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RESEARCH ARTICLE

Digital Patient Navigation Systems and Treatment Acceptance: A Mixed-Methods Study of Patient Coordination in Modern Healthcare Clinics

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Abstract: ***Background and Objectives*:** Digital patient navigation systems have transformed healthcare delivery through electronic coordination of patient care pathways. These systems facilitate appointment scheduling, treatment reminders, and communication between patients and healthcare providers. This study sought to examine the relationship between digital navigation system usage and treatment acceptance rates among patients attending outpatient clinics in London. Given the cross-sectional design, causality cannot be inferred.

***Material and Methods*:** A convergent mixed-methods design was employed across four National Health Service outpatient clinics between March and November 2024. The platform under investigation was CarePath Navigator (NHS Digital/Cerner), a cloud-based system integrated with electronic health records. The quantitative component involved 412 patients who completed structured questionnaires measuring system usage patterns, perceived ease of use, and treatment acceptance intentions. Treatment acceptance was operationalised using the nine-item Treatment Acceptance Scale (TAS-9), a validated instrument measuring behavioural intention, confidence, and self-reported adherence (Cronbach's $\alpha = .912$). The qualitative component comprised 28 semi-structured interviews with patients and 12 interviews with healthcare staff, analysed in NVivo 14 using thematic analysis with independent dual coding (Cohen's $\kappa = .893$). Data were analysed using SPSS version 27 for quantitative analysis and Braun and Clarke's six-phase approach for qualitative data. Mixed-methods integration was achieved through a joint display table.

***Results*:** Quantitative findings demonstrated a positive correlation between digital navigation system usage and treatment acceptance ($r = 0.64$, $p < 0.001$). However, this association is observational and may reflect self-selection by motivated patients. Patients who used the system regularly showed higher acceptance rates (78.3%) compared to infrequent users (52.1%; $F(3, 408) = 48.72$, $p < .001$, $\eta^2 = .264$). Multiple regression indicated that system usage frequency ($\beta = 0.312$, $p < .001$), perceived usefulness ($\beta = 0.298$, $p < .001$), and digital literacy ($\beta = 0.198$, $p < .001$) collectively explained 47.2% of variance in treatment acceptance, with no multicollinearity (all VIF < 2.0). Qualitative analysis identified three primary themes with nine sub-themes: enhanced patient autonomy (control over scheduling, access to information, informed decision-making), reduced administrative burden (efficient booking, automated reminders, staff workload reduction), and improved care continuity (secure messaging, perceived support, reduced unnecessary visits). Staff interviews highlighted the importance of system integration with existing electronic health records. Joint display analysis revealed convergence across all major themes, with divergence identified regarding staff training deficits.

***Conclusions*:** Digital patient navigation systems are positively associated with treatment acceptance through improved care coordination and patient empowerment. However, the cross-sectional design precludes causal conclusions. Healthcare organisations should invest in user-friendly navigation platforms that integrate with clinical workflows, whilst acknowledging that selection bias may inflate observed associations. Training programmes for both patients and staff remain essential for optimal system utilisation.

Keywords: Digital navigation, Patient Coordination, treatment acceptance, mixed methods, healthcare technology, CarePath Navigator.

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1. INTRODUCTION

Healthcare systems worldwide face mounting pressure to deliver efficient, patient-centred care whilst managing limited resources [1]. The integration of digital technologies into clinical practice represents a response to these challenges, with patient navigation systems emerging as a prominent innovation in care coordination [2]. These electronic platforms enable patients to schedule appointments, receive treatment reminders, access educational materials, and communicate with healthcare providers through unified interfaces [3].

The concept of patient navigation originated in the 1990s as a community-based intervention to address cancer care disparities among underserved populations [4]. Freeman established the first navigation programme in Harlem, New York, demonstrating that guided assistance through the healthcare system improved access to screening, diagnosis, and treatment [5]. Contemporary digital navigation systems extend this concept through technology-mediated coordination, offering potential advantages in scalability, accessibility, and data integration [6].

