DISCOVERING PERSONS WITH DISABILITIES PHYSICAL BARRIERS IN ACCESSING HEALTHCARE-BUILT ENVIRONMENT

Nuratiqah Aisyah Awang[1*], Shirley Jin Lin Chua[1], Azlan Shah Ali[1], Amalina Azmi [1], Amaramalar Selvi Naicker[2]

[1]Centre for Building, Construction & Tropical Architecture (BuCTA), Faculty of Built Environment, Universiti Malaya, 50603 Kuala Lumpur, Malaysia
[2]Department of Orthopaedics and Traumatology, Faculty of Medicine, Universiti Kebangsaan Malaysia, Jalan Yaacob Latif, Bandar Tun Razak Cheras, 56000 Kuala Lumpur, Malaysia.

E-mail: * nuratiqahaisyahawang@um.edu.my

ABSTRACT

Several studies have highlighted the dissatisfaction of Persons with Disabilities (PWDs) with the facilities and services in various built environments, yet limited research has focused on the healthcare-built environment. This study aims to identify the physical barriers faced by PWDs in accessing healthcare facilities in Malaysia. A qualitative approach was employed, involving semi-structured interviews and the analysis of complaint records. Four hospital engineers were selected through purposive sampling, and data from the facility management complaint database were extracted. Content analysis was conducted using Microsoft Word and Excel. Findings revealed that PWD toilets had the highest frequency of breakdowns and complaints, highlighting them as a key area for improvement. While breakdowns in most facilities were reported as low to moderate (2-10 times per month), issues with covered walkways were also noted, indicating broader accessibility concerns. PWD-related complaints were relatively low, reflecting their minority status in the population. The identified barriers related to maintenance, access to information, building use, and facility provision, impacting safety, accessibility, and overall ease of use. Establishing comprehensive data will help stakeholders understand physical barriers and develop strategies for improvement, ensuring equal access to healthcare facilities for PWDs. Future research on maintenance policies and their impact on PWDs is essential for fostering a more inclusive healthcare environment.

Keywords: Disability Friendly Healthcare, Facilities Management, Public Healthcare Facilities, Health Service, People or Persons with Disability, Malaysia.

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1. INTRODUCTION

Globally, WHO has reported that an estimated 1.3 billion people experience significant disability, representing 16% of the world's population or 1 in 6 of us (WHO, 2023). Persons with disabilities (PWDs) face many health inequities which arise from several unfair conditions, including inaccessible health facilities (WHO, 2023). Advocacy of the United Nations, the Convention on the Rights of PWDs was adopted in 2006 to establish the PWDs' rights. It has specified that joined states must recognise and abolish hurdles and obstacles to accessibility to buildings and other physical environments (United Nations, 2006). PWDs face unequal access to health care services, have more significant unmet health care needs, and experience more deficient health than the general population, where Article 25 of the CRPD reinforces PWDs to enjoy the highest health standard without discrimination based on disability (United Nations, 2006).

In the Malaysian context, the Department of Social Welfare Malaysia has reported 637,537 PWD registrations as of 31st January 2023 (Department of Social Welfare, 2023). Following the CRPD ratification, Malaysia enacted the Persons with Disability Act 2008 Act 685, which provides equal opportunity and protection assistance in all circumstances towards PWDs in Malaysia (Amin et al., 2017). The topic is not new; however, middle-income countries like Malaysia are still actively progressing towards fulfilling the PWDs' rights in various areas. Khan has mentioned that limited data and research are the common challenges and barriers to implementing the World Health Organisation's global disability action plan in low- and middle-income countries (Khan et al., 2018a; 2018b). The WHO has released specific recommendations to promote disability-inclusive health including (1) removing physical barriers to health facilities, information and equipment, (2) making healthcare affordable, (3) training all healthcare workers in disability issues including rights and (4) investing in specific services such as rehabilitation (WHO, 2022). This study tries to zoom into investigating physical barriers to health facilities that exist not due to the built environment design but due to Facilities Management (FM).

Although the primary objective of a hospital is clinical care, the most significant component of non-clinical services falls within the ambit of Facilities Management (FM) (Amos et al., 2021). In this study context, FM plays an essential role in addressing PWD users' needs through an appropriate strategy to ensure the integration of PWDs with the healthcare-built environment. Bright and Kuper (2018) mentioned that despite their greater need, PWDs faced challenges accessing healthcare services, contributing to poorer health (Bright & Kuper, 2018). Poor accessibility to healthcare facilities is a significant barrier for PWDs seeking care (Pinto et al., 2021). However, up to now, a minimal study has been conducted on disability barriers in the healthcare-built environment context in Malaysia. Healthcare performance on disability focuses more on clinical than non-clinical performance (Healthcare FM support service).

