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Transport barriers encountered by people with disability in Africa: An overview

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Background: The transport needs of people with disability are often marginalised, and universally accessible transport remains a challenge in many African countries. Lack of accessible transport may lead to high unemployment rates, poverty and lack of opportunities among people with disability.

Objectives: The purpose of this study is to identify transport barriers encountered by people with disability in Africa.

Method: A systematic literature review design was followed, while content analysis was used to analyse the data obtained.

Results: One of the most significant barriers for the African countries is the lack of universally accessible transport infrastructure coupled with poor maintenance of existing infrastructure. Lack of policies and legislation on transport and disability as well as poor implementation was also common among African countries.

Conclusion: The transport barriers identified in this study provide insights into what people with disability are experiencing in accessing public transport and guide policymakers and city planners in providing universally accessible transportation.

Keywords: public transport; transport barriers; people with disability; universally accessible transport; accessibility; Africa.

Introduction

In Africa, there are more than 80 million people living with some form of disability, which constitutes between 10% and 20% of the general population of Africa (Disabled World 2022). People with disability experience barriers to participation and socio-economic inclusion in society (Bjerkan et al. 2020; Cepeda, Galilea & Raveau 2018; Tennakoon et al. 2020). The needs of people with disability are often marginalised leading to inequality, unemployment, poverty, exclusion or lack of opportunities (Bjerkan & Øvstedal 2020; Cepeda et al. 2018; Tennakoon et al. 2020). It is well documented that transport can improve participation and socio-economic inclusion of people with disability in society (Bascom et al. 2017; Bekiaris et al. 2018; Eseta 2017; Lucas 2012; Velho et al. 2016). Yet, people with disability do not have equal access and freedom of mobility compared with those who are able bodied (Park, Chowdhury & Wilson 2020).

Transport enables people to access goods, services and opportunities and be part of a community (Cepeda et al. 2018; Odufuwa 2007; Vecchio 2017); hence, it supports social development (Rivasplata & Le Roux 2018) and good quality of life (Odufuwa 2007). Although transport should be regarded as a right for every citizen, this is not always true for people with disability especially in many of the low-income countries, as they often face barriers to accessing transport (Cepeda et al. 2018; Kett, Cole & Turner 2020). Park et al. (2020) acknowledge the increase in recognition of the impact of accessible transport on the livelihoods of people with disability. In cities, public transport has gained attention for improving sustainability and livelihoods (Saif et al. 2018). Transport barriers experienced by people with disability in accessing public transport should be understood and incorporated in transport planning to provide transport services that meet their needs. Because of the increase in the population of people with disability (United Nations [UN] 2015), an increased number of people with disability are likely to experience transport challenges in the future if their needs are not addressed effectively.

Although transport barriers are experienced across different cities in the world, transport barriers are usually worse for people with disability in Africa partly because of the lack of transport infrastructure and transport is not a right for every citizen (Cepeda et al. 2018; Kett et al. 2020). Many African countries continue to experience significant transport barriers in accessing public transport (Abraham et al. 2021; Guzman et al. 2017; Kett et al. 2020; Owusu-Ansah, Baisie & Oduro-Ofori 2019; Vanderschuren & Nnene 2021). Vanderschuren and Nnene (2021) found that many African countries do not involve people with disability in planning and designing transport infrastructure and services. Yet participation of people with disability in transport planning and designing is essential to meeting their mobility needs in society.

This study aims to identify transport barriers experienced by people with a disability described in the literature to improve awareness of public transport accessibility in transport planning and design in Africa. To address the aim of the study, three secondary objectives were formulated: (1) to understand ways in which people with disability are excluded from transport systems, (2) to establish whether transport systems in Africa are designed to accommodate the needs of people with disability and (3) to provide an overview of the current situation for people with disability in terms of access to public transport in Africa.

