

Original research

# Outdoor difficulties experienced by a group of visually impaired Iranian people

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## Abstract

**Propose:** A qualitative approach using semi-structured individual interviews was used to elicit common outdoor difficulties in individuals with visual impairment.

**Methods:** Interviews were recorded and then transcribed verbatim into text for thematic analysis. Twenty legally-blind individuals aged  $34.25 \pm 2.41$  years with different etiologies were included in this study.

**Results:** All participants had experienced some sort of difficulty in outdoor environments. The most important problems as perceived by the participants are installation of tactile ground surface indicators, unsafe sidewalks, existence of obstacles on sidewalks, difficulty reading bus numbers, disorientation, fear of falling, recognition of faces, inability to read street names, the presence of spaces between platforms and buses, walking into glass doors, crossing streets, and the risk of Aerial barriers.

**Conclusions:** As a visually impaired person might say, sidewalks can be the most dangerous of places. Appropriate urban modification can be very beneficial.

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**Keywords:** Visually impaired; Outdoors difficulty; Pedestrian; Accident; Urban modification

## Introduction

The task of Orientation involves environmental information regarding direction, locations, route, and positions. Mobility is about the ability of moving in an environment which has various objects, obstructions, holes, and stairs, as well as dangerous situations such as moving or stationary entities.

One of the consequences of vision loss is being uncomfortable about safety while moving around or traveling independently.<sup>1,2</sup> Individuals with visual impairment have many difficulties in self-navigation in unfamiliar outdoor environments.<sup>2</sup> Safe navigation on sidewalks is the most important requirement.<sup>3</sup> There are many skills and aids considered by professionals working in the field of orientation and mobility to help visually impaired people go outdoors safely. These include the use of canes, guide dogs, and mobility training. There are many studies that consider outdoors problems as well as techniques conceived for safe navigation. The most advanced techniques include Radio-Frequency Identification (RFID),<sup>4</sup> Global Positioning System (GPS),<sup>5</sup> Infrared Light-Emitting Diode (LEDs),<sup>6</sup> wireless sensors,<sup>7</sup> Navigation (NAVIG) devices,<sup>8</sup> remote sighted guidance,<sup>9</sup> an aid to increase the independent mobility of blind travelers (MoBIC),<sup>10</sup>

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infrared verbal guidance systems,<sup>11</sup> and computer vision modules.<sup>12</sup> It has also been shown that mobility performance improves with mobility training.<sup>13,14</sup>

User perspectives about existing problems in home environments also need to be considered.<sup>15</sup> In order to evaluate and understand the difficulties that people with visual impairment face indoors and at home, it is necessary to use a valid assessment tool based on client-centered perspectives.<sup>16–18</sup> It has been stated that using the subjects' perspectives regarding home environmental fit is helpful.<sup>19</sup> These perspectives are very important for practitioners who design training programs for people with visual impairment. A key to enhance information is involving people with visual impairment in the consultation process so that service providers have a better idea of what services should be included.<sup>15,16</sup> If their novel strategies are understood, people with visual impairment can be a good source of knowledge in designing a system in vision rehabilitation.<sup>20</sup> Consequently, to reach more accurate user needs, before starting any modification, it is best to involve the person who is the end-user of this modification.<sup>15,21–23</sup> This study aims to listen to people to provide evidence from the perspective of people with visual impairment.

This study evaluated outdoor difficulties and mobility experiences in detail of a group of Iranian individuals with visual impairment. To improve the quality of life for these individuals with vision impairment, it is important to listen to them and understand their difficulties.

## Methods

A qualitative approach using semi-structured individual interviews was used. This approach has been used previously to investigate the experiences of people with visual impairment related to housing needs,<sup>24,25</sup> and its advantages include that the two-way communication leads to a richness of data and deeper insight into the topic.<sup>26</sup> The lack of research on outdoor difficulties points to a need to understand in-depth the processes involved in managing environment strategies for navigation that may have been employed by these patients. In a qualitative approach, a sample target of 20–30 participants is selected as being the minimum number required.<sup>27</sup> In this study, thematic saturation was achieved at 20 participants. The interviewer asked about all the difficulties that had been experienced.

Interviews took place in the Bahman Cultural Center for the Blind. This centre is located in Bahaman Farhangsara in the southern part of Tehran, the capital of Iran, between February to July 2015 and was 20–40 min in duration. Interviews were audiotaped and transcribed verbatim into text authors. The transcripts were checked against the audiotapes for accuracy.

A set of open-ended questions were developed for this study. The questions were designed to investigate participants' experiences regarding the topic of study. Questions about different outdoor places were structured to distinguish relative difficulties. For example: "How often do you go out and for what reason? What is your main difficulty outdoors? What are your difficulties using tactile surface indicators? What are the possible hazards on the path of your usual routes? Do you ask

others for help? Are you using new technology for navigation? Have you experienced falling outdoors? Have you ever gotten lost? Have you had any accident? What do you think about a dog as a guide?" The final question asked of participants was: "Is there anything else that you would like to say with respect to your personal outdoor difficulties?"

Each participant was asked to read and sign a consent form. For those who were not able to see, consent was read by the interviewer. Interviews were recorded and then transcribed into text. The transcripts were then checked against the audiotapes for accuracy. All transcriptions were then deliberated with systematic examination in order to find themes. Key participant quotations were chosen to highlight the importance of specific findings.

## Results

There were 20 participants (10 men and 10 women) with a mean age of  $34.25 \pm 2.41$  years. Eleven were unmarried, and 9 were married. In terms of education, 7 had high school certificates, 12 had bachelor's degrees, and one had a M.Sc. degree. Eight people were unemployed, and 12 were employed. The causes of vision impairment (20 patients) were retinitis pigmentosa (7), optic atrophy (5), other retinal diseases (3), glaucoma (2), albinism (1), refractive error (1), and diabetes (1). All participants were legally blind.<sup>28</sup> The majority had light perception, and others had hand motion. All participants lived in Tehran.

Participants experienced a range of difficulties in their mobility performance. Similar themes, thoughts, and points of view were identified as follows:

### *The need to ask others for help*

All participants usually go out every day for various reasons such as performing personal activities, shopping, and working. In terms of asking others for help, some believe getting help from strangers is not desirable, and therefore asked a person such as a friend or family member to guide them. The majority of participants were unhappy asking others to guide them, "Because visually healthy people may not believe that we are visually impaired or blind, and this can be annoying". Therefore most participants had to think about how to express their needs. This was very common among participants that got lost in unfamiliar environments. A few participants said that they hire a private taxi to guide them when they go out. Although it is expensive, they believe this strategy is safer and minimizes difficulties.

### *Problems in identifying routes and using GPS*

Participants had different strategies in identifying routes such as keeping count of the places they passed, existence of stairs, shops, signs on the ground such as small stationary obstructions, types of terrain, bus stations, curb stones, overpasses, slopes, declivities, gas stations, recognizing bumps and counting them using their memory, buildings, signs of

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