2. LITERATURE REVIEW

2.1 Facilities Management

The role of Facility Management (FM) in achieving an inclusive service or building involves understanding the barriers that exist and developing strategies to remove them or implementing management practices that minimise or eliminate these obstacles to ensure equal service delivery (Hewitt, 2013). Similarly, Booty (2009) noted that service providers must identify physical barriers that may prevent or significantly hinder disabled individuals from accessing the service. Once these barriers are identified, the organisation can choose to remove them, modify them to eliminate the obstacle, or offer a reasonable alternative to bypass the feature (Booty, 2009). Inclusive facility managers must also anticipate the potential unintended consequences of building operations, which require input from all users of the building. By addressing the root causes of issues, rather than merely treating the symptoms, facility managers can foster a more inclusive environment (Maisel et al., 2017). This study does not focus on the implementation of physical features in accordance with standards. Instead, it concentrates on the management issues that need to be addressed regarding accessibility. The management issues highlighted by Sawyer and Bright (2007) include access to information, attitudes of staff and management, management practices, policies and procedures, building use, and maintenance concerns.

2.2 Physical Barriers

Physical barriers in healthcare environments present significant challenges for individuals with disabilities, severely affecting their ability to access care and negatively impacting their overall healthcare experiences. These

barriers, which include the absence of key infrastructure contribute to healthcare inequities and reduce the quality of care provided to individuals with disabilities.

2.2.1 Inadequate Facilities Provision

Inadequate facilities provision such as the lack or absence of ramps, handrails, elevators, adapted restrooms, and automated doors create significant challenges for individuals with disabilities (Moscoso-Porras et al., 2019, Mirza et al., 2023, Quon & Zhuo, 2024). In the same vein, Singh et al. (2022) also mentioned lack of accessible pathways, and insufficient facilities hinder their access to services and negatively impact their overall quality of life and healthcare experiences. These obstacles prevent easy access to care, often requiring patients to rely on others for assistance, which can delay treatment and compromise their independence.

2.2.2 Access to Navigation Information

Lack of tactile paving for the visually impaired, and inadequate signage that hinders user flow, significantly affect accessibility for individuals with disabilities in hospital public zones (Phaholthep et al., 2017). Supported by Quon and Zhuo (2024) where individuals particularly those with visual or hearing impairments, may struggle with inadequate signage and the lack of tactile paving or Braille, further complicating navigation within healthcare environments. Many hospitals have unclear signage and complex layouts, making navigation difficult for visually impaired individuals (Ahmed et al., 2022; Cambra-Rufino et al., 2024). The absence of basic navigation infrastructure makes it difficult for patients with sensory issues to navigate healthcare settings, forcing them to seek help or avoid certain areas altogether.

2.2.3 Non-compliancy of the Design

Non-compliance with the current accessibility standards in healthcare, such as poorly designed bathrooms for wheelchair users and narrow doorways, creates significant barriers for disabled individuals, making it difficult for them to access care safely and comfortably. Inadequate bathroom designs, such as insufficient space or missing grab bars, pose safety risks and force patients to rely on assistance, reducing their dignity and delaying care (Cambra-Rufino et al., 2024). Similarly, narrow doorways and obstructed pathways make it challenging for those using wheelchairs or mobility aids to move freely within healthcare environments, increasing the risk of accidents and restricting access to important areas like treatment rooms (Mirza et al., 2023; Singh et al., 2022). These physical barriers can also lead to frustration, stress, and feelings of alienation. Patients may feel that their needs are overlooked, which can affect their dignity and sense of independence (Mirza et al., 2023). Over time, this may discourage patients from seeking care, exacerbating health inequalities. To improve healthcare accessibility, it is crucial to prioritise universal design, ensuring that all patients, regardless of their abilities, can navigate healthcare settings safely and with dignity.

2.2.4 Maintenance Issues

The maintenance of amenities for PWDs in healthcare facilities is a pressing concern, with numerous studies highlighting systemic issues. Poor upkeep of essential infrastructure, such as toilets and lifts, undermines accessibility and reveals a lack of commitment to inclusivity (Awang et al., 2017). These shortcomings are compounded by the absence of critical features and maintenance issues such as ramps, handrails, and adapted bathrooms, severely limiting physical access to healthcare settings (Moscoso-Porras et al., 2019). Institutional barriers, including poorly maintained infrastructure, not only obstruct access but also highlight deeper inequities within healthcare systems. As Rotoli et al. (2023) emphasise, overcoming these barriers requires strategies like universal design, which incorporates accessibility into infrastructure from the outset, alongside robust policy frameworks that ensure consistent maintenance and inclusivity. Furthermore, the lack of designated facilities, specialised equipment, and accessible features, as noted by Ndyamukama et al. (2022), underscores the critical need for improved infrastructure and upkeep.

