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REVIEW

Application of Patient Navigation in Colorectal Cancer Screening: A Scoping Review

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Background: The global incidence and mortality of colorectal cancer are rising annually, posing a severe threat to public health. Studies have shown that patient navigation can significantly improve adherence to colorectal cancer screening, thereby reducing incidence and mortality rates. This review aims to summarize the existing evidence on the application of patient navigation in colorectal cancer screening, to provide an evidence-based foundation for subsequent research and clinical practice.

Methods: Based on Arksey and O'Malley's scoping review methodological framework, a search was conducted in PubMed, Embase, Cochrane Library, Web of Science, CNKI, VIP, Wanfang, and SinoMed for relevant studies published from database inception to May 20, 2025.

Results: 25 studies were included. The findings indicate that navigator types primarily include trained professional navigators, medical navigators, and novel navigators. Service delivery methods were diverse, with telephone navigation being the primary mode, often combined with SMS, face-to-face, email, and other multi-modal collaborative interventions. Navigation service content encompassed six main themes: colorectal cancer education, barrier assessment and resolution, guidance and reminders for guaiac fecal occult blood test/fecal immunochemical test and bowel preparation, colonoscopy process management, and post-examination follow-up. Efficacy evaluation demonstrated that patient navigation overall enhances colorectal cancer screening adherence, although heterogeneity existed in outcomes such as bowel preparation quality and patient satisfaction.

Conclusion: Current patient navigation services for colorectal cancer screening have formed a relatively mature intervention framework. However, there remains room for optimization in areas like the balance of service content and support for non-medical barriers. Future practice can draw upon existing research to implement full-cycle, culturally adapted, and cost-effective patient navigation interventions tailored to national contexts.

Keywords: patient navigation, colorectal cancer, colonoscopy, guaiac fecal occult blood test, fecal immunochemical test, scoping review

Background

Colorectal cancer (CRC) is a malignant tumor originating in the colon or rectum. It ranks as the third most common cancer globally, accounting for approximately 10% of all cancer cases, and is the second leading cause of cancer-related deaths, posing a severe threat to public health.[1] According to World Health Organization data, in 2020, there were over 1.9 million new CRC cases worldwide and more than 930,000 deaths. By 2040, the CRC burden is projected to increase significantly, with annual new cases reaching 3.2 million (a 63% increase) and annual deaths reaching 1.6 million (a 73% increase).[1] Data from the China National Cancer Center reflects this global trend, showing continuously rising CRC incidence and mortality rates in China, with CRC ranking second in incidence and fourth in mortality among malignancies.[2] This highlights the urgency of implementing effective prevention strategies.

Research indicates that regular CRC screening is the most effective approach for detecting precancerous lesions (adenomas) and early-stage cancers, enabling timely intervention and significantly reducing CRC incidence and mortality.[3] Screening methods recommended by the American Cancer Society (ACS) include guaiac fecal occult blood

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testing (gFOBT), fecal immunochemical testing (FIT), multi-target stool DNA testing (mt-sDNA), colonoscopy, CT colonography (CTC), and flexible sigmoidoscopy.[4] Among these, gFOBT/FIT and colonoscopy are the most widely used in clinical practice. gFOBT/FIT is favored for its simplicity, non-invasiveness, and high cost-effectiveness; while colonoscopy offers the unique advantage of direct visualization of the entire colorectal mucosa, allowing for simultaneous diagnosis, biopsy, and polyp removal, making it the diagnostic gold standard.

However, despite screening's potential for early detection and significant reduction of CRC risk and disease burden, CRC screening adherence remains low globally,[5,6] with significant geographical disparities. The ACS 2017 report indicated a CRC screening rate of 63% among US adults aged 50 and older;[7] a study in France showed its citizens' CRC screening adherence was slightly above 40%;[6] Turkey reported a mere 3.2% screening rate among its citizens;[8] and a study in China revealed a colonoscopy participation rate of only 14% among high-risk Chinese citizens.[9] This low screening participation is complex, stemming from patient-level barriers such as lack of knowledge, fear of the procedure or results, embarrassment, financial constraints, logistical challenges (eg, transportation, taking time off work), and distrust of the healthcare system,[10,11] as well as healthcare system-level barriers including insufficient physician recommendation, limited access to screening facilities (especially in underserved regions), cumbersome colonoscopy scheduling processes, stringent bowel preparation requirements, the invasive nature of colonoscopy, and concerns about potential complications (eg, bleeding, perforation).[10–13] Therefore, developing targeted interventions to improve CRC screening adherence based on these barriers is crucial.

