Exploring Innovative Approaches to Self-Management in Colorectal Cancer for Enhancing Quality of Life and Patient Outcomes - A Scoping Review

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KEYWORDS

Self-management, Colorectal cancer, Bowel cancer, Quality of Life, QoL

ABSTRACT

Introduction: Colorectal cancer is a leading global malignancy, and its diagnosis can significantly impact patients' quality of life. Therefore, exploring innovative approaches to self-management is crucial to empower patients and improve their outcomes. **Objectives**: This study aims to conduct a scoping review of innovative approaches to self-management in colorectal cancer for enhancing quality of life and patient outcomes. **Methods**: Literature was selected using the PC (Population, Concept) approach. The literature search was conducted following the PRISMA method. Databases such as PubMed, ProQuest, Cochrane Library, Science Direct, and Google Scholar were used to find relevant articles. Full-text articles published in English in the last ten years were evaluated. Eleven articles met the inclusion criteria. **Results**: 11 articles met the inclusion criteria. Innovative approaches to colorectal cancer self-management, such as personalized psycho-educational programs, the use of technology, and structured counseling, show the potential to improve patient's quality of life. **Conclusions**: Innovative approaches to self-management of colorectal cancer have great potential to improve patient quality of life and treatment outcomes. However, further research is needed to understand the effectiveness of this intervention in the long term. Considering the patient's specific context and needs, these interventions must be integrated into clinical practice.

1. Introduction

Colorectal cancer, or cancer of the colon and rectum, has become a global health concern. Its prevalence is rising, making it the third most common cancer and the fourth leading cause of cancer-related deaths [1]. GLOBOCAN 2020 data shows more than 1.9 million new cases and nearly 1 million deaths worldwide [2]. This increase is concerning, especially in developing countries [3]. Unhealthy lifestyles, poor diet, and lack of physical activity increase risk [4]. The impact of colorectal cancer on patients' quality of life is very significant [5]. Symptoms such as fatigue, abdominal pain, changes in bowel habits, and weight loss can lead to physical limitations, emotional distress, and decreased social participation [6]. Treatments such as surgery, chemotherapy, and radiation also bring side effects that have a negative impact. [7].

After colorectal cancer surgery, patients face various complex challenges, including physical, emotional, and psychosocial ones. [8]. Physical challenges such as fatigue, pain, and digestive problems can disrupt daily activities and limit bodily functions [9]. Not infrequently, patients also experience emotional distress such as anxiety, depression, and fear of disease recurrence [10]. The impact of these various challenges on the quality of life of colorectal cancer patients is very significant. Functional limitations can make it difficult for patients to perform basic activities such as

bathing, eating, and dressing [11]. Psychological pressure can disturb mental health and hinder recovery [12]. A decrease in social participation can trigger isolation and worsen depression [13]. Effective self-management is critical to overcoming challenges and improving outcomes for colorectal cancer patients. Self-management includes various approaches, such as patient education, social support, and lifestyle modifications. With the right strategies, patients can manage physical and emotional symptoms, improve quality of life, and achieve optimal treatment outcomes [14].

Although various self-management interventions, such as education, support groups, and rehabilitation programs, are available for colorectal cancer patients, the reality still falls short of expectations. These interventions often have limited effectiveness and fail to provide significant benefits to aspects of the patient's quality of life [15]. The lack of personalization is one of the main drawbacks, as these interventions do not always consider patients' needs and preferences. In addition, these interventions are often not patient-centered, resulting in insufficient involvement of patients in the decision-making process and management of their health [16]. The absence of comprehensive and systematic reviews that synthesize and evaluate the evidence regarding innovative self-management approaches in colorectal cancer further complicates efforts to address this gap. Existing reviews often focus on single interventions or specific types of interventions and do not provide a comprehensive picture of the research landscape of self-management in colorectal cancer. This finding makes it difficult to determine which interventions are most effective and identify research areas that need further attention.