2.3 Impact of Physical Barriers

Physical barriers in healthcare environments are a significant contributing factor to healthcare disparities, particularly for individuals with disabilities. These barriers can hinder access to care, negatively impact patient outcomes, reinforce ableism and involve safety concerns within the healthcare system, ultimately contributing to inequitable care and poor health outcomes.

2.3.1 Impact on Access and Patient Outcomes

Several studies highlight how physical barriers limit access to healthcare services for individuals with disabilities. Inadequate design elements, such as poor layout configurations, tripping hazards, narrow hallways, and poorly placed or insufficient seating, prevent patients from effectively accessing necessary care (Rotoli et al., 2023; Edussuriya et al., 2022). For example, for elderly patients, who may face mobility issues, poor maneuverability and inadequate signage can make it extremely difficult to navigate healthcare facilities. This results in delays, frustration, and in many cases, patients not receiving the care they need in a timely manner, which has direct consequences for their health and well-being. The struggle to navigate such environments also leads to an increased need for assistance, which, when not readily available, can lead to further negative impacts on care and patient outcomes (Bayramzadeh et al., 2021).

2.3.2 Barrier and Ableism

Physical barriers in healthcare environments, such as high reception counters and inaccessible facilities, perpetuate ableism by limiting access for persons with disabilities (Prakash, 2019). When healthcare settings are not designed to accommodate individuals with disabilities, it sends a message that these patients are less prioritised or less worthy of consideration. As pointed out by Bayramzadeh et al. (2021), disruptions in workflow caused by physical barriers can lead to delays in treatment, poor-quality care, and increased safety risks. These factors are not just inconveniences but also manifestations of systemic ableism, reinforcing societal views that people with disabilities are secondary or less deserving of optimal healthcare. This creates a cycle in which the healthcare environment becomes a barrier to care, fostering negative attitudes and further hindering equitable healthcare delivery.

2.3.3 Safety Concerns

Physical barriers in healthcare-built environments, such as clutter, inadequate flooring, and poorly designed unit layouts, pose significant risks to both patient and staff safety. As highlighted by Taylor and Hignett (2016), these environmental factors can directly contribute to patient falls, which not only affect health outcomes but also increase healthcare costs and strain resources. Improvements, such as better flooring materials, effective lighting, and secure handrails, are critical in enhancing visibility, providing stability, and reducing hazards, as noted by Feldbauer et al. (2008). Simsekler et al. (2018) further emphasise that elements like flooring, lighting, and handrails play crucial roles in patient safety, with poor design or maintenance of these features can increase the likelihood of accidents and diminish the quality of care. Despite the importance of understanding PWD users' needs, there remains a paucity of evidence from the complaint records' analysis. Complaints are complex narratives that report on perceived failures of healthcare delivery from the patient's perspective, and it has been recognised as a valuable source of data because most represent the care issues that breach a threshold of concern and compel patients and families to take action (Van Deal et al., 2020).

Systematic analysis of healthcare complaints can improve quality and safety by providing patient-centred insights that localise issues and shed light on difficult-to-monitor problems (Gillespie et al., 2018). Van Deal has summarised previous studies and has found that formal complaints primarily desire two outcomes, which are a patient-centric response and system-level quality improvement (Van Dael et al., 2020; Birkeland et al., 2013; Bismark et al., 2011; Bouwman et al., 2015; Bomhoff et al., 2016; Friele et al., 2006; Friele et al., 2013). However, O'dowd has mentioned that healthcare complaints are underutilised for quality improvement in general practice, where systematic analysis of complaints has identified hot spots and blind spots for improvement (O'dowd et al., 2022). Therefore, this study investigates PWDs' barriers in the healthcare-built environment by analysing complaint records.

3. METHODOLOGY

This study focuses on hospital buildings because (1) access to healthcare services is a fundamental human need; (2) the continuous and essential nature of these services necessitates robust facilities and effective services, where facilities management plays a crucial role; and (3) hospitals are likely to accommodate a higher number of people with disabilities (PWDs) compared to other types of buildings. Selangor recorded 104, 909 PWDs, the highest number among all states in Malaysia (Department of Social Welfare, 2023). Four hospitals in Selangor were selected for this study based on the construction year and the size of the hospital. The construction year is

significant in predicting the existence of PWDs facilities in the built environment based on the establishment of standards. On top of that, new buildings and new facilities do not critically portray FM issues during the first three years of operation. The second factor, the number of beds signifies the hospital size and usage frequency. Higher usage demands more efficient FM and increases the likelihood of obtaining more data.