Patient navigation (PN) is a patient-centered healthcare support service. Its core function is to provide comprehensive, personalized guidance and assistance through navigators, helping patients successfully navigate the entire healthcare journey, from prevention and diagnosis to treatment and rehabilitation within complex healthcare systems, reducing barriers caused by information asymmetry and cumbersome processes.[14] PN was first proposed by Freeman et al[15] who applied it to breast cancer screening patients in 1990. The results showed that PN effectively eliminated barriers during patient care, significantly shortening diagnosis and treatment times and increasing the 5-year survival rate from 39% to 70%. From 2002 to 2005, PN programs received significant funding from the US National Institutes of Health (NIH), gradually evolving into a healthcare model integrated throughout the cancer care continuum.[16] Subsequently, numerous studies confirmed PN's significant advantages in improving colonoscopy screening rates, optimizing follow-up processes, and promoting health equity, making it a vital tool for implementing CRC screening guidelines.[17,18]

However, current research shows considerable heterogeneity in PN applications for CRC screening regarding navigator types, implementation methods, service content, and evaluation indicators. This heterogeneity poses challenges for synthesizing evidence, determining best practices, and guiding the development of scalable and sustainable PN models. Furthermore, research on PN models specifically tailored to the Chinese healthcare system, with cultural adaptation and cost-effectiveness, is particularly scarce. Therefore, to systematically map the current landscape and synthesize international experience, this study employs the scoping review methodology to comprehensively collect and summarize PN-related literature. The objectives of this study are: (1) to systematically synthesize evidence on the application of various types of PN in CRC screening, covering navigator roles, implementation methods, and core service content; (2) to summarize existing PN evaluation indicators and their actual effects; and (3) to identify key facilitators and research gaps in the existing literature. By integrating these elements, the study aims to provide a scientific basis and practical reference for the development, implementation, and evaluation of localized PN models, especially in underserved regions like China.

Methods

This scoping review was conducted in accordance with the scoping review report specification checklist (PRISMA extension for scoping reviews, PRISMA-ScR) and adhered to Arksey and O'Malley's (2005) methodological framework. The framework includes five key steps: identifying the research question, searching for relevant studies, selecting studies, charting the data and collecting, summarizing and reporting the results. The review protocol was registered on the OSF (Open Science Framework) registries, with the following registration doi:10.17605/OSF.IO/5T6RW.

Identifying the Research Questions

The review addressed the following research questions:

1. What types of personnel provide PN services in CRC screening?
2. What are the implementation methods of PN in CRC screening?
3. What specific service content does PN provide for the CRC screening population?
4. What are the outcome indicators of PN application and their effects?

Search Strategy

To map existing research in this field, we systematically searched four international databases: PubMed, Embase, Web of Science, and Cochrane Library, and four chinese databases: CNKI, Wanfang, VIP, and SinoMed. Subject headings and free-text terms were combined using Boolean operators to construct search strategies. Relevant references were also tracked. The search timeframe was from database inception to May 20, 2025. English search terms included: "patient navigat/nurse navigator/care coordinat/nurse coordinat", "colonoscop/enteroscop*/colonoscopy screening/colorectal cancer screening/colorectal carcinoma screening/colon cancer screening/CRC screening". The PubMed search strategy (as an example for English databases) is shown in Box 1.

Inclusion Criteria

Inclusion criteria were formulated based on the PCC (Participants, Concept, Context) framework.

1. Participants (P): Populations undergoing CRC screening, including the general population, individuals not undergoing regular screening, high-risk groups, or those with a family history of CRC.
2. Concept (C): Interventions involving PN, including professional navigation, nurse/physician navigation, SMS navigation, peer navigation, lay navigator navigation, etc.
3. Context (C): CRC screening.

