



## Front Desk Inclusivity: A Systematic Review on Facilities Management Approaches for Autism Accommodation in High-Traffic Areas

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### **Abstract**

Persons with autism (PWAs) and their caregivers often face significant challenges when interacting with high-traffic front desk environments due to sensory sensitivities, a lack of staff awareness, and the absence of inclusive facilities. These issues can lead to distress, communication difficulties, and service delays, highlighting the urgent need for more autism-friendly practices in public service delivery. Aligned with the government's 'Ekonomi MADANI: Memperkasa Rakyat' initiative to enhance public service efficiency, this paper explores facilities management strategies for PWAs in high-traffic front desk areas. The aim is to create inclusive environments that cater to the unique needs of PWAs and their caregivers. Key strategies include sensory-friendly or quiet rooms to reduce overstimulation, special or fast lanes to minimise stress and waiting times, sensory kits for distraction, visible autism logos to signify available support and accommodation, and employee training on autism awareness and sensitivity. Using a qualitative methodology, specifically a systematic review following PRISMA guidelines, this study synthesises existing research on autism-friendly practices in facilities management. The findings aim to provide evidence-based recommendations for improving accessibility and user experience for PWAs and their caregivers. Facilities can enhance accessibility and the experience for persons with autism (PWAs) and their caregivers by adopting these inclusive practices, thereby creating a more welcoming and inclusive environment. (187 words).

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## 1.0 INTRODUCTION

### 1.1 Background

Persons with autism (PWAs) face numerous challenges daily due to differences in their behaviour, communication, and sensitivity to stimuli compared to neurotypical individuals. This is attributed to the neurodevelopmental challenges faced by PWAs, wherein difficulties in executive functioning significantly impact their social skills and behaviour (Fernandez-Prieto et al., 2021). These differences can make it difficult for PWAs to navigate environments designed for the majority, often leading to heightened stress or sensory overload. When sensory input becomes overwhelming, PWAs may experience meltdowns or tantrums. Unlike typical expressions of frustration, meltdowns are involuntary reactions triggered by an overstimulated nervous system, leaving PWAs unable to self-regulate without external support (Chua, 2024).

Front desk areas, being high-traffic zones with numerous unfamiliar people, can be particularly overwhelming for PWAs. Sensory stimuli such as bright lights and loud noises exacerbate this challenge, creating an environment that is difficult to manage for both PWAs and their caregivers (Clément et al., 2022). As is common practice, certain tasks in daily life necessitate interactions at front desk counters, such as those at immigration offices, school administrative offices, healthcare facilities, and other similar establishments. Despite these obstacles, PWAs and their caregivers must navigate these spaces to access necessary services.

Caregivers are pivotal in supporting PWAs, acting as advocates and primary sources of comfort and stability. However, this role places immense emotional and physical demands on them. Constant vigilance from their surroundings, coupled with the unpredictability of meltdowns, often leads to significant psychological strain, manifesting as chronic stress, anxiety, and even burnout (Kütük et al., 2021).

The task of balancing the emotional demands associated with caregiving, which often involves providing constant support and managing complex emotional responses, with practical responsibilities, can be highly challenging. These practical responsibilities include coordinating medical appointments, overseeing therapy sessions (such as speech, occupational, or behavioural therapy), and engaging in educational advocacy for their children. Each of these tasks requires time, attention, and organisational skills, which, when combined with the emotional toll of caregiving, significantly increase the overall burden. This dual responsibility of caring for the emotional well-being of the PWAs while ensuring their physical, educational, and social needs are met places considerable strain on caregivers, often leading to feelings of stress, exhaustion, and overwhelm (Wan Natrah et al., 2021; Kartini et al., 2018). These dynamic highlights the complexity of caregiving, where emotional and practical demands intersect and amplify the caregiver's workload.

The lack of societal understanding and support aggravates the challenges faced by these caregivers. Research consistently shows that support from family, colleagues, and authorities is vital for parents of PWAs in managing daily life (Siti Patonah, 2022). Family provides emotional and practical relief, while colleagues offer flexibility at work. Additionally, by receiving support from authorities, including healthcare providers and educators, access to necessary services and accommodations can be assured (Drogomyretska, Fox, & Colbert, 2020). This support network helps alleviate stress, improve well-being, and enhance caregiving, leading to better outcomes for both parents and children with autism. The presence of such a system is crucial in promoting resilience and effective coping strategies.

Public spaces such as hospitals, schools, or front desk areas are often ill-equipped to accommodate the needs of PWAs (An, Chan, & Kaukenova, 2020). The absence of sensory-friendly features (Mahajan Sagar, 2023) or trained personnel (Lipinski et al., 2022) not only increases stress for PWAs but also subjects caregivers to public scrutiny and judgment. These experiences may cause routine activities to become sources of profound anxiety, leaving caregivers feeling isolated and helpless (Wan Natrah et al., 2021; Pastor-Cerezuela et al., 2020; Kartini et al., 2018). The cumulative effects of these challenges may put a significant toll on the caregivers' mental health, leaving them emotionally drained and under-supported.

A broader commitment to inclusivity is required to address these challenges. By creating autism-friendly environments and offering resources to support caregivers, it is highly believed that their emotional burden can be reduced and their well-being improved (Simpson, 2020). While inclusive measures have been implemented in commercial establishments, such as Sunway Putra Mall (Sunway Stories, 2019; Fazil et al., 2022), One Utama Mall ("As I am", 2024), GSC Cinemas ("GSC Sensory-Friendly Movie Screening", n.d.), theme parks like Disney World ("Services for Guests Who Are Neurodivergent", n.d), and airports like Kuala

Lumpur International Airport (KLIA) (“The Butterfly Effect”, n.d.), similar accommodations are still lacking in public institutions. Key services such as the National Registration Department, immigration offices, and clinics or hospitals in Malaysia remain largely unequipped to meet the needs of PWAs and their caregivers.