Research on digital health interventions has grown substantially in recent years. A systematic review by Saluja and colleagues examined barriers and enablers to accessing community resources among primary care patients, highlighting the importance of both system-level and individual-level factors in determining access [7]. Their findings demonstrated that administrative procedures, transportation limitations, and financial constraints create substantial obstacles for patients attempting to navigate healthcare systems [8]. Digital navigation systems potentially address several of these barriers through remote access and automated coordination [9].

Treatment acceptance constitutes a critical outcome measure in healthcare delivery. Patients who accept recommended treatments demonstrate better clinical outcomes, reduced hospital readmissions, and improved quality of life [10]. Treatment acceptance is defined in this study as a composite of behavioural intention to follow medical recommendations, confidence in treatment decisions, and self-reported initiation and adherence behaviour [11]. Factors influencing treatment acceptance include patient understanding of medical recommendations, perceived accessibility of care, trust in healthcare providers, and practical barriers such as transportation and scheduling [12]. Digital navigation systems influence these factors through enhanced communication, reduced logistical barriers, and improved patient engagement [13].

Despite the proliferation of digital navigation platforms, evidence regarding their impact on treatment acceptance remains limited. Previous studies have examined navigation programmes in specific clinical contexts, including cancer care, mental health services, and chronic disease management [14]. However, few investigations have employed mixed-methods approaches to understand both the quantitative relationships and qualitative experiences associated with digital navigation system usage [15]. This study addresses this gap through a comprehensive evaluation of patient navigation technology in outpatient clinical settings.

The specific platform under investigation, CarePath Navigator (Version 4.2), was developed by NHS Digital in partnership with Cerner Corporation and deployed across participating trusts between January 2023 and June 2024. The platform provides appointment management, secure messaging, results access, educational content, and care pathway tracking through a cloud-based interface with iOS and Android applications (see Appendix A for full platform specification). Understanding how this specific, widely implemented platform relates to treatment acceptance is essential for informing NHS digital strategy.

The theoretical foundation for this research draws upon the Information-Motivation-Behavioural Skills Model, which posits that health-related behaviour change results from the interaction of information, motivation, and behavioural skills [16]. Digital navigation systems provide information about care pathways, enhance motivation through appointment reminders and educational content, and develop behavioural skills through self-management tools and provider communication [17]. This framework guided both the design of the study instruments and the interpretation of findings.

The primary objective of this study was to examine the relationship between digital patient navigation system usage and treatment acceptance among outpatient clinic attendees. Secondary objectives included identifying barriers and facilitators to system usage, exploring patient and staff experiences with the technology, and determining factors that moderate the relationship between navigation system engagement and treatment outcomes.

2. MATERIAL & METHODS

2.1. Study Design and Setting

A convergent parallel mixed-methods design was employed, wherein quantitative and qualitative data were collected simultaneously, analysed separately, and then integrated during interpretation [18]. This approach enabled the examination of both statistical relationships and lived experiences, providing a comprehensive understanding of digital navigation system impacts [19]. The study was conducted across four National Health Service outpatient clinics in London, selected to represent diverse patient populations and clinical specialities (cardiology, endocrinology, respiratory medicine, and musculoskeletal services).

The digital navigation platform, CarePath Navigator, had been fully implemented at all four sites for a minimum of nine months prior to study commencement (implementation dates: January–June 2023; study start: March 2024). This duration allowed for workflow stabilisation and ensured that both staff and patients had adequate exposure to the system. The platform was fully integrated with Cerner Millennium electronic health records at all sites, enabling bidirectional synchronisation of appointment data, clinical notes, and secure messaging.

2.2. Study Participants and Sampling

The quantitative sample comprised 412 patients aged 18 years and older who attended participating clinics between March and November 2024. Inclusion criteria required participants to have access to the digital navigation system for at least four weeks and to have received at least one treatment recommendation during the study period. Exclusion criteria included cognitive impairment preventing informed consent and inability to read English. These criteria introduce potential selection bias by excluding patients with lower digital literacy, limited English proficiency, and those without smartphone or internet access populations that may demonstrate lower treatment acceptance. This limitation is addressed in the Discussion and Limitations sections.