Exclusion Criteria

1. Studies not detailing the PN intervention methods.
2. Studies without a separate PN group, making it impossible to evaluate the independent effect of PN.
3. Studies where the full text could not be obtained.
4. Studies not published in English or Chinese.

Literature Screening

Zotero 7.0 software was used to manage literature and remove duplicates. Two researchers independently screened the literature strictly according to the inclusion and exclusion criteria. All reviewers received standardized training before screening to ensure consistency in the assessment process. Titles and abstracts were initially screened; full texts of

Box 1 Search Strategy

#1 patient navigation[MeSH Terms]
#2 patient navigat*[Title/Abstract] OR nurse navigator[Title/Abstract] OR care coordinat*[Title/Abstract] OR nurse coordinat*[Title/Abstract]
#3 #1 OR #2
#4 colonoscopy[MeSH Terms]
#5 colonoscop*[Title/Abstract] OR enteroscop*[Title/Abstract] OR colonoscopy screening[Title/Abstract] OR colorectal cancer screening[Title/Abstract] OR colorectal carcinoma screening[Title/Abstract] OR colon cancer screening[Title/Abstract] OR CRC screening[Title/Abstract]
#6 #4 OR #5
#7 #3 AND #6
#8 Filter: Randomized Controlled Trial, Clinical Trial

potentially eligible articles were then reviewed. Disagreements were resolved through discussion or consultation with a third reviewer. Reasons for exclusion were documented in detail. The search results are illustrated in the PRISMA flow diagram (Figure 1).

Data Extraction

A standardized data extraction chart was developed in Microsoft Excel, based on Arksey and O'Malley's data extraction form and finalized after consultation among all authors to ensure comprehensive data collection from the included studies. Two investigators independently gathered relevant information from the eligible records. Extracted content included: author, country, publication year, study type, study population, sample size, navigator type, navigation implementation method, navigation service content, control group measures, and outcome indicators.

Results

Overview of Findings

The initial search yielded 708 relevant records (see Figure 1). After removing duplicates, 456 unique articles remained. Title and abstract screening excluded 391 articles. Full-text review of the remaining 65 articles excluded 40 for not meeting inclusion criteria: 4 full texts unavailable, 3 study populations ineligible, 11 abstracts, 9 study protocols, 7 progress reports, 5 lacking an independent PN group, and 1 comparing different navigation types. Ultimately, 25 studies[10,13,17–39] were included in this scoping review.

