



Review article

A socioecological taxonomy of determinants to colorectal cancer screening in black men: Insights from a mixed-methods systematic review

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ABSTRACT

Background: In the United States, African/Black American (henceforth Black) men face significantly higher mortality rates from colorectal cancer (CRC) compared to other gender, racial, and ethnic groups. Although CRC is preventable and treatable with early detection, screening rates among Black men remain low. This study aimed to synthesize existing literature on the barriers and facilitators (determinants) of CRC screening to offer guidance to primary care teams in their efforts to improve screening uptake.

Methods: We performed a comprehensive systematic review of full-text, peer-reviewed studies published in English to explore the various determinants influencing CRC screening among Black men. Using key terms like “Black or African American,” “male,” and “colorectal cancer screening,” we searched databases including PubMed, PsychInfo, CINAHL, and Embase, published between 2009 and 2022.

Findings: The search identified 1235 articles, with 54 meeting the inclusion criteria. Most studies were cross-sectional, examining determinants across the socioecological system. Key barriers included a lack of CRC screening knowledge, poor patient-provider communication, lack of access to screening, and medical mistrust stemming from systemic racism. Significant facilitators included aging, receiving a provider recommendation, having social support, and effective culturally appropriate outreach strategies.

Conclusions: Key themes and significant findings from the review provide actionable strategies for primary care teams. These include enhancing knowledge about CRC screening within the patient population, improving patient-provider interactions, and reducing barriers to accessing screening. Future research should aim to develop culturally appropriate and collaborative preventive care strategies to improve screening adherence and CRC-related outcomes.

1. Introduction

In the United States (US), non-Hispanic African American/Black (henceforth Black) men experience a colorectal cancer (CRC) mortality rate that is 44 % higher than their non-Hispanic White counterparts (Siegel et al., 2023). Although CRC is highly preventable with regular recommended screening, these men are often diagnosed at advanced stages (Siegel et al., 2023). Despite national recommendations, screening rates remain suboptimal, with only 61 % of eligible Black

adults reporting being up-to-date with screening in 2021 (American Cancer Society, 2023). This is well below the National Colorectal Cancer Round Table's (NCCRT) goal of 80 % in every community (Shellnutt, 2020). Reducing CRC mortality in Black men through early detection must be a public health priority.

To achieve this, it is crucial to understand and address the specific challenges they face. Extensive literature has identified several determinants of CRC screening for the general population. At the individual level, factors such as limited socioeconomic resources, low

Abbreviations: CRC, colorectal cancer; NCCRT, National Colorectal Cancer Roundtable; JBI, Joanna Briggs Institute; MMSR, mixed methods systematic reviews; NIMHD, National Institute on Minority Health and Health Disparities; FOBT, fecal occult blood test; FIT, fecal immunochemical test; CT, computed tomography; PN, patient navigation.

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educational attainment, unreliable transportation, and lack of access to care are linked to decreased CRC screening rates among adults (Carethers and Doubeni, 2020; Wang et al., 2018). Interpersonal determinants include marital status and having a regular primary care provider (Luque et al., 2023). Community-level factors, such as strong masculinity beliefs, have been associated with decreased CRC screening in men (Rogers et al., 2022; Earl et al., 2022). Organizational level determinants include ineffective clinic practices and workflows that hinder proper outreach, counseling, and follow up (Zhu et al., 2022). At the societal level, cost-sharing has been identified as a barrier to screening (Fendrick et al., 2022).

Primary care clinicians, who frequently serve as the initial point of contact within the healthcare system and are responsible for initiating CRC screening, are uniquely positioned to tackle these challenges. Their ongoing relationships with patients and accountability to the community enable them to effectively address barriers and facilitate screening using the interdisciplinary care team. Focusing on primary care is essential because these settings are ideally positioned to integrate preventive screening into routine care, thereby addressing barriers and facilitating timely CRC screening in Black men.