Sample size was determined using power analysis for correlation coefficients, indicating that 340 participants would provide 80% power to detect a medium effect size ($r = 0.30$) at alpha = 0.05 [20]. The final sample of 412 exceeded this minimum requirement. Participants were recruited through clinic waiting room invitations and SMS invitations via CarePath Navigator. The mean duration of system use at enrolment was 14.3 weeks (SD = 6.8, range: 4–36 weeks).

For the qualitative component, purposive sampling was used to recruit 28 patients representing varied levels of system usage (high, moderate, low), age groups (18–39, 40–59, 60+), clinical conditions, and ethnicity. Additionally, 12 healthcare staff members including nurses ($n = 6$), physicians ($n = 4$), and administrative personnel ($n = 2$) participated in interviews. Recruitment continued until data saturation was achieved, defined as the point at which no new themes emerged from consecutive interviews [21]. Saturation was formally assessed after each interview by reviewing coded transcripts; no new codes were generated after the 34th interview (28 patients + 6 staff), at which point an additional 6 staff interviews were conducted to confirm saturation.

2.3. Data Collection Tools and Techniques

The quantitative data collection instrument comprised four sections. Section one collected demographic information including age, gender, ethnicity, employment status, education level, socioeconomic status (Index of Multiple Deprivation quintile), clinical diagnosis, duration of navigation system use, and digital literacy self-assessment. Section two measured digital navigation system usage through items adapted from the Technology Acceptance Model, assessing frequency of use, features accessed, and perceived usefulness [22]. Section three evaluated treatment acceptance using the nine-item Treatment Acceptance Scale (TAS-9), a validated instrument measuring intention to follow medical recommendations, confidence in treatment decisions, and self-reported adherence behaviour [23]. The TAS-9 employs a 5-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree), yielding a continuous score range of 9–45, with higher scores indicating greater treatment acceptance. In the current study, Cronbach's alpha was .912, with confirmatory factor analysis supporting a single-factor structure (CFI = .941, TLI = .923, RMSEA = .068, SRMR = .052). Full psychometric properties are reported in Appendix B. Section four assessed barriers to care access using items from previous navigation research [24].

Qualitative data were collected through semi-structured interviews lasting 30–45 minutes. Patient interviews explored experiences with the navigation system, perceived impacts on care coordination, and factors influencing treatment decisions. Staff interviews examined system integration with clinical workflows, observed patient responses, and suggestions for improvement. All interviews were audio-recorded with participant consent and transcribed verbatim.

The interview guides were developed through a three-stage process: (1) review of existing patient navigation literature; (2) consultation with two patient and public involvement (PPI) representatives; and (3) pilot testing with three patients and two staff members (not included in the final sample). Pilot interviews resulted in minor wording changes to improve clarity (see Appendix E for full interview guides).

2.4. Data Analysis

Quantitative data were analysed using SPSS version 27. Descriptive statistics including means, standard deviations, and frequencies characterised the sample and main variables. Pearson correlation coefficients examined relationships between system usage and treatment acceptance. Multiple regression analysis identified predictors of treatment acceptance whilst controlling for demographic variables. The regression model was assessed for multicollinearity using Variance Inflation Factor (VIF) and tolerance statistics, and model assumptions (linearity, homoscedasticity, normality of residuals) were evaluated through residual plots and the Durbin-Watson statistic. Independent t-tests and one-way ANOVA compared treatment acceptance across different user groups, with Tukey HSD post hoc tests and effect sizes (η^2) reported where appropriate. Statistical significance was set at $p < 0.05$.

Qualitative data were analysed using thematic analysis following the six-phase approach described by Braun and Clarke [25]. Two researchers independently coded all transcripts in NVivo 14 (QSR International). The coding framework was developed inductively from the data, with initial open coding followed by axial coding to identify relationships between codes. Inter-coder reliability was assessed using Cohen's Kappa, calculated on a subset of 10 transcripts (25% of the qualitative sample). The obtained Kappa value of .893 indicated very good to excellent agreement (see Appendix G). Discrepancies were resolved through consensus discussion. Themes were developed through iterative comparison of codes and review of raw data. Member checking with a subset of six participants verified interpretation accuracy.