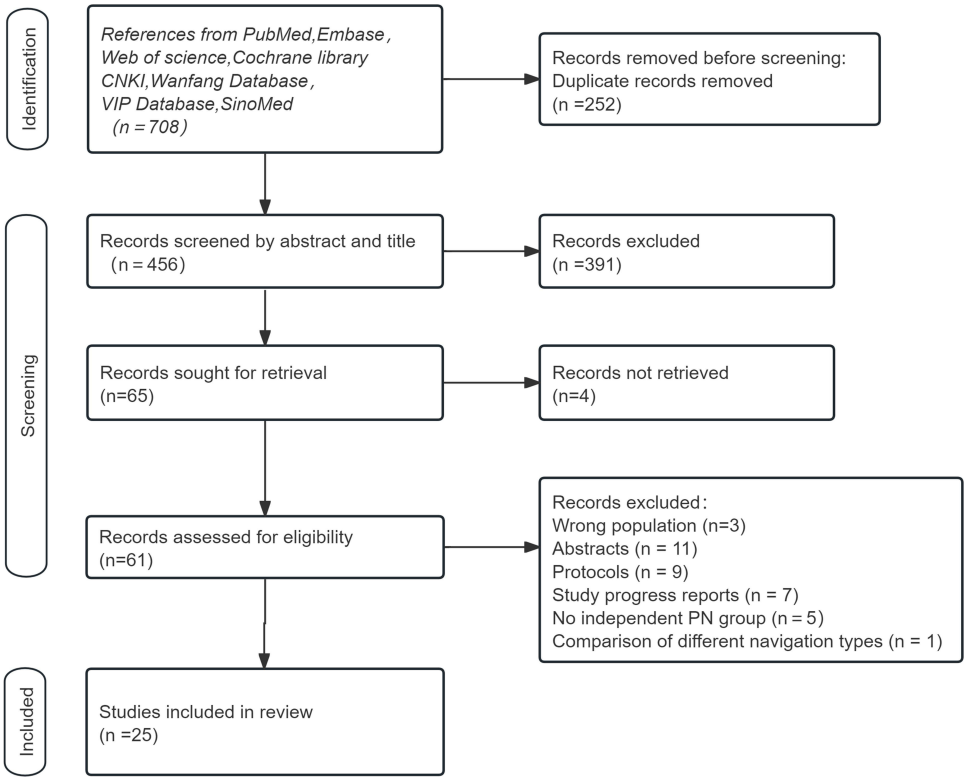

Figure 1 This flow diagram outlines the step-by-step process of literature screening and selection for the present review, in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Initially, a total of 708 potential records were identified through comprehensive searches across eight databases, including PubMed, Embase, Web of Science, Cochrane Library, CNKI, Wanfang Database, VIP Database, and SinoMed. Prior to formal screening, 252 duplicate records were removed, leaving 456 records for title and abstract screening. After title and abstract assessment, 391 records were excluded for failing to meet the preliminary eligibility criteria (eg, irrelevant research topics). A total of 65 records were then sought for full-text retrieval, among which 4 records could not be retrieved, resulting in 61 records being assessed for full-text eligibility. During the full-text eligibility assessment, 36 records were excluded for specific reasons: 11 were abstracts only (no full-text available), 9 were study protocols (not completed research), 7 were study progress reports (incomplete data), 5 lacked an independent physical navigation (PN) group, 3 involved an incorrect study population, and 1 focused on comparing different navigation types (not aligned with the review's research question). Finally, 25 studies that met all eligibility criteria were included in the final review and data analysis.

Study Characteristics

The 25 studies were published between 2005 and 2025. Twenty-two were randomized controlled trials (RCTs), and three were non-randomized controlled trials (NRCTs). Studies were predominantly from the United States (19), followed by France (2), China (2), Canada (1), and Turkey (1). Among the included studies, three[29,36,37] used a three-arm design. Given that their grouping did not substantially interfere with the assessment of navigation effectiveness, they were still included in the analysis. The basic characteristics of the included literature are detailed in Table 1.

Navigator Types

There are three main types of navigators. ①Trained Professional Navigators: Thirteen studies[10,17,23,25–27,29,31,32,34–37]utilized navigators who were systematically trained professionals, capable of executing standardized processes. These included social

Table 1 Study Characteristics

Included Study	Country	Year	Study Type	Study Population	Sample Size (Intervention/ Control, n)	Intervention Group			Control Group	Outcomes
						Navigator Type	Implementation Method	Service Content		
Jandorf et al[19]	USA	2005	RCT	①	38/40	Research assistant	Phone	A-E	Routine screening recommendation	ag
Temucin et al[20]	Turkey	2020	RCT	①	52/51	Nurse	Phone+ F2F	A-C F	Routine screening recommendation	ai
Green et al[21]	USA	2014	RCT	②	70/70	Nurse	Phone	A-D	Medical follow-up and tracking	aek
Ritvo et al[22]	Canada	2015	RCT	①	2629/2611	Nurse	Phone+ F2F	A-D	Opportunistic screening	a
Guillaume et al[23]	France	2017	RCT	③	14373/14556	Social Worker	Phone	A-C	Mailed gFOBT reminder	al
Enard et al[10]	USA	2015	RCT	①	135/168	Trained Navigator	Phone+ Email	A-D	Mailed education materials	a
Bourmaud et al[13]	France	2023	RCT	④	11657/12624	Peer Lay Navigator	Phone+ F2F	ABDG	Routine CRC screening service	am
DeGroff et al[24]	USA	2017	RCT	④	429/427	Bilingual Lay Navigator	Phone+ F2F +Email	B-E	Usual care	ab
Myers et al[25]	USA	2014	RCT	①	384/380	Trained Navigator	Phone	BC	Mailed instructions and reminder	a
Menon et al[26]	USA	2020	RCT	①	211/134	Trained Navigator	Phone	BCD	Group education	af
Horne et al[27]	USA	2015	RCT	⑤	578/642	Trained Navigator	Not specified	AB	CRC education	a
Solonowicz et al[28]	USA	2022	RCT	⑥	833/792	IT Platform	SMS	C	Usual care	abc
Jandorf et al[29]	USA	2013	RCT	①	181/123/46	Peer & Professional Navigator	Phone	ABCH	Basic facts and logistical help	a
Paskett et al[30]	USA	2020	RCT	⑦	515/528	Not specified	Phone	BE	Website intervention	a
Lasser et al[31]	USA	2011	RCT	①	235/230	Trained Navigator	Phone+ Email	ABCE	Usual care	ad
Coronado et al[17]	USA	2025	RCT	②	479/488	Trained Navigator	Phone	A-E	Routine medical follow-up	abe