Literature review

Transport barriers for people with disability are widespread, and there is a substantial body of literature exploring transport barriers for people with disability (Fast 2019; Ipingbemi 2015; Kett et al. 2020; Park & Chowdhury 2018). However, documentation of transport barriers that people with disability experience is lacking in low-income countries, especially African countries (Kett et al. 2020). Different types of groups of people with disability can experience different barriers; what may be relevant to a specific group may be irrelevant to another group. Within each group of people with disability, some people have unique transport needs. However, some barriers experienced are common across groups of people with disability. Moreover, some groups of people with disability experience severe problems in accessing public transport compared with other groups.

A journey by public transport consists of several elements that make up the journey chain, for example, transport information, walking to the bus stop or train station and getting into the vehicle, time in-vehicle, disembarking and walking to the destination (Nickpour 2012; Park & Chowdhury 2018). Often people with disability start by planning their journeys to avoid unexpected encounters, and it requires transport information (Park & Chowdhury 2018). Irrespective of body abilities, the journey chain should be easy to complete, and every element of the journey should be accessible. Barriers in transport are attributed to a wide range of factors including the design of vehicles, transport infrastructure, the built environment, public transport service and attitudes of drives and co-passengers (Amin, Razak & Akhir 2021; Bezyak et al. 2017; Solvoll et al. 2017; Vale et al. 2017; Wu, Li & Li 2017).

Vehicle design is one of the factors that affect the physical access (Ahmad 2015; Sze et al. 2017; Velho 2019), for example, boarding and disembarking vehicles with a step(s). The built environment includes elements such as pavements, kerbs and ticket counters. In the built environment, people with disability often encounter issues such as broken pavements and open manholes (Owusu-Ansah et al. 2019).

Public transport services consist of elements such as frequency, reliability, safety, security, cost, information and availability (Bjerkan et al. 2018; Gogiashvili et al. 2019; Iudici et al. 2017; Oksenholt & Aarhaug 2018; Park & Chowdhury 2018; Sze et al. 2017). The negative attitudes of public transport drivers towards people with disability have been highlighted by many scholars as one of the major barriers experienced (Bezyak et al. 2017; Calle et al. 2021; Fast 2019; Kabia et al. 2018; Oksenholt & Aarhaug 2018; Owusu-Ansah et al. 2019; Park & Chowdhury 2018; Stjernborg 2019; Tillmann et al. 2013; Velho 2019).

City practitioners that aim at designing transport infrastructure should not only focus on the physical elements of transport barriers but also on the overall journey chain (Park et al. 2020). Moreover, city practitioners should involve people with disability in planning and designing transport infrastructure and services.

Zajac (2016) acknowledges that the accessibility of public transport is interlinked to the elements of transport infrastructure and the design of public space. Previous research shows that transport challenges faced by people with disability can be overcome by the provision of universally accessible transport services (Bombom & Abdullah 2016). Universally accessible can be defined as 'the ambition of making a given transport sub-system accessible to many persons as possible' (Martens 2018:123).

Methodology

The purpose of this study was to document transport barriers experienced by people with disability in accessing public transport described in the literature to improve awareness of public transport accessibility in transport planning and design in Africa.

Public transport accessibility for those with mobility, visual and hearing impairments was analysed in this study. This study is based on a desktop review of the literature. Content analysis was applied in this study to synthesise and analyse transport barriers experienced by people with disability. Figure 1 shows the literature search process followed.

To determine the extent to which the topic has been covered in the academic literature, several databases were searched, including Science Direct, Sage, Emerald, Springer, Taylor & Francis, SCOPUS, Google Scholar, Sabinet, ResearchGate and Wiley Online. The keywords to search for relevant literature include transport disability, universally accessible transport, inclusive transport and transport-related exclusion. 'Universally accessible transport' is an evolving concept; therefore, articles from 2000 to the present were selected for review to ensure that

the latest research in the field is analysed, and the research is up-to-date and relevant.

As shown in Figure 1, the search process was carried out in four stages. The initial stage produced 234 articles relating to different countries across the world. Articles that were not primarily focused on transport barriers were excluded as well as those that were not focused on Africa resulting in 172 papers. The third stage was to read all abstracts of the remaining papers to check their relevance that resulted in 40 papers. The final stage was a full-text review that resulted in 16 articles, which were suitable for inclusion in the review. Table 1 shows an overview of included studies.