Objectives

This scoping review aims to comprehensively investigate the existing innovative self-management approaches for colorectal cancer. First, this review will identify various self-management approaches developed and used in clinical practice and research. Next, this review will evaluate these approaches' characteristics, implementation, and effectiveness, allowing a better understanding of how they can benefit colorectal cancer patients. Hopefully, this scoping review will provide the information necessary to develop evidence-based self-management guidelines and recommendations for colorectal cancer patients. By basing recommendations on existing evidence, it is hoped that the resulting self-management guidelines will help improve the quality of care and overall outcomes of colorectal cancer patients.

2. Methodology

Articles were carefully selected through online searches using PubMed, ProQuest, Cochrane Library, Science Direct, and Google Scholar. We used Boolean operators (AND, OR) and the keywords Colorectal Cancer OR Colorectal Neoplasm OR Bowel Cancer AND Self-Management AND Quality of Life (QoL). We also conducted a manual search of the bibliography of selected articles. All authors assessed the same publications, the results were discussed, and the screening and data extraction methods were updated before starting the screening process for this review to increase consistency among all authors. To identify relevant articles, we followed PRISMA flowchart guidelines. We performed the following steps: identified and matched articles to avoid duplication across databases; reviewed titles and abstracts to select articles according to research objectives; reviewed full articles to assess feasibility, validity, and intervention process and excluded articles that did not meet requirements; and resolve disagreements in study selection and data extraction through consensus and discussion with other reviewers when necessary. Data were extracted by two authors using a data collection form. Each article's findings that meet the criteria are presented narratively based on predetermined characteristics. All authors discussed and approved the results of the final analysis. The process of searching and filtering articles is presented in Figure 1 in detail.

Table 1: Inclusion and Exclusion Criteria for Scoping Review

Criteria	Inclusion Criteria	Exclusion Criteria
Population	- Patients diagnosed with colorectal cancer who have	- Pre-operative colorectal cancer

	received self-management interventions.	patients. - Patients with other colorectal cancers (e.g., anal cancer, rectal cancer).
Dimensions and Concept	- Self-management interventions focused on: • Patient Education • Psychological Support • Physical Rehabilitation • Nutrition Management • Internet-based Interventions - Oriented towards improving quality of life and patient outcomes.	- Non-self-management interventions. - Medical or surgical interventions.
Context	- Research studies on the effectiveness of self-management interventions for improving outcomes and quality of life in postoperative colorectal cancer patients. - Types of studies: • Randomized Controlled Trials (RCTs) • Prospective Observational Studies • Cohort Studies • Case-Control Studies - Published in English. - Published in peer-reviewed scientific journals. - Publication date: Within the last ten years (2015-2024).	- Literature reviews. - Meta-analysis studies. - Qualitative studies. - Study types such as reports or letters to the editor. - Non-English publications. - Published in non-peer-reviewed journals.

Source: The Joanna Briggs Institute Reviewers' Manual 2015: Methodology for JBI Scoping Reviews [17]