(*Continued*)

Table 1 (Continued).

Included Study	Country	Year	Study Type	Study Population	Sample Size (Intervention/ Control, n)	Intervention Group			Control Group	Outcomes
						Navigator Type	Implementation Method	Service Content		
Rohan et al[32]	USA	2016	RCT	⑥	420/423	Trained Navigator	Phone+ F2F+ Email	ABCF	Usual care	cj
Mahmud et al[33]	USA	2019	NRCT	⑥	21/50	IT Platform	SMS	C	Usual care	abg
Christie et al[34]	USA	2008	RCT	④	13/8	Health Educator	Phone+ Email	A-E	Routine medical follow-up	abc
Percac-Lima et al[35]	USA	2009	RCT	④	409/814	Health Center Outreach Worker	Phone+ F2F	ABC	Usual care	ad
Myers et al[36]	USA	2013	RCT	①	312/317/316	Trained Navigator	Phone	ABC	Usual care	a
Coronado et al[18]	USA	2021	RCT	②	200/215	Nurse	Phone	A-E	Usual care	a
Cole et al[37]	USA	2017	RCT	①	234/238/259	Communi-ty Health Worker	Phone	ABCE	Motivational Interviewing	a
Wan Wenlin et al[38]	China	2024	NRCT	①	461/460	Nurse	Phone	A-E	Usual care	ad
Wang Fei[39]	China	2023	NRCT	⑧	45/48	Nurse	Phone+ SMS+ WeChat	A-E	Usual care	aeh

Notes: Study Population Key: ①Individuals not undergoing regular CRC screening ②gFOBT/FIT or sigmoidoscopy positive ③Individuals aged 50–74 years ④Low-income /impoverished or rural residents ⑤Urban African American adults (65–75 yrs) ⑥Individuals scheduled for colonoscopy ⑦First-degree relatives of CRC patients ⑧Advanced colorectal adenoma patients. Navigation Service Content Key: A: CRC Education (screening importance, risks, methods, insurance) B: Barrier Assessment & Resolution C: gFOBT/FIT & Bowel Prep Guidance/Reminders D: Colonoscopy Process Guidance E: Post-examination Follow-up F: Personalized Guidance/Motivational Interviewing G: Social Issue Resolution (bills, legal, etc). H: Sharing Personal Colonoscopy Experience. Outcomes Key: a: CRC Screening Adherence b: Bowel Preparation Quality c: Patient Satisfaction d: Lesion Detection Rate e: Time to Complete Colonoscopy f: Primary Care Visit Rate g: Colonoscopy Appointment Adherence h: CRC Health Belief Score i: Perceptions of Screening Benefits/Barriers j: Time Spent on Navigation k: Reasons for Non-completion/Delay l: Reduction of Social Inequalities m: Time Delay to Screening.

workers, health coordinators, health center outreach workers, or community health workers, familiar with community environments and possessing inherent advantages in health promotion and linking community resources/social support. ②Medical Navigators: Primarily nurses or other healthcare professionals. Six studies[18,20–22,38,39] reported nurses acting as navigators, some of whom received specific PN training and motivational interviewing training. Three studies[10,17,29] involved other healthcare professionals providing navigation; their medical background and communication experience facilitated service delivery. ③Novel Navigators: Included IT platforms,[28,33] peer/bilingual lay navigators,[13,24] peer navigators who had recently undergone colonoscopy screening,[29] and research assistant navigators sharing cultural backgrounds with participants.[19] One study[30] did not specify navigator qualifications.