Moreover, existing guidelines for front desk management, such as the *Buku Layanan Perkhidmatan Pelanggan Sektor Awam* (2023), are still in deficit of specific provisions for accommodating persons with disabilities (PWDs), including PWAs. These guidelines fail to address how to effectively identify and meet the unique needs of PWAs or provide tailored assistance for an inclusive customer service experience. Implementing autism-friendly practices in public service spaces could significantly enhance their experience, foster smoother and less stressful interactions, while promoting sustained access to essential services.

This initiative aligns with the government's *Ekonomi MADANI: Memperkasa Rakyat* framework, which emphasises improving the quality of life and enhancing public service efficiency (Zakaria & Long, 2024). Autism-friendly measures embody the framework’s values of compassion (*Ihsan*) (Mohd Yusoff et al., 2024), respect (*Hormat*), and innovation (*Daya Cipta*), contributing to a more inclusive and prosperous Malaysia. Furthermore, fostering a more inclusive environment supports the Sustainable Development Goals (SDGs), particularly SDG 10, which focuses on reducing inequalities and promoting inclusive societies, and SDG 3, which highlights health and well-being for all, including PWAs and their caregivers (United Nations: Malaysia, Singapore, and Brunei Darussalam, 2023). By promoting these inclusive policies and practices under the SDG framework, PWAs can be empowered to participate more fully in society and enable them to sustain their daily activities effectively.

Additionally, this approach is also in line with the principles of justice in Islamic law (*Syari'ah*) as outlined by Imam al-Ghazali, signifying the importance of placing things in their rightful and proper places (Sabri Orman, 2018). It is both justifiable and in society’s best interest to ensure that PWAs and their caregivers receive well-thought-out services and priorities that benefit all. The concept of fairness in this context can be interpreted as providing facilities and accommodations tailored to the specific abilities of PWDs. In Malaysia, the diverse categories of PWDs, coupled with varying levels of ability, should enable relevant authorities to design and implement facilities based on these differences. For instance, PWAs who experience significant challenges in crowded environments may be given priority in service management compared to other PWDs who demonstrate a higher tolerance for such settings.

Therefore, it is essential for relevant stakeholders to understand the characteristics and traits of PWAs to effectively address the needs and challenges faced by them and their parents/caregivers. Such understanding could facilitate the efficient design and planning of necessary support and accommodations for this community.

## 1.2 Objectives

By analysing current practices of front desk services, this study aims to investigate deeper and suggest possible changes to solve the numerous concerns mentioned in the previous section, such as sensory overload, inadequate staff training, and the lack of inclusive facilities in front desk areas. The following are the study's specific objectives:

- a. To understand the challenges faced by persons with autism (PWAs) and their caregivers in navigating front desk environments.
- b. To identify and explore effective strategies for creating a more inclusive and accommodating front desk experience for PWAs and their caregivers.

## 2.0 LITERATURE REVIEW

### 2.1 Overview of Autism Spectrum Disorder (ASD)

Autism Spectrum Disorder or ASD is a complex neurodevelopmental condition identified by problems expressing and recognising emotions, difficulties in making social connections, delayed or abnormal language and communication, and a tendency towards repetitive behaviours, stereotypical routines or intense interests (Centers for Disease Control and Prevention, 2025). These characteristics can vary widely among individuals, reflecting the diverse nature of ASD.

The American Psychiatric Association (2013) outlines two primary criteria for diagnosing ASD: social communication difficulties and the presence of restricted, repetitive behavioural patterns. For the first criterion, in social interactions, PWAs may find it challenging to engage in reciprocal emotional exchanges and may exhibit non-verbal tendencies, which can hinder mutual understanding. For the second criterion, regarding behavioural patterns, a diagnosis requires at least two of the following indicators: (i) repetitive movements or speech, (ii) insistence on sameness and adherence to rigid routines, (iii) intense fixations on specific interests, and (iv) unusual sensory responses, where individuals may be hyper-sensitive or hypo-sensitive to sensory stimuli, leading them to either avoid or seek out certain sensory experiences. The severity of each criterion is categorised into three levels: Level 1 (requiring support), Level 2 (requiring substantial support), and Level 3 (requiring very substantial support).

However, based on their traits and capacity for independence, other researchers also divided them into three categories: (i) mild (or high functioning autism), (ii) moderate, and (iii) severe (low functioning autism) (Eow et al., 2020). Previous articles by Newcomb & Hagopian, (2018), stated that PWAs exhibit a variety of syndromes, such as hand flapping, obsessive interests, echolalia, self-spinning in circles, sleep issues, aggression, and tantrums when anything disturbs their activity or condition. These behaviours can vary in intensity and may present unique challenges in different environments.

## **2.2 Challenges of Persons with Autism (PWA) and their Caregivers at the Front Desk**

The term "front desk," as defined by the Cambridge Dictionary, refers to the area near the entrance of establishments like hotels and office buildings where visitors check in and obtain information. In this paper, the "front desk" encompasses service counters beyond mere registration, including those for issuing identification cards or passports. These desks are common across various institutions, and their busy environment with multiple layers of sensory inputs (touch, smell, hearing, taste, visual and more) can pose significant challenges for PWAs.

As mentioned in a study by Clément et al., 2022, PWAs often find the combination of crowds, noise, and overwhelming sensory stimuli in such spaces to be highly distressing, sometimes even unbearable. Many try to cope in their own, unique ways, but this can lead to misunderstandings, with others perceiving their behaviour as rude or inappropriate. As a result, some PWAs may choose to abandon their tasks, while others remain but feel trapped and exhausted.

Parents and caregivers of PWAs encounter additional challenges when managing their children in public spaces. Tantrums or meltdowns in children triggered by sensory overloads, attract judgmental stares from others, which can be more distressing for caregivers than the situation itself. This social scrutiny often leads to feelings of embarrassment and isolation. Some parents are also hesitant to register their children as part of the disabled group (PWD) because their child's disability is not immediately apparent (hidden), and they appear "normal." They were also afraid to accept the truth that their child was "different/disabled". Due to their denial, disappointment, embarrassment and fear of judgment from those who are unaware, this reluctance prevents them from utilising special lanes designated for PWD that are available in certain establishments. Furthermore, caregivers also face a lack of awareness and knowledge among staff and officers on how to properly identify and interact with PWAs, which further complicates their experiences (Wan Natrah et al., 2021).