Four (4) hospital engineers were selected using purposive sampling for semi-structured interviews. All interviewees had an engineering background and, on average, possessed 7.5 years of experience in industry practices. Their roles included assistant engineer, head of the engineering unit/department, and head of the maintenance department, responsible for overseeing maintenance activities. The respondents' details are as shown in Table 1. Data collected from semi-structured interviews were supplemented with the archival records (complaint records). The data were analysed using Microsoft Word and Excel.

Table 1. Respondents' details (semi-structured interview)

Respondent	Position	Years of working experience
R1	Assistant Engineer, Engineering and Privatisation Department	6
R2	Head of Engineering Unit	5
R3	Head of Engineering and Privatisation Department	5
R4	Head of Maintenance Department (Head of Civil Unit), Building Management Department (PRASARANA)	15

Complaints were extracted from computerised management software systems and exported in Excel format. It involves data with no mandatory field set to filter the PWDs' complaints during the data input. Therefore, each complaint must be thoroughly read, manually filtered, and thematised accordingly. Microsoft Excel software with a pivot table function was used to analyse the data. Figure 1 shows the complaint filtration process. It includes four phases: extraction, filtration, thematisation 1, and thematisation 2. 69,333 complaints from four hospitals were extracted in Phase 1. Complaints unrelated to PWDs were deleted in Phase 2, where PWD complaints comprised only 2% of the total complaints extracted. Complaints were thematised according to the type of facility, component, issue, and problem in Phase 3. Lastly, complaints were thematised according to the issues and problems discovered. Each phase was further elaborated on in the next paragraph.

Figure 2 shows the detailed process of Phase 3, which consists of thematised complaints according to the facility, component, issue, and problem. Complaint number 1,157 was an example of a complaint with complete information that will give management a better understanding of how a particular issue can affect PWDs. Damaged pathway floor tiles were not critical from the perspective of ordinary users but can create hazards for wheelchair users. Complaint numbers 1,269 and 833 were complaints with incomplete information that created ambiguity for this study to interpret the problem and its criticality. Figure 3 shows the detailed process of Phase 4. Complaints were thematised according to management issues and problems encountered. Management issues include maintenance, access to information, use of the building, and provision of the facilities. Problems encountered include safety, inaccessibility and difficulty.

