



Assessment of Mosques Accessibility for Prayers with Disabilities

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Research Article

Volume 4 Issue 3

Received Date: March 14, 2021

Published Date: July 01, 2021

DOI: 10.23880/aphot-16000202

Abstract

Purpose: To assess the accessibility in mosques for prayers with disabilities including wheelchair users. We also aimed to provide recommendations for the development of an implementation plan specifying what improvements we can make to remove barriers to make existing mosques more accessible.

Methods: The Americans with Disabilities Act (ADA) Checklist for Readily Achievable Barrier Removal "Checklist for Existing Facilities-Version 2.1" was used to measure accessibility in mosque buildings.

Results: Accessibility of 45 mosques within the city of Jeddah in Saudi Arabia was assessed. Of the 45 mosques, 20 mosques met the inclusion criteria and were included in the final analysis. In the accessible approach and entrance, the highest compliance score was (86%) which is in the route of travel section. The lowest score was (49.45%) which is in the parking and drop-off section. In the access to goods and services, the highest score was (94%) which is in the horizontal circulation. The lowest score was (55%) which is in the signage of goods and services. In the access to rest rooms, the highest score was (84%) which is in the lavatories. The lowest score was (45.54%) which is in getting to the rest rooms.

Conclusions: Some items on the ADA checklist had low compliance scores such as getting to the rest rooms, parking and drop-off areas, and entrance indicating poor accessibility. This study has provided useful baseline data for future studies in mosques buildings. Collective efforts are needed to make mosques more accessible for prayers with disabilities in our community.

Keywords: Accessibility; Mosque; Persons With Disabilities; Prayers; Wheelchair Users

Introduction

Disability is part of being human. Almost everyone will temporarily or permanently experience disability at some point in their life. Over one billion people; about 15% of the global population lives with some form of disability and this number is increasing. The term persons with disabilities (PWDs) is used to apply to those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others [1]. The Americans

with Disabilities Act (ADA) defines a person with a disability as a person who has a physical or mental impairment that substantially limits one or more major life activity [2]. Disability has become an issue of humans seeking equal opportunity for all, and its combination with accessibility has recently been highlighted. PWDs are handicapped by barriers that impede their activities of daily living and the focus is no longer on impairment rather PWDs should have access to a barrier-free environment for their daily life without limitation. The theoretical basis of disability legislation is to provide physical, environmental and social accessibility to enable PWDs to move freely and use all the available services

on an equal basis with other members of society. The removal of all barriers from the surroundings leading to an accessible environment constitutes the key component of disability law and regulations in all communities [3].

In Saudi Arabia, limited research has been conducted on the prevalence and incidence of disability [4]. More than half a million Saudi citizens (1 out of every 30 individuals) reported the presence of disability during the year 2016 [5]. The 2017 survey results indicated that (2.9%) of Saudi population have disabilities with extreme difficulty [6]. Disability law and regulations in Saudi Arabia are trying to help PWDs to achieve independence and participate actively in society by giving them access to a barrier-free environment. Ensuring physical mobility as well as personal integration towards inclusion in every sphere of the life of PWDs is crucial. However, in practice there have been some reported challenges and cultural barriers in giving equal rights to PWDs or helping them to experience an independent life which has resulted, in some cases, in their further isolation [7,8]. Saudi Arabia is the heartland of Islam, the birthplace of its history, the site of the two holy mosques and the focus of Islamic devotion and prayer. Praying "*Salat*" is the second of the Five Pillars of Islam. It is considered one of the most purposeful and meaningful activities of everyday life "*occupations*" that gives value and meaning to Muslims. Muslims pray five times each day which allows Muslims to communicate with God "*Allah*", listen to God and follow in the footsteps of the prophets [9]. This concurs with the definition of occupations as important aspects of individuals and groups lives for the purpose of active participation in social and spiritual roles and situations in community [10,11]. The primary purpose of the mosque is to serve as a place where Muslims can come together for prayer, as praying together holds great importance in Islam. Saudi Arabia is the country of the two Holy Mosques and Islam is the first to be aware of the issue of disability and the rights of PWDs. There are thousands of mosques in Saudi Arabia. City of Jeddah alone includes more than 2,300 mosques [12].