However, a study by Kartini et al. (2019) stated that many parents found the PWD card helpful in accessing additional assistance, support services and benefits. When in need, for example, a meltdown scenario is taking place, by presenting the PWD card, parents/caregivers can discreetly communicate their child's condition, foster empathy and reduce potential misunderstandings or judgments from others. Despite the benefit, societal stigma and misunderstandings about autism traits continue to pose challenges (Malcolm, 2022), underscoring the need for increased awareness, empathy, and support for PWAs and their families.

## **2.3 Facilities Management to Cater to Persons with Autism (PWA) and their Caregivers at the Front Desk**

According to the International Organisation for Standardisation (ISO), facilities management is defined as a multifaceted organisational function that integrates people, places, and processes within the built environment to enhance both qualities of life and business productivity. This definition, also adopted by the International Facility Management Association (IFMA), underscores the need for functionality, comfort,

safety, sustainability, and efficiency in the built environment. Facilities management ensures the management and maintenance of the organisation's, not to mention the public spaces' physical assets and infrastructure, including those with front desk services, are not only operational but accessible to all, inclusive of PWAs and their caregivers.

A key aspect of facility management is the incorporation of universal design principles, which aim to create environments that can be simply understood, accessible and usable by all individuals, regardless of age, ability, or disability. The Centre for Excellence in Universal Design outlines seven principles: (i) equitable use, (ii) flexibility in use, (iii) simple and intuitive use, (iv) perceptible information, (v) tolerance for error, (vi) low physical effort, and (vii) appropriate size and space for approach and use. Some examples of incorporating universal designs are ramps for wheelchair accessibility and sensory-friendly environments. By reducing both physical and emotional barriers, inclusive design in public spaces benefits not only people with autism (PWAs) but everyone (Clément et al., 2022).

The Department of Town and Country Planning (PLANMalaysia) under the Ministry of Housing and Local Government Development, in the Autism-Friendly Environment Initiative Guide (PRISMA) (2023), also suggests six principles for planning an autism-friendly environment: (i) connected environment, (ii) calm environment, (iii) safe environment, (iv) free environment, (v) clear environment, and (vi) private environment. Some of the elements in the initiative guide that are highlighted to assist PWAs include calming spaces, lighting, sound, emergency buttons, wayfinding, signage, visual storytelling, as well as colours, materials, pavement, and patterns that are suitable for the characteristics of PWAs.

#### **2.4 Existing Research on Autism-Friendly Spaces**

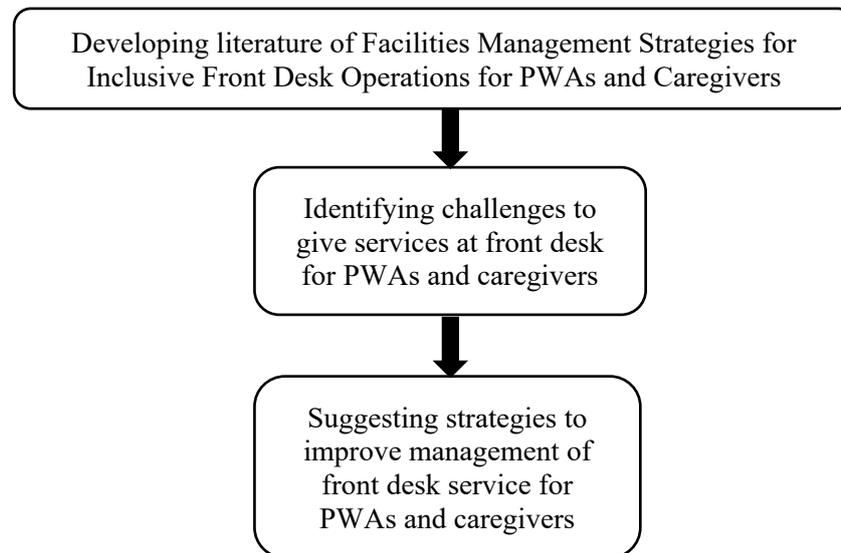
Ample research has explored autism-friendly spaces in schools (Bahrami & Nejad, 2024) and hospitals (Bond et al., 2025), but far fewer studies focus on public spaces, particularly establishments with front desk services. Similar strategies that are often employed across the different environments studied sensory input. Common approaches include reducing or controlling the amount of sensory input in an area. This can be done by having the ability to control brightness and temperature of a room, the use of neutral colours and textures on walls, floors and furniture, noise reduction or noise control, prominent signage visuals for better navigation and understanding, and the creation of sensory or calm zones as an escape route from overstimulation (Clouse et al., 2020; Clément et al., 2022; Black et al., 2022; DeGuzman et al., 2024). Additionally, a study by Litwin & Sellen (2023) introduced the concept of sensory kits containing tools and toys to meet the diverse needs of children with autism. The sensory kits acted as a form of distraction for the children with autism to pass time peacefully in the waiting room. Caregivers found that the initiative was a positive experience for them all while waiting for care in the paediatric emergency department.

Training staff and workers is undeniably crucial in creating autism-friendly environments, as it reduces misunderstandings and communication problems, offering comfort to PWAs and their caregivers. For instance, a review by Clouse et al. (2020) highlights the importance of environmental adjustments and staff training in medical settings to reduce sensory overload for youth with autism, leading to improved experiences during medical visits. Similarly, a Gulf State survey of paediatric nurses found many lacked sufficient autism knowledge, highlighting the need for specialised training to bridge gaps in care (Alruwaili et al., 2023). Additionally, Rascon (2022) advocates for the increased use of a Communication Complex (CC) approach in first responders' autism awareness training in Indiana, which could boost their understanding and effectiveness in catering to PWAs in emergency settings. A scoping review by Sreckovic et al. (2022) underscores that autism training for law enforcement officers is imperative to prevent negative escalations in interactions with individuals on the autism spectrum, given the potential for misunderstandings of ASD characteristics to worsen high-stakes situations.