Findings

A total of 16 published studies between 2000 and the present year that met study criteria were analysed, and the list of extracted data is presented in Table 1. Of the 16 studies, five were conducted in South Africa, while four were conducted in Nigeria. A small proportion was from Zimbabwe, Libya and Ghana.

The other two studies were classified as developed countries and low- and middle-income countries. Most of the studies (14 studies) applied qualitative methods, while a small proportion applied mixed methods research (two studies). While most of the studies were focused on mobility, hearing and visual groups of people with disability, a few focused on multiple groups of people with disability.

Transport barriers identified in the literature experienced in African countries were classified into five broad categories,
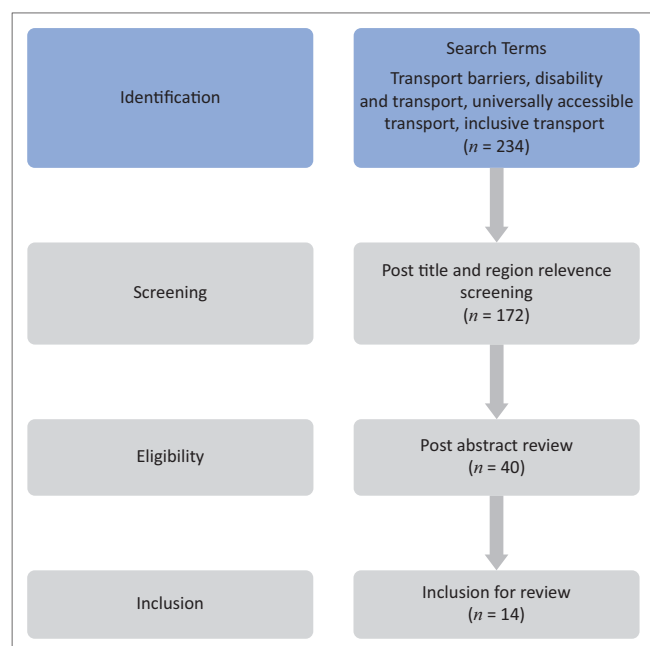
Source: Ku, B. & Rhodes., 2020, 'Physical activity behaviours in parents of children with disabilities: A systematic review', Research in Developmental Disabilities 107, 103787. https://doi.org/10.1016/j.ridd.2020.103787

FIGURE 1: Literature search process.

TABLE 1: An overview of included studies.

Study	Method	Geographic area	Focus group	Barriers
Abraham et al. (2021)	Qualitative	Ghana	Visual	Parking, taxi stations, footpaths, drivers
Vanderschuren and Nnene (2021)	Qualitative	South Africa	Not specific	Transport planning, policies, legislation, structural
Ajayi et al. (2020)	Quantitative	Nigeria	Visual, hearing, physical	Vehicles, bus stop, operators, discrimination, information
Kett et al. (2020)	Qualitative	Low- and middle-income countries	Not specific	Legislation, policies, infrastructure, vehicles, attitudes, availability
Thembelihle (2020)	Qualitative	Zimbabwe	Not specific	Vehicle, affordability, street vendors
Owusu-Ansah et al. (2019)	Mixed	Ghana	Mobility, visual	Roads, vehicles, ramps, pavements, crossings
Kabia et al. (2018)	Qualitative	Kenya	Mobility, visual	Drivers' attitudes, cost, gender,
Rivasplata and Le Roux (2018)	Qualitative	South Africa	Deaf	Inaccessible vehicles, boarding, cost, safety
Bombom and Abdullahi (2016)	Mixed	Nigeria	Mobility, visual	Road surface, street furniture, cost, safety, attitudes
Lister and Dhunpath (2016)	Qualitative	South Africa	Mobility, visual, hearing	Taxi ranks, taxi drivers, cost, availability, stakeholders
Green, Mophosho and Khoza-Shangase (2015)	Qualitative	South Africa	Communication disorder	Communication
Ipingbemi (2015)	Quantitative	Nigeria	Visual, physical	Bus design, sidewalks, street vendors, street parking, attitudes, drivers
Aljanzouri Anwar and Zaika (2014)	Quantitative	Libya	Hearing, visual, physical	Security, awareness, vehicle design, infrastructure, institutional
Lorenzo (2008)	Qualitative	South Africa	Not specific	Waiting time, taxi violence, attitudes, finance, structural
Odufuwa (2007)	Quantitative	Nigeria	Not specific	Security, information, infrastructure, service quality
Mashiri et al. (2005)	Qualitative	Developing world	Not specific	Special transport, legislation, regulation, information

