



## Research Paper

# Recognizing the Viewpoint and Experience of Blind People in Navigation and Daily Traffic



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### Conflict of interest

The authors declared no conflict of interest.

## ABSTRACT

**Background and Objectives:** One of the most obvious problems faced by the blind is the inability to navigate properly. Safe and independent urban navigation is difficult for visually impaired people. According to the international classification of functioning, disability, and health (ICF), the health and illness status of a person is measured by the structure and function of the body, limitations in performing activities, and the person's participation in society. Individual factors and environmental factors affect a person's activities, and these activities affect a person's participation in society. For this reason, the present study was conducted to investigate the individual factors that blind people use in their daily traffic.

**Methods:** In this qualitative study, 12 blind people, 1 person with severe visual impairment, and 1 sighted person were selected using the snowball sampling method to participate in the study. Information was collected through in-depth and semi-structured interviews. The conventional content analysis method was used for analysis and the data triangulation method was used to validate the findings.

**Results:** After analyzing the statements and classifying the extracted codes, 4 sub-themes were obtained, including "learning the route", "reluctance to travel", "helping others", "using environmental signs" and from the integration of these sub-themes, the theme "daily traffic" appeared.

**Conclusion:** The present study showed that blind people use similar strategies in their daily traffic. These solutions include keeping the path, traveling on familiar paths, using environmental signs, and getting help from others. Reasons, such as fear of the environment, fear of injury, and the family's unwillingness to leave are an obstacle to the independent movement of the blind person.

**Keywords:** Blindness, Patient navigation, Daily traffic, Qualitative research, Router program



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↑ *What is “already known” in this topic:*

*Blind individuals face challenges in daily navigation and performing activities of daily living (ADL) due to visual impairments, leading to high dependence on others. Safe and independent urban navigation is difficult for them. This study investigates individual factors affecting their daily traffic experiences.*

→ *What this article adds:*

*This article offers new insights into visually impaired individuals' navigation behaviors in urban settings, exploring strategies used in daily traffic and challenges they encounter. Findings highlight the role of individual factors and environmental cues in shaping navigation decisions. Valuable for designing interventions to enhance visually impaired people's mobility and independence.*

## Introduction

Individuals with visual impairments provide different stories about how visual impairments have made it difficult or impossible to perform activities of daily living (ADL) (eating, gathering food, walking, driving, and using the toilet). In some cases, the inability to perform ADL-related activities due to visual impairments leads to a person's high dependence on others, mainly family members [1, 2].

The inability to navigate properly is one of the most obvious problems faced by blind people. Safe and independent urban navigation is difficult for visually impaired people [3]. These people usually make less effort to travel independently on unfamiliar routes. The direct path for a sighted person can become a complicated and dangerous endeavor for a blind person [1, 3].

According to the integrative model of the International Classification of Functioning, Disability, and Health (ICF), a person's health and illness status is measured by the structure and function of the body, limitations in performing the activities, and the person's participation in society. Individual and environmental factors affect a person's activities, and these activities affect a person's participation in society. Also, according to [World Health Organization \(WHO\)](#), rehabilitation refers to the use of all means to reduce the impact of disability and disability conditions and enable people with disabilities to achieve desirable social integration [4]. For this reason, the present study was conducted to investigate the individual factors that blind people use in their daily traffic, to achieve the final goal of this study, which is to know the experiences of blind people in how to navigate their daily traffic.

## Materials and Methods

The goal of qualitative research, a type of social research, is to know some social phenomena [5]. Conventional content analysis is one of the analytical methods in qualitative studies. This method is suitable when the existing theories or previous texts about the phenomenon in question are limited. Since information about the experiences of blind people from router programs as well as about how these people access and use them in Iran was unavailable until the time of conducting this research, this study is based on the qualitative method of content analysis, which leads to the acquisition of in-depth information through semi-structured interviews with the participants directly and openly without imposing predetermined classes or ideas.