Mixed-methods integration was achieved through a joint display table linking quantitative findings with qualitative themes, enabling direct comparison of convergence and divergence [26]. The integration process involved: (1) identifying quantitative results; (2) mapping corresponding qualitative themes; (3) classifying convergence, divergence, or complementarity; and (4) developing meta-inferences. The joint display is presented in Appendix H.

2.5. Ethical Considerations

Ethical approval was obtained from the London-South East Research Ethics Committee (reference 24/LO/0892). All participants provided written informed consent. Data were stored securely in accordance with General Data Protection Regulation requirements. Participant identifiers were removed from transcripts and replaced with pseudonyms. No financial incentives were provided for participation.

3. RESULTS

3.1. Participant Characteristics

Table **1** presents the demographic characteristics of the quantitative sample. The mean age was 54.2 years (SD = 14.6), with 58.3% female participants. Most participants (67.2%) reported using the digital navigation system at least weekly, whilst 18.4% used it daily. Educational attainment varied, with 42.5% holding university degrees. Digital literacy self-ratings were moderate to high, with 71.8% rating themselves as comfortable or very comfortable with technology.

The sample was ethnically diverse: 48.1% White British, 21.1% Black/African/Caribbean, 16.5% Asian/Asian British, 8.3% Mixed/Multiple, and 6.1% Other. Employment status varied, with 37.9% in full-time employment and 23.8% retired. Socioeconomic distribution across Index of Multiple Deprivation quintiles was relatively balanced, though 14.1% resided in the most deprived areas. The most common clinical diagnoses were cardiovascular conditions (23.8%), diabetes/endocrine disorders (18.4%), and respiratory conditions (15.5%). Mean duration of system use was 14.3 weeks (SD = 6.8). Full extended demographic data are provided in Appendix I.

Table 1. Demographic characteristics of participating patients (n = 412).

Characteristic	N	%
Age (years)		
18-39	89	21.6
40-59	156	37.9
60+	167	40.5
Gender		
Female	240	58.3
Male	172	41.7
Ethnicity		
White British	198	48.1
Black/African/Caribbean	87	21.1
Asian/Asian British	68	16.5
Mixed/Multiple	34	8.3
Other	25	6.1
Employment status		
Employed full-time	156	37.9
Employed part-time	68	16.5
Self-employed	34	8.3
Retired	98	23.8
Unemployed	34	8.3
Unable to work	22	5.3
Education level		
Secondary or below	142	34.5
College/vocational	95	23.1
University degree	175	42.5
System usage frequency		
Daily	76	18.4
Weekly	277	67.2
Monthly	42	10.2
Less than monthly	17	4.1

3.2. Digital Navigation System Usage and Treatment Acceptance

Analysis revealed a statistically significant positive correlation between digital navigation system usage and treatment acceptance ($r = 0.64$, $p < 0.001$). However, given the cross-sectional design, this association does not establish causality. It is plausible that patients with higher intrinsic motivation to engage with healthcare are both more likely to use digital systems and more likely to accept treatment recommendations.

Patients who used the system daily reported treatment acceptance rates of 78.3%, compared to 68.6% for weekly users, 61.9% for monthly users, and 52.1% among those using the system less than monthly (Table **2**). One-way ANOVA confirmed significant differences between groups ($F(3, 408) = 48.72$, $p < .001$, $\eta^2 = .264$, indicating a large effect). Tukey HSD post hoc tests revealed that all pairwise comparisons were statistically significant ($p < .05$) except monthly versus less-than-monthly ($p = .012$, still significant but with a smaller effect). Full post hoc results are provided in Appendix J.

Multiple regression analysis indicated that system usage frequency ($\beta = 0.312$, $p < .001$), perceived usefulness ($\beta = 0.298$, $p < .001$), and digital literacy ($\beta = 0.198$, $p < .001$) collectively explained 47.2% of variance in treatment acceptance ($F(3, 408) = 121.583$, $p < .001$). The constant was 2.341 ($SE = 0.612$, $p < .001$). All 95% confidence intervals excluded zero. Multicollinearity was not problematic: tolerance ranged from .652 to .718, and all VIF values were below 2.0 (range: 1.393–1.531). Model assumptions were satisfied: Durbin-Watson = 1.924, indicating independence of residuals; residual plots confirmed linearity and homoscedasticity; and the P-P plot supported normality of residuals. Full regression output, including assumption testing, is provided in Appendices C and D.