Rehabilitation and occupational therapy services aim to meet patients' needs and foster independence in all aspects of their daily life. This includes not only activities of daily living, but also includes encouraging patient re-integration into the community by engaging in social and functional interaction with other people and surrounding environment [13]. Most of these needs are presented under the umbrella term 'access' [14]. Restriction of mobility is likely to be the most common handicap amongst PWDs [15]. Accessibility for PWDs is a worldwide concern. Accessibility of built environment is one of the primary concerns of urban planning and design. An urban space can be a successful public place if accessibility is provided. Besides this, a public place should provide accessibility to everyone, regardless physical abilities or

financial resources, because 'accessibility is the freedom and the ease of individuals to decide to participate in different activities [13]. Assessment of building accessibility and public accommodations is the first step in a planning process for readily achievable barrier removal. This assessment is usually done manually which is a source of errors that may affect the reliability of the evaluation results [16]. However, assessments could be done through using some objective outcome measures and checklists that are valid and reliable. These checklists help identify accessibility problems and solutions in existing facilities in order to meet obligations and accessibility universal standards [17]. The goal of such checklists is to study how to make the facilities accessible for PWDs. The Americans with Disabilities Act (ADA) Checklist for Readily Achievable Barrier Removal "Checklist for Existing Facilities-Version 2.1" highlights some of the requirements found in the ADA Standards for buildings accessibility [18,19]. Only a handful of research studies have focused on measuring accessibility in mosques buildings [20,21]. Furthermore, no previous studies were identified that examined the degree of accessibility in mosques in the west region in Saudi Arabia. Therefore, the purpose of this study was to examine the degree of accessibility for mosques facilities and buildings for PWDs.

Methods

A team consisted of undergraduate research assistants and occupational therapy students conducted this study. The Americans with Disabilities Act (ADA) Checklist for Readily Achievable Barrier Removal "Checklist for Existing Facilities-Version 2.1" was used to measure accessibility in mosques buildings. The accessibility of a total of 45 mosques was investigated. Our sample included mosques established between the year of (1967) and the year of (2001). Mosques that had more than two constructions/buildings were excluded due to limitations of time and data collectors. In addition, buildings that yielded missing data due to many non-applicable items in the ADA checklist were also excluded. Of the 45 mosques, 20 mosques met our inclusion criteria and data derived from was included in the final analysis. This study was conducted using the standards derived from the ADA checklist. This checklist is based on four priorities recommended by the Title III regulations for planning readily achievable barrier removal projects: (1) Accessible approach and entrance Priority, (2) Access to goods and services Priority, (3) Access to rest rooms Priority, and (4) Any other measures necessary.

Priority number 4 (any other measures necessary) and some subtitles were removed because most items in this priority were not applicable to the buildings examined (e.g., drinking fountains, public telephones).

The ADA checklist was used to record the data from direct observation and measurement. Priority 1 focuses on that PWDs should be able to arrive on the site, approach the building, and enter as freely as everyone else. At least one route of travel should be safe and accessible for everyone, including PWDs. Priority 2 focuses on that the layout of the building should allow PWDs to obtain materials or services without assistance. Priority 3 focuses on that when rest rooms are open to the public, they should be accessible to PWDs.

Results

Descriptive statistics of simple percentages and means were used to determine the level of accessibility to the surveyed mosques based on the guidelines and standards of the ADA checklist. The scores indicate the number of accessible mosques.

Accessible Approach/Entrance

Four subtitles were surveyed to assess accessible approach/entrance:

- **Route of Travel**

Five items were surveyed to assess route of travel. All items were applicable to assess for all mosques (n=20). The mean compliance percentage recorded in route of travel was 86% (see Table 1).

- **Ramps**

Four items were surveyed to assess ramps. Items “Do all ramps longer than 6 feet have railings on both sides?”, and “Is the width between railings or curbs at least 36 inches?” were applicable to assess for fourteen mosques (n = 14), however; the other two items were applicable to assess for all mosques (n = 20). The mean compliance percentage recorded of ramps was 85% (Table 1).

- **Parking and Drop-Off Areas**

Four items were surveyed to assess parking and drop-off areas. Item “Are an adequate number of accessible parking spaces available?” was applicable to assess for eighteen mosques (n = 18). However, the other three items were applicable to assess for all mosques (n = 20). The mean compliance percentage recorded of parking and drop-off areas was 49.45% (Table 1).