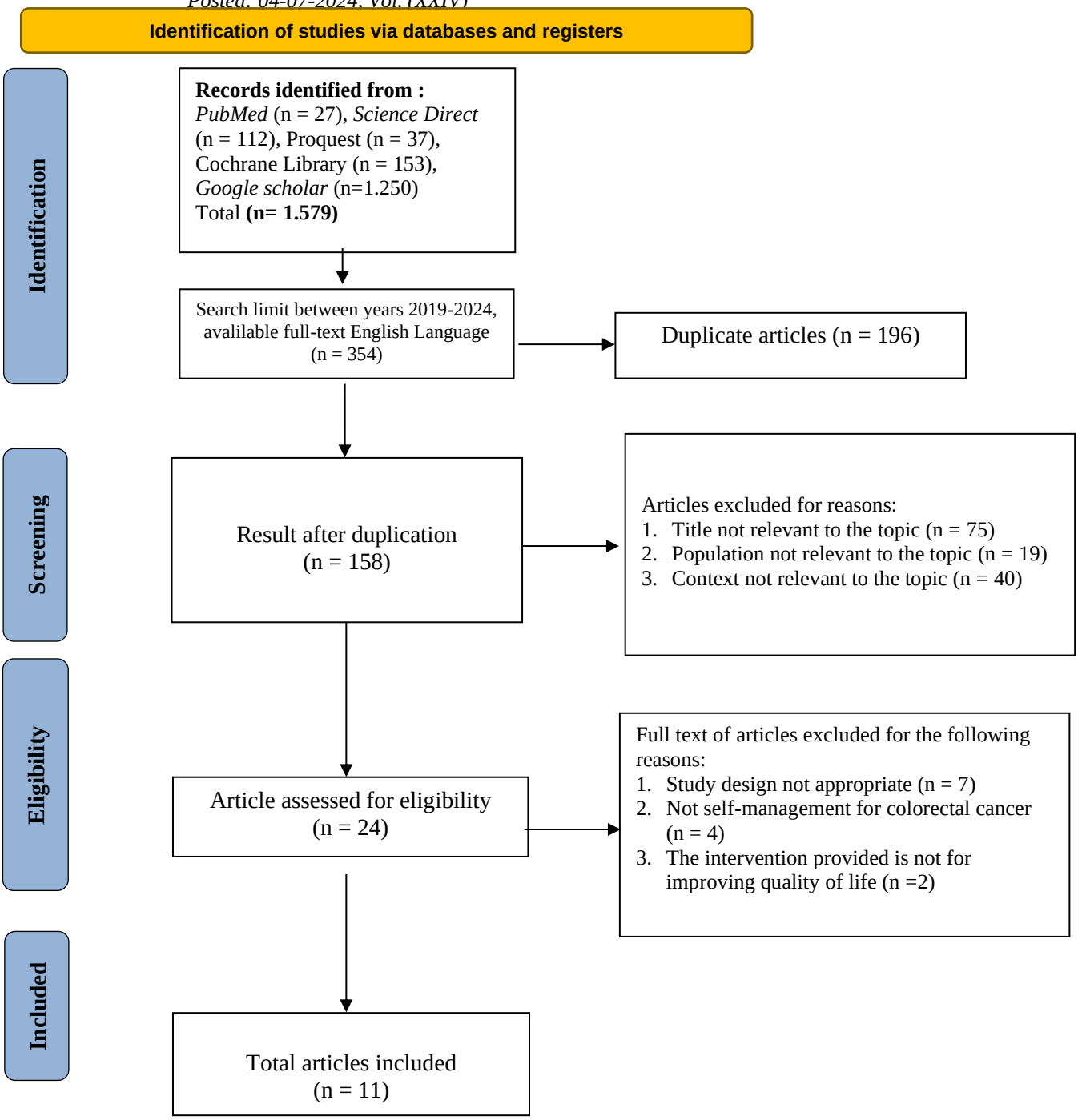

Figure 1. Article search process using PRISMA

3. Result and Discussion

Study Selection Results

The selection process resulted in 1,579 articles from databases, with details: 27 from PubMed, 112 from Science Direct, 37 from Proquest, 153 from Cochrane Library, and 1,250 from Google Scholar. Articles irrelevant to the study population were removed from the inclusion criteria in the title screening process. As a result, 354 articles met the requirements. Next, duplicate articles were sorted out, resulting in 158 articles. We continued the stage of removing 134 articles from the list for several reasons; namely, the title did not match the topic (75 articles), the population did not match the topic (19 articles), and the context did not suit this study (40 articles). This stage resulted in 24 articles. Articles that did not fit the title of the Literature Review were removed from the list, and finally, a quality assessment was carried out on the 11 selected articles.

Study Characteristics

This study involved eleven studies from various countries. We acknowledge that the inclusion of 11 articles might seem limited; however, this number reflects the stringent inclusion and exclusion criteria applied to ensure the quality and relevance of the reviewed studies. Each article in this review contributes uniquely and significantly to our understanding of self-management interventions for colorectal cancer. While we have made efforts to minimize bias, we recognize the limitations of access to some databases and the inclusion of only English-language articles, which should be considered for future research. We are confident that this review provides a solid foundation for further research and clinical practice aimed at improving the quality of life for colorectal cancer patients.