Table 2. Treatment acceptance rates by digital navigation system usage frequency.

Usage frequency	n	Acceptance Rate (%)	Mean TAS-9 score (SD)
Daily	76	78.3	39.2 (4.1)
Weekly	277	68.6	34.8 (5.2)
Monthly	42	61.9	31.4 (6.1)
Less than monthly	17	52.1	26.8 (7.3)
Total	412	67.5	34.2 (6.4)

3.3. Qualitative Findings

Thematic analysis of interview data identified three primary themes related to digital navigation system impacts on patient experience and treatment acceptance, encompassing nine sub-themes. The coding framework, developed in NVivo 14, is detailed in Appendix F.

Theme 1: Enhanced Patient Autonomy. This theme comprised three sub-themes: (1.1) control over scheduling, (1.2) access to information, and (1.3) informed decision-making. Participants frequently described how the navigation system increased their sense of control over healthcare decisions. One participant noted: "I can see all my appointments, test results, and messages in one place. It helps me understand what is happening and make better decisions about my care." Another participant commented: "Before the system, I felt like things happened to me. Now I feel involved in the process." A third participant emphasised the sub-theme of informed decision-making: "When the doctor suggested a new medication, I could look up the information leaflet on the app before deciding. That made me feel like it was my choice, not just an instruction." Staff observations supported this theme, with nurses reporting that patients who used the system asked more informed questions during consultations.

Theme 2: Reduced Administrative Burden. This theme comprised three sub-themes: (2.1) efficient booking, (2.2) automated reminders, and (2.3) staff workload reduction. Both patients and staff highlighted the efficiency gains from automated scheduling and reminder functions. A patient explained: "I used to spend ages on the phone trying to book appointments. Now I can do it in minutes on my phone." Another participant highlighted reminders: "The text before my appointment is brilliant. I have ADHD and I forget things, but that reminder means I don't miss appointments anymore." Administrative staff reported similar benefits: "The system handles routine bookings, which frees us to deal with more complex patient needs." However, some participants noted that technical issues occasionally created additional work when appointments did not synchronise correctly with clinic schedules.

Theme 3: Improved Care Continuity. This theme comprised three sub-themes: (3.1) secure messaging, (3.2) perceived support, and (3.3) reduced unnecessary visits. Participants valued the communication features that enabled contact with healthcare providers between appointments. One participant stated: "Being able to message my nurse with questions makes me feel supported. I am less likely to miss appointments or skip medications when I know help is available." Another described perceived support: "Even when I'm not in the building, I know the team is there. I sent a message about side effects and got a reply the same day. That continuity matters." Physicians noted that secure messaging reduced unnecessary appointments whilst maintaining patient engagement: "Patients can ask quick questions without coming in, which saves time for everyone."

3.4. Barriers to System Usage

Despite overall positive findings, several barriers to digital navigation system usage were identified. Older participants (over 70 years) reported greater difficulty with system navigation, with 34.2% rating the interface as confusing. One participant aged 74 noted: "The text is too small, and I don't know where to press. My grandson helps me, but I can't do it alone." Limited internet access affected 12.3% of participants, particularly those from lower socioeconomic backgrounds. Language barriers were noted by 8.7% of participants, as the system was only available in English. A Polish-speaking participant explained: "I understand English, but medical words are difficult. If the app was in Polish, my mother could use it too, but now she is excluded." Staff identified insufficient training as a barrier, with 67% reporting they had received no formal instruction on system features beyond the initial e-learning module. An administrative staff member stated: "We were told to use it, but no one showed us what to do when it breaks. When appointments don't sync, I have to fix it manually."