- **Entrance**

Seven items were surveyed to assess the entrance. Items “Can the alternate accessible entrance be used independently?”, and “Is the door handle no higher than 48 inches and operable with a closed fist?” were applicable to assess for eighteen mosques (n = 18). However, the other five items were applicable to assess for all mosques (n = 20). The mean compliance percentage recorded of entrance was 65% (Table 1).

Table 1: Compliance Scores of Accessible Approach/Entrance.

Items	Score	%	# Mosques (n=20)
1-Accessible Approach/Entrance			
1.1 Route of Travel			
Is there a route of travel that does not require the use of stairs?	20	100%	20
Is the route of travel stable, firm and slip-resistant?	20	100%	20
Is the route at least 36 inches wide?	20	100%	20
Can all objects protruding into the circulation paths be detected by a person with a visual disability using a cane?	12	60%	20
Do curbs on the route have curb cuts at drives, parking, and drop-offs?	14	70%	20
Total	86	430%	
Mean	17.2	86%	
1.2 Ramps			
Are the slopes of ramps no greater than 1:12?	14	70%	20
Do all ramps longer than 6 feet have railings on both sides?	10	71.40%	14
Is the width between railings or curbs at least 36 inches?	14	100%	14
Are ramps non-slip?	20	100%	20

Total	58	341%	
Mean	14.5	85%	
1.3 Parking and Drop-Off Areas			
Are an adequate number of accessible parking spaces available?	14	77.80%	18
Are the access aisles part of the accessible route to the accessible entrance?	12	60%	20
Are the accessible spaces closest to the accessible entrance?	8	40%	20
Is there an enforcement procedure to ensure that accessible parking is used only by those who need it?	4	20%	20
Total	38	197.80%	
Mean	9.5	49.45%	
1.4 Entrance			
If there are stairs at the main entrance, is there also a ramp or lift, or is there an alternative accessible entrance?	14	70%	20
Do all inaccessible entrances have signs indicating the location of the nearest accessible entrance?	2	10%	20
Can the alternate accessible entrance be used independently?	12	66.70%	18
Does the entrance door have at least 32 inches clear opening (for a double door, at least one 32-inch leaf)?	16	80%	20
Is there at least 18 inches of clear wall space on the pull side of the door, next to the handle?	16	80%	20
Is the door handle no higher than 48 inches and operable with a closed fist?	18	100%	18
Can doors be opened without too much force exterior doors reserved; maximum is 5 lb for interior doors)?	10	50%	20
Total	88	457%	
Mean	12.6	65%	

Maximum obtainable score on each item is 20, representing 100%

Access to Goods and Services

Eight subtitles were surveyed to assess access to goods and services:

- **Horizontal Circulation**

Four items were surveyed to assess horizontal circulation. All items were applicable to assess for all mosques (n=20) except the last item "Is there a 5-foot circle or a T-shaped space for a person using a wheelchair to reverse direction?" (n = 16). The mean compliance percentage recorded in horizontal circulation was 94% (Table 2).

- **Doors**

Four items were surveyed to assess the doors. All items were applicable to assess for all mosques (n=20). The mean compliance recorded in doors was 83% (Table 2).

- **Rooms and Spaces**

Three items were surveyed to assess rooms and spaces. The first two items were applicable to assess for all mosques

(n=20); however, the third item "In circulation paths through public areas, are all obstacles cane-detectable (located within 27 inches of the floor or higher than 80 inches, or protruding less than 4 inches from the wall)?" was applicable to assess fourteen mosques (n = 14). The mean compliance recorded in rooms and spaces was 68% (Table 2).

- **Signage for Goods and Services**

Six items were surveyed to assess signage for goods and services. All items were applicable to assess for all mosques (n=20). The mean compliance recorded in signage for goods and services was 55% (see Table 2).

- **Controls**

Two items were surveyed to assess controls. Item "Are they operable with a closed fist?" was applicable to assess sixteen mosques (n= 16); however, item "Are all controls that are available for use by the public (including electrical, mechanical, cabinet, game, and self-service controls) located at an accessible height?" was applicable to assess all mosques

(n=20). The mean compliance recorded in controls was 79% (Table 2).