Navigation Service Implementation Methods

The main service implementation methods of PN are as follows. ①Telephone navigation (n=22):[10,13,17–26,29–32,34–39] The most primary implementation method, used to provide CRC education, barrier assessment and resolution, guidance reminders, and follow-ups. It has the advantages of high efficiency and convenience, strong interactivity, and breaking through time and space constraints. ②Face-to-face navigation (n=6):[13,20,22,24,32,35] Usually used as a supplement to telephone navigation. It builds trust through on-site assessment, education, resource coordination, solving practical problems, and providing emotional support, addressing in-depth psychological and cultural barriers, and is known as "the most warm navigation form". ③SMS navigation (n=2):[28,33] Sends standardized, step-by-step guidance messages (eg, on diet, medication) and reminder information to participants through information platforms, and provides question-and-answer support. This method is low-cost, automated, and easy to operate. ④Email navigation (n=4):[10,24,32,34]

Suitable for delivering standardized information, written materials, and reminders, with traceability, and often used in combination with telephone. ⑤Combined navigation methods (n=10):[10,13,20,22,24,31,32,34,35,39] To improve efficiency and experience, two or more navigation methods are often combined (eg, telephone + email, telephone + face-to-face, telephone + face-to-face + email) to form a multi-dimensional, full-process support system. It is worth noting that the study by Wang Fei et al[39] combined WeChat, a widely used APP in China (WeChat + telephone + SMS), reflecting the exploration of using localized information tools to optimize service accessibility, and providing preliminary experience for China's future innovation in navigation models.

Navigation Service Content

Navigation service content covers six major themes. ①CRC education (n=18): Explaining the significance of screening, risk factors, screening methods, medical insurance coverage information, etc. ②Barrier assessment and resolution (n=23):[10,13,17–27,29–32,34–39] Core function. Assessing individual barriers such as fear, difficulty in making appointments, transportation inconvenience, insurance reimbursement issues, procedural concerns, cultural conflicts, etc., and providing targeted support such as psychological counseling, assistance with appointments, transportation guidance, explanations of insurance reimbursement procedures, procedural explanations, and language and cultural support. ③Guidance and reminders for gFOBT/FIT testing and bowel preparation (n=22) [10,17–26,28,29,31–39]: Providing or mailing testing kits, guiding usage methods, and reminding to submit samples; detailed guidance on bowel preparation procedures, including confirming bowel preparation solutions, reminders for low-residue and clear liquid diets, and detailed instructions on the timing and method of taking bowel preparation solutions. ④Guidance on colonoscopy procedures (n=12):[10,13,17–19,21,22,24,26,34,38,39] Including introduction to preoperative preparation, anesthesia methods, and postoperative precautions. ⑤Post-examination follow-up (n=10):[17–19,24,30,31,34,37–39] Confirming the completion of examinations, inquiring about reasons for non-completion and promoting subsequent screening; following up on examination results, such as referring those with positive gFOBT results for colonoscopy, and assisting in making appointments for diagnosis and treatment for those with detected lesions. ⑥Other supportive services (n=4): Including personalized support;[32] motivational interviewing;[20] assistance in solving social issues such as bills, rent, and legal matters;[13] and peer sharing of personal experiences.[29]