As mentioned in the introduction, many commercial establishments, including those in Malaysia, have implemented strategies to create autism-friendly spaces and services. Similar to the approaches seen in schools and hospitals from the literature review, malls and cinemas have also taken steps to reduce sensory input for their autistic guests (e.g., Sunway Putra Mall, One Utama Mall and Golden Screen Cinemas). Additionally, some venues have introduced special or priority lanes to minimise waiting times and avoid overcrowding (e.g., Disney World and Kuala Lumpur International Airport). Furthermore, Virgin Atlantic Airlines has developed a special symbol for passengers with hidden disabilities to use during boarding, ensuring they receive the necessary assistance.

### 3.0 METHODOLOGY

This present study involves an in-depth analysis of existing literature involving a broad search of databases for related studies. This study uses a qualitative approach by referring to previous studies on the topic. Research design is developed by first developing the literature of facilities management strategies for inclusive front desk operations for PWAs and caregivers. After that, it is followed by identifying the challenges to provide services at the front desk for PWAs and caregivers. Consequently, strategies to improve management of front desk service for PWAs and caregivers are suggested from the literature. Figure 3.1 below demonstrates the research design for this present study.



**Figure 1.** Research Design

The academic databases consulted in this study were Scopus, ScienceDirect, EBSCOhost, and SAGE Journals. These were selected for their reliability, multidisciplinary coverage, and thematic relevance to autism, caregiving, and facilities management. The databases are also fully accessible through the university's website. Scopus is one of the largest abstract and citation databases, providing extensive access to peer-reviewed literature in science, technology, medicine, and social sciences, making it ideal for multidisciplinary research on autism and environmental design (Elsevier, 2025a). ScienceDirect, also managed by Elsevier, offers high-impact publications in healthcare, engineering, and behavioural sciences—essential for exploring the clinical and architectural aspects of autism accommodation (Elsevier, 2025b). EBSCOhost provides access to databases such as CINAHL, Education Source, and Psychology & Behavioural Sciences Collection, covering literature on caregiving, education, and social inclusion (EBSCO, 2025). Lastly, SAGE Journals contributes literature on public administration, inclusive service delivery, and disability studies, relevant to facilities management in high-traffic public areas (SAGE Publishing, 2025).

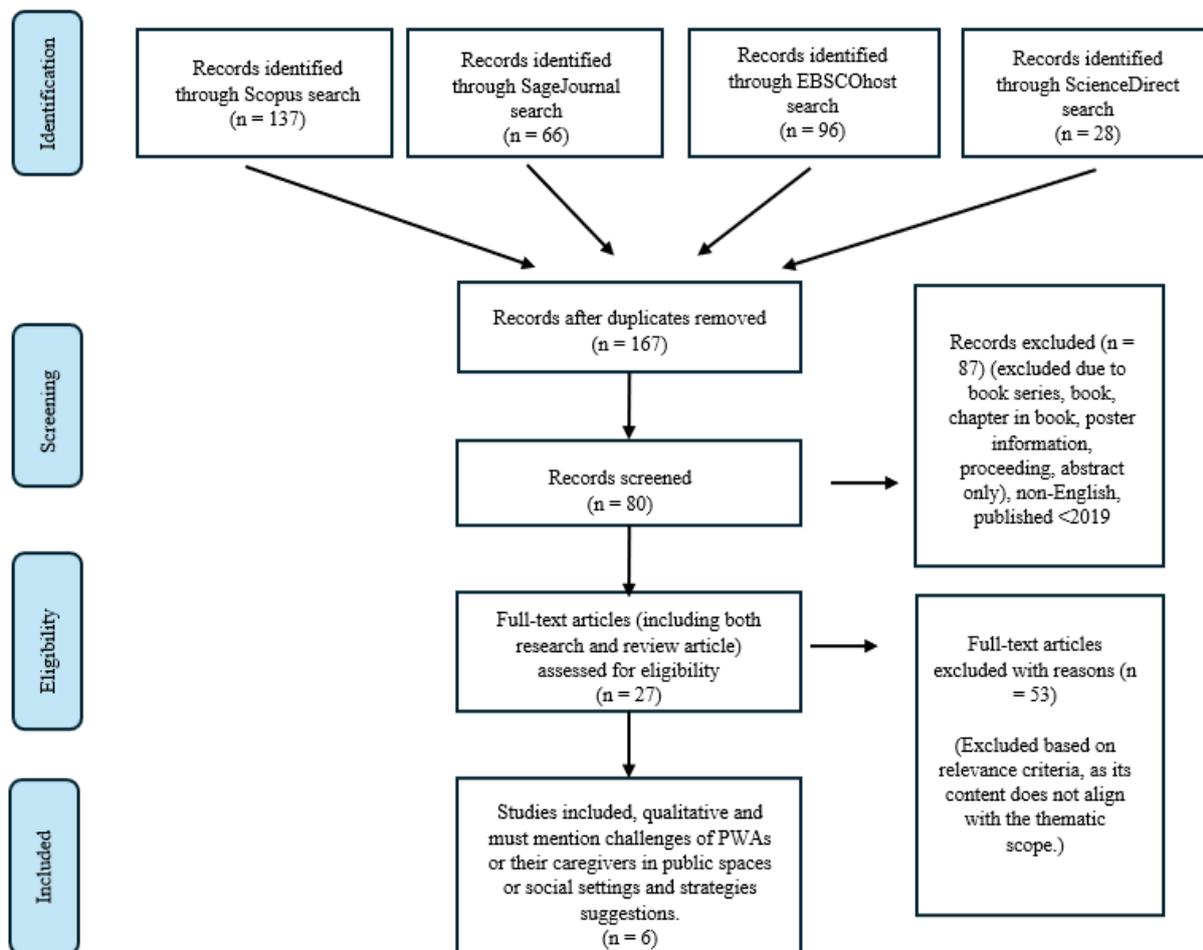
The literature search was conducted using keywords such as “Autism,” “Autism-Friendly,” “Facilities,” “Environment,” “Management,” and “Front Desk.” The search was limited to open-access, peer-reviewed journal articles, written in English, available in full text, and published between 2019 and 2024. This five-year range was selected due to the significant increase in autism-related research during this period, reflecting growing global awareness and advancements in inclusive practices.

