicians, psychologists, dentists, veterinarians, medical doctors, medical officers, nurses and others hospital buildings professional users, (patients) were excluded as they spent limited duration in the buildings, the study is intended for the people working in the hospitals, and this is part of objective of the study. They are in the best position to give details about their hospital buildings based on their years of work in the hospital buildings, professional affiliations, experience and qualifications. The hospital buildings users' identities are not disclosed, and ethical approval exempted. Statistical Package for the Social Sciences (SPSS) version 25 was used to analysis the data.

Medical experts including nurses, doctors, psychologists, dentists, veterinarians, other healthcare practitioners, and maintenance management specialists made up the study's respondents. The questionnaire was divided into section A (demographic) and section B (wards conditions) and employed a five-point likert scale for distinct part with the likert scale, 1 = "very uncomfortable", 2 = "uncomfortable", 3 = "slightly comfortable", 4 = "comfortable", and 5 = "very comfortable". This study focuses on the opinions of various stakeholders about maintenance management as well as the opinions of the staff members in charge. The study was limited to the states of Johor, Negeri Sembilan, Kedah, Pahang, Malacca, Selangor, Sarawak, Sabah, Terengganu, Perlis, and Kelantan. A trustworthy number of target audiences is provided by the estimation procedure for sampling size determination.

Due to the COVID-19 epidemic, this study distributed the questionnaires using both a "Snowball Sampling" (non-probability sampling approach) and a "Simple Random Sampling" (where the probabilities are equal for any particular participant to be chosen). In order to meet the research issues and accomplish the goal of this study, a thorough literature analysis was conducted before developing the questionnaire. The survey received responses from 274 individuals, which were then analysed. In order to determine the validity and reliability of the questionnaire, SPSS was used. The ability of an instrument to consistently measure the characteristics of a variable or construct is known as reliability.

Validity refers to how precisely an instrument can measure a concept's attribute (Tappen, 2022). The reliability, validity, mean, and standard deviation tests were used. To improve the accuracy of the apparatus, the Bartlett test was carried out. How closely the sample mean resembles the population mean is determined by the sample mean's standard error. For accurate data collection, the validity and reliability of the data gathering device are essential. For a questionnaire to be judged acceptable, it must have both reliability and validity. The former evaluates the consistency of the questionnaire, whereas the latter evaluates how closely the answers of the questionnaire reflect reality. The sample mean is a more accurate approximation of the population mean when the standard error is lower. The study's data was examined using SPSS.

3.1 Theoretical Framework for the Study

The study used Herzberg two-factor theory to examine the user's satisfaction working in the hospital buildings shown in the Table 1 below. According to Herzberg's two-factor theory, there are motivational and hygiene-related components (Sedighi et al., 2018). Dissatisfying factors or hygiene factors refer to the collection of circumstances that cause discontent. It covers wages, policies, and working conditions. The group of elements that because satisfaction is known as the motivators, or satisfiers. It entails accomplishment, acknowledgment, and personal development (Pham Thi & Duong, 2022). The reason for sharing knowledge is best understood in terms of motivation, not hygienic considerations. For instance, salary reductions or bonuses may lead to a rise in the use of knowledge-sharing tools. But there's no evidence that hygienic characteristics, like status, can spur information sharing. They may hinder information sharing when they are not present, but they are unable to increase people's motivation to share knowledge (Sedighi et al., 2018).

Table 1 Hospital buildings Herzberg two-factor theoretical framework

Theory of Hospital Buildings	Motivation for working in the wards
Theory X	Dissatisfaction
Theory Y	Satisfaction
Reinforcement theory	Pleasant and unpleasant condition
Two factor theory	Satisfiers/dissatisfies. It includes personal growth, achievement and recognition.