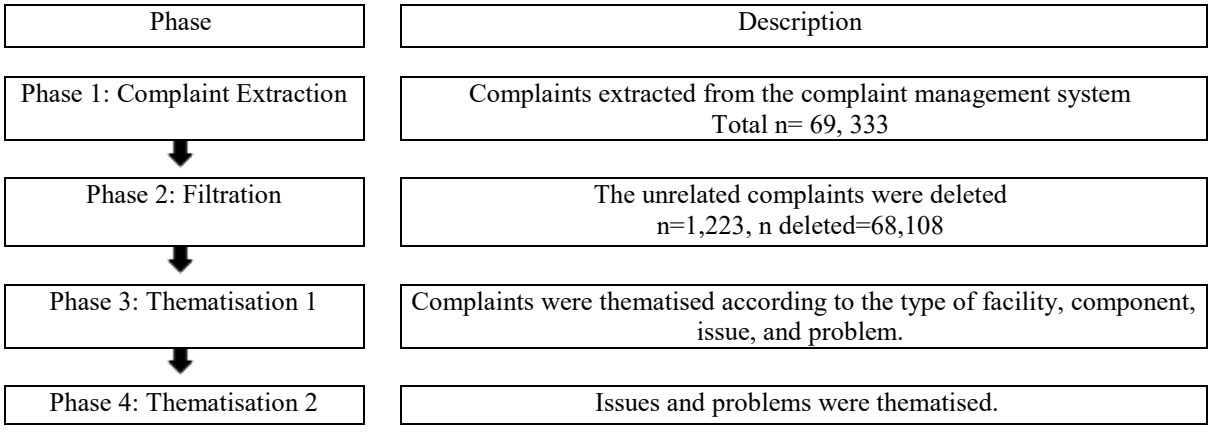

Figure 1: Complaint filtration process

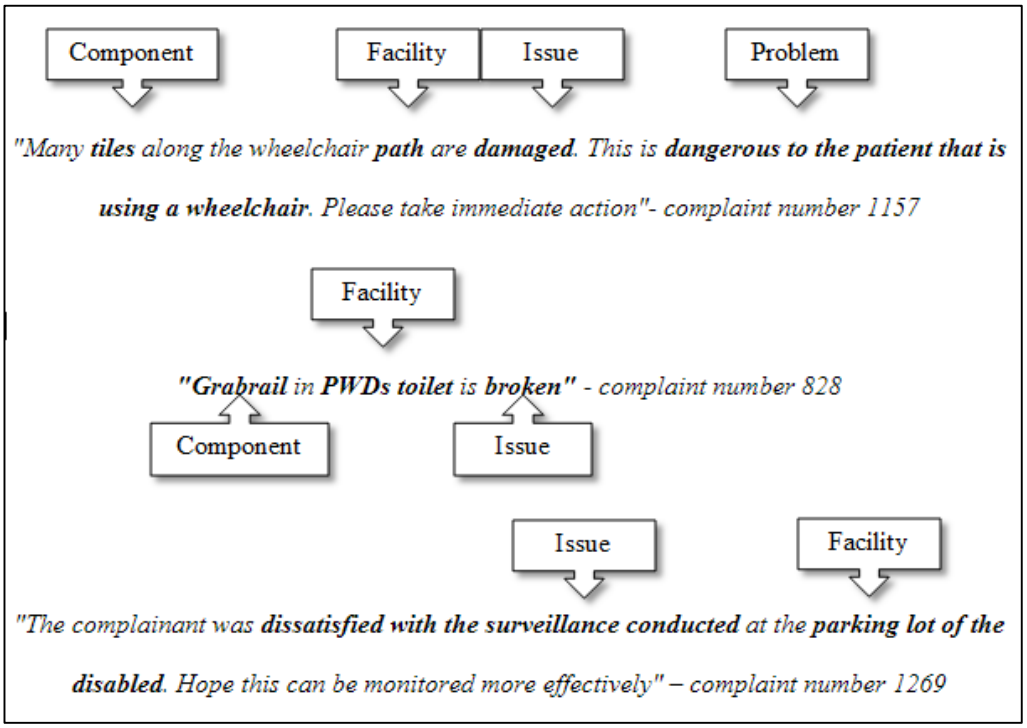

Figure 2: Complaints were thematised according to facility, component, issue, and problem

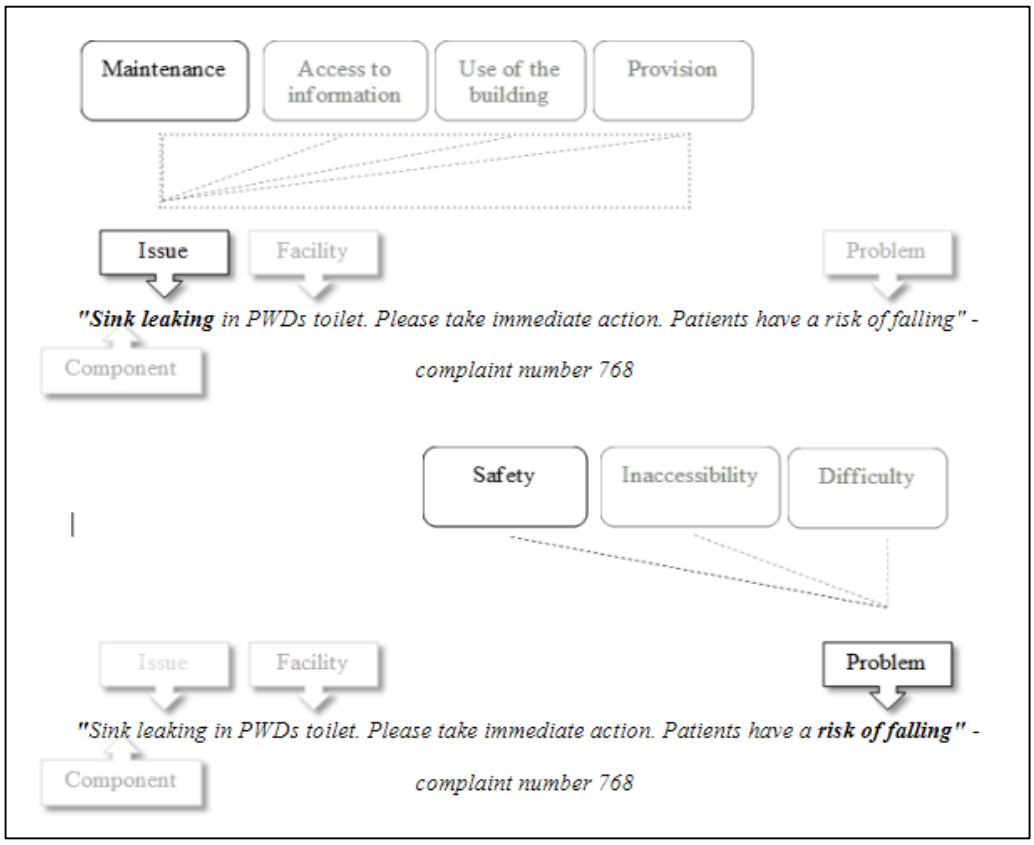

Figure 3: Complaints were thematised according to the category of issue and problem