3.5. Integration of Mixed Methods Findings

Mixed-methods integration through the joint display (Appendix H) revealed strong convergence between quantitative and qualitative findings across all three primary themes. The quantitative correlation between usage and acceptance converged with qualitative narratives of enhanced autonomy and care continuity. The quantitative finding that system usage frequency was the strongest predictor ($\beta = 0.312$), followed closely by perceived usefulness ($\beta = 0.298$), converged with qualitative accounts of administrative efficiency and reduced burden. One area of divergence emerged: whilst the regression model explained 47.2% of variance without including staff training variables, qualitative data revealed that 67% of staff lacked adequate training, suggesting that the quantitative model may underestimate the organisational infrastructure required to sustain patient engagement. This divergence implies that future interventions should address staff competency as a prerequisite for patient-level outcomes.

4. DISCUSSION

This mixed-methods study provides evidence that digital patient navigation systems are positively associated with treatment acceptance among outpatient clinic attendees. The strong positive correlation between system usage and treatment acceptance ($r = 0.64$) suggests that patients who engage regularly with navigation technology demonstrate greater willingness to follow medical recommendations. However, it is essential to emphasise that this observational study cannot establish causality. The observed association may reflect reverse causality or confounding by indication: patients who are inherently more motivated to manage their health may be more likely to adopt digital tools and concurrently more receptive to treatment recommendations. Longitudinal and experimental designs are required to disentangle these relationships.

The quantitative results support the theoretical proposition that digital navigation systems enhance treatment acceptance through multiple pathways, whilst acknowledging the limitations of cross-sectional inference. The Information-Motivation-Behavioural Skills Model provides a useful framework for understanding these relationships [27]. The system delivers information about care pathways and treatment options, enhances motivation through reminders and educational content, and develops behavioural skills through self-management tools. The regression analysis indicates that these factors collectively account for nearly half the variance in treatment acceptance, suggesting that navigation systems influence patient behaviour through mechanisms beyond simple information provision. Notably, the absence of multicollinearity and satisfaction of model assumptions strengthen confidence in the robustness of these statistical relationships.

Qualitative findings illuminate the mechanisms underlying the quantitative associations. The theme of enhanced patient autonomy resonates with self-determination theory, which emphasises the importance of perceived control in health behaviour change [28]. Patients who used the navigation system reported feeling more involved in their care, which translated into greater acceptance of treatment recommendations. This finding has implications for clinical practice, suggesting that healthcare providers should encourage patient engagement with digital tools as a means of promoting treatment adherence, whilst recognising that not all patients have equal capacity to engage.

The reduction in administrative burden identified in this study supports previous research on digital health technologies. A scoping review by Kelly and colleagues examined patient navigation programmes linking individuals to primary care, finding that streamlined appointment processes improved access to services [29]. The current study extends these findings by demonstrating that administrative efficiency gains are associated with improved patient outcomes, not merely system efficiency. However, the cross-sectional design means we cannot conclude that efficiency gains directly cause improved acceptance.

Care continuity emerged as a critical factor in patient experiences. The ability to communicate with healthcare providers between appointments created a sense of ongoing support that encouraged treatment acceptance. This finding is consistent with research on patient navigation in cancer care, where continuous support throughout the care continuum improved satisfaction and adherence [30]. The digital medium enables this continuity at scale, potentially reaching larger patient populations than traditional in-person navigation programmes.

The barriers identified in this study warrant attention from healthcare organisations and system developers. The age-related difficulties with system navigation suggest that interface design must accommodate users with varying levels of digital literacy. Previous research has demonstrated that older adults can successfully use digital health technologies when appropriate support and training are provided [31]. Healthcare organisations should invest in digital inclusion initiatives to ensure that navigation systems do not exacerbate existing health inequalities.

Language barriers and limited internet access represent structural determinants of digital exclusion that require systemic responses. The finding that 8.7% of participants faced language barriers highlights the need for multilingual navigation platforms in diverse populations. Similarly, the 12.3% of participants with limited internet access indicates that digital navigation systems cannot entirely replace traditional care coordination methods. Hybrid models that combine digital and in-person navigation may be necessary to ensure equitable access. The selection criteria requiring English literacy and four weeks of system use likely excluded the most vulnerable populations, potentially inflating the observed treatment acceptance rates.

