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EXPLORING THE IMPACTS OF BARRIERS IN EXISTING PUBLIC BUILDINGS IN THE MAJOR CITIES OF SINDH

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Abstract

This paper examines the accessibility challenges present in public buildings located in major cities of Sindh, Pakistan, with a specific focus on Civic Centre Karachi, Civic Centre Hyderabad, and Shahbaz Building Hyderabad. Despite the presence of building bylaws and international accessibility standards, a large proportion of public buildings remain difficult to access for individuals with disabilities, elderly users, and people with temporary mobility limitations. This research identifies major architectural barriers, assesses user experiences, and evaluates the current state of accessibility to propose evidence-based solutions for creating inclusive public environments.

1. Introduction

Accessibility is a fundamental requirement for the wellbeing and independence of all individuals. Globally, approximately 15.3% of the population lives with moderate or severe disability, and 60% of disabled individuals face challenges in accessing buildings due to architectural barriers. Public buildings in Pakistan, particularly in Sindh, often lack essential accessibility features such as ramps, elevators, proper signage, and adequate circulation space. As a result, individuals with reduced mobility struggle to navigate these structures safely and comfortably.

The lack of accessible design not only violates principles of universal design but also restricts the social participation, independence, and dignity of users. The present study explores the physical and structural barriers in selected high-traffic public buildings in Karachi and Hyderabad to understand the extent of accessibility issues and the impact on daily users.

2. Literature Review

2.1. Universal Design and Inclusive Architecture

Recent studies emphasize that universal design remains the most effective framework for developing barrier-free built environments. Universal design focuses on creating spaces usable by all individuals regardless of age, ability, or physical limitations, shifting from disability-specific solutions to inclusive planning (Biglieri et al., 2025). Contemporary research shows that public buildings often lack features such as accessible pathways, signage, and adaptable spaces, making routine navigation challenging for users with disabilities. Scholars argue that cities must integrate universal design into planning codes to reduce exclusion and enhance societal participation. The push toward universal design is increasingly important as global aging trends and urban density continue to rise.

2.2. Accessibility Challenges in Public Buildings

Research into public infrastructure accessibility highlights significant shortcomings in design implementation, particularly in developing countries. Carlsson et al. (2021) conducted a scoping review of public buildings and found that architectural barriers such as inadequate ramps, steep slopes, narrow corridors, and inaccessible restrooms remain common across many regions. These hindrances restrict mobility, increase safety risks, and negatively impact the independence of individuals with disabilities. The review concluded that many accessibility

barriers stem not from a lack of standards, but from weak enforcement, insufficient maintenance, and limited awareness among stakeholders.

2.3. Barriers in Historic and Existing Buildings

Studies on accessibility in existing or historic buildings indicate that retrofitting remains a major challenge due to structural constraints, cost limitations, and preservation requirements. Pinna et al. (2020) argue that a large proportion of older buildings were never designed with accessibility in mind, resulting in deeply embedded barriers such as stair-only access, uneven flooring, and poorly designed circulation routes. Their research suggests that bridging the gap between heritage conservation and accessibility requires innovative design solutions and adaptive technologies. They emphasize that accessibility in historic public buildings is not only a design concern but a human rights obligation.

2.4. Mobility Behaviour and Barriers in Urban Public Spaces

Research on pedestrian mobility reveals that architectural barriers affect not only individuals with disabilities but also elderly users, parents with strollers, and those with temporary injuries. Strohmeier (2016) demonstrated that uneven pavements, missing curb cuts, steep slopes, and lack of resting areas significantly restrict mobility behaviour, particularly in congested urban areas. Although not a new challenge, more recent urban studies continue to confirm similar issues—a sign that cities still struggle to implement barrier-free mobility strategies. Enhancing walkability through universal accessibility is linked to improved independence, reduced accidents, and greater participation in urban life.

2.5 Findings from Literature

Existing literature emphasizes the importance of universal design principles to ensure that buildings are accessible to the widest range of users. Research indicates that accessible routes, proper ramps, signage, elevators, and communication systems are key contributors to building usability. International guidelines, such as those from ADA, highlight the standards for inclusive built environments.

Studies conducted in various countries reveal that many public buildings still fail to meet minimum accessibility requirements, creating barriers for individuals with disabilities. Local research in Pakistan is limited, particularly regarding accessibility in Sindh's public institutions, indicating the need for comprehensive evaluation and context-specific recommendations.

3. Research Gap and Novelty

Although prior studies have evaluated accessibility in selected buildings across Pakistan, there is limited research specifically addressing the major cities of Sindh. There is also a lack of comprehensive data assessing user experiences, long-term effects of Architectural barriers, and gaps between building bylaws and actual implementation.

This study introduces a localized approach by evaluating real-world user experiences in three major public buildings. The development of prototype models and context-specific recommendations adds a novel contribution to architectural research in Pakistan.

4. Methodology

A mixed-methods approach was adopted, utilizing an Explanatory Sequential Design, where quantitative data was collected first, followed by qualitative insights. A Likert-scale questionnaire was administered to 1000 visitors across the selected buildings. Reliability was tested using Cronbach's alpha, which yielded a strong value of 0.9. Chi-square tests were used to analyze the association between key indicators, such as entrance accessibility and user satisfaction.

Data collection included participant observation and detailed site assessments using accessibility checklists based on ADA guidelines. Non-probability purposive sampling was employed to ensure participation from frequent visitors.

