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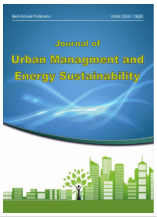

CASE STUDY RESEARCH PAPER

Investigating the effectiveness of urban planning and architecture rules and regulations for people with disabilities in providing accessibility for the blind (case study: selected government offices in Yazd province)

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ABSTRACT

The disability of the blind is due to the lack of sense of sight, and this type of sensory disability has made their conditions different from other disabled people who usually suffer from physical complications. The rules and regulations of urban planning and architecture for the disabled and other regulations related to this area, often seek to meet the needs of the physically disabled and have prescribed physical guidelines to ensure the accessibility of the blind. Now this question arises: To what extent have these rules, regulations and architectural design guidelines been effective in providing the accessibility of government offices for the blind? In this research, the effectiveness of architectural design rules and regulations in making the environment accessible to the blind has been investigated with the descriptive-analytical research method and applied goal. Selected government offices in Yazd city were studied as samples. After observing the orientation of 8 blind people and interviewing 12 other people, a simple random sampling was done. When no more new information was obtained, the data was analyzed using the method of interview content analysis and open coding. The results revealed that the approach of architectural rules and regulations for the disabled is to meet their needs and provide accessibility by relying on physical issues, and the behavioral and psychological characteristics of the blind have been given less attention. Also, imposing costs on administrative projects to comply with the rules and regulations of urban planning and architecture for the disabled, especially in the field of the blind, is not effective, and in most offices, using trained guides, service desks, and e-government can be more effective in making the blind accessible to government services. provide construction. This research was compiled based on the studies and observations made in Yazd city, and the explanation and extension of the findings and suggestions to other regions needs more detailed studies.

Running Title: The effectiveness of urban planning and architecture rules and regulations for people with disabilities in providing accessibility for the blind

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21	01	03

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INTRODUCTION

From the point of view of urban planning, a healthy city is a city where all citizens can benefit from its spaces. (Nuzhari and Qasimzadeh, 2007) Human society is an unbalanced combination of healthy and disabled people. The phenomenon of disability and its negative physical, mental and social consequences are considered one of the obstacles to the growth and development of a country. (Bajlan, 1387) Physically disabled people are a part of society who, like others, need to access and use public facilities and services. However, the existence of some special obstacles in terms of design, architecture and urban planning has made many urban spaces, especially public places and buildings, lacking the necessary conditions to meet the needs of disabled people , 2013) Blind people in the artificial world They live a life that is often built by the sighted and for the sighted on the basis of the emotional and perceptive characteristics of the sighted, and the most important key to human communication with the environment in this world is the sense of sight and perception resulting from it. Office spaces, like other sighted spaces, are planned, designed and implemented based on the function of the sense of sight. Spaces that, despite addressing the sighted, are often difficult, ambiguous and complicated to use for the sighted as well. Failure to pay attention to other methods of communication between humans and architecture has caused defects in the communication of sensory disabled people such as the blind and deaf to architecture. Paying attention to the position of the blind in the design and planning of space and environment requires identifying their other abilities and communication channels with space and environment in architecture. Designing the space and environment according to the movement, aesthetic, sensory, and functional needs of the blind require a detailed understanding of the blind, their needs, limitations, abilities, demands from the space, their mutual response to the environment, limitations, facilities, and the design platform. (Kamanroudi Kejori, 2009) A point that has been neglected in the establishment of special design rules and regulations for the disabled is the special conditions of the blind compared to other disabled people. The sensory deficiency of the blind and their different sensory-perceptual conditions have made the rules and regulations of architectural design for the disabled, which are mainly based on movement defects, less effective for the blind. The ineffectiveness of special design rules and regulations for the disabled in response to the functional needs of the blind in public spaces has turned these spaces into inaccessible spaces for them. has limited their presence in the society. The limitation of the blind in using the sensory ports of the environment results in their different understanding of the surrounding environment. Due to the lack of the sense of blindness, blind people usually rely on other sensory channels such as the sense of hearing, touch and even smell to communicate with the environment and understand it, and this kind of difference in the sense of the environment causes a different understanding of the surrounding space for them. What is important in designing for the blind, regardless of the design topic, is to pay attention to other human senses except vision and his ways of understanding and communicating with the environment. The physical, functional, functional and psychological features of the office environment should interact with the features of the audience. For planners and designers of office environments who have always learned and experienced designing and solving problems centered on the sense of sight, it is necessary to refer to the research results of the interaction between the architecture of office spaces and blindness. (Qaem, 2007) Problems in urban design and architecture are one of the biggest obstacles to the presence of disabled people in social activities. Despite having many capabilities and abilities, disabled people face lack of mobility and access to facilities in the urban environment due to these obstacles, and

