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Original Research Article

Evaluating the impact of human assistance in wayfinding experience of outpatient visitors in a tertiary healthcare centre

Mustansir Abbas Ali[1]*, Ashima Aggarwal[2], Manju Toppo[1], Utkarsh Tiwari[1], Akanksha Singh[1], Manu Rai[1], Parth Sharma[1], Himanshu Panse[1], Sushmita Chandani[1], Pradeep Valluri[3]

[1]Department of Community Medicine, Gandhi Medical College, Bhopal, Madhya Pradesh, India
[2]Post Graduate Institute of Medical Education and Research, Chandigarh, India
[3]Santhiram Medical College, Nandyala, Udumalpuram, Andhra Pradesh, India

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***Correspondence:**
Dr. Mustansir Abbas Ali,
E-mail: mustansir.abbas8871@gmail.com

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ABSTRACT

Background: Effective wayfinding is essential in large healthcare facilities, where complex layouts, crowded environments, and frequent structural changes often create confusion for first-time visitors. Despite the availability of signage and digital tools, many patients still struggle to navigate outpatient departments efficiently. This study aimed to compare wayfinding experiences among first-time outpatient visitors who received human assistance with those who navigated without such support in a tertiary care teaching hospital.
Methods: An analytical cross-sectional study was conducted across outpatient departments of Gandhi Medical College, Bhopal. A total of 336 first-time visitors were recruited through consecutive sampling. Data were collected using a validated semi-structured questionnaire administered during exit interviews. Participants were categorized based on whether they received human assistance while finding their destination. Descriptive statistics and comparative analyses were performed, followed by multivariate regression to identify factors associated with seeking human assistance.
Results: Among all participants, 69.6 percent relied on human assistance for navigation. Difficulty locating signage, language barriers, and confusion were the most common challenges reported. Participants who took longer than ten minutes to reach their destination were significantly more likely to seek help. Higher educational attainment showed a strong association with requesting assistance, while labourers were less likely to do so compared to salaried individuals. Stress levels also influenced help-seeking behaviour.
Conclusions: The study highlighted the continued importance of human navigators in improving wayfinding in busy hospital settings. Although signage and maps are useful, they often fall short in dynamic environments. Integrating trained personnel into wayfinding systems may enhance patient experience, reduce delays, and support smoother outpatient flow.

Keywords: Assistance, Hospitals, Navigation, Outpatients, Signage, Stress, Wayfinding

INTRODUCTION

Wayfinding is the process of orienting and navigating oneself in physical space. With the advent of sophisticated and reliable digital navigation applications, wayfinding has never been more convenient and accessible. While navigation technologies have revolutionized outdoor travel and general orientation, their efficacy diminishes indoors, particularly in multi-layered, micro-level navigation and in dynamic environments like large tertiary care centers, where wayfinding becomes even more important as services are often needed urgently and with minimal room for confusion or delay. These facilities are often vast and

complex, with numerous departments spread across multiple floors and buildings. Navigating in these healthcare facilities can be problematic, and adversely affect the time of patients, visitors, and caregivers; especially for individuals with visual impairments, cognitive difficulties, and restricted physical mobility.[1] In a tertiary government setting, the challenges of wayfinding are compounded by several factors, making it difficult for most people to find their way even with clear wayfinding signs. Patients travelling from different towns and cities face language barriers and unfamiliarity with the environment, which further exacerbates the difficulty for them to find their way without assistance. Even in settings equipped with multilingual signage, visitors often struggle to locate critical areas such as intensive care units, operation theaters, and laboratories.[2] These facilities are constantly adapting, undergoing frequent renovations, expansions, and re-configurations which leads to new construction, closed-off areas, and shifting departments that further disorient visitors and even staff. This constant flux renders static wayfinding solutions quickly obsolete. These complexities lead to frustration, missed appointments, and delayed treatments, which ultimately results in incivility towards staff who operate under significant workload and required to maintain constant focus are frequently interrupted by individuals experiencing wayfinding difficulties.[3,4] Consequently, conventional techniques and technologies alone often fail to provide seamless intuitive guidance during critical moments, underscoring a fundamental void that necessitates alternative solutions. Trained personnel on the other hand can provide personalized guidance, address specific queries, and offer reassurance to those who are anxious or confused. Unlike static signage, human navigators can tailor their guidance to individual needs, considering factors such as language, literacy, and familiarity with the hospital environment. Such personalized support has the potential to reduce patient travel time, minimize delays, and enhance overall satisfaction. This study, therefore, sought to compare the effectiveness of human assistance versus no human assistance in wayfinding among first-time outpatient visitors, with the goal of evaluating the potential benefits of incorporating human navigators in hospital settings to improve both patient experience and operational efficiency in hospital settings.