- **Vertical Circulation**

Two items were surveyed to assess vertical circulation. The two items were applicable to assess all mosques (n=20). The mean compliance percentage recorded in vertical circulation was 80% (see Table 2).

- **Stairs**

Two items were surveyed to assess stairs. The two

items were applicable for all mosques (n=20). The mean compliance percentage recorded in stairs was 60% (Table 2).

- **Elevators**

Six items were surveyed to assess elevators. The first five items were applicable to assess eighteen mosques (n = 18). However, item "is the emergency intercom identified by braille and raised letters?" was applicable to assess sixteen mosques (n = 16). The mean compliance percentage recorded in elevators was 62.30% (Table 2).

Table 2: Compliance Scores of the Access to Goods and Services.

Items	Score	%	# Mosques (n=20)
2-Access to Goods and Services			
2.1 Horizontal Circulation			
Does the accessible entrance provide direct access to the main floor, lobby, or elevator?	20	100%	20
Are all public spaces on an accessible route of travel?	18	90%	20
Is the accessible route to all public spaces at least 36 inches wide?	20	100%	20
Is there a 5-foot circle or a T-shaped space for a person using a wheelchair to reverse direction?	14	87.50%	16
Total	72	378%	
Mean	18	94%	
2.2 Doors			
Do doors into public spaces have at least a 32-inch clear opening?	16	80%	20
On the pull side of doors, next to the handle, is there at least 18 inches of clear wall space so that a person using a wheelchair or crutches can get near to open the door?	16	80%	20
Can doors be opened without too much force (5 lbf maximum for interior doors)?	14	70%	20
Are door handles 48 inches high or less and operable with a closed fist?	20	100%	20
Total	66	330%	
Mean	16.5	83%	
2.3 Rooms and Spaces			
Are all aisles and pathways to materials and services at least 36 inches wide?	20	100%	20
Is there a 5-foot circle or T-shaped space for turning a wheelchair completely?	18	90%	20
In circulation paths through public areas, are all obstacles cane-detectable (located within 27 inches of the floor or higher than 80 inches, or protruding less than 4 inches from the wall)?	2	14.28%	14
Total	40	204%	
Mean	13.3	68%	
2.4 Signage for Goods and Services			

If provided, do signs and room numbers designating permanent rooms and spaces where goods and services are provided comply with the appropriate requirements for such signage?	20	100%	20
• Signs mounted with centerline 60 inches from floor.	8	40%	20
• Mounted on wall adjacent to latch side of door, or as close as possible.	18	90%	20
• Raised characters, sized between 5/8 and 2 inches high, with high contrast (for room numbers, rest rooms, and exits).	20	100%	20
• Brailled/ text of the same information.	0	0%	20
If pictogram is used, it must be accompanied by raised characters and braille.	0	0%	20
Total	66	330%	
Mean	11	55%	
2.5 Controls			
Are all control that are available for use by the public (including electrical, mechanical, game and service controls) located at an accessible height?	14	70%	20
Are they operable with a closed fist?	12	87.50%	16
Total	26	158%	
Mean	13	79%	
2.6 Vertical Circulation			
Are there ramps, lifts, or elevators to all public levels?	16	80%	20
On each level, if there are stairs between the entrance and/or elevator and essential public areas, is there an accessible alternate route?	16	80%	20
Total	32	160%	
Mean	16	80%	
2.7 Stairs			
Do treads have a non-slip surface?	16	80%	20
Do stairs have continuous rails on both sides, with extensions beyond the top and bottom stairs?	8	40%	20
Total	24	120%	
Mean	12	60%	
2.8 Elevators			
Are there both visible and verbal or audible door opening/closing and floor indicators (one tone = up, two tones = down)?	8	44.50%	18
Are the call buttons in the hallway no higher than 42 inches?	12	66.70%	18
Do the controls inside the cab have raised and braille lettering?	12	66.70%	18
Is there a sign on both door jambs at every floor identifying the floor in raised and braille letters?	10	55.60%	18
If an emergency intercom is provided, is it usable without voice communication?	14	77.80%	18
Is the emergency intercom identified by braille and raised letters?	10	62.50%	16
Total	66	373.80%	
Mean	11	62.30%	

Maximum obtainable score on each item is 20, representing 100%

Usability of Rest Rooms

Three subtitles were surveyed to assess usability of rest rooms:

- **Getting to the Rest Rooms**

Two items were surveyed to assess getting to the rest rooms. Item "If rest rooms are available to the public, is at least one rest room (either one for each sex, or unisex) fully accessible?" was applicable to assess sixteen mosques (n = 16). However, item "Are there signs at inaccessible rest rooms that give directions to accessible ones?" was applicable for fourteen mosques (n = 14). The mean compliance percentage recorded in getting to the rest rooms was 45.54% (Table 3).