the society is deprived of their forces. Adapting the city environment to the needs of physically disabled people is actually returning these people to society, life and activity.

MATERIALS AND METHODS

Literature Review

Research Background

In our country, from the beginning of 1366, the experts of the Housing Building Research Center started research on the design of public spaces due to the needs of the society. favorable situation) was conducted in the Housing Research Center, where it was determined that wheelchairs, due to their large dimensions, create the most restrictions for disabled people. In the same year, at the suggestion of the welfare organization, a committee consisting of representatives of the Iranian Institute of Standards and Industrial Research, Faculty of Rehabilitation, University of Tehran, Ministry of Housing and Urban Development, etc. was formed. The result of this committee's work was the compilation of numerous pamphlets on the application of the basic principles of designing urban spaces for the disabled. In October 1988, the book "Urban Spaces and the Disabled" was published, and the criteria and standards mentioned in this book and the design criteria of public buildings for the physically disabled were provided to experts and relevant centers in a draft form. After 4 months, opinions were collected and a commission was formed in March 1988 based on two offices of urban space and the disabled and public buildings and the disabled and prepared the final draft and on 1989 it was approved by the members of the Supreme Council of Urban Planning. and architecture (Nubakht Sobhani and others). A research report on urban space and disabled people was conducted in 1988 by the Building and Housing Research Center. In this research, existing urban barriers for disabled people were investigated. The result of this project was presented in the form of criteria for the design of the urban environment for the disabled and suitable solutions. The research report on public buildings for the disabled was conducted by the Building and Housing Research Center in 1990. In this research, customization was considered in the countries of Canada and England and the things that must be observed in all public buildings for customization were identified. In 1991, research was conducted under the title of educational buildings and disabled people in the center and housing. In this research, the problems of schools for the use of disabled people were identified and special design criteria for disabled people were presented. In 1992, research was conducted under the title of housing and the disabled in the research center. In this research, all components of the housing were examined and problems were identified and necessary criteria for adaptation were presented. In 1992, the plan to evaluate the performance and approvals of the Supreme Council of Urban Planning and Architecture of Iran regarding the criteria of urban planning and architecture regulations for physically disabled people by the Urban Planning and Architecture Research Center of the Ministry of Housing and Urban Development (in the form of a survey of people and officials regarding the above approval It was concluded that one of its results can be mentioned the control of criteria during the issuance of permits and inspection of architectural plans.

In 2015, Rajabi and Alimoradi conducted research to compare spatial memory and spatial orientation among blind, partially sighted and healthy people. The findings of this research showed that there is a significant difference between the three groups of sighted, blind and partially sighted people in terms of spatial memory and blindness is a factor in strengthening spatial memory and spatial orientation. In 2016, Porgivi et al investigated the effective factors in the design of navigation for the blind. Based on the results of this research and in line with the responses of the interviewees, it was found that the remaining senses, the type of materials and architecture of the building, the level of education of the blind, the type of reha-