Outcome Measures and Effects

Six main aspects are involved. ①CRC screening adherence: This is the most important outcome indicator for evaluating the effect of navigation services. Most studies[13,17,18,20,22–26,28,31,35–39] showed that PN can improve the completion rate of gFOBT/FIT and endoscopic examination rates, but a few studies[21,29,30,33,34] did not observe significant differences, and three studies[10,19,27] indicated that PN mainly improved adherence to endoscopic examinations but had no effect on gFOBT. Among the 25 included documents, only one study[32] did not use this as an outcome indicator. ②Bowel preparation quality: Four studies[17,24,33,34] reported no significant difference in bowel preparation adequacy between PN and routine care, while only one RCT[28] showed that automated SMS navigation can improve bowel preparation quality for colonoscopies performed for screening/monitoring purposes (no significant effect on diagnostic colonoscopies). ③Patient satisfaction: Results were heterogeneous. Two studies[32,34] reported that participants highly recognized the navigation services and were willing to recommend them to family and friends; one study[28] showed that the satisfaction score of the automated SMS navigation group was similar to that of the routine care group, which may be related to the lack of interpersonal interaction. ④Lesion detection rate: Two studies[31,38] showed that PN services helped improve the detection rate of colorectal lesions, and one study[35] showed that PN can increase the polyp detection rate but had no statistical significance on the detection rate of related cancers. ⑤Time to complete colonoscopy: Three studies involved the time to complete colonoscopy, but the conclusions were inconsistent. One study[17] reported that PN can shorten the time from abnormal results to completion of colonoscopy; the other two studies[21,39] showed no difference in the time to complete colonoscopy between the two groups. ⑥Other indicators: Some studies also reported positive effects of PN services on participants' primary care clinic visit rates,[26] colorectal cancer health beliefs,[39] and perceptions of CRC screening benefits and barriers.[20]

Discussion

This review systematically synthesized the application of PN in CRC screening across 25 studies over the past two decades. To our knowledge, this is the first study to comprehensively evaluate the existing evidence on PN application in CRC screening. The review found significant variations in navigator types, implementation methods, service content, and effectiveness.

Diverse Navigator Types, Trained Professionals are Mainstay

As implementers of PN interventions, the role types and qualifications of navigators significantly affect navigation effects. Professional navigators, after systematic training, can not only implement standardized intervention processes but also adhere to the "patient-centered" concept, proactively identify and resolve barriers, and effectively improve screening adherence,[17,26] making them the dominant type in current studies. Navigators with medical professional backgrounds, such as nurses and doctors, rely on their medical knowledge, familiarity with screening processes, and ability to interpret results to provide professional medical guidance and assist in subsequent diagnosis and treatment, playing an irreplaceable role in navigator types. In addition, the emergence of innovative roles such as information platforms, peer/bilingual non-professional navigators, and peer navigators reflects that PN is developing towards lower costs, higher accessibility, and more humanistic care. In future practices, based on existing studies, a systematic training system covering communication skills, basic medical knowledge, resource linking, and cultural sensitivity can be constructed, and a national unified navigator qualification certification system in line with national conditions can be established to standardize the role positioning and access thresholds of navigators.

Diverse Implementation Methods: Telephone Dominates, Combination Is the Trend

Included studies showed that PN has various implementation methods, including telephone, face-to-face, SMS, and email, which are applicable to multiple scenarios and different needs. Telephone navigation has become the dominant method of navigation services due to its core advantages of wide coverage, efficient interaction, and personalized communication. However, attention should also be paid to the limitations: telephone navigation lacks written intuitiveness, automated reminders, and it is difficult to profoundly solve certain psychological and cultural barriers; face-to-face navigation has high costs and narrow coverage; SMS navigation has limited interaction depth and difficulty in solving complex problems; Email navigation has weak interactivity. Therefore, the combination of multiple methods has become an inevitable trend. For example, Rohan et al[32] combined telephone, email, and face-to-face methods to construct an intervention model that is both efficient and standardized, and full of humanistic care. It not only improved the participation rate and quality of CRC screening but also effectively narrowed the health gaps among low-income, ethnic minority, and other groups through the balance between personalization and standardization, providing an excellent model for navigation programs.

