

# **Improving Clinical Navigation for People with Visual Impairments: Insights from Real-World Scenarios**

## **Background**

People with visual impairments (PVI) frequently visit optometry and ophthalmology clinics, yet these environments are often difficult to navigate independently. Factors such as poor lighting contrast, non-standardized signage, and inadequate spatial cues can compromise safety and autonomy. This study aimed to identify task-specific environmental features that facilitate or hinder navigation for PVI within clinical settings.

## **Methods**

Fifteen adults with visual impairments (8 blind, 7 with low vision) participated in a simulated optometry visit conducted at a vision rehabilitation center. Participants completed eight sequential navigation tasks, including entering the building, reaching reception, using stairs or elevators, locating a chair, finding the appointment room, visiting an optical shop, exploring a low-vision boutique, and exiting the building. Objective metrics (distance traveled, time, relative environmental luminance, and task success rate) were combined with participant feedback collected immediately after each task.

## **Description of Figures**

Figure 1 shows navigation routes on the first and third floors of the clinic. The green line represents the route to the appointment room, while the red line represents the return route, illustrating navigation complexity across floors.

Figure 2 compares the distance traveled by blind participants and participants with low vision when entering the clinic and locating the receptionist. Blind participants generally traveled longer distances, indicating greater orientation challenges.

## **Results**

Navigation performance and feedback revealed task-dependent needs. At building entry, participants emphasized the importance of knowing door type and avoiding obstacles such as pillars or nearby stairs. At reception, ambient audio cues (e.g., music or radio) and high-contrast signage improved orientation. Participants preferred stairs with uniform lighting and elevators equipped with illuminated, tactile, and voice-activated controls. In waiting areas and appointment rooms, clear spatial layout and human guidance were critical for successful navigation. In optical shops and low-vision boutiques, participants reported confusion related to lighting conditions, layout complexity, and inaccessible payment systems. Several

participants expressed concern that healthcare professionals lacked training in appropriate human guiding techniques, describing guidance that felt forceful rather than supportive. Across tasks, higher environmental luminance was associated with greater navigation success.

### **Design Implications**

Findings support the use of high-contrast doors and signage, consistent lighting, tactile ground indicators, auditory cues at reception, accessible elevators, simplified layouts, and staff training in vision-assistance techniques.

### **Conclusions**

Designing vision-friendly clinics requires the integration of multisensory and contextual cues, including visual, tactile, and auditory information, alongside properly trained human assistance. These findings provide evidence-based recommendations for clinic design and staff training to improve accessibility, independence, and safety for people with visual impairments in eye-care settings.