A total of 327 records were identified across the databases: 137 from Scopus, 96 from EBSCOhost, 66 from SAGE Journals, and 28 from ScienceDirect. After removing 160 duplicates, 167 records remained for initial title and abstract screening. At this stage, 87 records were excluded based on the following exclusion criteria: article types such as book series, book chapters, conference posters, abstract-only; publications in languages other than English; and articles published before 2019.

Subsequently, 80 full-text articles were assessed for eligibility. Of these, 53 articles were excluded due to a lack of relevance to the thematic scope—specifically, articles that did not focus on autism-specific public service or front desk environments, or those that failed to propose or analyse facilities management strategies.

A final total of six articles was included in the qualitative synthesis, primarily from the United States, Canada, Australia, and New Zealand.

This review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework, which enhances the transparency and structure of evidence-based research. The PRISMA method enabled a systematic organisation of previous findings aligned with the research objectives and supported the use of thematic analysis for synthesising insights. The PRISMA flow can be referred to in figure 3.2 below.



**Figure 2.** PRISMA Flow diagram for challenges of PWAs and caregivers at public spaces and suggestions of strategies to be implemented

The six-phase framework developed by Braun and Clarke (2006) was used to guide the thematic analysis. The first step in becoming familiar with the material was reading the six chosen papers several times to identify initial insights or perennial issues. Second, initial codes were manually created by highlighting pertinent characteristics such as caregiving pressures, environmental strategies, and PWA difficulties. Third, codes were categorised into more general candidate themes, for example "design strategies for inclusive environments," "caregiver-staff interaction challenges," and "sensory overload in public spaces." In order to ensure coherence and internal consistency, these themes were reviewed and polished in the fourth phase by cross-referencing with the original texts. Fifth, the themes were established and given labels. The remaining categories were sensory-friendly rooms, special/fast lanes, autistic signage, sensory kits, and staff training. Lastly, the results were written down and clarified in the discussion section where it will be related to the front desk environment to explore how public space design can be improved to better accommodate PWAs. Even though there were only six studies included, this systematic methodology ensured that the qualitative data was rigorously and transparently synthesised.

#### 4.0 FINDINGS AND DISCUSSIONS

Interacting at front desk counters can be challenging for many individuals, but these difficulties are significantly more pronounced for those with autism. PWAs often face heightened struggles due to sensory sensitivities, difficulties in understanding social cues, navigating complex instructions, and coping with crowded and unpredictable environments (Harvey-Lloyd et al., 2024). The systematic review of previous studies revealed that only six articles met the criteria established by the author, i.e. use qualitative methods, mention the challenges of PWAs and/or their caregivers in public spaces or social settings, and strategies suggestions. These articles are listed as follows:

**Table 4.** List of selected articles based on the specified criteria

No	Research Title and Author	Region and Year	Challenges of PWAs and Caregivers at the Front Desk	Strategies Suggestion
1	Designing beyond the Americans with disabilities act (ADA): Creating an autism-friendly vocational centre. (Clouse et al.)	USA 2020	<ul style="list-style-type: none"> <li>• PWAs feel overwhelmed in social situations.</li> <li>• PWAs are more sensitive towards their surrounding environments.</li> </ul>	<ul style="list-style-type: none"> <li>• Inclusive/universal design in architecture that notes the sensory sensitivities of PWAs in vocational centres.</li> </ul>
2	The need for sensory-friendly “zones”: Learning from youth on the autism spectrum, their families, and autistic mentors using a participatory approach. (Clément et al.)	Canada and USA 2022	<ul style="list-style-type: none"> <li>• PWAs are more sensitive towards their surrounding environments.</li> <li>• Their sensitivities include sensitivities toward bright lights, smell, sound, and movement.</li> <li>• They are also sensitive to unpredictable automatic items such as automatic hand dryers/sanitiser and extremely uncomfortable being in very close proximity to other people like in the waiting rooms, sitting squished with one another.</li> <li>• Having to navigate a crowd during rush times is also a very big challenge for them.</li> <li>• In crowded lines, they often would leave without completing their matters or stay but feel trapped.</li> <li>• Face misunderstandings by others to their difference in behaviour and communication difficulties.</li> </ul>	<ul style="list-style-type: none"> <li>• Universal design in everyday environments that benefit PWAs and others.</li> <li>• Having a quiet place to retreat to, having more time to prepare before facing a crowded place or to recover from sensory meltdowns.</li> <li>• Sensory-friendly zones with proper signage in everyday places will help them with the sensory regulations and educate the public on their needs.</li> <li>• Use of a new disability symbol and sign that better represents their needs</li> </ul>
3	Back to basics: Practical strategies to reduce sensory overstimulation in the emergency department identified by adults and caregivers of	USA 2024	<ul style="list-style-type: none"> <li>• PWAs are more sensitive towards their surrounding environments.</li> <li>• Their sensitivities include sensitivities toward sounds, smells, visuals, touch, taste and proprioception.</li> </ul>	<ul style="list-style-type: none"> <li>• A quiet waiting room helps calm and regulate PWAs’ senses.</li> <li>• Placing PWA patients in rooms further away from noise and crowds.</li> <li>• Make sure the area has proper ventilation, is</li> </ul>