The precise impact of CRC screening knowledge, patient-provider interactions, and strategies to mitigate screening barriers on the screening behaviors of Black men remains unclear. There is limited literature that has systematically reviewed these concepts in this population. This systematic review aims to identify multilevel barriers and facilitators (determinants) of CRC screening in Black men that can be addressed through specific interventions by the primary care team. By synthesizing available literature, we aim to provide actionable data to inform primary care transformation efforts.

2. Methods

2.1. Study design

The Joanna Briggs Institute's (JBI) mixed methods systematic reviews (MMSR) approach was employed to thoroughly explore and examine the multilevel determinants of CRC screening in Black men (Stern et al., 2020). This mixed methods approach integrates both qualitative and quantitative findings. The review was standardized using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) guidelines. This review only analyzed previously published data and we followed ethical guidelines when selecting and interpreting studies included.

2.2. Search strategy

This systematic review was registered on PROSPERO on 4/21/2021 under registration number CRD42022327498. In consultation with research librarians, electronic databases including *PubMed*, *PsychInfo*, *CINAHL*, and *Embase* were searched from inception through May 2022 with an updated literature search in September 2023. The keywords and MeSH terms used to search the literature were: "Black" OR "African Americans" AND "Male" OR "Men" AND "Social Determinants of Health" AND "Colorectal Neoplasms" AND "Colonoscopy" OR "Early Detection of Cancer". The full search strategy can be found in Table 2. The reference lists of included studies were hand searched for additional relevant literature. An automatic alert based on the search strategy identified new published titles for review following the initial search. Full text, peer-reviewed articles published in English were included. Eligibility criteria included studies that collected primary data, conducted in the United States, included Black men aged 45–75 with at least 13 % of sample were Black American, examined factors for *United States Preventive Services Task Force* recommended screenings for average-risk adults, and reported determinants of CRC screening. Intervention studies that did not identify determinants of CRC screening and articles investigating cancers other than CRC were excluded.

2.3. Review framework

To fully assess the multilevel factors affecting CRC screening among this at-risk population of Black men, the *National Institute on Minority Health and Health Disparities (NIMHD) Research Framework*, adapted from the socioecological model (Bronfenbrenner, 1977) and the *National Institute on Aging Health Disparities Research Framework* (Hill et al., 2015) guided this review. The NIMHD framework examines health determinants and health outcomes for minoritized populations (e.g., race/ethnicity, socioeconomic status, rurality, and sexual or gender minorities) using a multilevel and multi-domain approach (Alvidrez et al., 2019). Using the NIMHD framework, we carefully classified and examined determinants based on the levels of the socioecological system. To our knowledge, this is the first systematic review to use this framework which directly responds to the call by the NIMHD to use a multilevel approach when studying health disparities (Alvidrez et al., 2019).

2.4. Data management

Covidence software was utilized for data management and team collaboration (*Veritas health innovation. Covidence Systematic Review Software, 2022*). All articles identified during the literature search were imported into Covidence, and duplicate studies were removed. Two authors (P.Z. and E.M.) independently reviewed titles and abstracts for full-text review, and subsequently reviewed the full texts for inclusion. Data extraction was performed independently using a template created in Covidence and refined by the entire review team for accuracy. Extracted data included study title, author details, study purpose, study design, intervention, control/usual care, sample size, percentage of male participants, percentage of Black American participants, inclusion and exclusion criteria, instruments/measures, screening modality, determinants of screening, and strengths and limitations of the study. Any disagreements were resolved through discussion, resulting in an inter-rater reliability rate of 90 % agreement among the reviewing authors.

2.5. Quality assessment

P.Z. and E.M. independently evaluated studies for risk of bias. Mixed-method studies were assessed for methodological quality using the Mixed-Methods Appraisal Tool (MMAT; version 2018), while qualitative and quantitative studies were evaluated using the JBI critical appraisal checklists. Studies were assigned a high, medium, or low rating based on the presence and type of criteria met. P.Z. and E.M. independently reviewed each article and discussed their evaluations after completing a specified number, continuing this process until all appraisals were finished.

2.6. Data synthesis

To comprehensively synthesize the review findings, we employed the JBI MMSR convergent integrated approach. This method involves transforming quantitative data and integrating it with qualitative data (Stern et al., 2020). We began by analyzing the quantitative data to identify statistical associations and relationships using descriptive statistics and inferential analyses. This analysis allowed us to understand the prevalence of barriers and facilitators to CRC screening among Black men and to identify significant predictors.