- **Door ways and Passages**

Seven items were surveyed to assess doorways and passages. All the items were applicable to assess sixteen mosques (n = 16) except for the first item "Is there tactile signage identifying rest rooms?" which was applicable to assess eighteen mosques (n = 18). The mean compliance percentage recorded in doorways and passages was 72.43% (Table 3).

- **Lavatories**

Five items were surveyed to assess lavatories. All items were applicable to assess for all mosques (n = 20) except for the item "Can the faucet be operated with one closed fist?" which was applicable for eighteen mosques (n = 18). The mean compliance percentage recorded in lavatories was 84% (Table 3).

Table 3: Compliance Scores of the Usability of Rest Rooms.

Items	Score	%	# Mosques (n=20)
3-Usability of Rest Rooms			
3.1 Getting to the Rest Rooms			
If rest rooms are available to the public, is at least one rest room (either one for each sex, or unisex) fully accessible?	10	62.50%	16
Are there signs at inaccessible rest rooms that give directions to accessible ones?	4	28.57%	14
Total	14	91.07%	
Mean	7	45.54%	
3.2 Doorways and Passages			
Is there tactile signage identifying rest rooms?	8	44.50%	18
Are pictograms or symbols used to identify rest rooms, and, if used, are raised characters and braille included below them?	4	25%	16
Is the doorway at least 32 inches clear?	16	100%	16
Are doors equipped with accessible handles (operable with a closed fist), 48 inches high or less?	16	100%	16
Can doors be opened easily (5 lbf maximum force)?	14	87.50%	16
Does the entry configuration provide adequate maneuvering space for a person using a wheelchair?	12	75%	16
Is there a 36-inch-wide path to all fixtures?	12	75%	16
Total	82	507.00%	
Mean	11.7	72.43%	
3.3 Lavatories			
Does one lavatory have a 30-inch-wide by 48-inch-deep clear space in front?	20	100%	20
Is the lavatory rim no higher than 34 inches?	20	100%	20
Is there at least 29 inches from the floor to the bottom of the lavatory apron (excluding pipes)?	14	70%	20
Can the faucet be operated with one closed fist?	16	88.90%	18

Is the mirror mounted with the bottom edge of the reflecting surface 40 inches high or lower?	12	60%	20
Total	82	419%	
Mean	16.4	84%	

Maximum obtainable score on each item is 20, representing 100%

Discussion

Accessibility refers to the degree to which an environment can be approached, entered, operated in, or used safely and with dignity by PWD [22]. As a public building, mosque should be accessible for all and should have no barriers that may confront prayers with disabilities and hinder them from performing their religious rituals. Unfortunately, prayers with disabilities still find difficulties in accessing mosques. For example, the calling to prayer through loudspeakers only could be problematic for persons with hearing loss. Also, prayers with physical disabilities, such as wheelchair users, have difficulties in several areas in the mosque, including the entrance, place of ablution, the lavatories and the area for removing shoes at the entrance to the prayer hall forcing them to pray in isolation in their houses and preventing them from participating in an important part of their faith [20,21].

In this study a convenience sample of twenty mosques within the northern side of Jeddah city was examined to investigate accessibility. High percentages indicated relatively high compliance and good accessibility while low percentages indicated relatively low compliance and poor accessibility. In the accessible approach and entrance, the highest compliance percentage was in the route of travel section (86%). Most routes did not require the use of stairs, were stable, firm and slip-resistant, and were at least 36 inches wide. The lowest compliance percentage was in the parking and drop-off section (49.45%). Some of them did not have an enforcement procedure to ensure that accessible parking is used only by those who need it, and the accessible spaces were not closest to the accessible entrance. In the access to goods and services, the highest compliance percentage was in the horizontal circulation (94%). Most of their entrance provided direct access to the main floor, lobby, or elevator, and the accessible route to all public spaces was at least 36 inches wide. The lowest compliance percentage was in the signage of goods and services (55%). None of the mosques had raised characters and Braille texts of the pictogram. In the access to rest rooms, the highest compliance percentage was in the lavatories (84%). Most of the mosques had at least one accessible lavatory that had 30 inches wide by 48 inches deep clear space in front, and the lavatory rim was no higher than 34 inches. The lowest compliance percentage was in getting to the rest rooms (45.54%). Most of them did not have at least one rest room fully accessible, and there were no signs at inaccessible rest rooms that give directions

to accessible ones.