Future research should explore the effectiveness of different combination models based on national contexts to provide stronger evidence for developing more universal and precise navigation approaches. For instance, leveraging the high WeChat app usage in China, a combination model of "WeChat Official Account for standardized information + telephone for personalized guidance + face-to-face for in-depth communication when necessary" could be prioritized to maximize CRC screening adherence and patient satisfaction among Chinese residents.

Comprehensive but Uneven Service Content

Current CRC screening navigation focuses on "full-cycle support", systematically addressing key issues throughout the participant journey from scheduling to completion via the six-theme service system, forming a complete intervention loop. However, existing services heavily concentrate on CRC education, barrier resolution, and gFOBT/FIT/bowel prep guidance, while colonoscopy procedure guidance and post-screening follow-up are relatively weak, indicating uneven coverage. Secondly, support for non-medical barriers is insufficient; social issues like rent or employment, though mentioned in isolated cases, lack systematic solutions, and such problems often lead to screening discontinuation. Future efforts should optimize content, strengthen weak areas (eg, supplement visual procedure guides, refine post-procedural complication identification/management guidance, enhance post-screening follow-up), and actively explore partnerships

with community service agencies to provide tangible social support (eg, affordable housing, employment counseling), building a more comprehensive support network.

Patient Navigation Generally Improves CRC Screening Adherence; Other Effects Need Further Confirmation

As an important strategy to optimize the CRC screening process, studies have shown that PN has a positive effect on improving CRC screening adherence, with only few studies[21,33,34] failing to observe significant differences, which may be related to small sample sizes (13 in the experimental group and 8 in the control group)[34] and differences in navigator qualifications (automated SMS navigation).[33] In terms of bowel preparation quality, the overall effect of PN is unclear, which may be related to the fact that routine care already provides basic support and confounding factors are not fully controlled, suggesting that more targeted interventions, such as enhanced education and personalized plans, may be needed to improve bowel preparation quality. At the same time, patient satisfaction varies with implementation methods. Interpersonal interactions in telephone and face-to-face navigation can better enhance trust and satisfaction, while automated methods have relatively weak experience, suggesting that a balance between efficiency and humanistic care needs to be struck, especially in high-contact medical service scenarios, where the value of interpersonal interaction is irreplaceable. In addition, the research evidence that PN significantly improves the detection rate of colorectal lesions[38] and its possible role in shortening examination waiting time[17] together indicate that it has the potential to improve patients' clinical outcomes. Finally, the positive impact of PN on indirect indicators such as participants' colorectal cancer health beliefs and primary care utilization suggests that it may fundamentally improve the accessibility of CRC prevention and control by reshaping cognitive and behavioral patterns. It is worth noting that only one study[32] evaluated the time spent on navigation activities but did not explore its relationship with navigation effects. In the future, researchers can standardize navigation activities, reasonably allocate time for navigation activities, and evaluate their impact on CRC screening adherence.

Limitations

Although this study provides a comprehensive review of PN application in CRC screening, several methodological limitations should be noted. Firstly, due to language barriers, only Chinese and English literature were included, potentially omitting important information. Secondly, limited resources led to the exclusion of grey literature and unpublished studies; thus, results might be influenced by publication bias. Finally, the lack of quality assessment of primary studies means the influence of low-quality research on results cannot be ruled out. In the future, our team will consider including multi-language literature and grey literature to mitigate language and publication bias, and conduct a systematic review and meta-analysis in this field to enhance the strength of evidence.

Conclusion

This scoping review systematically synthesized the application characteristics of PN in CRC screening, including navigator types, implementation methods, service content, outcome measures, and effects. Current evidence indicates PN is relatively mature in providing initial screening guidance and resolving immediate barriers, with its feasibility and effectiveness in improving CRC screening adherence preliminarily validated. The included literature predominantly originates from the US (19 studies), with only a few studies from other countries, reflecting that PN in these nations requires further development. In future practice, drawing on existing research findings and integrating national contexts, full-cycle, culturally adaptable, and cost-effective patient navigation interventions should be implemented to enhance CRC screening adherence, efficiency, and early diagnosis rates among populations worldwide, ultimately achieving the goal of early detection and treatment of CRC.

Patient and Public Involvement

Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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