Subsequently, we transformed this quantitative data into qualitative themes through qualitzing, where numerical findings were converted into narrative descriptions. These qualitative themes were then compared with the thematic analysis results of the qualitative studies. This comprehensive integration of both data types provided a robust mixed methods framework, ensuring a holistic understanding of the factors influencing CRC screening uptake.

3. Results

Our search strategy returned 1235 articles for review; 499 duplicates were removed. Seven hundred thirty-six titles and abstracts were screened for possible inclusion. Of those screened, 209 full text articles were selected for full review. Fifty-four articles met inclusion criteria (Fig. 1) and were published between 2009 and 2022. Of the 54 studies, 37 (69 %) were quantitative, 16 (30 %) were qualitative, and one was mixed methods. Nearly all (84 %) of the quantitative studies were cross-sectional with few using experimental designs. The studies varied in their methodological quality with 28 (48.3 %) being rated as high, 27 (46.5 %) were medium, and 3 were of low quality. The few studies that received low ratings were retained because their findings were consistent with other studies, and their samples included the target population. The low ratings were primarily due to the use of non-validated instruments and insufficient reporting of measurements and methods. Black participants varied from 15 to 100 % of sample composition with 64 % of studies having a majority Black sample. Male participants ranged from 2 to 100 % of sample composition with 25 % of the studies having a majority male sample. Detailed study demographics can be found in Table 1.

3.1. Multilevel determinants of screening

This review identified various determinants of CRC screening among

Black men, categorized by socioecological levels to highlight areas where primary care teams can improve their efforts. Barriers to CRC screening are classified into four socioecological levels. At the individual level, factors within personal control, such as knowledge and behaviors, are considered. The interpersonal level involves interactions with immediate surroundings such as family and support systems. Community-level factors encompass broader aspects, including norms, resources, and the built environment. For this review, we combined community and organizational levels since primary care clinics are embedded within communities. Finally, the societal level includes external factors such as policies, laws, healthcare quality, and cultural norms that can impose limitations on individuals. This framework underscores the importance of primary care settings in addressing these multilevel barriers effectively.

We observed that barriers to CRC screening overlap across socioecological levels. Through structured discussions and iterative processes, we classified these barriers based on their primary level of influence or where we determined their impact would be most significant. The screening modalities examined in the studies included stool-based tests (fecal occult blood tests [FOBT], fecal immunochemical tests [FIT]), flexible sigmoidoscopy, colonoscopy, and computed tomography (CT) colonography (US Preventive Services Task Force et al., 2021). The key themes across both qualitative and quantitative studies are presented. Detailed results from these studies are presented in Supplemental Tables 1 and 2. The major findings include knowledge of