■4.0 RESULTS AND DISCUSSION

4.1 Analysis of Condition of Wards

The condition of wards analysis ranges from the demographic and profile such as education, professional affiliation, academic background, working experience, position in the hospital, average age of building, hospital location and type of hospitals. Due to space all these were not displayed except Table 2 for educational background and Table 3 for years working in the hospitals. The state of wards was examined and addressed in this section. The section on wards conditions has a total of 16 entries. The reliability and validity tests were used to determine the data's strength in order to carry out the data analysis and discussion. Table 2 below lists the respondents' educational backgrounds. With the highest frequency of respondents 108, biomedical scientists, 16 respondents typically work in laboratories, where they use computers and sophisticated lab equipment, the respondents who are nurses are responsible for identifying patients' symptoms, administering medications within their scope of practice, providing other symptom relief methods, and collaborating with other professionals to enhance patients' comfort and families' comprehension and adaptation.

They conduct a range of scientific tests to help physicians and other healthcare professionals identify, track, and manage diseases. Biomedical specialists can also do blood transfusion tests, 33 of the respondents are doctors and their work schedule include ensuring the safety of their patients. No matter their position, the doctors must perform the following: work together with co-workers to uphold and enhance patient's healthcare quality and safety, participate in conversations and choices towards improving the quality of the service and results. The doctors examine patients, review their medical history, diagnose illnesses or injuries and provide therapy and counselling to patients on their health and well-being. There were nine respondents from the Science Laboratory. Their duty is to perform laboratory tests, prepare samples/specimens, conduct daily quality control checks, generate reports with reliable data, interpret results based on findings, use the most recent methodology and best practices, and follow the right process. 11 of the respondents work at the finance department of the hospitals. Their duty is to ensure sound financial management. They plan, direct, and control accounting and financial operations. They create paperwork and report on accounting transactions for management scrutiny. 13 of the respondents who are administrators help keep offices running smoothly by carrying out clerical tasks and initiatives. They also set up project meetings in their capacity as a hospital administrator. They type documents, take calls for business, and offer customer service. They need strong IT skills, because their work includes processing of a lot of information on a computer.

According to the findings, the majority of responders were nurses, followed by workers in research labs, biomedical science, administration, finance, and accounting. This demonstrated the various areas of specialization in the hospital. And also, there are 274 respondents who have worked in hospitals for less than five years in total. Despite having the highest percentage of respondents, those who have worked in hospitals for under five years are still able to provide information about their workplaces and the number of years they have been employed there. In addition, the hospital industry has helped to create jobs as more people have been using hospitals in recent years all over the world.

The goal of this study to examine the conditions of wards in the hospital buildings in which people working in the hospital buildings for longer periods of years can give details about their hospital buildings as they are well knowledgeable and experienced about how to use the hospital buildings, especially 20-year-olds. 114 of them had worked less than 5 years, 63 had worked for 5 to 10 years, and 54 had worked for 11 to 15 years, respectively shown in Table 3. Years of works experience is very vital due to the medias and news surrounding Malaysia hospitals buildings ineffective delivery. Users at Malaysia's medical buildings reported concerns with fire outbreaks and physical degeneration as reasons for their departure. As a result, it has been advised to carry out extensive research to analyse the maintenance management methods of hospital buildings in Malaysia (Olanrewaju et al., 2018).

Table 2 Educational background

Educational Background	Frequency	Percent
Nursing	108	39.4
Biomedical Science	16	5.8
Medicine	33	12.0
Science Laboratory	9	3.3
Finance	11	4.0
Administration	13	4.7
Accounting	4	1.5
Others	80	28.9
Total	274	

Table 3 Working experience

Working Experience in the Hospital	Frequency	Percent
Less than 5 years	114	41.6
5—10 years	63	23.0
11-15 years	54	19.7
16-20 years	6	2.2
20 years above	13	4.7
Others	24	8.9
Total	274	

4.2 Reliability Test Analysis of Conditions of Wards

Table 4 contains the result of the α value in this survey was 0.807, so, it showed that the conditions of wards have high internal consistency and therefore, the data is highly reliable.