namely structural, psychosocial, service quality, socio-demographic and institutional barriers.

Structural barriers

Structural barriers in this analysis involve factors that prevent transport users from accessing the service because of the condition of the built environment, transport infrastructure and transport vehicles. To make it clear, structural barriers are discussed in three themes: built environment, transport facilities and transport vehicles.

Built environment

The built environment includes pavements, street crossings, kerbs, intersections and street furniture. Owusu-Ansah et al. (2019) found that in Kumasi Central Business District (CBD), the pedestrian environment is not conducive for people with disability. The streets of Kumasi CBD are characterised by 'open drains, broken pavements, unpaved surfaces, elevated kerbs and uncovered manholes'. Similar conditions of streets are common across cities in African countries, for example, Zimbabwe (Thembelihle 2020) and Nigeria (Ipingbemi 2015; Odufuwa 2007).

In many instances, pavements lack the free flow of human traffic because of street vendors or on-street parking (Ipingbemi 2015), and the mobility of people with visual and mobility disability is severely affected in constricted streets. Moreover, lack of pavements or poor state of pavement not only compromise the safety of people with disability but also everyone. Thembelihle (2020) found that pavements were occupied by street vendors making mobility difficult for people who use wheelchairs.

Lack of tactile surfaces makes the situation worse for people with visual disability, and research reveals that it is a common problem across many cities in Africa (Aljanzouri et al. 2014; Vanderschuren & Nnene 2021). People with visual disability in Libya find it difficult to locate bus stops, correct platforms or bays because of the absence of tactile surfaces (Aljanzouri et al. 2014). In instances where tactile surface is present, the installation is wrong or people with visual disability do not know how to use it. As a result, people with visual disability found tactile surfaces not useful to them.

Although such deplorable conditions of the built environment can endanger everyone, people with visual and mobility disability are severely affected. There is a high risk of falling for people with visual disability (Vanderschuren & Nnene 2021). In contrast, poor pavements can completely block people with mobility disability from moving, thereby making independent mobility impossible among people with mobility disability (Vanderschuren & Nnene 2021).

Lack of safety at crossings and intersections put people with disability at risk of colliding with vehicles. Crossings in Nigeria do not take safety aspects for people with disability (Ipingbemi 2015). The situation in Nigeria is made worse by drivers who drive fast and not observing traffic rules (Bombom & Abdullahi 2016). People with visual and mobility disabilities require assistance to cross roads. It is therefore important to increase awareness among designers and architects so as to incorporate design standards that are compliant with principles of universal access.

Transport vehicles

Barriers concerning transport vehicles include vehicle design, space, seating and steps at the entrance of the vehicle. Vehicle design is a common barrier identified from the literature concerning universal access principles. Compared with other groups, people with a mobility disability are severely affected by the design of the vehicle, leaving them with limited transport options.

The design of conventional buses and mini-buses does not accommodate people in wheelchairs (Ajayi et al. 2020; Thembelihle 2020). Conventional buses and mini-buses do not have access mechanism for people in wheelchairs, which makes boarding and disembarking difficult (Thembelihle 2020). Without ramps, physical effort is required to assist people who use wheelchairs that may be difficult for drivers.