bilitation equipment, the learning ability of the blind and the general culture of the society are among the most important factors in product design. or the navigation system for the blind. It is also necessary to pay special attention to the psychological feedback of the blind in the use of the product or system, in addition to the mentioned factors. In 2016, Qadiri and Tabaian investigated the effectiveness of architectural spaces on improving the performance of blind and visually impaired children. The results of these studies show the improvement of blind users' sense of the surrounding environment and their ability to communicate with the surrounding space, in environments designed with multi-sensory architectural criteria. In 2016, Shoiklo et al. studied the comparison of the efficiency of the sensory systems involved in controlling the posture of congenitally deaf and blind people. The results of this research show that due to the absence of the visual system, blind people are most dependent on the body sense system, while deaf people rely more on the data obtained from visual information to maintain balance, and in the next stage, the body sense system plays the second role. It plays in these people. In 2016, Saberi and Fahimizadeh investigated the role of gravity and non-visual senses on the mental and spatial imagery of the blind in landscape design. This article examines the role of gravity in the landscape from the aspect of non-visual senses based on experiences and blind perception of the environment and analyzes it based on the process (perception by passing through the place). In fact, physical forces have been considered very influential in the spatial understanding of the environment and the human relationship with design and have provided a different organization of space understanding. Also, the understanding of the force of attraction itself is recognized under the influence of the environment in which they are placed and is considered as a factor to strengthen the sense of place. According to the nature and method of descriptive-analytical research, this article analyzed the data obtained from Bersi Williams et al. In this article, the ways in which architecture helps or hinders blind people's navigation have been investigated. Also, in this article, architectural and environmental changes are proposed, which are better than the routing methods based on future technologies through accessible and standard architecture. Calder et al. (2018) studied the accessibility of security places for the disabled in research. In this research, by studying the selected statistical population and analyzing the data, they came to the conclusion that in the architectural design of public centers, usually factors such as aesthetics, the economic nature of the project, and the performance of the building in front of people without disabilities, affect the possibility of the building being accessible for the disabled. has priority Regher et al. (2021) in research titled how basic research in the field of spatial cognition can increase the visual accessibility of architecture for visually impaired people investigated how the blind and visually impaired perceive space. According to the findings of this research, it is possible to improve the understanding of the space for the visually impaired with architectural measures such as the color and texture of materials, openings and skylights, etc. Following the studies that were conducted in the field of designing suitable and accessible spaces for disabled people in the building and housing research center, the set of rules and regulations of urban planning and architecture for physically disabled people was approved by the Supreme Council of Urban Planning and Potential Architecture in 1368.

The supplementary text of the first revision of the rules and regulations of urban planning and architecture for physically disabled people was approved by the Supreme Council of Urban Planning and Architecture of Iran on 1999 after completing the literary editing process and asking for opinions from technical experts. It replaced the previous resolution and compliance with its provisions came into

effect. According to paragraph 6 of the above resolution, the Ministry of Housing and Urban Development is obliged to revise the rules and regulations of this resolution in accordance with the new conditions and possibilities every five years and propose it to the Supreme Council of Urban Planning and Architecture for approval. In this regard, the research project of compiling the draft of the third edition of urban development and architecture rules and regulations for physically disabled people was implemented in the Road, Housing and Urban Development Research Center to be submitted to the Supreme Council after being approved by the scientific review committee. The purpose of compiling these rules is to provide the correct technical criteria and legal requirements in order to ensure improvements in the level of crossing and the quality of accesses in the current situation and in future developments, and it includes the desirable criteria for the design of the urban space, the optimization of the roads, the general criteria for the design of public buildings and the criteria Recommendations for adapting the city environment for the disabled.

Blindness

At the 73rd World Health Assembly in 2020, based on recommendations and reports on vision (2019), a resolution on integrated and people-centered eye care, including preventable blindness and visual impairment, was approved The rules and regulations of urban planning and architecture for people with disabilities consider a blind person as a person whose vision in both eyes or the best correction by a lens is less than 1.10 or his field of vision is less than 10 degrees so that he is able to recognize hand movements. And the number of fingers should not exceed one meter.