	children with autism spectrum disorder. (DeGuzman et al.)		<ul style="list-style-type: none"> <li>• Crowds of people, noise and cluttered places stimulate their senses and if not controlled, can put them in a difficult situation.</li> </ul>	<p>fragrance-free and uses plants for fresh air.</p> <ul style="list-style-type: none"> <li>• Use dimmable and natural lighting, change the room colour from harsh to cold or natural tone, reduce decorations and items that can be quite the visual clutter, and limit the number of people to reduce movements in a crowd.</li> <li>• Improve communication with PWAs before handling them and provide touch-based distractors such as tablets, fidget toys, etc.</li> <li>• Put out guidelines and train staff members to give better service to PWAs.</li> </ul>
4	Designing a sensory kit to improve the environment for children with autism spectrum disorder in the Paediatric Emergency (Litwin & Sellen)	Canada 2023	<ul style="list-style-type: none"> <li>• PWAs are more sensitive towards their surrounding environments.</li> <li>• Challenges include a chaotic environment, unpredictable wait times, invasion of personal space and procedural discomfort.</li> <li>• Waiting is more difficult in PWAs.</li> </ul>	<ul style="list-style-type: none"> <li>• Immediate care or minimal waiting time.</li> <li>• Creation of sensory kits containing different sensory items and tools to accommodate PWAs' sensory needs while acting as a distraction while waiting for their turn.</li> </ul>
5	Considerations of the built environment for autistic individuals: A review of the literature (Black et al.)	Australia 2022	<ul style="list-style-type: none"> <li>• PWAs are more sensitive towards their surrounding environments.</li> <li>• Their sensitivities include sensitivities toward visual, touch and sound stimuli.</li> </ul>	<ul style="list-style-type: none"> <li>• The built environment must include universal design.</li> <li>• More feasible strategies include removing visual clutter, changing lightbulbs, changing colours, re-arranging furnishings and zoning of spaces.</li> <li>• Reduce sound and limit background noise and echo by implementing sound-absorbing material.</li> <li>• Adding quiet spaces or sensory-friendly rooms.</li> </ul>
6	Environmental accessibility for autistic individuals: Recommendations for social work (Malcolm)	New Zealand 2022	<ul style="list-style-type: none"> <li>• PWAs are more sensitive towards their surrounding environments, making environments such as public outdoor spaces, classrooms, workspaces and more inaccessible.</li> <li>• Their sensitivities include sensitivities toward visual, touch, sound, smell,</li> </ul>	<ul style="list-style-type: none"> <li>• Implementing inclusive/universal design.</li> <li>• Reduce sensory input such as using sound-proofing material, muted colours and minimising intense smells.</li> <li>• Implementing quiet and sensory-friendly rooms.</li> <li>• Provide pre-visit information to give insights</li> </ul>

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| <p>proprioception and vestibular senses.</p> <ul style="list-style-type: none"> <li>• PWAs' self-stimulatory behaviour or <i>stimming</i> might cause misunderstandings for unaware people, who would try to stop the behaviour.</li> </ul> | <p>and a sense of predictability to new environments.</p> <ul style="list-style-type: none"> <li>• Having practice visits to help alleviate anxiety and familiarise PWA with sensory stimuli in a new environment.</li> <li>• Use clear signage to help PWA navigate and understand spaces.</li> <li>• Use sensory packs/kits to help PWA cope with sensory issues.</li> </ul> |
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Most of the literature selected for this review originates from the Global North, particularly the United States and Canada, with limited representation from the Global South, such as Australia and New Zealand. High-income countries (HICs) in the Global North have advanced significantly in autism-related research, intervention strategies, and caregiver support. They also contribute disproportionately to the global body of autism literature compared to low- and middle-income countries (LMICs) (Frickel et al., 2022).

In contrast, Southeast Asian countries, including Malaysia, face multiple barriers to autism research. These include limited resources, high costs associated with diagnostic tools and training (Durkin et al., 2015), and a lack of clinical and research infrastructure (Rice & Lee, 2017). Moreover, cultural perceptions of autism—often marked by stigma, denial, or reluctance to seek diagnosis—further hinder research participation and service development (Wan Natrah et al., 2021; Kartini et al., 2019). These disparities highlight the need for more region-specific studies to ensure that proposed strategies are relevant and effective within the Malaysian context.

Additionally, much of the selected literature relies heavily on anecdotal input from PWAs, their caregivers, or design professionals. There is a noticeable lack of research that incorporates perspectives from key stakeholders such as government officials, policymakers, facility managers, and frontline service providers. This gap limits the practicality and scalability of proposed strategies, as the voices of those responsible for policy implementation and service delivery are underrepresented.

An interview study conducted with several parents at Akademi Permata Semenyih highlighted the need for a special lane for individuals with autism when dealing at the front counter:

*“So we pressed the OKU (Persons with Disabilities) option, but the number still runs the same (together with typical patients/ customers). Only after the previous numbers are done will our number be called. The system runs the same queue even though we selected OKU. So there’s no priority. Do you understand what I mean?”*

*“Another thing is, they only seem to prioritise those in wheelchairs.” (7<sup>th</sup> August 2024)*

The analysis of the literature review reveals several key findings relevant to the management of front desk services for PWAs. The following are the challenges and strategies that have been or are suitable to be implemented to improve the management of front desk services:

#### 4.1 Sensory-Friendly/Quiet Rooms

As mentioned in section 2.1, PWAs exhibit varying reactions to sensory stimulation; some actively seek it for those who are hypo-sensitive (under-responsive to sensory stimulus), while others tend to avoid it for those who are hyper-sensitive (over-responsive to sensory stimulus). These reactions can evolve as individuals age, with some children who initially seek sensory input later becoming more avoidant as they grow older (Clément et al., 2022; Malcolm, 2022). Many studies recommend reducing sensory input in spaces to prevent overstimulation by dimming harsh lighting, lowering speaker volumes, reducing noise, using cool-toned walls, and ensuring neutral smells—preferably fresh air without strong fragrances (Deguzman et al., 2024; Black et al., 2022; Malcolm, 2022; Clouse et al., 2020). However, implementing these changes in public spaces with

front desk services can be challenging. Not only would such efforts be costly, but they would also require substantial ongoing maintenance. Undertaking drastic changes may be overwhelming for some establishments, making it difficult to implement and sustain sensory-friendly modifications at a large scale.