4. RESULTS AND DISCUSSION

The findings from the semi-structured interviews are presented in Table 2. It indicates that PWD toilets consistently experience the highest frequency of breakdowns and complaints, highlighting them as a key area requiring attention. While the number of breakdowns for most facilities is reported as low to moderate (2–10 times per month). Additionally, one respondent mentioned covered walkways as a secondary concern, suggesting broader accessibility challenges. Details of the complaints need to be referred to the complaint records. Complaint records were extracted and analysed. This study identified barriers arising from the initial stage of complaint data entry, where no mandatory fields are set (e.g., disability cardholder status or disability category). Consequently, each complaint must be thoroughly reviewed, manually filtered, and thematically categorised. Facilities management staff may lack awareness of the specific needs of PWDs and may struggle to assess the criticality of such complaints. Grouping PWD complaints with general complaints in a large dataset—without mandatory fields for differentiation—can result in these complaints being overlooked. Furthermore, the criticality of complaints is often judged based on volume, which disadvantages PWD complaints as PWDs represent a minority of the population, making numerical interpretation inadequate. To address this, a systematic data entry system must be established. Such a system would enable efficient analysis and support effective actions to remove barriers for PWDs. Table 3 provides an overview of the findings, including (1) type of facility, (2) description of the issue and problem, (3) management issues (barriers) (4) category of problems (impact). The facilities examined include PWD toilets, PWD car parks, car park ticket machines, lifts, pathways, escalators, wheelchairs, and information counters. PWD toilets had the highest number of reported issues and problems, followed by pathway facilities. These findings align with the data gathered from the semi-structured interviews.

Table 2. Semi-structured interview findings

Interview Questions/ Respondents	**R1**	**R2**	**R3**	**R4**
Number of Breakdowns	Seldom problem arises with PWD facilities, around 5 to 10 times per month.	PWDs facility. Not many, 2 to 3 times	In a year around 5 times based on complaints	Moderate
Details of complaints	Need to refer to the complaint record	Need to refer to the complaint record	Need to refer to the complaint record	Need to refer to the complaint record
Highest Breakdown	PWDs toilet	PWDs toilet	PWDs toilet	PWDs toilet
Highest Complaint	PWDs toilet	PWDs toilet	PWDs toilet	PWDs toilet and covered walkway

4.1 Category of Management Issues (Barrier)

Barriers discovered include maintenance issues, inadequate provision of the facility, misuse of space and access to navigation information.

4.1.1 Maintenance Issues

Poor upkeep of essential infrastructure undermines accessibility and reveals a lack of commitment to inclusivity (Awang et al., 2017). These shortcomings are exacerbated by the absence of critical features and maintenance issues, which severely limit physical access to healthcare settings (Moscoso-Porras et al., 2019). The findings of this study reveal that maintenance issues are a major contributor to barriers, causing difficulties, inaccessibility, and jeopardising safety. Examples of complaints include a lift that is not functioning, forcing patients to wait longer or, in the worst-case scenario, preventing them from accessing other floors until the lift is repaired. In another case, a PWD toilet door is not functioning properly, trapping the patient inside, while broken grabrails—occurring more than once—require replacement with stronger alternatives to prevent falls. Leaking sinks and toilet blockages can lead to flooding, posing a risk of patient falls. Uneven flooring, such as peeled vinyl or broken tiles, creates tripping hazards, particularly for the elderly, wheelchair users, and children. Other complaints include loose nails or screws, which need to be tightened and secured, as one patient accidentally swallowed a screw. Additionally, unmaintained and uneven drain covers are hazardous, as they can cause falls,

and the drains themselves pose further risks. Institutional barriers, including poorly maintained infrastructure, not only obstruct access but also highlight deeper inequities within healthcare systems. As Rotoli et al. (2023) emphasise, overcoming these barriers requires strategies like universal design, which incorporates accessibility into infrastructure from the outset, alongside robust policy frameworks that ensure consistent maintenance and inclusivity.

4.1.2 Inadequate Provision of the Facility

Inadequate provision of facilities, such as the lack or absence of ramps, handrails, lifts, adapted restrooms, and automated doors, creates significant challenges for individuals with disabilities (Moscoso-Porras et al., 2019; Mirza et al., 2023; Quon & Zhuo, 2024). Similarly, Singh et al. (2022) highlighted that the absence of accessible pathways and insufficient facilities hinder access to services and adversely affect the overall quality of life and healthcare experiences of persons with disabilities (PWDs). This study identified the inadequate provision of facilities as the second major contributor to accessibility barriers, causing difficulties, inaccessibility, and jeopardising safety. For instance, feedback received included recommendations to install PWD-friendly doorknobs and water taps. The size and design of doors are also critical to accommodating wheelchair users. An example is PWD toilet doors that open inwards, which create significant challenges for wheelchair entry. Additionally, the installation of ramps or escalators from car parks to main lobbies would significantly improve access for PWDs and elderly individuals.