METHODS

Study design

It was an analytical cross-sectional study.

Study setting

The study was carried out in different outpatient departments in block A and block B of Gandhi Medical College, Bhopal (Figure 1). Daily outpatient department (OPD) load of the hospital is around 2600.

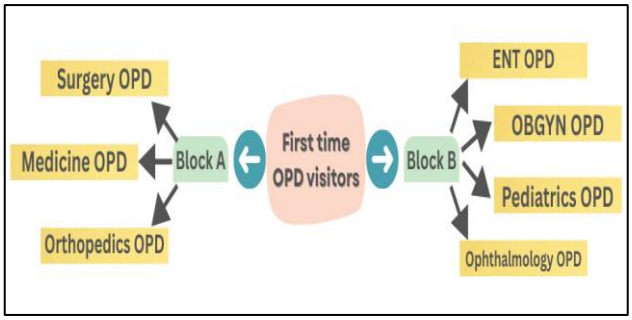

Figure 1: Block wise distribution of departments.

Ethical considerations

Ethical clearance was taken from the Institute Ethical Committee, Gandhi Medical College, Bhopal (Registration number: ECR/1055/Inst/MP/2018). ICMR 2017 National Ethical Guidelines for Biomedical and Health Research Involving Human Participants were followed. Written informed consent was obtained from all study participants whenever there will be an interaction of participants with the study investigators. Privacy and confidentiality of the data was ensured. The data was handled, stored, and shared during data collection and analysis such that information obtained from and about research participants was not revealed.

Study population

we recruited participants with the following criteria:

Inclusion criteria

First time visitors to outpatient departments. Visitors who provide informed consent. Visitors aged 18 years and above.

Exclusion criteria

Visitors who have prior directions or experience navigating the hospital. Visitors who are accompanied by hospital staff or people who have prior experience navigating the hospital. Visitors who require urgent medical attention and referral after the visit

Sample size and sampling

The study employed consecutive sampling to recruit participants. All first-time visitors who meet the inclusion criteria during the study period were included in the study. A convenience sampling technique was employed to recruit participants for the study. All first-time visitors who met the inclusion criteria and attended the outpatient department (OPD) during the study period were invited to participate. A total of 336 participants were enrolled. The sample size was considered adequate and representative of the hospital's average daily OPD footfall. Data collection was conducted across multiple days and time

slots to capture variations in visitor flow and ensure a balanced representation of the outpatient population.

Study tool

A semi-structured questionnaire draft was designed in consultation with domain experts which was validated with a pilot study. It was used during the interview to gather non-identifying demographic information and details about the wayfinding experience, like time taken to reach the destination, perceived level of stress, etc.

Study plan

Following clearance from the institutional ethical committee, this cross-sectional study was carried out in different outpatient departments in Blocks A and B of the hospital. The selected outpatient departments were reviewed to ensure an even and homogeneous distribution of existing navigation aids along their paths. Based on this assessment, some departments were added or excluded prior to data collection to prevent differential visitor experiences and minimize the risk of misclassification bias. The investigator, after receiving consent, interviewed the patient and/or the accompanying person immediately after the medical visit as an exit interview. Participants were assigned to groups based on whether they received human aid or not during their wayfinding experience.

Group A (human aid)

Participants who received assistance from hospital staff or volunteers to reach their destination (Figure 2).

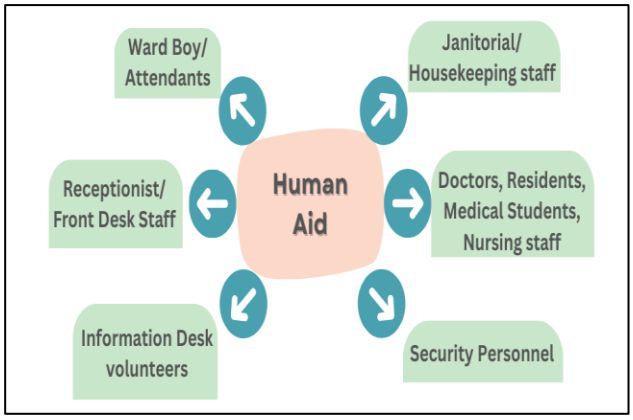

Figure 2: Human aid available in the hospital.