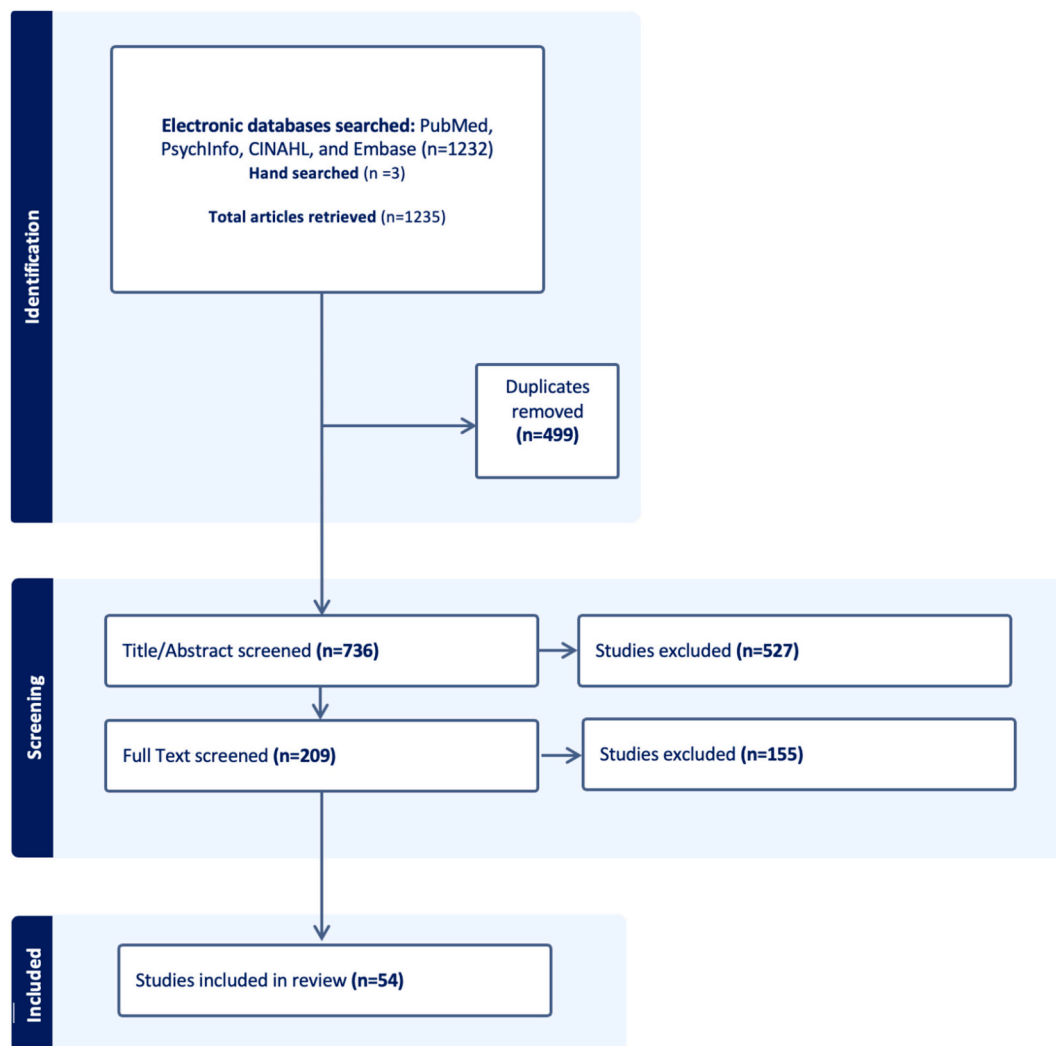


Fig. 1. PRISMA flow diagram depicting search results.

Table 1
Characteristics of the included articles and summary of results.