The studied population included blind people older than 18 years and experienced people in the field of navigation programs as well as activists in the field of the blind. Snowball sampling and person-to-person introduction were used to select the participants.

Of the 14 participants in this study, 12 were blind, one had severe visual impaired, and one was sighted. The participants of this study included blind people, experts in the field of the blind, and experienced people in the field of router programs.

In this study, data were collected through in-depth semi-structured interviews to determine the main purpose of the interviewee and obtain the maximum required information. Due to the spread of COVID-19 and the restrictions during this time, the interview was conducted in person, by phone, or via the Skype program.

The average duration of each interview was 45 minutes. Interviews continued until no new information or data was obtained, and the obtained data were repeated and reached saturation.

In the interviews, guiding questions were used to guide the sessions and reduce marginal content. All participants were asked similar questions, but they were free to answer them. At the same time, according to the answers of the participants, several other questions were also asked during the interview.

The conventional content analysis method was used in this study. This method is used as a systematic method for the deep description of the phenomenon, and it is suitable to examine the experiences and understanding of people regarding a specific subject, and it is more applicable when the existing theory and studies related to the phenomenon under study are limited [6, 7]. In conventional content analysis, researchers avoid using pre-conceived categories and instead arrange for the categories to emerge from the data. In this case, researchers float on the waves of data to obtain novel knowledge for them. Therefore, categories emerge from the data by induction.

To increase the credibility of the obtained data, the extracted codes were reviewed by the research team with qualitative research experts in the field of rehabilitation. The triangulation method has also been used to validate the data.

## Results

The participants recounted their experiences in daily traffic and how to navigate to reach the desired destination. According to the statements of the participants and the extracted codes, 4 sub-themes of “learning the route”, “reluctance to travel”, “helping others”, and “use of environmental signs” emerged and from the integration of these sub-themes, the theme of “everyday traffic” emerged. In the following, we will examine each of these sub-topics and their related codes.

### Learning the route

In expressing their experiences, people pointed to learning and maintaining everyday and familiar routes. The codes obtained from the participants’ statements include “learning the daily path”, “keeping the path”, “the importance of spatial intelligence in commuting” and “similarity of keeping the path with sighted people”.

In expressing their experiences, people mentioned that when they travel a route daily, they learn that route and

next time they do not need the help of another person or a route finder.

“Wherever we want to go, the route is already known, therefore it is not required for many of us to use the route finder with the same white cane, once we have learned the route or been there a few times, it is within our reach” (P6).

Another issue that was mentioned in this section was the preservation of familiar routes.

“If I go a route in any way now, once I go to learn it either with the help of a companion or now alone, the next series of that route will come to my mind” (P3).

“Blind people tend to move around in environments they already know and feel very safe in that environment because new environments mean unfamiliarity and insecurity, therefore this is what is happening again” (P11).

With maintaining familiar routes, people emphasized the issue of security of familiar routes:

“Another issue that was mentioned was the similarity of how to maintain familiar paths in sighted and blind people, “I cross the street; I go to the other side and there is a bridge right in front of me on the sidewalk. I walk on the sidewalk. I go down. I know two alleys exist on my right side. All the things were available that you can address with your eyes closed. You know this in your place; you know what there is” (P12).

### Helping others

Blind people need help and guidance from other people in different situations. According to the participants, the extracted codes in this section include “getting help from people in traffic”, “difference in getting help from women and men” and “getting help and communication of blind people with each other”.

Getting help from others in unfamiliar directions, when crossing the street, in crowded environments, when using online taxi programs, and at bus stops, were the things that people mentioned

“In some places where many twists and turns exist or in some places where the street is busy, you want to cross the street here, well, many times you cannot do it alone and anyway you have to count on the help of others” (P7).

According to blind people, differences are observed between women and men in seeking help from others, and they emphasized that women travel less than men due to existing restrictions and depend on other people for transportation.