Group B (no human aid)

Participants who navigated using only the existing signage and maps.

Responses were recorded in the Epicollect application. Each question/situation was translated into the local language without losing its original context and rendered in the way that the participant understood best. Data cleaning and sample duplicate entry was done to assure data quality due to possible capturing errors and for any kind of missing value.

Data analysis and presentation

Data was compiled in MS Excel and analyzed using IBM SPSS trial version 29.

Descriptive statistics was calculated for demographic variables.

Comparative analysis between the two groups was performed using t-tests for continuous variables (e.g., time taken to reach the destination) and chi-square tests for categorical variables (e.g., overall satisfaction).

A p value of <0.05 was considered statistically significant. Multivariate regression analysis was conducted to control for potential confounding variables.

RESULTS

Section I: socio-demographic characteristics of the participants

A total of 336 participants were surveyed, with a mean age of 36.25±12.28 years; the majority were in the 31-50 years age group (45.5%), followed by 18-30 years (37.5%) and above 50 years (17%). Males constituted a slightly higher proportion (58%) compared to females (42%). Most respondents were ever married (74.1%), while about one-fourth were unmarried (25.9%). Educational attainment was fairly distributed, with 25% educated up to primary, 23.2% up to high school, 25% up to higher secondary, and 26.8% having completed graduation or higher. Over one-third of participants were unemployed (36%), while equal proportions (16% each) were engaged as laborers, students, salaried employees and self-employed. Almost half of the participants reported a monthly family income of ≤20,000 INR (48.2%), followed by 33% in the range of 20,001-50,000 INR (Table 1).

Section II: wayfinding in the hospital by the first time OPD patients

Among first-time visitors to the hospital OPD, the majority (69.6%) reported receiving human assistance for wayfinding, while 30.4% navigated through alternative means like signage and maps. Of those who sought assistance, most interactions lasted between 30 seconds to 1 minute (37.2%), followed by less than 30 seconds (24.3%). Regarding the total time taken to reach their destination, nearly half of the participants (45.5%) required 5-10 minutes, while 20.5% each took 10-15 minutes and more than 15 minutes, and only 13.4% were able to reach within 5 minutes (Table 2).

Table 1: Socio-demographic characteristics of the participants.

Characteristics	Number	Percentage
Age (years)	Mean±SD = 36.25±12.28	
18-30	126	37.5
31-50	153	45.5
>50	57	17
Gender		
Male	195	58
Female	141	42
Marital status		
Ever married	249	74.1
Unmarried	87	25.9
Education		
≤Primary	84	25
Upto High school	78	23.2
Upto Hr Sec School	84	25
≥Graduation	90	26.8
Occupation		
Unemployed	120	36
Labor	54	16
Student	54	16
Salaried	54	16
Self-employed	54	16
Total family income		
≤20,000	162	48.2
20,001-50,000	111	33
50,001-1,00,000	27	8
>1,00,000	36	10.7

Table 2: Wayfinding in the hospital.

Characteristics	Number	Percentage
Received human assistance		
Yes	234	69.6
No	102	30.4
Interaction time for human assistance (total time of all interactions, if multiple)		
<30 seconds	57	24.3
30 seconds-1 minute	87	37.2
1-2 minutes	42	18
>2 minutes	48	20.5
Total time taken to reach the destination		
<5 minutes	45	13.4
5-10 minutes	153	45.5
10-15 minutes	69	20.5
>15 minutes	69	20.5

Section III: various challenges and barriers faced by participants during their wayfinding in hospital

The most commonly reported challenge was difficulty in locating signage (32.2%), followed by language barriers (30.3%) and feelings of anxiety or confusion (26.8%), while a smaller proportion (10.7%) faced issues of physical inaccessibility. In terms of stress levels, nearly half of the participants (47.3%) reported no stress, whereas 15.2% experienced mild, and 18.8% each reported moderate or severe stress. When asked about preferred modes of assistance, the majority favoured human aid (69.6%), while 21.4% preferred signage and maps, and 9% opted for self-navigation. Overall, more than half of the respondents (53.5%) expressed satisfaction with their wayfinding experience, 34.8% remained neutral, and 11.6% were dissatisfied (Table 3).