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/ Exclusion	Summary of Findings
Agho et al., 2012	Health literacy and colorectal cancer knowledge and awareness among African American males.	Cross sectional study	Survey	Midwest	To present preliminary results of a faith-based CRC screening and health literacy demonstration study	100	100	142	Inclusion: African American males aged 49 years and older	There was a positive correlation between having a provider's recommendation and screening ($r=.20$; $p=.01$). Positive correlation between health literacy and CRC knowledge ($r=.24$; $p=.05$). Barriers: Embarrassment and uneasiness with CRC screening, negative sexual connotation, knowledge deficit, and fear of the screening findings.
Bass et al., 2011	Perceptions of colorectal cancer screening in urban African American clinic patients: differences by gender and screening status.	Qualitative	Focus Groups	Not disclosed	To elucidate if/how gender and screening status may be related to perceptions of barriers to CRC screening in an African American general internal medicine primary care continuity clinic population, located in an urban teaching hospital, to enable the research team to develop strategies to overcome barriers in a CRC screening intervention program being designed for this population.	100	34.8	23	Not specified	Facilitators: Physician communication, perceived benefit of peace of mind after screening.
Bazargan et al., 2009	Colorectal cancer screening among underserved minority population: Discrepancy between physicians recommended, scheduled, and completed test	Correlational	Surveys	West	To examine the correlates of (1) health care provider recommendation of colorectal cancer screening; (2) provider scheduling for recommended CRC screening using sigmoidoscopy, colonoscopy, or double-contrast barium enema, and (3) adherence to CRC testing among underserved minority population	16	23	306	Inclusion: Adults 50 and over no history of CRC	Participants with higher levels of risk for CRC were twice as likely to report physician recommendation of screening (OR= 1.9; CI: 1.3-2.8). Participants at greater risk of CRC (OR= 1.2; CI: 1.1-2.1), had health insurance (OR= 1.7; CI:1.1-2.8), and lower perceived barriers to screening (OR= .4; CI: .21-.86) had higher odds of scheduling CRC screening. Participants at greater risk of CRC (OR= 1.5; CI: 1.1-2.1), married (OR= 2.1; CI: 1.2-3.8), extensive comorbidities (OR=1.6; CI:1.2-2.5), and lower perceived barriers to screening (OR= .39; CI: .18-.85) were more likely to have completed scheduled CRC screening.
Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Belue et al., 2011	Psychosocial risk profiles among black male Veteran's Administration patient's non-adherent with colorectal cancer screening	Cross-sectional	Surveys	Midwest	To explore psychosocial and demographic characteristics of African American men who are currently non-adherent with CRC screening according to the recommendations for screening from the American Cancer Society.	100	100	260	Not specified	The following general latent classes emerged for men as it related to CRC screening across 3 screening modalities (FOBT, sigmoidoscopy, colonoscopy): 1. Preparedness, 2. Barriers and self-efficacy, 3. Benefits and self-efficacy, and 4. Susceptibility.
Born et al., 2009	Colorectal cancer screening, perceived discrimination, and low-income and trust in doctors: a survey of minority patients	Cross-sectional	Surveys	Midwest	To investigate the relationship between perceived discrimination, trust in most doctors, and completion of Fecal Occult Blood Testing among a low-income, minority primary care population in an urban setting.	69	48	282	Inclusion: Adults 40 and older without acute illness or apparent cognitive deficit	Perceived discrimination and trust in physicians were negatively associated ($r= -.25$, $p< .01$). Participants who were up to date with CRC screening were more likely to

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
										have lower perceived discrimination (OR= .86; CI: .76-.96).
Brittain et al., 2012	Family Support and Colorectal Cancer Screening Among Urban African Americans	Correlational	Surveys	Midwest	To examine the relationships between family support and influence, cultural identity, CRC beliefs, and their relationship to an informed decision about CRC screening among African Americans and to test the model of an informed decision.	100	49	129	Inclusion: Being an African American man or woman, regardless of CRC screening history and family history of CRC, age 50 and older, and able to speak English. Exclusion: Have or had CRC and do not have insurance coverage for CRC screening. Individuals without health care insurance coverage for CRC screening were excluded because lack of health insurance and/or coverage for CRC screening is a known barrier to CRC screening.	Age was associated with screening adherence ($\chi^2= 4.79$; $p= .03$). Family support significantly predicted CRC beliefs ($\beta= .46$; $p<.01$). CRC beliefs significantly predicted informed decisions of screening ($\beta=-.30$; $p<.01$).
Brouse et al., 2004	Barriers to colorectal cancer screening: an educational diagnosis	Qualitative	Semi-structured Interviews	Northeast	To identify barriers to CRC screening that are amenable to change through health education in a low income, minority population of individuals 52 to 80 years old.	67.7	30	226	Inclusion: Age 52-80 without recent CRCs or gastrointestinal disease	Barriers: CRC knowledge deficit, negative beliefs and perceptions of screening, lack of self-efficacy to follow through with testing, not receiving recommendation from provider, and lack of time for appointments.
Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Burgess et al., 2011	Presence and correlates of racial disparities in adherence to colorectal cancer screening guidelines	Cross-sectional	Surveys	Not disclosed	To examine the presence and correlates of Black/White racial disparities in adherence to guidelines for colorectal cancer screening (CRCS).	15	96	2,155	Inclusion: male and female veterans 50-75 one or more primary care visits between 1/2005 and 12/2006. Exclusion: VA employees deceased patients anyone enrolled in VA adult day care or nursing home facilities diagnosed with CRC, dementia, or Alzheimer's.	Having some college education (OR= 1.86; $p\leq .01$), CRC salience (OR= 1.82; $p\leq .01$), CRC fears (OR= 1.16; $p\leq .05$), screening efficacy (OR= 1.23; $p\leq .05$), self-efficacy (OR=1.33; $p\leq .01$), being marital status (OR=1.59; $p\leq .01$), social influence (OR= .73; $p\leq .01$), and physician recommendation (OR= 3.16; $p\leq .01$) predicted CRC screening.
Chablani et al., 2017	Colorectal Cancer Screening Preferences among Black and Latino Primary Care Patients	Cross-sectional	Survey	Northeast	To provide an assessment of CRC screening preferences among blacks, English-speaking Latinos, and Spanish-speaking Latinos for Cologuard, colonoscopy, CTC, and FIT; describe the test attributes that influence their preferences; assess the strength of their preference; and determine whether preference is associated with their socio-	32.6	30.2	86	Inclusion: average risk, English or Spanish speaking, Black or Latino aged 50-74, had a screening colonoscopy in past 5 years Exclusion: Patients with history of colorectal neoplasia or inflammatory bowel disease	Individuals aged 60 and older had higher odds of preferring Cologuard testing versus colonoscopy (OR=3.49, CI: 1.12-10.83). Screening with unpreferred test option lowered the odds of screening (OR=.50, CI:.30-.84).