The current provision of car parks is insufficient to meet patient demand, making it difficult for PWD patients to attend appointments. Strategically locating car park ticket machines is equally important to ensure ease of access. Further suggestions included the installation of drainage systems along pathways to facilitate wheelchair use and protective barriers to prevent accidents involving children. Finally, aligning the availability of wheelchair services with consultation hours is vital to improving patient access. These obstacles hinder seamless access to care, often forcing patients to rely on others for assistance, which can delay treatment and compromise their independence. Providing facilities that adhere to established standards and incorporating user feedback are essential steps towards addressing these issues and meeting the needs of PWDs.

4.1.3 Misuse of Space

The misuse of PWD parking spaces by able-bodied individuals without PWD stickers or valid reasons is a significant issue in building usage. These parking spaces are essential for PWDs, providing them with convenient and accessible entry to the building. When abled users occupy these spaces, it not only demonstrates a lack of consideration but also creates barriers for PWDs, limiting their access and mobility. Adding to the problem is dissatisfaction with how PWD parking spaces are monitored. Ineffective systems, such as inadequate surveillance, absence of penalties, or lack of on-site personnel, allow unauthorised use to go unchecked. This leaves PWDs frustrated and negatively impacts their experience with the building, which may appear poorly managed or less inclusive.

4.1.4 Access to Navigation Information

Previous studies have highlighted the lack of tactile paving for the visually impaired and inadequate signage, which hinder user flow and significantly affect accessibility for individuals with disabilities in hospital public zones (Phaholthep et al., 2017). This is supported by Quon and Zhuo (2024), who note that individuals, particularly those with visual or hearing impairments, may struggle with inadequate signage and the absence of tactile paving or Braille, further complicating navigation within healthcare environments. Many hospitals have unclear signage and complex layouts, making navigation challenging for visually impaired individuals (Ahmed et al., 2022; Cambra-Rufino et al., 2024). This study reveals similar findings, where the absence of staff at information counters causes individuals with visual impairments to face difficulties when trying to access the emergency department. They often need assistance from the public to navigate. The lack of basic navigation infrastructure—such as tactile paving, Braille, and the presence of staff at information counters—makes it difficult for sensory-impaired patients to navigate healthcare settings, forcing them to seek help or avoid certain areas altogether.

4.2 Category of Problem (Impact)

All the barriers identified have a significant impact on PWD users, including safety risks, inaccessibility, and difficulty. Most of the barriers jeopardise the safety of PWD users and create challenges in accessing healthcare

environments, as shown in Table 3. Safety issues, particularly those related to patient falls, are caused by various factors, such as the condition of the flooring, leaks and flooding, and the integrity of grabrails, guardrails, and drain covers. A rare incident was reported involving a psychiatric patient who swallowed a loose screw. The difficulties patients face are primarily due to designs that are not PWD-friendly, flooded pathways, broken grabrails, poorly located car park ticket machines, and wheelchair service hours that do not align with consultation hours. Additionally, car park facilities are often insufficient, and vision-impaired patients encounter challenges accessing the emergency department due to the unavailability of staff at the information counter. In terms of inaccessibility, complaints include lifts not functioning, wheelchair users being unable to access other floor levels, and door sizes not accommodating wheelchairs. In conclusion, the barriers identified have a significant impact on PWD users, affecting their safety, accessibility, and overall ease of movement within healthcare environments. These obstacles not only jeopardise the safety of PWDs but also create substantial difficulties in accessing essential services.

Table 3: PWDs barriers exist in the healthcare-built environment

Facility	Issue and/or problem	Category of Management Issues (Barriers)				Category of Problems (Impact)		
		Maintenance	Access to information	Misuse of space	Provision of the facility	Safety	Inaccessibility	Difficulty
PWDs toilet	The door frame is detached, and nails are dangerous to a psychiatric patient.	●				●		
	The sink leaks urgently to prevent the patient from falling.	●●				●●		
	Install a door handle to ease patients with injured fingers to open the door.				●			●
	All water supply is hot urgent to avoid an unwanted incident.	●				●		
	Change the water tap to a long design that is easy to be used by a paralysed patient.				●	●		
	The ceiling is leaking urgently to avoid any incident.	●				●		
	Toilet bowl blockage water flooded the floor, and the patient has a risk of falling.	●				●		
	The door has broken; urgent it involves a safety factor.	●●				●●		
	The door lock is difficult to open, and it is urgent to prevent the patient from becoming trapped inside the toilet.	●						●
	The sink is leaking, and the patient has the potential to fall because the floor is slippery.	●				●		
	Door detachment is urgent due to safety factors.	●				●		
	The door lock is not functioning, and the patient has been trapped inside the toilet (item 826)	●						●
	Pipe leaking urgent repair due to safety factor	●				●		
	Grab rail detach urgent repair for patient safety. Install stronger type to avoid the same incident because it has already happened three times it detached.	●			●	●		
	Tighten the screw or nail because there is an incident patient swallows the screw.	●				●		