Ipingbemi (2015) found that the design of existing buses and mini-bus taxis in Nigeria does not accommodate people with disability, especially those with mobility disability. Mini-bus taxis have limited space to carry mobility aids such as wheelchairs (Ipingbemi 2015). Thembelihle (2020) reveals that public transport in Zimbabwe is inaccessible to people with disability, especially those who use wheelchairs. Because of inaccessible vehicles, some people with disability end up using expensive modes of transport that provide on-demand services (Rivasplata & Le Roux 2018). Not only buses and mini-bus taxis are inaccessible to many people with disability but also trains. A study carried out in South Africa reveals that the trains are not fully accessible to people with disability, and safety is an issue of concern (Rivasplata & Le Roux 2018).

In South Africa, the three main modes of public transport used are rail, mini-bus taxi and bus (Mashiri et al. 2005; Stats SA 2021). The level of accessibility of the public transport modes in African countries is low. Many people with a disability such as mobility find it challenging to use public transport (Aljanzouri et al. 2014). Similarly, in Nigeria, Ghana, Kenya and other African countries, the design of public buses and trains does not comply with universally accessible principles (Ajayi et al. 2020; Kabia et al. 2018; Owusu-Ansah et al. 2019).

Transport facilities

Bus stations, train stations, bus stops, terminals, platforms and toilets form a part of transport facilities. Aljanzouri et al. (2014) found that in Libya, transport infrastructure such as stations and stops are not universally designed to cater for the needs of different groups of transport users. Lack of

consistency in designing infrastructure makes it difficult for people with disability to plan their journeys.

In South Africa, most taxi ranks do not comply with universal access principles (Lister & Dhunpath 2016). Similarly, with Metrorail stations in South Africa, the infrastructure design does not comply with universal access principles. In Nigeria, Ipingbemi (2015) found that bus stop design does not comply with universal access principles. Table 2 summarises the structural barriers that affect people with disability in accessing public transport.

In summary, structural factors identified from the literature include the pedestrian environment, ramps, stairs, elevators, vehicle design, platforms and toilets. Overall, transport infrastructure in many African countries is not designed to accommodate the needs of people with disability. As a result, many people with disability may encounter difficulties in accessing public transport. However, the severity of barriers depends on the type of disability.

Psychosocial barriers

Psychosocial barriers include beliefs, attitudes, fear, perceptions, values and conformity. In the literature, it is well documented that public transport drivers have negative attitudes towards people with disability (Abraham et al. 2021; Ipingbemi 2015; Kabia et al. 2018; Kett et al. 2020). Yet, drivers play a vital role for people with disability in accessing transport as well as serving as a social support system. Negative attitudes of drivers towards people with disability are often attributed to a lack of knowledge, awareness and training on disability (Ajayi et al. 2020; Aljanzouri et al. 2014).

Drivers are of the opinion that people with disability are 'difficult passengers' of which may inform their attitudes (Bombom & Abdullahi 2016; Ipingbemi 2015). Ajayi et al. (2020) found that operators in Oyo State, Nigeria, discriminate and lack patience with people with disability.

Ipingbemi (2015) found that in Nigeria, drivers and conductors victimise people with disability when boarding and alighting the vehicle. In Kenya, drivers are not patient with women passengers with disability (Kabia et al. 2018). Women with mobility and visual disability reported that they are often denied access to public transport, and in many cases, drivers charge a higher transport fare compared with other passengers (Kabia et al. 2018).

Generally, drivers lack training in handling and providing transport services to people with disability (Abraham et al. 2021). Negative attitudes in public transport also come from co-passengers (Kett et al. 2020), which may be formed through a lack of disability awareness. Table 3 summarises psychosocial barriers that affect people with disability in accessing public transport.

People with disability can experience transport barriers in the form of psychosocial factors including drivers' attitudes, co-passengers' attitudes, fear, insecurity and self-esteem. The negative attitudes of drivers towards passengers with disability is a common problem across many African countries.

Service quality

Service quality elements include factors such as frequency, reliability, comfort, safety, affordability and efficiency. Barriers concerning information and communication are most common among people with visual, hearing or speech disability. However, transport information is a necessity for every transport user.

Transport services and infrastructure that are 'safe, reliable, reliable, affordable, efficient and comfortable' enhance transport security (Odufuwa 2007). Transport security should be observed at all times for different groups of transport users. Some drivers do not give people with disability sufficient time to board and alight, which compromise their safety on public transport (Odufuwa 2007).