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Christy et al., 2016	A community-based trial of educational interventions with fecal immunochemical tests for colorectal cancer screening uptake among blacks in community settings	Pragmatic RCT	Pre and post structured interviews/ surveys	Southeast	demographic characteristics, background knowledge of CRC, or CRC screening history. To compare the efficacy of two intervention conditions promoting CRC screening among Black individuals.	93	52	394	family history of colorectal neoplasia Inclusion: self-identified as Black or African American, were aged 50-75, were not up to date per guidelines, were at average risk with no CRC symptoms, were willing to provide at least two forms of contact information and the contact information of a secondary individual, and could speak, read, and write English. Exclusion: Individuals at increased CRC risk due to having one first-degree relative with CRC diagnosed age <60, >2 first-degree relatives with CRC, or a personal history of CRC, adenomas, or inflammatory bowel disease were not eligible.	Living further away from the healthcare clinic (OR=1.03, CI: 1.01-1.05, p=.015), having stronger religious beliefs (OR= 1.09, CI:1.02-.1.16, p=.015), and employment status (OR=.15, CI: .05-.46) were significantly associated with failure to return FIT kits.
Cortes et al., 2018	The Role of Incarceration and Reentry on Colorectal Cancer Screening Among Formerly Incarcerated Black and Hispanic-Latino Men in New York City	Qualitative	Semi- structured Interviews	Northeast	To examine how the experience of incarceration and reintegration affects the awareness of CRC screening practices, the attitudes towards these services, the availability of services, and the frequency of CRC screening among recently released Black and Hispanic-Latino men over the age of 50 in NYC.	66.5	100	21	Inclusion: Formerly incarcerated males that self-identified as Black or Hispanic-Latino, were 50 years of age or older, were released from prison or jail within the last 6 months, and were English or Spanish speaking	Barriers: Fear/fatalism, medical avoidance, beliefs regarding CRC screening, lack of physician recommendation, negative perceptions of the healthcare system, machismo, CRC knowledge deficit, and physician ignorance on reentry issues were barriers to completing CRC screening. Facilitators: humanistic medical treatment outside of prison, social support, physician communication, and family history of cancer were factors that facilitated CRC screening.
Cronan et al., 2008	Ethnic differences in colorectal cancer screening	Cross-sectional	Survey	West	To assess ethnic disparities in CRC screening among a low-income population in southern California	36.7	48.7	158	Inclusion: age, ethnicity, living within the zip code, and speaking English or Spanish	Perceived efficacy of screening (OR= 1.35, CI: 1.14-1.57, p<.005) and receiving a physician's recommendation (OR= 11.47, CI: 10.15-12.75, p< .0004) were predictors of screening.
Crookes et al., 2014	Promoting colorectal cancer screening through group education in community-based settings	Non- randomized experimental study	Pre-posttest assessment	Northeast	To create an education program on CRC by adapting existing curriculums used for breast	62.7	2.37	1065	Inclusion: Black and Latino people aged 50 and older	Having a physician's recommendation (OR= 10.29, CI: 5.65-18.73), aged 65 or older (OR= 1.79, CI: 1.046-3.071). increased CRC