Table 3: Barriers in wayfinding.

Characteristics	Number	Percentage
Challenges faced during wayfinding		
Could not find signage	108	32.2
Language barrier	102	30.3
Anxiety/confusion	90	26.8
Physical inaccessibility	36	10.7
Perceived level of stress		
Not at all	159	47.3
Mild	51	15.2
Moderate	63	18.8
≥Severe	63	18.8
Preferred mode of assistance		
Human aid	234	69.6
Signage and maps	72	21.4
Self-assisted	30	9
Overall experience of wayfinding		
≥Satisfied	180	53.5
Neutral	117	34.8
≥Dissatisfied	39	11.6

Section IV: Factors associated with and without human assistance for wayfinding of participants in hospital

In the unadjusted analysis, participants with higher education were strongly associated with taking human assistance, with participants educated up to high school (PR=2.85, 95% CI: 1.52-5.36), higher secondary (PR=4.80, 95% CI: 2.40-9.66), and graduation or above (PR=5.25, 95% CI: 2.62-10.54) being more likely to seek help compared to those with primary education or less. However, after adjustment, only participants with graduation or above remained significantly associated (APR=4.78, 95% CI: 1.61-14.14). Occupation also showed variation, with laborers being less likely to use human assistance compared to the salaried group (PR=0.33, 95% CI: 0.17-0.66), and this negative association remained significant even after adjustment (APR=0.21, 95% CI: 0.06-0.72). The time taken to reach the destination showed a clear association, as participants who took longer (>10 minutes) were significantly more likely to rely on human assistance compared to those who reached within 5 minutes, with the likelihood being highest among those taking 10-15 minutes (APR=9.65, 95% CI: 2.51-37.02) and >15 minutes (APR=7.17, 95% CI: 1.76-29.27). Perceived level of stress also showed association. We found that participants reporting both

moderate level of stress (APR=0.01, 95% CI: 0.01-0.03) and no stress at all (APR=0.012, 95% CI: 0.01-0.06) were significantly less likely to take human assistance compared to participants reporting mild level of stress (Table 4).

Table 4: Factors associated with wayfinding in hospital with and without human assistance.

Factors	Total	Wayfinding with human assistance		Unadjusted PR (95%CI)	Adjusted PR (95%CI)
	N	N	%		
Total	336	234	69.6		
Age (years)					
18-30	126	75	32	1.16 (0.35, 3.88)	Not included
31-50	153	117	50	0.49 (0.15, 1.60)	
>50	57	42	18	Reference	
Gender					
Male	195	129	55.1	1.49 (0.92, 2.41)	Not included
Female	141	105	44.9	Reference	
Education					
≤Primary	84	60	25.6	Reference	Reference
Upto High school	78	63	27	2.85* (1.52, 5.36)	0.79 (0.25, 2.45)
Upto Hr. Sec. School	84	69	29.4	4.80* (2.40, 9.66)	2.40 (0.88, 6.53)
≥ Graduation	90	42	18	5.25* (2.62, 10.54)	4.78* (1.61, 14.14)
Occupation					
Unemployed	120	90	38.5	2.67* (1.04, 6.85)	2.98 (0.96, 9.30)
Labor	54	48	20.5	0.33* (0.17, 0.66)	0.21* (0.06, 0.72)
Student	54	33	14.1	0.67 (0.33, 1.34)	0.57 (0.22, 1.50)
Self-employed	54	36	15.4	0.52 (0.26, 1.04)	0.83 (0.27, 2.63)
Salaried	54	27	11.5	Reference	Reference
Total time taken to reach the destination					
<5 minutes	45	27	11.5	Reference	Reference
5-10 minutes	153	102	43.6	0.48 (0.22, 1.08)	0.92 (0.28, 3.06)
10-15 minutes	69	48	20.5	0.42* (0.21, 0.85)	9.65* (2.51, 37.02)
>15 minutes	69	57	24.4	0.32* (0.13, 0.74)	7.17* (1.76, 29.27)
Perceived level of stress					
Not at all	159	84	35.9	0.09* (0.03, 0.33)	0.012* (0.01, 0.06)
Mild	51	33	14.1	Reference	Reference
Moderate	63	57	24.4	0.06* (0.02, 0.19)	0.01* (0.01, 0.03)
≥Severe	63	60	20.5	0.48 (0.11, 1.99)	0.27 (0.06, 1.33)

*p value <0.05 was considered significant.