“Personally, because I am a woman and I have my limitations like any other woman and considering that our urban furniture is not suitable for a blind person to travel around, I can honestly say that I do not want to be a family. They get upset and find trouble if something happens to me, the fact is that I do not go anywhere alone” (P2). People emphasized that some blind people cannot use router programs due to a lack of access to virtual networks.

“If a blind person is in contact with blind people, he knows about router programs, if not, he doesn’t know, and now communication is open through social networks, it is getting better, and the one who doesn’t know, probably has less or more limited access to social networks, or is illiterate. It is unnecessary to have it” (P13).

### Reluctance to travel

According to the participants’ statements and extracting the codes of “people’s concerns about independent travel”, “fear of the environment”, and “the family’s unwillingness for the blind person to travel”, this sub-theme was obtained, which in this sub-theme refers to the factors that make blind people reluctant to travel.

The injuries that other blind people saw while commuting were one of the reasons for blind people’s concern for independent transportation.

“Many of my students, many of my friends, who went out with a cane, had many problems, broken arms and legs, and maybe even had problems for the rest of their lives, and some of my colleagues had accidents and died” (P2).

Some other people emphasized the lack of attention to independent traffic concerns.

“I don’t think about my worries anymore. Because if you want to think, you cannot walk anymore. When I walk, I walk depending on whether there is a hole in front of me or something in front of me, no, I don’t think about these things at all, maybe some friends think, but I don’t, I don’t think at all” (P3).

Fear of the environment was another factor affecting the immobility of blind people.

“I am ahead of many of my friends in terms of transportation. I am not afraid of the environment. I walk faster and work more successfully but some people are afraid of the environment” (P3).

The unwillingness of blind people’s families was another factor that affected the immobility of blind people.

“Well, to be honest (laughter), I am afraid that something may happen to me, and then my family won’t let me go around alone” (P8).

### Use of environmental signs

Another topic that blind people used in their daily traffic was signs and environmental signs, the obtained codes include “use of sensory signs” and “use of fixed environmental signs” and the sub-theme of use of signs was obtained.

Some blind people use their five senses to find their daily path and identify places with the help of their senses.

“Busy places, such as banks, bakeries, etc. Have a series of signs. For example, a bank always has an ATM in front of it, therefore you can tell from the sound of the ATM that this is a bank. I’m in the bakery, hence I’m talking about the sound of the bakery’s oven, from the smell of bread that is around now. It turns or the line that people usually stand in front of the bakeries, it is obvious that the bakery is there” (P3).

Another thing that blind people use to mark and identify their daily path is the use of fixed environmental signs.

“Permanent signs, I want to say walking mode, for example, somewhere along the mosaic path, the shape and material of the sidewalk changes, or somewhere there is a motorcycle stop, or somewhere suppose that a slope or a step exists in the sidewalk, these are permanent signs that based on them, he should indicate his route to know whether he is traveling correctly or not. However the signs can be present when we get into the car, for example, a speed limiter exists on your way or you are turning, the corner that the car is turning. Suppose that when we use the bus, the number of stops that the bus stops is an indication” (P7).

## Discussion

### Learning the route

According to the participants’ statements in this research, it was found that people get help from their pre-

vious experiences in their daily traffic. In this way, when they travel a route daily, they learn it and can travel on that route without the help of a guide. In the meantime, they keep the routes traveling regularly or once with the help of a guide, and they can easily travel on that route next time. Here, the importance of spatial intelligence to memorize and navigate is determined. People who have high spatial-motor intelligence can integrate new routes with previous routes and have a complete mental map of the environment in mind. The details of the path that these people take have become mental so that they can guide others. In the study conducted by Aghazadeh et al., one of the innovative strategies of the visually impaired and the blind in performing ADL-related activities is to use intelligence and memory. Repeating a path, taking help from memory and precious memories, and making logical connections with things are among the things consistent with the results of the present study [8]. Blind people prefer to travel on familiar routes because they are sure of the safety of these routes and have the details of the route in their minds, therefore they are aware of the possible dangers of the route. Brady et al. showed that navigating in unfamiliar places and performing ADL-related activities have become the most challenging tasks for blind people [9]. The way blind people remember the routes is similar to normal people, they remember the details as a normal person, and they use them to navigate.