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
					and cervical cancer education program					knowledge (OR= 1.02; CI: 1.008-1.029) had higher odds of ever being screened by colonoscopy.
Curbow et al., 2015	Pathways to colonoscopy in the South: seeds of health disparities	Cross-sectional	Surveys	Southeast	To investigate demographic differences in pathways to the colonoscopy clinic.	15.4	38.2	1841	Inclusion: Aged 18 and older able to read and write English Patients scheduled for colonoscopy	Expressing fear of screening was negatively associated with ever being screened by colonoscopy (OR=.295, CI: .179-.487). Being employed (OR= .40; CI: .30-.53), older age (OR= .93; CI: .92-.94) and having a higher income (OR= 1.63; CI: 1.13-2.34) were positively associated with having a colonoscopy.
Davis et al., 2012	FOBT completion in FQHCs: impact of physician recommendation, FOBT information, or receipt of the FOBT kit	Cross-sectional	Surveys	Southeast	To determine the effect of common components of primary care-based colorectal cancer screening interventions on fecal occult blood test completion within rural and urban community clinics, including: (1) physician's spoken recommendation, (2) providing information or education about FOBTs, and (3) physician providing the FOBT kit; to determine the relative effect of these interventions; and to compare the effect of each intervention between rural and urban clinics.	68	22.6	849	Inclusion: Not up to date with screening according to US Preventive Service Guidelines and did not have a previous history of cancer or a family history requiring screening at earlier ages according to American Cancer Society guidelines. English-speaking and being enrolled as a patient in the study clinic. Exclusion: Having severe visual or hearing impairments and being too ill to Participate.	Having a physician's recommendation in rural participants (RR= 5.3; CI: 3.7-7.7) and in urban participants (RR= 2.1; CI: 1.6-2.8) was associated with higher screening. Receiving FOBT information from the clinic staff positively influenced screening in both rural (RR= 3.8; CI: 2.9-5.1) and urban participants (RR= 1.9; CI: 1.4-2.4). Receiving a FOBT kit directly from the physician was the strongest predictor of completing screening in both rural (RR= 22.3; CI: 14.1-35.3) and urban participants (RR= 10.1; CI: 5.7-18.0).
Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Davis et al., 2017	A randomized controlled trial of a multicomponent, targeted, low-literacy educational intervention compared with a nontargeted intervention to boost colorectal cancer screening with fecal immunochemical testing in community clinics	RCT	Baseline interviews, post-intervention survey, medical chart review	Southeast	To test the differential impact of a multicomponent, targeted, low-literacy intervention (photonovella booklet and DVD plus FIT kit) (hereafter denoted as CARES condition) compared with a standard Centers for Disease Control and Prevention (CDC) "Screen for Life" brochure plus, FIT kit (hereafter denoted as comparison condition) to increase CRC screening	28.2	46.4	416	Inclusion: Receiving care at either FQHC or CHC, age 50-75, currently not inclusion: Up to date with CRC screening, average risk for CRC, read and speak English	Failure to return FIT kits were associated with not having a regular physician (OR= 1.67; CI: 1.02-2.75), being younger (OR= 1.07; CI: 1.00-1.14), receiving care in a FQHC (OR= 1.67; CI: 1.02-2.75), and having health insurance (OR= 2.14; CI: 1.24-3.72).
Dyer et al., 2019	Patient-Reported Needs Following a Referral for Colorectal Cancer Screening	Qualitative	Focus Groups	Midwest	To present findings on patient information needs and barriers to colorectal cancer screening after receiving a physician screening recommendation, and their	40	37.8	45	Inclusion: Adults aged 50-75, adopted portal technology, and received a physician's referral for CRCS within the previous	Barriers: Physician time constraints, bowel preparation, not knowing about test alternatives, emotional and cognitive challenges, and complications from screening from