Table 4 Reliability of conditions of wards

Cronbach's Alpha	N of Items
0.807	16

Table 5 contains the α value for each item in conditions of wards. The range of value was from 0.992 to 0.993. Damaged switches socket and others accounted the lowest α value of 0.992 while two constituted the highest value of 0.993 which is the conditions of damaged doors locks and faulty doors. Each of the elements in this survey obtained a good α value, therefore, it was very satisfactory, and proved all the elements had high consistency and reliable. The outcomes of validity test by using communalities contained in Table 6 indicate that the values range from 0.861 (damaged switch sockets) to 1.00 (cleanliness of wards).

Table 5 Showing reliability test of condition of wards

Condition of Wards	Scale Meanif Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
Cleanliness of the Wards	57.0741	244.687	0.932	0.992
Damaged Lamps Ceilings	57.1481	243.362	0.953	0.992
Faulty Floor (Floor Tiles/Floor Finishes)	57.1852	244.080	0.922	0.992
Faulty Wall (Wall Finishes/Painting)	57.1481	243.362	0.953	0.992
Faulty Columns	57.1111	243.103	0.971	0.992
Faulty Poles	57.1481	242.746	0.973	0.992
Faulty Ventilation	57.2593	243.661	0.955	0.992
Faulty Doors	57.0000	247.000	0.884	0.993
Faulty Doors Locks	57.2222	243.564	0.901	0.993
Faulty Windows Handles	57.1481	242.054	0.931	0.992
Faulty Windows Frames	57.1481	242.593	0.945	0.992
Faulty Electrical Wires	57.0000	243.923	0.949	0.992
Faulty Fire Alarms	57.1111	242.795	0.981	0.992
Faulty Fire Extinguisher signage	57.0741	241.917	0.954	0.992
Faulty Good bedding orders	57.0000	243.923	0.949	0.992
Faulty Switches Sockets	57.1111	242.179	0.936	0.992

Table 6 Showing validity test of condition of wards

Condition of Wards	Initial	Extraction
Cleanliness of the Wards	1.000	1.000
Damaged Lamps Ceilings	1.000	0.969
Faulty Floor (Floor Tiles / Floor Finishes)	1.000	0.956
Faulty Wall (Wall Finishes / Painting)	1.000	0.936
Faulty poles	1.000	0.950
Faulty Beams	1.000	0.936
Faulty Ventilation	1.000	0.898
Faulty Doors	1.000	0.828
Faulty Doors Locks	1.000	0.789
Faulty Windows Handles	1.000	0.818
Faulty Windows Frames	1.000	0.842
Faulty Electrical Wires	1.000	0.868
Faulty Fire Alarms	1.000	0.917
Faulty Fire Extinguisher signage	1.000	0.874
Good bedding orders	1.000	0.868
Faulty Switches Sockets	1.000	0.861

4.3 Validity Test Analysis on Condition of Wards

The safest conditions of rudiments in wards ranked by 274 respondents are described in Table 7 below. The mean value of each element was shown and ranked was based on to their mean value. In another words, the higher the mean value, the higher the rank. Table 7 contains the mean ranging from 3.55 to 3.81, in which the polluted ventilation in wards accounted the highest mean value (3.81) and faulty floor (floor tiles/floor finishes) in wards established the lowest mean value (3.55). The total average of mean and standard deviation was 29.8 and 5.844, respectively. The value of standard deviation provides the idea about the distribution of scores around the average mean. The smaller the standard deviation, the nearer it is to the average score. Therefore, the average standard deviation of conditions of wards (5.844) is very near to the average standard and showed minor problems in the condition of wards. It was further stated that to enhanced naturally cooling ventilated ward space, there is need of order to maximize thermal comfort inside the hospital buildings (Rahman et al., 2021).