Architectural design criteria

Rules and regulations of urban planning and architecture for people with physical-motor disabilities were first approved in 1368 by the Supreme Council of Urban Planning and Architecture of Iran, and its second edition was approved in 1378. In 2018, the road, housing and urban planning research center compiled the rules and regulations of urban planning and architecture. In 2002, the rules and regulations of urban planning and architecture for people with physical and mobility disabilities were prepared by the Deputy of Technical Affairs of the Program and Budget Organization in the form of publication 246

Accessibility

The Executive Regulations of Article 3 of the Law on Protection of the Rights of Disabled Persons approved in 2018 defines accessibility as follows:

A set of actions aimed at creating a barrier-free and accessible environment for the participation of people with disabilities in all areas of life and providing equal opportunities for them to enjoy the facilities of social life, like other people. Access includes transportation system, physical environment, information, education, technology, employment, appropriate communication and media resources.

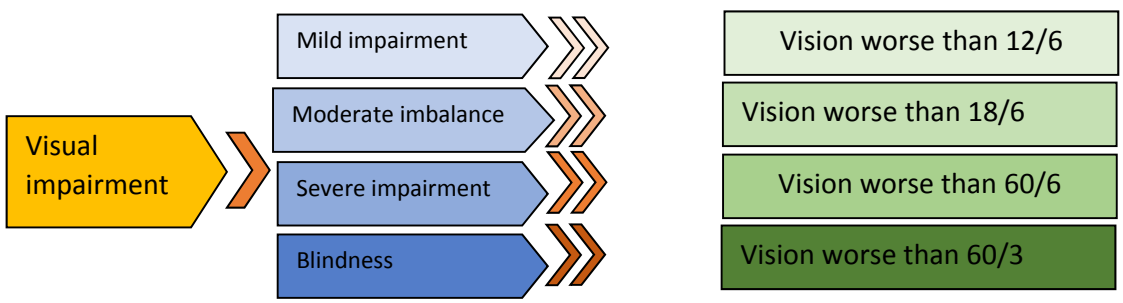

Figure 1: Classification of blindness disorders according to the World Health Organization (WHO) definitions

Office buildings

An office building is a space where the employees of an organization carry out administrative work in order to support and realize the various goals of the organization. The rules and regulations of urban planning and architecture for people with physical and mobility disabilities consider public buildings as those buildings that are one of the They provide all kinds of public services to the people of the society.

Offices in classical antiquity were often part of a palace complex or a large temple. Often there was a room where scrolls were kept and scribes did their work (Kim, 2004). The primary purpose of an office building is to provide a workplace and work environment primarily for administrative and managerial staff. These employees usually occupy specific areas in the office building and are usually provided with desks, personal computers, and other equipment they may need in these areas. An office building can be divided into sections to serve different purposes or may be dedicated to just one service. In any case, each office will normally have a reception area, one or more meeting rooms, individual or open-plan offices, as well as public services (Stefani, 2022). The main purpose of an office environment is to support its residents in doing their work. - Preferably with minimum cost and maximum satisfaction. Although different people perform different tasks and activities, choosing the right office spaces is not always easy. To help with decision-making in workplace and office design, three different types of office spaces can be distinguished: workspaces, meeting spaces, and support spaces. For new or developing businesses, remote satellite offices and project rooms, or serviced offices, can provide a simple solution and provide all of the previous space types (Jeff, 2022).

Methodology

The research method used in this article is an analytical-descriptive method with the aim of investigating the effectiveness of city planning and architecture rules and regulations for people with disabilities in providing accessibility to government offices for the blind; Government offices of Yazd province were studied as samples. The sample size has been determined by reaching the theoretical satisfaction, which includes interviewing 12 people and observing the orientation of 8 blind people, and sampling was done in a simple random way. The information related to the research was collected through interview and observation and was analyzed by open and axial coding method.