DISCUSSION

This study investigated the effectiveness of human assistance in wayfinding for first-time OPD visitors to the hospital. We found nearly 70% of participants favoring this mode for navigation.

This overwhelming preference for human aid in our study reinforces that a human guide offers a personalized solution that static systems cannot. They overcome language and literacy barriers, offering reassurance to anxious individuals. This is consistent with a study from a public hospital in India, where 98% of participants who rated the signage as good or excellent still felt the need to reconfirm directions with a person.[2] Another study on navigation in large hospitals reported verbal directions often from staff in uniform as the most commonly mentioned aid for navigation.[5] The presence of a human guide transforms abstract instructions into a personal experience, which is crucial in a setting where patients and visitors are already under stress. Wayfinding is also not just about reading signs, it's social. Dalton et al described that people naturally follow or ask others when they are unsure in a new environment, especially if the other person looks familiar with the surroundings.[4]

Our analysis showed significant associations between socio-demographic characteristics and the use of human assistance. One being that participants with higher education were significantly more likely to seek human assistance. This seems counterintuitive but reflects differing information-seeking behaviours. Although studies that observed in hospital wayfinding and the common practice of asking staff for directions didn't

show a direct statistical test linking individuals' education level to their likelihood of asking for navigational help, a possible explanation is that individuals with higher education may be more confident to direct inquiry, preferring to quickly access human expertise over struggling with environmental cues. A survey conducted with 1041 participants found almost half of them experienced difficulties navigating in hospital, especially older adults and individuals with lower educational attainment.[6] Moreover, the finding that labourers were significantly less likely to use human assistance compared to salaried employees could indicate the influence of perceived social distance or communicative understanding in a formal healthcare setting. Research on health equity suggests that individuals from lower socio-economic or certain occupational backgrounds are often more reluctant to initiate interaction with staff they perceive as authority figures, leading them to struggle by themselves for longer.[7]

A strong predictor of seeking human assistance was the time taken to reach the destination. Participants taking over 10 minutes were more likely to have relied on human help. This suggests that human interaction is often a corrective measure, sought after other methods have failed and significant delay has already occurred. This delay is a critical factor, as roughly 30% of late-arriving patients attribute their tardiness to way-finding issues.[8]

Difficulty in finding signage, language barrier, and confusion were among the most common problems reported during wayfinding. Studies by Passini and Carpman and Grant have shown that "signage clutter" and inconsistent visual cues lead to confusion rather than clarity.[9,10] Even well-designed signage systems often fail to account for the dynamic nature of hospitals, where departments shift or construction occurs frequently.

It is worthwhile to mention the recently launched AIIMS DISHA, a digital indoor navigation application launched for AIIMS, New Delhi. It provides voice and visual guidance to help visitors navigate within the hospital.[11] Similarly, at PGIMER, Chandigarh, the Sarathi initiative has been introduced to assist patients through trained personnel who provide real-time, personalized guidance and support within the hospital premises. Such efforts illustrate the growing recognition of patient navigation as an essential component of healthcare delivery. Given the scale and complexity of healthcare institutions in India, similar digital and human-assisted navigation systems should be explored and implemented across other major public hospitals. Establishing such systems nationwide could significantly improve accessibility, reduce confusion among first-time visitors, and contribute to a more patient-friendly healthcare environment.[12]

We acknowledge limitations of our study. As a single-centre study, the findings may not be fully generalizable to other healthcare facilities with different architectural layouts, patient demographics, or cultural contexts. The cross-sectional design does not permit causal inference and temporality of association. Future research with larger sample could employ a longitudinal or experimental design to more definitively assess the impact of human way-finding interventions.

CONCLUSION

In conclusion, this study reaffirms the irreplaceable value of human interaction in hospital way-finding. Confusing layouts can increase anxiety, and clear navigation systems can reduce mental fatigue.[13,14] For better patient flow, hospitals should have clear, consistent signage along with trained navigators or volunteers. Roughly 30% of late-arriving patients cite wayfinding issues as the main reason. Hospitals that improve wayfinding can reduce late arrivals by up to 25%.[15] Our results support the studies that states signs alone cannot replace human guidance.[2,4] By integrating human navigators into way-finding strategy, hospitals can create a more supportive, efficient, and patient-centered environment, ensuring that a visitor's journey begins with clarity and compassion instead of confusion and delay.

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