Table 7 Showing result of condition of wards ranking of element of condition of wards

Conditions of Wards	Number	Std. Deviation	Mean	Rank
Polluted Ventilation	16	0.534	3.81	1
Faulty lamps Ceilings	16	0.635	3.81	2
Faulty fire Alarms	16	0.834	3.81	3
Faulty wall (Wall Finishes/Painting)	16	0.617	3.78	4
Faulty windows Handles	16	0.934	3.78	5
Faulty doors	16	0.974	3.78	6
Inappropriate bedding orders	16	0.811	3.78	7
Faulty fire Extinguisher signage	16	0.823	3.76	8
Faulty electrical Wires	16	0.912	3.70	9
Faulty poles	16	0.5.87	3.70	10
Inappropriate cleanliness of the Wards	16	0.723	3.70	11
Faulty windows Frames	16	0.920	3.67	12
Faulty switches Sockets	16	0.778	3.67	13
Faulty columns	16	0.602	3.67	14
Faulty doors Locks	16	0.967	3.63	15
Faulty floor (Floor Tiles/Floor Finishes)	16	0.623	3.55	16
Total		11.687	59.6	

Moreover, there is a need for research to determine the different in-patient ward occupants' needs for thermal comfort in all climate zones, but the tropics in particular like Malaysia (Khalid et al., 2018). The condition of wards with the various components such as polluted ventilation, faulty lamps ceilings, faulty fire alarms, faulty wall (wall finishes/painting and faulty window handles, faulty doors, inappropriate bedding orders, faulty fire extinguisher signage, faulty electrical wires, faulty poles, inappropriate cleanliness of the wards, faulty windows frames, faulty switches sockets, faulty columns, faulty doors locks, and faulty floor (floor tiles/floor finishes) are presented in Table 7. For condition of the wards for the components, only the condition of wards with the highest rank were discussed, polluted ventilation, faulty lamps ceilings, faulty fire alarms, faulty wall (wall finishes/painting), and faulty window handles of wards conditions in hospital building, users concur that faulty doors and faulty doors lock as the highest default as shown in Table 7.

As far as the faulty windows handle and faulty windows frames are concerned, the hospital building users concur that windows handles and windows frames also require maintenance due to malfunctions. Consequently, it is crucial to prevent problems by using preventative maintenance technique (Wong et al., 2022). This could be as a result of misuse by users or damaged handles, or defective materials used. Then, faulty fire alarms and faulty fire extinguisher signage, these are very important for security reason which needs routine inspection or replacement. Due to the sophistication of building facilities and the need of maintaining their usable state, maintenance has become more and more crucial in recent decades (Basri et al., 2017).

The hospital buildings users in the wards should be comfortable while taking their duties. The distribution and integration of services within the structure are crucial architectural concerns because numerous healthcare buildings need a high level of servicing. It is viewed as one of the most crucial conditions for increasing occupant satisfaction and comfort in the indoor environment (Yuan et al., 2022). Thus, relevant information and knowledge regarding condition of wards can be utilized as a precaution to pre-empt failures before the occurrences and thereby curtail unnecessary expenditure due to unfavourable condition of wards. This was to achieve the objective of the study, which was to examine the ward conditions and highlight recommendations from the study. Respondents of the study claimed that the lack of a framework and principles lead to poor management planning, which is a major cause of failure. Other studies also indicate that hospital users complain a lot about the hospital buildings' poor functioning (Wong et al., 2021; Jesumoroti et al., 2022; Sarbini et al., 2021; Mong et al., 2019; Ali et al., 2016).

The condition of wards can be improved to achieve the desire services, which will be value added. Also, failing to deliver these crucial services will result in a loss of value for hospitals and clients if the service rendered by the staff or hospital buildings is not satisfactory (Olanrewaju et al., 2021). Maintenance management should be prioritized as a paramount responsibility, not just for the top management of hospital buildings, but also for all stakeholders and hospital building users alike. By doing so, there is bound to be a re-evaluation of the maintenance management of hospital buildings, which can deviate from the assumption that it is solely an operational function, to a recognition that propels the adoption of effective management practices and ensures the prevention of either major or minor flaw in the ward condition in all ramifications. Building performance are both impacted by one another. To gauge how well a building performs, flaws are evaluated according to their severity (Olanrewaju et al., 2022b).