Considering that the obtained results are consistent with the results of the mentioned studies, it was found that memory and previous experiences, and familiar paths are effective factors in learning the paths of the blind, and spatial intelligence is vital in creating a mental map in the blinds.

### Reluctance to travel

Independent traveling was one of the participants' concerns, therefore some of them traveled with the help of a companion or using a taxi. The injuries caused to others and the death of some blind people was among the concerns in their independent transportation. Based on the research results of Shakuri and Shahmoradi, traffic is one of the critical problems and obstacles to the presence of the blind in society, and a major part of their problems in this field is related to the obstacles on the sidewalks that cause mild to severe physical injuries or at least disturbances in orientation while moving. Therefore, they are constantly threatened by their environment and feel insecure, anxious, afraid, and worried [10]. Fear of the surrounding environment in the blind was another factor of people not moving. A blind person feels fear and inse-

curity due to ignorance of his surroundings due to lack of vision. In other studies, people's avoidance and desire to stay at home on routes that do not have enough information or are inaccessible have been mentioned [6, 7].

The concerns and unwillingness of the blind's family for their independent transportation have caused these people to lack the necessary self-confidence for independent transportation. Pajouhan et al. showed that blind girls and women often give up on pursuing their rights due to the fear of accidents and the low level of social security, or they are less present in society than men. In the traffic section, men should be concerned about water channel obstacles, pits, and steep slopes, therefore not cause physical harm. In addition, women should be careful of abnormal behaviors, such as teasing, and moral abuse of their status, which is an obstacle that keeps visually impaired girls at home [11].

Therefore, it seems that one of the critical obstacles for blind people to move independently in society is the lack of environmental security and insufficient accessibility to the environment for these people. Therefore, if the environment is safe for these people without obstacles in their way, the fear of the environment and getting hurt will decrease and they will be more willing to travel.

### Helping others

Blind people are often exposed to forced or non-forced assistance from others when leaving home. These people need the guidance of other people on unfamiliar paths to reach their destination; therefore they prefer to get help from others. Also, it is not possible to cross the street without the help of others. Meanwhile, women and men have a difference in seeking help from others, and men take less help from others than women because they show that they are less dependent. One of the strategies used by the participants in Steven's study was to trust others in doing things. The type of this trust depended on factors, such as the degree of low vision, personal attitudes, family conditions, society, and also the type of desired activity. Visually impaired or blind people may have many abilities; however, sometimes they need help from others [12].

Therefore, it is inevitable for the blind to get help while traveling. According to the issue that Steven also mentions, people trust others and get help from them according to conditions, such as the degree of low vision and their moods. Therefore it is recommended to allow the blind person to ask for help or ask him if he needs help while driving.

## Use of environmental signs

When traveling, blind people use the signs in the environment to find the right direction or ensure their path. These symptoms are divided into two categories, sensory symptoms, and permanent environmental symptoms. People with the help of their other five senses through the sense of hearing, identify the smell of different places and find the way. The research conducted in this field has emphasized the role of other senses in navigation, taking help from environmental signs and clues and marking the traffic of blind people [1, 8, 13, 14], which is consistent with the results obtained. Meanwhile, constant environmental signs also help blind people. These signs are divided into two categories, permanent signs, and temporary signs. Fixed signs are permanent signs, such as the page or the slope of the streets; temporary signs are another group of signs in the environment for a while, such as scaffolding or shops that are closed at certain times. In the study conducted by Riazi et al, the participants used different strategies in identifying the routes, including maintaining the number of passing places, the presence of stairs, shops, and signs on the ground, such as small fixed obstacles, types of trams, roadblocks, bus stops, slopes, detecting bumps and counting them using memory, buildings, hearing, and smelling clues from the environment [15].