A practical solution is the introduction of sensory-friendly or quiet rooms that can be easily accessed (with permission) within these establishments. Such spaces, no matter the size, allow PWAs to step away from the overwhelming environment of the front desk, providing a haven to recover from sensory overload (Clément et al., 2022; Clouse et al., 2020; Malcolm, 2022). It is best that these rooms or spaces be located further away from the busy, noisy, bustling environment to ensure no kind of external sensory stimulation can enter and serve their purpose. If that is not possible, the rooms should at least be soundproof and visually shielded from outside stimuli. It is recommended that these rooms maintain a neutral colour palette to minimise visual overstimulation.

Additionally, a study by DeGuzman et al. (2024) found that a quiet waiting room had a calming effect on one respondent's child while they waited for medical services. Some of the respondents also suggested limiting the number of visitors going in and out of the room and putting the rooms far away from the beeping monitors. It is in the best interests that quiet waiting rooms provide a reprieve by minimising sensory triggers such as noise and visual clutter. Such spaces not only reduce sensory overload but also create a sense of safety and predictability, which is crucial for many PWAs.

A close example of the implementation of this strategy in Malaysia can be seen at Sunway Putra Mall and One Utama Mall. These shopping malls have taken proactive steps to create more inclusive environments by implementing sensory-friendly and quiet rooms designed to support shoppers with autism and their caregivers ("Autosome", n.d; "As I am", 2024). These prominent shopping malls are widely recognised not only for their extensive size and variety of retail offerings but also for their strategic locations as transportation hubs, connected to LRT and MRT stations. This positioning ensures a steady influx of daily visitors, making their autism-friendly initiatives even more significant.

Caregivers who register as members at these malls are granted access to designated spaces specifically designed to support children with autism. These accommodations enable families to engage in shopping or recreational activities without the added concern of excluding their children, thereby facilitating greater participation of PWAs in daily social experiences. Such inclusivity strengthens family bonds and contributes positively to the general well-being of both children and caregivers. Through the provision of these facilities, Sunway Putra Mall and One Utama Mall exemplify best practices in creating public environments that are accessible, supportive, and inclusive of diverse community needs.

## 4.2 Special/Fast Lanes

Waiting in line in crowded areas can be highly stressful and overwhelming for PWAs. Faced with overstimulation while queuing, many PWAs may either choose to leave and escape the environment altogether or endure the discomfort, which can be mentally and emotionally draining, affecting their well-being and limiting their ability to complete necessary tasks in public spaces (Clément et al., 2022).

Therefore, another effective strategy for accommodating PWAs in high-traffic areas, like the front desk, is the use of special or priority lanes. This approach has been adopted by several airlines and airports to assist neurodivergent passengers, including those with autism. Emirates Airline, Sydney Airport, and the Civil Aviation Authority of the UK use sunflower lanyards as discreet signals for staff to guide these passengers to designated lanes with reduced sensory stimuli leading to their boarding gates ("Hidden disabilities", n.d.). Some airports also provided these passengers with a map of the airport to help them navigate through the special lanes, away from areas of high sensory input, where others are gathered ("Guidance for airlines on assisting people with hidden disabilities", n.d.). Similarly, in Malaysia, Kuala Lumpur International Airport employs butterfly lanyards for the same purpose ("The Butterfly Effect", n.d.).

Disney theme parks or Walt Disney World also utilise similar strategies to accommodate neurodivergent guests ("Services for Guests Who Are Neurodivergent", n.d.). They offer two specific programs to help reduce waiting times and sensory overload: Rider Switch and Single Rider. Rider Switch allows groups to take turns waiting outside an attraction, so one person can experience the ride while the other waits, and then they switch without waiting in line again. Single Rider, often with shorter and less sensory-intensive queues, allows guests

to split up and experience select attractions individually, further minimising the sensory stress of crowded queues.

Another notable example is, again, Sunway Putra Mall. Every Tuesday, the shopping mall provides designated parking spaces and priority lanes at participating outlets ("Autosome", n.d). This initiative can significantly reduce the stress associated with navigating crowded spaces, allowing caregivers and their PWAs to enjoy their shopping trips without undue challenges.

By prioritising inclusivity and addressing the unique needs of this marginalised group, the establishments above harbour a welcoming atmosphere and encourage repeat visits, demonstrating that thoughtful accommodations can enhance accessibility while simultaneously building customer loyalty. Thus, these real-life applications can also be adapted to front desk areas, where PWAs and their caregivers could be provided with special or fast lanes. Such accommodations would offer PWAs the opportunity to finalise their matters comfortably and efficiently, enhancing inclusivity in high-traffic environments.

### **4.3 Autistic Logo and Signage**

Some caregivers are reluctant to register their autistic children as part of the disabled group (PWD) due to the hidden nature of their disabilities. Despite their children appearing "normal," these caregivers worry about judgmental glances from those unaware of the challenges faced by individuals with autism (Wan Natrah et al., 2021). The current International Symbol of Access, featuring a wheelchair, does not adequately represent the wide range of disabilities, especially hidden ones like autism. Many people perceive the wheelchair symbol as exclusively denoting mobility-related disabilities, overlooking other forms of disabilities such as those affecting hearing, vision, or cognitive functioning (Vice et al., 2020). The development of a dedicated logo for PWAs could serve as an effective measure to address this issue, providing a more accurate and respectful representation of their distinct needs. Virgin Atlantic Airlines' introduction of a hidden disability symbol serves as a compelling example of how such an initiative can be successfully implemented. By recognising this symbol, staff members and other passengers are immediately made aware of the individual's specific needs, cultivating greater understanding and encouraging efforts to provide appropriate accommodations.

Applying clear visual signage is also highly crucial to the successful implementation of strategies like the sensory-friendly rooms and special/fast lanes. Proper signage clearly indicates the location of these spaces, allowing PWAs and their caregivers to access them more easily. Additionally, such signage helps others understand the purpose of these accommodations, reducing misunderstandings and promoting inclusivity (Clément et al., 2022; Malcolm, 2022). A few respondents from a study by DeGuzman et al. (2024), also suggested clear signage along routes within a space to facilitate smoother movement and navigation. This method may help reduce confusion and potential conflicts from PWAs and their caregivers.