Facility	Issue and/or problem	Category of Management Issues (Barriers)				Category of Problems (Impact)		
		Maintenance	Access to information	Misuse of space	Provision of the facility	Safety	Inaccessibility	Difficulty
	Floor drain blockage, a slippery floor, can cause patients or staff to fall.	●				●		
	The need to widen the door because it cannot fit a wheelchair user				●		●	
	A PWDs toilet door that opens inward is difficult for the patient to get in.				●			●
	The grab rail detached, and the patient almost fell.	●				●		
	Mirror detachment is urgent because it involves the safety of the user.	●				●		
	The door handle is broken, and the presence of nails risks to the user.	●				●		
	Install a grab rail suitable for an elderly patient to prevent the patient from falling while using the toilet.				●	●		
	The grab rail falls off, and wheelchair users will encounter difficulty getting up if the grab bar is unavailable.	●						●
PWDs carpark	The PWDs car park is hardly available, and it is not easy to attend an appointment.				●		●	●
	Increase the number of PWDs car parks because elderly patients must walk far from the car park area to the hospital.				●			●
	PWDs car parks are occupied by normal users (no PWDs stickers).			●●●●		Not stated		
Carpark ticket machine	The location of the ticket machine is at the upper floor level, and it is difficult to access wheelchair users.				●●			●●
Lift	The floor is not even, and it is challenging to move the trolley and dangerous to staff and users.	●				●		●
	The lift is not functioning; patients/staff need to wait longer.	●						●
	The lift is not functioning, and the wheelchair user is stuck.	●					●	

Facility	Issue and/or problem	Category of Management Issues (Barriers)				Category of Problems (Impact)		
		Maintenance	Access to information	Misuse of space	Provision of the facility	Safety	Inaccessibility	Difficulty
Pathway	Broken tiles are dangerous to patients, especially kids and wheelchairs.	●				●		
	Install guarding to avoid incidents involving kids.				●	●		
	The floor uneven at the doorway caused the patient to trip and risk falling.	●●				●●		
	Floor damage can risk patients tripping and falling.	●●				●●		
	The drain cover is not even and sturdy, which is perilous because the drain is down-reaching.	●				●		
	Guarding broken urgent repair because it involves the safety of the user.	●				●		
	The floor tile is broken/has a hole dangerous to the wheelchair user.	●				●		
	Floor broken/got hole dangerous to wheelchair user wheel can be stuck in the hole.							
	Wet floor three times it happens patient almost falls and lastly has fallen.	●				●		
	Provide a ramp from the car park area to the main lobby to ease access for the elderly.				●			●
	Install drainage to channel out water to ease the path for a wheelchair.				●			●
Escalator	Provision of an escalator at the car park area to the main lobby to ease PWDs and the elderly.				●●			●●
Wheelchair	Open the wheelchair service earlier to ease the user.				●			●
	Operation hour ends at 4.30 pm. The patient must return the wheelchair even if the consultation with the doctor and pharmacist is incomplete.				●			●
Information Counter	The staff is not available at the counter. PWDs (vision impaired) face difficulty accessing the building; the patient must go to the promotion counter, and the promoter helps direct the patient to the emergency department.		●					●

5. CONCLUSION

In conclusion, this study has explored the barriers faced by PWDs in healthcare-built environments through semi-structured interviews and the analysis of complaint records. The findings provide clear insight into real-world experiences and feedback from users. The significance of PWD-related complaints cannot be assessed solely based on the number or percentage of complaints, as PWDs represent a minority of the population. It is important to note that technological advancements and big data analytics tools will greatly benefit future studies by enabling more efficient and effective data interpretation. The choice of analysis tools is crucial for gaining critical insights and adding value to the data. For instance, linking patients' health conditions with existing barriers can help grade the severity of issues, evaluate the potential harm they may cause, and pinpoint the locations of problems. Establishing robust data will assist researchers, facilities managers, and policymakers in better understanding the nature of barriers in healthcare environments, allowing for the development of strategies to overcome them. Addressing these barriers will significantly impact equal access to healthcare facilities for PWDs, enabling them to enjoy the highest standards of health and well-being, without discrimination based on disability. Future studies should focus on investigating, developing, or improving healthcare facilities' management practices, policies, and procedures related to PWDs to eliminate these barriers.

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