The staff training deficit identified in this study represents a modifiable barrier to system effectiveness. Previous research has shown that healthcare worker engagement with digital technologies influences patient adoption [32]. Organisations implementing navigation systems should provide comprehensive training for all staff members, not only those in direct patient care roles. Administrative staff, in particular, require training on system features to assist patients effectively.

5. STRENGTHS AND LIMITATIONS

The mixed-methods design enabled both statistical generalisation and in-depth understanding of patient experiences. The sample size exceeded minimum requirements for power analysis, providing confidence in quantitative findings. The inclusion of multiple clinics enhanced generalisability across different clinical contexts. Data collection over eight months captured variations in system usage patterns and seasonal fluctuations in clinic attendance. The use of a validated outcome instrument (TAS-9) with strong psychometric properties in this population strengthens the reliability of the primary outcome. Independent dual coding with excellent inter-coder reliability (Cohen's $\kappa = .893$) and member checking enhance the trustworthiness of qualitative findings.

For limitations, the cross-sectional design prevents causal inference regarding the relationship between navigation system usage and treatment acceptance. It is equally plausible that highly motivated patients are more likely to engage with digital navigation systems and accept treatment recommendations. Longitudinal studies tracking patients over time would strengthen causal conclusions. Second, self-report measures of treatment acceptance may not reflect actual behaviour, and are susceptible to recall bias and social desirability bias. Patients may overreport adherence to present themselves favourably to researchers. Third, the study was conducted in a single city (London), potentially limiting generalisability to other geographic contexts, particularly rural or less digitally mature settings. Fourth, the study examined a specific navigation system (CarePath Navigator), and findings may not transfer to platforms with different features or interfaces. Fifth, selection bias is a significant concern. Participants were required to have access to the digital navigation system for at least four weeks and to read English. These criteria may have excluded patients with lower digital literacy, individuals from disadvantaged socioeconomic groups, and non-English-speaking populations. The resulting sample may overestimate treatment acceptance rates compared to the broader outpatient population. Sixth, 67% of staff reported inadequate training, which may have influenced their ability to support patients and thus affected observed outcomes.

6. IMPLICATIONS FOR PRACTICE

Findings from this study carry several implications for healthcare practice and policy. Healthcare organisations implementing digital navigation systems should prioritise user-centred design that accommodates patients with varying levels of digital literacy. Interface features such as clear navigation menus, large text options, adjustable font sizes, and accessible help functions can reduce barriers for older users. Investment in multilingual platforms is essential for serving diverse patient populations.

Training programmes for both patients and staff represent critical success factors. Patients require instruction on system features and benefits to achieve optimal usage. Staff training should extend beyond technical operation to include strategies for encouraging patient engagement and troubleshooting common problems. Organisations should consider peer support models wherein experienced users assist newcomers, reducing the burden on clinical staff.

Integration with existing electronic health record systems emerged as an important consideration. Staff interviews highlighted that navigation systems function most effectively when they synchronise with clinical documentation and scheduling systems. Healthcare organisations should evaluate integration capabilities when selecting navigation platforms, prioritising solutions that minimise duplicate data entry and workflow disruption.

SUGGESTIONS FOR FUTURE RESEARCH

Future research should employ longitudinal designs to examine causal relationships between digital navigation system usage and treatment outcomes over time. Randomised controlled trials comparing navigation system access with usual care would provide the strongest evidence for effectiveness. Studies examining cost-effectiveness are needed to inform resource allocation decisions. Additional research should investigate optimal strategies for supporting older adults and other populations facing digital exclusion.

Qualitative research exploring patient experiences in greater depth would complement the findings of this study. Particular attention should be paid to understanding why some patients choose not to use navigation systems despite availability. Investigation of staff perspectives on system implementation and maintenance would inform organisational strategies for successful adoption. Future mixed-methods studies should incorporate joint display methodology from the design phase to strengthen integration.

ETHICAL APPROVAL

Approved

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None.

CONFLICT OF INTERESTS

The author declares no conflict of interests.

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