### **4.4 Sensory Kits**

Another effective way to accommodate PWAs in densely populated areas like the front desks is by providing sensory kits. A study by Litwin and Sellen (2023) demonstrated that sensory kits significantly improved the moods of children with autism in the waiting area of a paediatric emergency department. These kits contained sensory tools and toys designed to meet the children's various sensory needs, including squishy balls, bubble towers, and fidget toys. To ensure the items are safe for reuse, staff members or volunteers assist in cleaning and sanitising the materials after each use, adhering to hygiene protocols.

As noted by Clément et al. (2022) and mentioned in previous sections, many children with autism actively seek additional sensory input. In this context, sensory items such as toys, videos, and games act as distractions, helping children tolerate unfamiliar environments and long wait times (DeGuzman et al., 2024). While some caregivers may bring sensory items with them, situations may arise where these items are forgotten at home or unavailable. Therefore, it is invaluable to have pre-prepared sensory kits readily available in such cases. These kits provide immediate relief and support, ensuring that caregivers do not face unnecessary stress in managing their child's sensory needs.

### **4.5 Staff Training**

A respondent in Clément et al.'s (2022) study emphasised the need for autism awareness training for staff in various public services, including transportation, restaurants, law enforcement, and policymakers. They stressed the importance of knowing "what you do and what you don't do," believing that many would benefit

from such understanding. Kartini et al. (2019) similarly highlighted the necessity of training for teachers and medical providers to enhance autism awareness and improve services. Strauss et al. (2019) also underscored the importance of staff training in medical settings, not only to individualise care plans for PWAs but to facilitate smoother interactions with both them and their families. A review by Alruwaili et al. (2023) further suggests that more comprehensive training programs are needed for health professionals to deepen their understanding of ASD and ensure they can deliver appropriate care. A further illustrative example is drawn from Sunway Putra Mall, which has established an ongoing collaboration with the Autism Behavioral Centre (ABC) to deliver quarterly training sessions for tenants, business partners, and management associates. These sessions aim to equip participants with the requisite knowledge and skills to effectively support individuals within the autism community. Although the programme has garnered positive feedback from attendees, participation rates remain limited, with only 10–20% of relevant personnel trained. This low uptake can be attributed primarily to protracted approval procedures required from the principal owners of chain stores, coupled with elevated rates of staff turnover (“Sunway Stories”, 2019). By implementing such training, public service workers can provide optimal care, while the public can foster a more inclusive and supportive environment for PWAs. All these suggestions highlight the critical importance of ASD awareness for staff who will directly or indirectly interact with this group, including the front desk officers. Furthermore, Malcolm (2022) stated that staff/workers who work with society need to at least equip themselves with knowledge of diverse groups and their needs for better service.

## 5.0 CONCLUSION

In conclusion, enhancing accessibility and comfort for PWAs and their caregivers requires the creation of autism-friendly front desk environments. Based on this study’s findings, challenges in high-traffic service areas can be significantly reduced through strategies such as the provision of sensory-friendly or quiet rooms, special or fast lanes, clear signage, and sensory kits tailored to individual needs. A dedicated symbol for autism may also help reduce stigma and facilitate non-verbal identification of support needs. Crucially, fostering such inclusive and supportive environments depends on the active involvement of multiple stakeholder groups.

Policymakers play a pivotal role in shaping inclusive public services. Autism-specific provisions should be embedded into existing service delivery guidelines, such as the *Buku Layanan Perkhidmatan Pelanggan Sektor Awam*. Furthermore, dedicated funding for pilot programs to implement sensory-friendly environments and priority lanes in selected government offices is recommended. Cross-agency collaboration—particularly among the Ministry of Health, Ministry of Women, Family and Community Development, and local authorities—will be essential to institutionalise inclusive practices. Facility managers in public service settings should allocate low-cost spaces for sensory rooms using basic materials such as acoustic panels, soft lighting, and neutral colours. Autism-friendly service hours or token queueing systems may also be adopted to reduce waiting times and overcrowding. Engagement with local autism advocacy organisations can support implementation and ensure services are responsive to actual community needs.

Frontline staff, especially front desk officers, should undergo mandatory autism awareness training to improve sensitivity, communication strategies, and de-escalation skills. Providing discreet identifiers (e.g., autism symbol) and offering visual aids or pictorial service guides can further ease the service experience for neurodivergent clients. Architects and designers are equally instrumental in applying universal design principles to service environments. This includes the use of calming colours, natural lighting, acoustic treatments, clear wayfinding signage, and spatial separation between waiting areas and service counters to reduce sensory overload.

These strategies, together with the effective role played by all stakeholders will enhance PWAs’ and their caregivers’ experiences while also being in line with national framework like "Ekonomi MADANI: Memperkasa Rakyat" and the more universal inclusivity objectives like the Sustainable Development Goals (SDGs). The concept of justice or *‘adl* in Islam can also be upheld proudly. By employing these strategies, establishments can create a fairer and more inclusive environment, enabling PWAs and their caregivers to use public services with dignity and ease.

The findings in this study can also serve as a foundation for conducting an empirical study for future research. The results and strategies mentioned in this study are derived from secondary data and conceptual frameworks, given that it is built on a systematic review of the content currently available literature. Building

on this basis, future studies should employ empirical methods to assess the feasibility and efficacy of autism-friendly practices in actual public service environments, especially in Malaysia. To demonstrate the relevance of the above strategies' recommendations, both qualitative and quantitative research is required, including surveys with caregivers and PWAs, observational studies in crowded environments, and interviews with front desk officers. Furthermore, to facilitate evidence-based policymaking, pilot studies or action research could be conducted to test treatments (such as quiet rooms, sensory kits, and signage systems) in designated government agencies. A more comprehensive understanding of regional inclusivity disparities may also be obtained through comparative research between rural and urban areas or between Southeast Asian nations.

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