5. Results and Discussion

Findings indicate that the majority of users expressed dissatisfaction with the accessibility conditions of all three public buildings. Key issues included steep ramps, narrow pathways, inadequate signage, poor lighting, inaccessible entrances, and lack of maneuvering space for wheelchair users. Over 60% of respondents found entry and exit points unsatisfactory. Chi-square analysis confirmed significant associations between ramp usability, entrance door width, and overall user satisfaction. The results revealed a significant association between the Entrance door and slopes for users Clearly marked entrance was also found to be significantly associated with slopes for users .. ($\chi 2$ (16) =1384.984,$p < .001$).as shown in table 1

Table no 1

slopes for users * entrance doors Crosstabulation

Count

		entrance doors					
		Strongly Disagree	Disagre	Neutral	Agree	Strongly Agree	Total
slopes for users	Strongly Disagree	187	0	22	0	0	209
	Disagre	25	122	0	0	0	147
	Neutral	82	0	12	0	0	94
	Agree	0	0	0	20	0	20
	Strongly Agree	0	0	0	0	30	30
Total		294	122	34	20	30	500

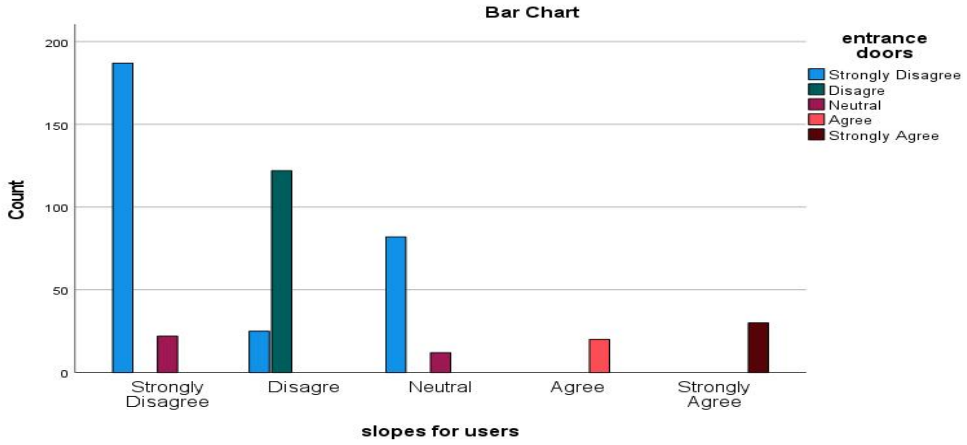

Chart no 1

Table No 2

Statistics

		easily identifiable	free from obstacles	slopes for users	appropriate to use	entrance doors	visibility for users	accessible features	uneven surfaces	maneuvering	lighting	entry and exit	handrails	seating area	emergency	staff	senior citizens	accidents	accessible	overall satisfied
N	Valid	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250	250
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		2.15	2.06	2.12	1.88	1.81	2.23	2.01	3.42	1.85	3.31	1.90	2.10	1.92	2.03	2.08	1.97	1.89	1.92	1.86
Std. Deviation		1.009	1.170	1.106	1.200	1.169	1.046	1.196	1.487	1.212	1.577	1.132	1.082	1.198	1.161	1.127	1.114	1.207	1.195	1.156

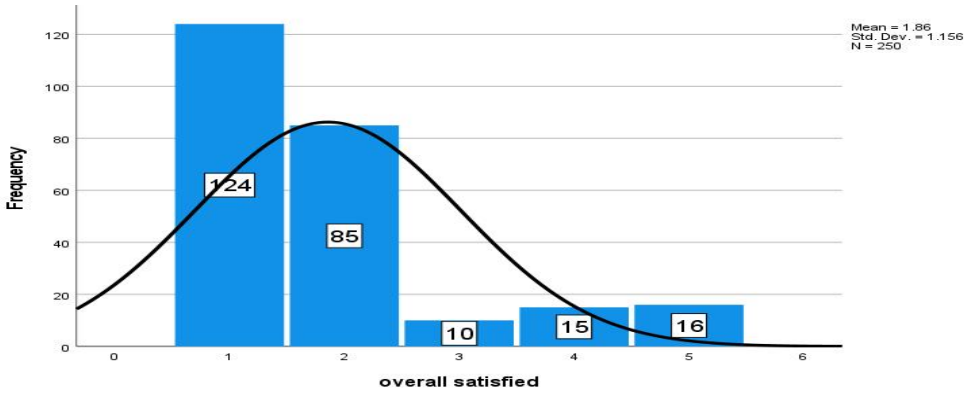

Chart No. 2

data revealed that both disabled and non-disabled users encountered difficulties, demonstrating that accessibility barriers affect all categories of visitors. The study highlights inconsistencies between building bylaws and their implementation in real-world settings.

6. Conclusion

The study concludes that the selected public buildings in Karachi and Hyderabad lack adequate accessibility features, resulting in widespread dissatisfaction among users. Immediate improvements are required in structural design, circulation spaces, and accessibility provisions such as ramps, elevators, signage, and emergency systems.

The findings emphasize the necessity for strict enforcement of accessibility bylaws, maintenance of public buildings, and incorporation of universal design principles in future Architectural planning. Ensuring inclusive and barrier-free environments will significantly enhance the quality of life for all users, especially individuals with disabilities.

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