The transport cost of people with disability is often high, especially for those who use wheelchairs (Owusu-Ansah et al. 2019). Lorenzo (2018) found that women with disability in Cape Town spend long time waiting for transport. Because of the inaccessible design of public transport modes, some people with a disability rely on private vehicles or other modes that are expensive (Rivasplata & Le Roux 2018). High costs of transport may also emanate from the need to travel with an assistant. In some instances, wheelchairs pay for space in public transport modes such as mini-buses (Kabia et al. 2018). Table 4 summarises service quality barriers experienced by people with disability in accessing public transport.

TABLE 2: Summary of structural barriers.

Barriers	Mobility	Vision	Hearing
Vehicle design	✓	✓	✓
Stops	✓	✓	✓
Shelters	✓	✓	✓
Ticketing	✓	✓	✓
Pavements	✓	✓	✓
Stairs	✓	✓	-
Ramps	✓	✓	-
Platforms	✓	✓	-
Building entrance and exits	✓	✓	-
Toilets	✓	-	-

TABLE 3: Summary of psychosocial barriers.

Barriers	Mobility	Vision	Hearing
Drivers' attitudes	✓	✓	✓
Co-passengers' attitudes	✓	✓	-
Ignorance	✓	✓	✓
Fear	✓	✓	✓
Insecurity	✓	✓	✓
Self-esteem	✓	✓	✓

Overall, service quality barriers affect everyone including those who are able-bodied. However, the severity of the service quality barrier is more pronounced among the vulnerable, such as people with disability. Service quality factors identified in the literature include information, availability, comfort, ticketing, overcrowding and cost. Transport services offered in different African countries generally tend not to consider the needs of people with disability.

Socio-demographic barriers

Socio-demographic factors identified from the literature include income, employment, education and support systems such as family, travel companions, travel assists, escorts or caregivers (Kabia et al. 2018; Rivasplata & Le Roux 2018). In literature, socio-demographic barriers concerning people with disability are largely unexplored. The scholarly work on the association between disability and socio-demographic barriers is limited. However, one factor that frequently came out in many studies was the support system (travel companions, caregivers, family and travel assistants) (Aljanzouri et al. 2014; Kabia et al. 2018; Odufuwa 2007).

In Nigeria, Odufuwa (2007) found that most people with disability cannot travel independently. Kabia et al. (2018) found that mini-buses often do not stop for unaccompanied women with disability. The inability to travel independently often results in high transport costs for people with disability. However, drivers argue that transporting people with disability is time consuming and involves hard work in loading wheelchair users (Kabia et al. 2018). Similarly, in other countries such as South Africa and Ghana, drivers do not stop for unaccompanied people with disability, especially those in wheelchairs (Owusu-Ansah et al. 2019).

Support may also come from co-passengers. In cases where drivers do not perceive people with visual or hearing as passengers needing assistance, co-passengers may assist. Research performed by Green et al. (2015) in South Africa reveals that there are some co-passengers who assist other passengers with hearing disability in minibus taxis. Passengers with hearing disability mainly need help in communicating with the driver while people with visual disability may only require guidance. However, co-passengers in some instances do not show compassion towards people with disability and are unwilling to assist

(Bombom & Abdullahi 2016). It could imply that co-passengers are not aware of or indifferent to their disability.

People with disability with high income are more likely to travel more and in comfort. Odufuwa (2007) found that people with disability earning high income to travel in comfort and have access to private transport. Table 5 summarises socio-demographic barriers experienced by people with disability in accessing public transport.

Only a few articles have analysed the influence of socio-demographic factors on transport. Support system was one of the important factors that can reduce the severity of barriers imposed by transport infrastructure and services. Lack of support systems such as travel companions or escorts can exclude people with disability from transport systems, especially people who use wheelchairs and people who are blind.