The current study helped us identify accessibility problems and some possible solutions in the existing mosques in Jeddah city in order to meet obligations and accessibility universal standards. Some possible solutions for Route of travel are to: widen route, move or remove protruding objects, and add a ramp if the route of travel is interrupted by stairs. Some possible solutions for Ramps are to: lengthen ramp to decrease slope, add railings, widen the ramp, and add non-slip surface material. Some possible solutions for Entrance are to: install signs, replace inaccessible knobs with a lever or loop handle, and adjust door closers. Some possible solutions for stairs are to: add non-slip surface to treads, and add or replace handrails if possible within existing floor plan. Some possible solutions for Elevators are to: provide a permanently attached reach stick, and install raised lettering and braille next to buttons.

Saudi Arabia strives to ensure full inclusion of PWDs in different fields and enable them to obtain full rights that ensured their independence and integration in the society. The integration of PWDs into main stream society will require a genuine change in the perception and attitude of the general public towards disability and a shift from the traditional medical model towards the social and integrated models. This can be achieved by educating friends and family and by advocating professionals and policymakers for changes that would help [7,8]. Through the Quality of Life program, a part of the Vision 2030, the Kingdom sought to ensure the accessible infrastructure throughout the country and was working to create the fully accessible physical environment to enable PWDs to live independently and to integrate into society. As the Custodian of the two Holy Mosques, Saudi Arabia was committed to serving the pilgrims and visitors of all abilities to the holy places in Makkah and Madinah. The Universally Accessible Built Environment Guidelines Manual was developed as part of a larger accessibility initiative within Saudi Arabia. This manual provides technical design guidelines and application criteria as a benchmark for the creation of universally accessible buildings and other built environments and outlines the technical design requirements necessary to achieve universally accessible built environments across Saudi Arabia. Architects, engineers, interior designers, urban planners and others involved in the design of the built environment can use these guidelines for project development, resulting in creation of

buildings and other built-environments that accommodate all members of Saudi society including people with disabilities and older persons. The manual includes a whole section related to mosques design considerations, such as but not limited to: access to all areas of worship and other activity areas in the mosque should be provided, access assumes that PWDs may be participants, leaders, staff, or volunteers, places of worship and/or reflection should comply with this section, mosques should comply with applicable design requirements, accessible paths of travel in mosques should be clear of shoes and other obstructions, seating should be provided at entrances and at other locations where people are required to remove their shoes, seating should also be provided within the prayer hall to accommodate people who cannot bend to pray, a designated area to accommodate people using mobility devices should be provided in a location that integrates people with mobility devices into the gathering, and provision should be made to address the potential lack of cleanliness of mobility device wheels where the route to the designated area crosses prayer hall carpeting [12].

This study had some limitations. A convenience sample with a relatively small sample size was used in this study. Our study only included mosques in one city in Saudi Arabia due to limitation of funding grants and data collectors. There were also time limitations for conducting the study due to other workload demands which limited the data collection process. In addition, our study didn't include all items from the ADA checklist because there were many non-applicable items on most of the studied mosques, such as drinking fountains and public telephones. For future studies, we recommend to use a larger sample through well-funded research and the inclusion of more mosques that are applicable to most of the items on the ADA checklist. The more items we include the more informative data we can obtain. Expanding the timeline to conduct the study and having more data collectors and multiple visits to different mosques to eliminate the effect of missing data is also recommended. Additionally, we recommend conducting qualitative research studies that would measure level of satisfaction of prayers with disabilities and include their very valuable points of view and inputs.