■ 5.0 CONCLUSION AND RECOMMENDATION

This study's goals are to assess the wards' current state in hospital facilities and make suggestions for improvement to various stakeholders. The findings of this investigation were required by the state of the hospital buildings, particularly the condition of the wards. The state of the wards, including the many parts like the ventilation vents, faulty lamps ceilings, faulty fire alarms, faulty wall (wall finishes/painting and faulty window handles, faulty doors, inappropriate bedding orders, faulty fire extinguisher signage, faulty electrical wires, faulty poles, inappropriate cleanliness of the wards, faulty windows frames, faulty switches sockets, faulty columns, faulty doors locks, and faulty floor (floor tiles/floor finishes) of wards conditions. All of the parts, albeit only to name a few of the most important, occasionally need maintenance because of flaws. The results indicated that polluted ventilation, faulty ceiling lamps, faulty fire alarms, faulty wall (wall finishes/painting) and faulty window handles, were the wards' condition that the respondents were dissatisfied with was classified highest, necessitating a better strategy to stop further deterioration of the wards' condition in the hospital buildings. Additionally, according to the research, ward components may be always kept in good condition by employing a holistic approach that would lessen ward components depreciations and produce high-quality service outputs for the users. By using appropriate techniques and maintenance management plans, the conditions of the hospital wards might be significantly improved. This can be the consequence of human error, broken handles or components, or both. Hospital wards often have lengthy, continuous fissures in the walls, beams, columns, ceilings, and flooring. The width and slant of the wall fractures also differ (Yagi et al., 2022).

Then, ventilation vents, faulty ceiling lamps, faulty fire alarms, faulty wall (wall finishes/painting and faulty window handles, faulty doors, inappropriate bedding orders, faulty fire extinguisher signage, faulty electrical wires, faulty poles, inappropriate cleanliness of the wards, faulty windows frames, faulty switches sockets, faulty columns, faulty doors locks, and faulty floor (floor tiles/floor finishes) of the wards are all very vital for security reasons and require routine examination or replacement. While performing their jobs, users in the wards should feel at ease. Moreover, it can be concluded that fire preventive system in wards is of more concerned than the building structures. The services offered by hospital facilities should be viewed as value-added services for users (patients) (Olanrewaju et al., 2021).

Patients' healthcare experience will not be the best if the users (patients) are not satisfied with the service provided since they are uncomfortable and the personnel is causing disruptions (Khalid et al., 2018). Also, there must be a correlation between the service's value for the money paid and its quality (Wong et al., 2021), as the service must be satisfactory. Maintenance management is typically seen as an operational role rather than the duty of top management. Sadly, management only pay attention to it when things go wrong. For instance, fundamental issues like inadequate design standards and poor construction have been connected to building faults (Jesumoroti & Khor, 2021). Maintenance management seeks to determine, assess, and suggest when, what, how, and where maintenance procedures are needed. In the end, users would not be happy with the level of the service they are receiving, and maintenance backlogs will grow. Consequently, it is necessary to improve current maintenance practices by value-basing maintenance service delivery in order to reduce expenses, increase savings, improve building performances, as well as patients' recovery and other users' productivity, which will access the wards state, and therefore, stakeholders will use holistic approach to facilitate best service delivery. The findings presented here support the need to prioritize maintenance management and urge all industry stakeholders to work together to implement a proactive and comprehensive approach to maintenance management in order to maintain the good condition of hospital facilities especially the wards conditions.

Wards conditions in the hospital buildings maintenance management required systematic preventive maintenance management at regular interval based on their current conditions thereby increase sustainability. In doing so, it is important to use a systematic and

planned approach rather than a preventive one to address the unfavourable conditions issues that develop owing to the moderately comfortable conditions of the wards. As a result, pertinent information and knowledge about exploratory wards can be used as a preventative measure to anticipate failures before they occur and so reduce wasted spending because of unfavourable wards. To get the services you want and create value, the ward conditions can be enhanced. Further studies can investigate the condition of wards or components in hospital buildings with the regards workmanship re-evaluations, the limitation of this studies was as a result of COVID-19 pandemic because of restriction, or standard operation procedure as responds was mar. The study looks at ward condition of hospital buildings in Malaysia, and the result showed that they are relative good, but attention must be given to parts or items slightly not in order.

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