Therefore, environmental signs, as well as olfactory, tactile, and taste clues, are vital in blind people's navigation. Due to the feature of announcing the surrounding places, most of the navigation programs can be effective in finding environmental signs as quickly as possible and helping the blind person.

## Conclusion

According to this study, blind people use similar strategies in their daily traffic. These solutions include maintaining the path, traveling on familiar paths, using environmental signs, and getting help from others. At the same time, reasons, such as fear of the environment, fear of injury, and the unwillingness of the family to leave are obstacles for the blind person to move independently.

## Ethical Considerations

### Compliance with ethical guidelines

The Ethics Committee of the [Iran University of Medical Sciences](#) approved this study (Code: IR.IUMS.REC.1399.1434). All participants in this study signed an informed consent form.

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## Authors' contributions

Conceptualization and supervision: Mohammad Kamali, Reza Salehi and Homa Kazemi; Methodology: Mohammad Kamali; Investigation, writing–review & editing: All authors; Writing–original draft: Homa Kazemi and Mohammad Kamali; Data analysis and contribution to the discussion and result: Reza salehi and Hossein Mobaraki.

## Conflict of interest

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## مقاله پژوهشی



## شناخت دیدگاه و تجربه افراد نابینا در مسیریابی و تردد روزمره

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### چیکید

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**مقدمه:** یکی از بارزترین مشکلاتی که نابینایان با آن مواجه هستند، عدم توانایی مسیریابی مناسب و جهت یابی است. ناوبری شهری ایمن و مستقل برای افراد با نقص بصری مشکل است. طبق طبقه بندی CF، وضعیت سلامتی و بیماری فرد، با ساختار و عملکرد بدن، محدودیت در انجام فعالیتها و مشارکت فرد در اجتماع سنجیده می شود. فاکتورهای فردی و فاکتورهای محیطی بر انجام فعالیت های فرد تأثیر گذار هستند که این فعالیتها بر مشارکت فرد در اجتماع مؤثرند. به همین جهت مطالعه حاضر جهت بررسی فاکتورهای فردی که نابینایان در تردهای روزمره خود به کار می گیرند، انجام گرفته است تا به هدف نهایی این مطالعه که آگاهی از تجربیات افراد نابینا از نحوه مسیریابی در تردهای روزانه خود است، دست پیدا کند.

**مواد و روشها:** در این مطالعه کیفی ۱۲ فرد نابینا، ۱ نفر کم بینای شدید و ۱ فرد بینا به صورت گلوله برقی جهت شرکت در مطالعه انتخاب شدند. اطلاعات از طریق انجام مصاحبه های عمیق و نیمه ساختاریافته جمع آوری شد. از روش تحلیل محتوای قراردادی جهت تجزیه و تحلیل و از روش مثلث سازی داده ها برای اعتبار سنجی یافته ها بهره گرفته شد.

**یافته ها:** پس از تجزیه و تحلیل گفته ها و طبقه بندی کدهای استخراج شده، چهار زیرمضمون شامل «یادگیری مسیر»، «عدم تمایل به تردد»، «کمک دیگران» و «کاربرد علائم محیطی» به دست آمد و از ادغام این زیرمضمون ها، مضمون «تردد روزمره» پدیدار شد.

**نتیجه گیری:** مطالعه حاضر نشان داد نابینایان در تردهای روزمره خود از راهکارهای مشابهی استفاده می کنند. این راهکارها شامل حفظ کردن مسیر، تردد در مسیرهای آشنا، استفاده از علائم محیطی و کمک گرفتن از دیگران است. در عین حال، دلایلی از جمله ترس از محیط، ترس از آسیب و عدم تمایل خانواده به تردد، موانعی برای تردد مستقل فرد نابینا هستند.

### کلیدواژه ها:

نابینایان، تردد، مسیریابی، دسترسی، برنامه مسیریابی.

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