The geographical distribution shows that these studies are spread across several continents. Three studies were conducted in China, indicating a significant representation of that country in this research. Two studies came from the United States, while Japan, South Korea, Germany, Austria, and the Netherlands each had one study. Most studies (nine of eleven) used a randomized clinical trial (RCT) design, reflecting a preference for methodology considered the gold standard in medical intervention research. Of the remainder, one study used a pilot RCT and quasi-experimental design. Detailed characteristics of the included studies are presented in Table 2.

Table 2: Summary of Studies Included in the Review

Author, Year, Country	Respondents and Setting	Study Design	Intervention	Trainer and Learning Materials	Results and Outcomes
Zhang et al., 2014 [15]	China N = 121 (Control: 53, Intervention: 68) One cancer center and two affiliated hospitals in Southern China, Guangzhou	RCT	Six-month psycho-educational self-efficacy program and standard care	Oncology nurse One-on-one education, pocketbook with information, audio relaxation techniques, and health-coaching telephone follow-ups.	Significant improvement in self-efficacy and reduction in symptom severity, anxiety, and depression at three and six months post-intervention in the intervention group. No significant difference in quality of life perception between the groups.
Mayer et al., 2018 [18]	USA N = 284 (Control: 140, Intervention: 144) 7 locations in the USA	RCT	Monthly program using a mobile app with a health coach to enhance physical activity, offering dynamic content like forums, messages, and videos.	Health coach (BCoach) App notifications reminded users to track exercise. The coach supported participants through the 12-month data collection period.	Effective in increasing physical activity; participants using the app were more likely to meet physical activity guidelines compared to the control group.
Knoerl et al., 2019 [16]	USA N = 370 (Control: 188, Intervention: 182) Two cancer centers in Seattle and Boston, USA	RCT	Nine-week Electronic Symptom Assessment and Self-Care (ESRA-C) intervention to support self-management during therapy.	Trainer not mentioned Features included symptom control, communication coaching, self-reporting, education, and tracking.	High adherence to clinician recommendations (73.8%); lower use of additional self-management strategies for symptom management (49.2%). No significant improvement in adherence or use of self-management

					strategies compared to the control group.
Wang et al., 2023 [19]	China N = 156 (Control: 76, Intervention: 80) Cancer center in Taiwan	RCT	Six-month colorectal cancer self-management program based on Acceptance and Commitment Therapy (ACT) principles.	Two personal skills trainers Included a self-management booklet, two training sessions, and 12 follow-up telephone calls.	The program effectively reduced emotional distress and fatigue, and improved overall quality of life in colorectal cancer patients.
Takano et al., 2021 [20]	Japan N = 200 (Control: 100, Intervention: 100) A hospital in Japan	RCT	Standard chemotherapy, supportive care, and a self-help workbook.	Workbook contained materials on disease understanding, standard care, coping strategies, medical information, communication strategies, decision-making, and goal-setting.	Limited effect overall; however, post-hoc analysis showed significant improvement in emotional functioning for patients receiving long-term chemotherapy (P = 0.0007).
Willems et al., 2017 [21]	Netherlands N = 462 (Control: 231, Intervention: 231) 21 hospitals in the Netherlands	RCT	Access to eHealth KNW, an online platform with eight modules, for six months.	Trainer not mentioned Modules covered issues like returning to work, fatigue, anxiety, depression, relationships, physical activity, and diet/smoking cessation.	No lasting benefits for overall psychological recovery at 12 months, but improved social functioning for men and reduced fatigue in younger patients (under 56) at six months. Decreased depression in those undergoing chemotherapy; sustained improvement in social functioning for those with a high school education.
Park & Lee, 2024 [22]	South Korea N = 58 (Control: 30, Intervention: 28) A tertiary university hospital in South Korea	RCT	Self-managed return-to-work (RTW) intervention based on the transtheoretical model (TTM).	Trainer not mentioned Program included education on colorectal cancer and RTW, setting SMART goals, action planning, self-monitoring, and problem-solving skills.	Significant increase in return-to-work rates, and improvements in workability, self-efficacy, readiness, and overall well-being in the intervention group compared to the control group.
Reiter et al., 2021 [23]	Germany N = 189 (Control: 75, Intervention: 114) A single hospital in Germany	Quasi-experimental	Structured in- and outpatient oncology nurse and nutritional counseling.	Oncology nurse and nutritional counselor Structured counseling covered discharge management, side effects management, and nutrition.	Structured counseling improved patients' ability to manage side effects, understand dietary needs, and potentially reduce gastrointestinal issues. Enhanced readiness for discharge and transition back home.
Giesler et	Germany	RCT	Immediate access to the	Website module	No significant effects