DISCUSSION AND FINDINGS

In order to achieve the objectives of the research and collect information, the method of interview and observation has been used. The statistical community has been divided into two groups: architects with a history of designing office spaces and blind people with educations ranging from diploma to doctorate, and the statistical results are shown in figures 1 and 2. The purpose of this priority is to interview individuals who were present in the community alone and have full understanding and experience of the problems present in the community. Most of the level of education below the diploma is related to the blind. In the open coding table (Table 1), the trim index and the most important verbal statements of the interviewees were written. By reading the statements, concepts related to specific verbal statements were extracted. Then, axial coding was used to communicate between the concepts obtained from the open coding table. In the axial coding table (Table 2), the concepts were categorized. By examining the new concepts and re-categorizing them, the final conclusion from the interview was made and it was displayed under the title of category. The obtained categories include navigation training for the blind, the degree of compliance of the building architecture with the rules and regulations of urban planning and architecture for the disabled, and the effectiveness of these rules in providing accessibility for the blind

Interviewee Code	Theological propositions	Concepts (Open Coding)
N1	The worst possible thing for a blind person is to go to an office to follow up on their affairs. In offices, it is difficult to use stairs without the help of others. It is more difficult to go down a flight of stairs than to climb it.	Blind Fear of Facing Office Environments The blind person has difficulty in using the communication elements in space.
N2	The client's guidance officer cannot help the blind person in finding directions. Highlighted route guide lines are not available in Edrat. Braille signage is not available in offices.	Inefficiency of Architectural Methods and Elements to Make the Environment Accessible to the Blind
N3	It is not possible to go to the offices without the help of others. There are no guidelines for the blind in the offices.	The blind person's dependence on the help of a guide to access the environment
N5	I prefer not to use the toilet in the offices. Rooms in straight and unobstructed corridors are more convenient for navigation. I prefer using the elevator to the stairs.	The components of the building and the architectural elements of the offices are not suitable for the blind. Blind people need special elements and components in the building to access office environments.
N6	Offices with large areas in front of the building are more difficult to navigate. Offices with separate buildings are difficult to find directions. Offices do not have wall signs for navigation.	The relationship between filled and empty spaces is important for blind access to office environments.
N7	I prefer offices that have separate rooms to open offices. The difference between the level and the single stairs is a problem for me. In offices, it is difficult to find a place to sit and rest.	The physical and mental conditions of the blind are different from other clients.
N9	I hate offices that have nested corridors. There are several ways to find directions within the offices. I prefer to use ramps over stairs.	Transparent and direct communication elements and spaces are more suitable for blind people to access space.
M1	In the design of office spaces, attention to the navigation of the blind is complicated. Making the environment accessible to the blind is not one of the demands of employers. The ratio of blind clients to the total number of clients is very small.	Due to the low ratio of blind patients to others, they are often overlooked.
M2	Making office environments accessible imposes a lot of cost on the employer and lacks economic justification from their point of view. Because of the reasonable complexity of routing the blind, designers and employers are not interested in getting involved in this issue.	The design and implementation of the building based on special rules and regulations is not economically justified.
M3	Blind people's dependence on guides has led to the inefficiency of routing architecture methods for them. There are less expensive and more efficient ways to provide services to the blind than to implement architectural standards for them.	There are more efficient ways to ensure that the blind are accessible to office environments.