Institutional barriers

Institutional factors include legislation, policies, strategic planning and political will. Although legislation and policies concerning transport accessibility of people with disability are present in many countries, barriers persist. Lister and Dhunpath (2016) highlight that despite significant policies and legislation in place in South Africa, people with disability still experience barriers in accessing public transport.

Aljanzouri et al. (2014) argue that in Libya, the government lacks interest in providing accessible transport infrastructure. Vanderschuren and Nnene (2021) found that in Africa, people with disability are not included in planning documents and institutional guidelines. Lack of participation of different transport stakeholders in transport planning can result in barriers for people with disability. To a large extent, transportation in African countries is not an issue of priority; therefore, issues around universal accessibility of transport are overlooked.

Vanderschuren and Nnene (2021) argue that Africa is still behind concerning inclusive transport planning and more work is required in the development and implementation of people-oriented transport, which focuses on the needs of people rather than vehicles. Mashiri et al. (2005) acknowledge that the lack of legislation, guidelines, regulation and enforcement mechanisms in the built environment makes transport challenges worse.

TABLE 4: Summary of service quality barriers.

Barriers	Mobility	Vision	Hearing
Cost	✓	✓	✓
Information	✓	✓	✓
Availability	✓	✓	✓
Reliability	✓	✓	✓
Frequency	✓	✓	✓
Overcrowding	✓	✓	✓
Route coverage	✓	✓	✓
Safety	✓	✓	✓
Connectivity	✓	✓	-
Seats	✓	✓	-
Distance	✓	✓	✓

TABLE 5: Summary of socio-demographic barriers.

Barriers	Service quality barriers	Vision	Hearing
Age	✓	✓	✓
Income	✓	✓	✓
Gender	✓	✓	✓
Employment status	✓	✓	✓
Education	✓	✓	✓
Travel companion	✓	✓	-
Escorts	✓	✓	-

TABLE 6: Summary of institutional barriers.

Barriers	Mobility	Vision	Hearing
Political will	✓	✓	✓
Legislation and policies	✓	✓	✓
Regulations	✓	✓	✓
Implementation process	✓	✓	✓

The lack of action plans and resources dedicated to implementation of universally accessible transport is common in African countries. Table 6 summarises the institutional barriers identified from the literature.

Institutional barriers affect the provision of transport infrastructure and services and, generally, the whole transport system. Overall, people with disability are hardly involved in activities such as policy making, transport planning and designing; yet, their participation is essential to meeting their mobility needs in society.

Discussion

The aim of this study was to establish the transport barriers experienced by people with disability in Africa described in the literature to improve awareness of public transport accessibility in transport planning and design. The transport barriers experienced by people with disability are similar across African countries.

The main barriers experienced by people with mobility disability in this study were related to structural and psychosocial barriers. Structural barriers are more acute for people with disability compared with other groups. The design of transport infrastructure in Africa to a large extent does not comply with universal access principles. While people with vision disability mostly experience barriers related to bus drivers' attitudes, information and communication, navigating unfamiliar places is also a challenge for people with visual disability and the risk of falling in unfamiliar places is high.

The findings reveal that people with a hearing disability mostly experienced barriers related to information and communication. People with disability are not involved in the planning and designing transport infrastructure. The lack of consultation by designers and planners is incomprehensible yet they know little about people with disability. The major issue concerning legislation and policies in some countries is deeply rooted in the implementation processes and regulation while for some countries there is a serious lack of policies and legislation concerning transport and disability (Kett et al. 2020; Lister & Dhunpath 2016; Vanderschuren & Nnene 2021).

Although the severity of transport barriers for people with disability is more pronounced in Africa, there are some common problems encountered by people with disability across different cities worldwide. Common barriers encountered by people with disability in accessing transport include negative attitudes of drivers and drivers' lack of training (Abraham et al. 2021; Bombom & Abdullah 2016; Ipingbemi 2015; Kabia et al. 2018).

Research carried out in New Zealand indicates that some drivers intentionally do not stop for people with disability to alight the vehicle when they reach their destinations (Park & Chowdhury 2018). It was deduced that these drivers have negative attitudes towards people with disability (Park & Chowdhury 2018), demonstrating that developed countries are not immune to transport challenges concerning people with disability.