al., 2017 [24]	N = 212 (Control: 109, Intervention: 103) A hospital in Germany		Colorectal Cancer module on the German DIPEx website krankheitserfahrungen.de for two weeks.	included narratives from patients, information on the disease and treatment, coping tips, and support resources.	on self-efficacy for coping with cancer or patient competence at two or six weeks after baseline.
Raphaelis et al., 2020 [25]	Austria N = 153 (Control: 92, Intervention: 61) 17 wards across three public hospitals in Vienna	RCT	Four-week structured pain self-management support program (ANtiPain).	Nurses with at least two years of oncology experience Program included pain management support for hospitalized patients before discharge.	Pain self-management support significantly benefited rooms where the intervention was routinely implemented, suggesting a positive impact on managing pain before discharge.
Li Cong et al., 2023 [26]	China N = 95 (Control: 48, Intervention: 47) Gastric wards in two tertiary hospitals in Beijing	Pilot RCT	Predetermined self-management program plus routine postoperative care.	Trained nurse Structured plan designed to help patients manage their health and well-being.	Significant improvement in bowel symptom self-management behaviors and therapeutic outcomes in the intervention group compared to the control group.

Discussion

In general, the results of all studies indicate that innovative approaches to self-management of colorectal cancer positively impact patients' quality of life. However, the results vary depending on the type of intervention applied.

Psycho-educational Program

A diagnosis of colorectal cancer can cause significant stress and anxiety for patients. Psycho-education programs offer an innovative approach to the self-management of colorectal cancer patients by providing them with the knowledge and skills to overcome the psychological challenges associated with this disease. This program not only increases patients' self-efficacy in managing their condition but has also been shown to be effective in reducing anxiety and depression. By reducing the psychological burden, psycho-education programs allow patients to focus more on their medical care and actively participate in decisions regarding their health. [27]. In addition, psycho-education programs can help patients develop practical coping skills to deal with medication side effects and disease symptoms [28]. This program can ultimately improve the quality of life, allowing patients to live more productive and meaningful lives while undergoing cancer treatment.

The study of Zhang et al.[15] demonstrated that their psycho-educational intervention resulted in significant increases in self-efficacy, decreased symptom severity, and improved emotional well-being in colorectal cancer patients. Increased self-efficacy indicates that patients feel better able to manage their condition and overcome the challenges associated with the disease. Decreased symptom severity and improved emotional well-being suggest that the program helps patients feel better overall and can live their lives more quickly. Although this study did not find significant differences in perceived

quality of life between the intervention and control groups, it is essential to note that quality of life is a multidimensional concept influenced by various factors. The improvements in self-efficacy, symptom severity, and emotional well-being observed in this study suggest that the psycho-educational program likely positively affected patients' quality of life. However, this effect may not be immediately apparent in their perceptions. The study of Wang et al.[19] further strengthens the evidence of the benefits of psycho-educational programs. This study shows that a self-management program based on the principles of Acceptance and Commitment Therapy (ACT) effectively reduces emotional distress and fatigue and improves the overall quality of life in colorectal cancer patients.

Technology-Based Interventions

Technology-based interventions have shown great potential as an innovative approach to self-management in colorectal cancer to improve quality of life and patient outcomes. The study by Mayer et al. and Knoerl et al. highlights how mobile applications and electronic symptom assessment tools can support patient self-management. Mayer et al. developed an 18-month program using a mobile app with a health coach to increase physical activity, which significantly helped participants meet physical activity guidelines [18]. This finding suggests that technology can drive sustainable positive behavioral change, which is essential in improving cancer patients' quality of life. On the other hand, Knoerl et al. introduced Electronic Symptom Assessment and Self-Care (ESRA-C). However, results showed variable adherence to self-management strategies and no significant improvement in patient outcomes [16]. This finding underscores the challenges of ensuring consistent and effective patient engagement when using technology for self-management.