Concepts (Axial Coding)	Fild
Blind Fear of Facing Office Environments The physical and mental conditions of the blind are different from other clients.	Psychological Issues
The blind person has difficulty in using the communication elements in space. The components of the building and the architectural elements of the offices are not suitable for the blind.	Build quality
The relationship between filled and empty spaces is important for blind access to office environments. Transparent and direct communication elements and spaces are more suitable for blind people to access space. Blind people need special elements and components in the building to access office environments. There are more efficient ways to ensure that the blind are accessible to office environments. Inefficiency of Architectural Methods and Elements to Make the Environment Accessible to the Blind	Inefficiency of existing architectural rules and regulations
Due to the low ratio of blind patients to others, they are often overlooked.	Training Architects
The design and implementation of the building based on special rules and regulations is not economically justified.	Construction Cost

Observations

Observation of blind people's behavior and communication style in selected office environments was carried out in 6 2-hour periods during 6 days and the results were categorized in Table No. 3.

Observation time frame	Office Building Case Study	Floores	Type of office space organization	Observation Result
9-11 a.m.	General Welfare Office of Yazd Province	3	Closed System (Separate Space)	Blind with Companion Help: A ramp was used to enter. Touching the wall to maintain balance Failure to use embossed mosaics to navigate and access the building
9-11 a.m.	Building No. 1 of Social Security of Yazd Province	2	Closed and open system	Blind with Companion Help: Elevator Use The columns interfered with the blind man's navigation.
10-12 a.m.	Yazd Special Education	1	Closed System	Unaccompanied blind person: The high height of the stairs is problematic for the blind to pass.
10:30-12:30	Yazd Provincial Courthouse	4	Closed System	Unaccompanied blind person: It would not have been possible to find information and guides without the help of others. Partition spaces are confusing for the blind.
14-12	Municipality of District 3 of Yazd	2	Closed and open system	Blind with Companion Help: In an open office system, it is difficult for the blind to communicate with the employee from behind the counter. The difference in consecutive levels is problematic for him.
14-12	General Welfare Office of Yazd Province	3	Closed System	Blind with the help of a guide: Corridors with successive turns for navigation are problematic.
8-10 a.m.	Yazd Province Post Office	3	Closed and open system	The Blind Without Help Guide: It is difficult to find a place to rest for the blind.
8-10 a.m.	Cooperative, Labor and Social Welfare Office of Yazd Province	2	Closed System	Blind with Companion Help: The height of the shelter's aid is dangerous in the openings of the building. The location of the toilet in the basement made it difficult for the blind to use it.

RESULT AND CONCLUSION

By categorizing, analyzing and summarizing the results obtained from the interviews and observations, it was found that the studied office buildings built in the last two decades, despite the relative observance of the rules and regulations of urban planning and special architecture for the blind, have not been adapted for their accessibility. In the investigation of the blind people's behavior and way of interacting with office environments, it was determined that the rules and regulations of urban planning and architecture for the disabled have proposed solutions based on the ability of the sense of touch in the blind, and other navigation methods based on their other remaining senses such as visualization Mental, gravitational attraction, smell and hearing are ignored. In the economic aspect, despite the ineffectiveness of existing rules and regulations, the implementation of these rules challenges the economic justification of projects due to the imposition of a double financial burden in the construction of administrative buildings. Research and study in the behavioral and psychological field of the blind and revision of the regulations, rules and regulations of architecture and urban planning based on these findings, can make the rules and regulations of architecture and urban development special for the disabled for the accessibility of the blind. Due to the fact that blind people do not benefit from the most important sensory portal, the needs and challenges of these disabled people are different from those of the disabled. Therefore, it is suggested that the drafting of rules and regulations for architectural design and urban planning for the blind based on the behavioral, psychological and physical issues of this group of disabled people should be taken into consideration by the relevant institutions and organizations. Observance and implementation of rules and regulations of urban planning and special architecture for the disabled, especially in the field of the blind, has caused a lot of costs to administrative projects. Compliance with these rules and regulations is inevitable in some departments that are dedicated to the blind, such as the Department of Exceptional Education, the Association of the Blind, etc. However, in other institutions where blind people are referred on a case-by-case basis, it is suggested that by revising some government services such as e-government and non-attendance services, service desk, public relations and client guidance, the conditions to facilitate the accessibility of blind people to various administrative departments with the help of trained guides accept

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