In Sweden, some drivers do not stop at bus stops to pick up people with disability (Stjernborg 2019). It may not be anticipated that drivers from developed countries lack training and knowledge of disability. In the United States, research carried out by Bezyak et al. (2017) reveals that drivers lack training and are unaware of the needs of people with disability. In Nigeria, Bombom and Abdullahi (2016) found that many drivers lack empathy towards people with disability. Similarly, in Ghana, some drivers do not stop to pick up people in wheelchairs as they consider the loading of the passenger and wheelchair time consuming (Owusu-Ansah et al. 2019).

One of the significant differences in transport barriers experienced in African countries found in this study is lack of accessible transport infrastructure. To a large extent, African countries lack transport infrastructure that is accessible to people with disability (Ipingbemi 2015; Kett et al. 2020; Owusu-Ansah et al. 2019). In many cases, the existing infrastructure in African countries is not properly maintained (Ipingbemi 2015; Kett et al. 2020; Owusu-Ansah et al. 2019). This is not necessarily the case in developed countries. Research reveals that, to a great extent, developed countries have transport infrastructure that complies with universal access principles. In Sweden, all the public buses in Stockholm are low floor (Stjernborg 2019). Big cities such as Auckland and Wellington in New Zealand use mostly buses that are compliant to universal access principles (Park & Chowdhury 2018). These buses are designed with ramps for wheelchairs, kneeling function, different formats to convey information, space for wheelchairs and other safety features (Park & Chowdhury 2018).

According to Velho (2019), all the buses in London, with the exception of the Heritage Route, are low-floor and equipped with ramps. While in Africa, only a few buses that are mostly owned by states are low floor. Similarly, in South Africa, the most frequently used mode of transport (mini-bus taxi) is not designed for people with disability (Behrens & Gorgens 2019). Taxi ranks (Lister & Dhunpath 2016) and Metrorail stations (Rivasplata & Le Roux 2018) in South Africa are not universally accessible. It may appear that in Africa, transport is not a priority while many developed countries, over the years, have made significant improvements in the provision

of transport infrastructure and services (Buehler, Pucher & Altshuler 2017; Velho et al. 2016).

However, it can be argued that accessible transport infrastructure is of little value if the drivers have negative attitudes towards people with disability. Drivers with little knowledge on disability are not likely to add value to a system that complies with universal access principles. Perhaps the consequences of the barriers experienced by people with disability in different countries across the world are the same.

Conclusion and further studies

Based on the findings of this study, design of public transport vehicles makes public transport inaccessible to some groups of transport users such as those in wheelchairs. As a recommendation, governments should have strict regulations on acquisition and manufacturing of public transport vehicles. Vehicle specifications should be in full compliance with universal access principles. Vehicle manufacturers should adhere to regulations set by the government. The governments should give incentives to the private transport providers to acquire low-floor buses, which provide transport for all.

Based on the findings on the state of the pedestrian environment, cities are encouraged to carry out periodic infrastructure audits and prioritise upgrading pedestrian environment to improve access for everyone. Minor changes and maintenance of pedestrian environment can make a difference, for example, repair of pavements and good street lighting.

Training of drivers across transport organisations to develop their understanding of disability is recommended to reduce barriers encountered by people with disability. Transport personnel engagement may provide understanding and awareness. Drivers should be equipped with skills in handling different groups of transport users.

One of the problems experienced by governments in providing accessible infrastructure is lack of financial resources. Governments should consider private capital to finance transport infrastructure. Private sector partnerships can promote the development of new infrastructure.

This study contributes to the literature on transport barriers experienced by people with disability in African countries. Transport barriers experienced by people with disability, in general, are underrepresented in the literature (Vanderschuren & Nnene 2021). The barriers and experiences of people with disability established in this study could help improve policies and legislation regarding the provision of transport infrastructure and services.

The limitation of the study is that it was a scoping study and needs to be tested in a practical environment to determine the extent to which the barriers are experienced and the importance of the various barriers in providing universal access.

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