Meanwhile, Willems et al. implemented an eHealth platform that allows patients to select and complete modules according to their needs. Although not all aspects of quality of life significantly improved, the program successfully promoted long-term psychological recovery, such as improved social functioning and reduced fatigue in specific subgroups. [21]. This situation suggests that flexibility and personalization in technology-based interventions can add more value to the self-management of cancer patients. [29]. However, challenges such as ensuring long-term engagement and program compliance remain. Although technology offers powerful tools to support self-management, the success of these interventions is highly dependent on user-friendly design, personalization, and ongoing support to maximize their impact on quality of life and patient outcomes [30].

Structured Self-Management Program

Structured self-management programs have been proven to be a practical, innovative approach to supporting colorectal cancer patients to improve their quality of life and health outcomes. Studies by Soo Yeun Park, Myung Kyung Lee, and Raphaelis et al. demonstrate the success of these programs. Soo Yeun Park and Myung Kyung Lee developed a return-to-work program based on the transtheoretical model (TTM), significantly improving return-to-work rates, employability, self-efficacy, preparedness, and overall well-being for colorectal cancer survivors. These results emphasize the importance of a structured approach that provides ongoing support and empowers patients to achieve their health goals [22].

Additionally, Takano et al. and Li Cong et al. highlight the importance of structured educational and nutritional counseling. Takano et al. implement counseling that includes side effect management and preparation for returning home, which helps patients manage treatment side effects and increases their

readiness to transition from hospital to home [20]. Li Cong et al. demonstrated that a structured bowel symptom management program could improve patient self-management behaviors and therapeutic domains, contributing to improved quality of life [26].

These programs demonstrate that structured interventions that include educational support, counseling, and active patient involvement can produce significant benefits [31]. By providing the necessary tools and knowledge and establishing an environment of ongoing support, structured self-management programs can help colorectal cancer patients meet the challenges of treatment and recovery and improve their emotional and physical well-being. Effective implementation of these programs in clinical practice may be vital to improving long-term health outcomes for patients.

Although structured programs offer many benefits, it is essential to consider some challenges. Availability of these programs may be limited in some areas, and the cost of the programs may be prohibitive for some patients. Additionally, structured programs may require a significant commitment of time and effort from the patient.

4. Conclusion and future scope

Innovative approaches to self-management of colorectal cancer show great potential in improving patients' quality of life, primarily through personalized psycho-education programs, the use of technology, and structured counseling. However, the results vary, and some interventions require further research to understand their impact in-depth and long-term. These interventions must be integrated into clinical practice, considering the patient's specific context and needs to maximize their benefits and quality of life.

We identified several shortcomings in the reviewed studies. Most research focuses on short-term education-based interventions and rarely investigates the impact on patients' skills (both hard and soft skills) for managing colorectal cancer. Additionally, the majority of studies were conducted in developed countries, leaving the effectiveness of interventions on geographically and culturally diverse populations largely unexplored. Nevertheless, most studies employed RCT designs, which is a strength of this review. Further research is needed to address these gaps. Longitudinal studies are required to assess the long-term impact of self-management interventions on various aspects of patients' quality of life, such as physical, psychological, social, and spiritual dimensions. Future research should consider developing integrated interventions that help patients develop hard and soft skills to manage their disease. Multi-site studies investigating the effectiveness of interventions on geographically and culturally diverse populations are also necessary. Finally, exploring cultural and social factors that may influence the effectiveness of self-management interventions is crucial. Findings from this scoping review suggest that self-management interventions have the potential to improve the quality of life for colorectal cancer patients. Further research with stronger designs and more diverse populations can strengthen this evidence. Future studies should consider developing integrated interventions that enhance patients' hard and soft skills by involving existing support systems (family, healthcare providers, and community). A holistic approach that considers the physical, psychological, and social needs of patients is needed to help them lead better lives.

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