Conclusion

This study has provided useful baseline data for future studies in the mosques of the west region in Saudi Arabia which need to be accessible. The compliance scores for some items such as Getting to the Rest Rooms, Parking and Drop-off Areas, Signage for Goods and Services, Stairs, Elevators, and Entrance for PWDs (prayers) in the examined mosques had the lowest scores among other scores, which means the least accessible items among mosques. This is probably because

prayers with disabilities and experts in the area of physical ability management were not consulted and involved in the design and construction of these mosques. International standards should be followed in building new mosques whereas existing mosques can be modified to be accessible. To improve accessibility in mosques buildings, there should be synchronization among prayers, the occupational therapists, physiotherapists, politicians and decision makers, engineers, and architects. Collaborative professional teams need to work together to make mosques buildings more accessible for PWD to meet the needs of this vulnerable population in our community, help achieve independence, and enhance satisfaction and quality of life.

Funding Details: No funding was required.

Acknowledgements: I would like to thank all research assistants and data collectors for their cooperation and support.

Author Contribution: Sole author.

Declarations

Ethics Approval: not applicable.

Consent to Participate: not applicable.

Competing Interests: The author declares no competing interests.

References

1. World Health Organization (2011) World Report on Disability.
2. Adaptive Environments Center (1995) The Americans with Disabilities Act: checklist for readily achievable barrier removal.
3. Wood T, Dolmage J, Price M, Lewiecki Wilson C (2014) Where We Are: Disability and Accessibility. *Composition Studies* 42: 147-150.
4. Al-Jadid MS (2013) Disability in Saudi Arabia. *Saudi Med J* 34(5): 453-460.
5. Bindawas SM, Vennu V (2018) The national and regional prevalence rates of disability, type, of disability and severity in Saudi Arabia—analysis of 2016 demographic survey data. *International journal of environmental research and public health* 15(3): 419.
6. General Authority for Statistics (2020) A specialized survey, measuring the spread of disability, contains all disability statistics details.

7. United Nations Human Rights (2020) Committee on the Rights of Persons with Disabilities examines the report of Saudi Arabia.
8. Mohammad A, Al-Harbi TS (2016) Design of the built environment and the integration of wheelchair users in the Kingdom of Saudi Arabia: Commentary and exploratory study. *Journal on Developmental Disabilities* 22(2): 121.
9. Kurniawan H (2010) Universal Mosque Design. Paper for the 3rd International Conference for Universal Design October 30, 2010. HAMAMATSU, Yogyakarta, Indonesia.
10. American Occupational Therapy Association (2018) What is occupational therapy?.
11. American Occupational Therapy Association (2020) Occupational therapy practice framework: Domain and process (4th Edn.), *American Journal of Occupational Therapy* 74(S2): 7412410010.
12. Prince Salman Center for Disability Research (2020) Universal Accessibility Built Environment Guidelines for the Kingdom of Saudi Arabia.
13. Evcil AN (2009) Wheelchair accessibility to public buildings in Istanbul. *Disability and Rehabilitation. Assistive Technology* 4(2): 76-85.
14. Useh, AM Moyo, Munyonga EU (2001) Wheelchair accessibility of public buildings in the central business district of Harare, Zimbabwe. *Disability & Rehabilitation* 23(11): 490-496.
15. Hamzat TK, Dada OO (2005) Wheelchair accessibility of public buildings in Ibadan, Nigeria. *Asia Pacific Disability Rehabilitation Journal* 16(2): 115-124.
16. Otmani R, Moussaoui A, Pruski A (2009) A new approach to indoor accessibility. *International Journal of Smart Home* 3(4): 1-14.
17. Bodaghi NB, Zainab AN (2013) Accessibility and facilities for the disabled in public and university library buildings in Iran. *Information development* 29(3): 241-250.
18. The Americans with Disabilities Act (1995) checklist for readily achievable barrier removal.
19. Ellek D (1990) The Americans with disabilities act of 1990. *Am J Occup Ther* 45(2): 177-179.
20. Al Mansoor NF (2018) Universal mosque/masjid design. *Transforming Our World through Design. Diversity and Education* pp: 293-298.
21. Abu Tariah H, Ghasham N, Alolayan M, Alahmadi B, Alqarni A (2018) Wheelchair accessibility of mosques in Riyadh. *Work* 60(3): 385-391.
22. Welage N, Liu K (2011) Wheelchair accessibility of public buildings: A review of the literature. *Disability & Rehabilitation. Assist Technol* 6(1): 1-9.