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
					perspectives on using electronic patient portals as platforms for health-related decision support.				6 months	known associates were barriers to completing screening.
Earl et al., 2022	Barriers and Facilitators to Colorectal Cancer Screening in African-American Men	Qualitative	Interviews	Southeast	To gain a comprehensive understanding of key determinants of CRC screening behavior, including the extent to which masculinity and gender norms play a role in influencing health behavior, to ultimately strengthen our awareness of the types of health messages related to CRC screening that are most salient among African American men.	100	100	135	Exclusion: EHR documented CRC risk factor (personal/family history of CRC or bowel disease such as Crohn's or ulcerative colitis) Inclusion: Self-identifying Black or African American men ages 45–75 years old who reside in metropolitan Atlanta.	Facilitators: Provider communication and speaking with someone who had a colonoscopy facilitated screening. Barriers: CRC screening knowledge deficit, financial concerns, and cultural beliefs were barriers to screening. Facilitators: Provider recommendation, social and family support, and male role norms facilitated screening.
Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Green and Kelly, 2004	Colorectal Cancer Knowledge, Perceptions, and Behaviors in African Americans	Correlational	Surveys	Not disclosed	To bridge the existing gap by determining the CRC knowledge, perceptions, and screening behaviors of low-income older African American men and women.	100	42	100	Inclusion: Adults 50 years and older who speak English and not currently being treated for CRC.	Knowing someone with CRC ($\beta = -5.08$, $t = -2.36$, $p = .05$) and having higher educational levels ($\beta = -1.20$, $t = -3.29$, $p < .01$) significantly reduced the perception of CRC threat. There was a difference in perceived barriers and CRC knowledge based on education. Those with higher education had decreased perceived barriers to screening ($t = -2.48$, $p = .018$). Those with higher education had more CRC knowledge ($t = 4.07$, $p = .000$). Those with higher income had significantly different CRC knowledge scores ($t = 2.580$, $p = .027$) and perception of threat ($t = 2.746$, $p = .021$) than those with lower income.
Greene et al., 2012	Using Population Data to Reduce Disparities in Colorectal Cancer Screening, Arkansas, 2006	Cross-sectional	Surveys	Southwest	To identify associations among demographic, health care, and screening characteristics of the Arkansas population to develop a state-sponsored screening program that increases screening rates among vulnerable populations.	19	35.8	2,021	Inclusion: Private residences within 5 public health regions in Arkansas, in which 1 or more people aged 50 and older live Exclusion: History of CRC and self-identifies as multi-racial or Hispanic	Having a regular healthcare provider (OR = 2.98; CI: 2.18-4.09), with at least 5 provider visits in past year (OR = 2.00; CI: 1.58-2.53), having a provider who explains things in an understandable way (OR = 2.47; CI: .81-7.52), and receiving screening advice (OR = 257.6; CI: 135.5-489.6) were associated with screening.
Greiner et al., 2005	Predictors of fecal occult blood test (FOBT)	Prospective	Surveys	Midwest	To examine the knowledge, preferences, perceptions, and attitudes of a multiethnic, low-income adult population toward CRC	69	49.2	293	Inclusion: Adults aged 40 and older without acute illness or apparent cognitive deficit	Being of older age (OR = 1.05; CI: 1.01-1.10), higher educational level (OR = 0.22; CI: .05-.93) and no FOBT barriers (OR = 3.81; CI: 1.87-7.78) were associated with returning FOBT

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Table 1 (continued)

Author/Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Greiner et al., 2005	Knowledge and Perceptions of Colorectal Cancer Screening Among Urban African Americans	Qualitative	Focus Groups	Midwest	To explore CRC screening knowledge, attitudes, barriers, and preferences among urban African Americans as a prelude to the development of culturally appropriate interventions to improve CRC screening rates.	100	44	55	Inclusion: African American individuals 50 and older who are without obvious mental or cognitive impairment.	<p>completion among low-income adults</p> <p>screening and to assess predictors of FOBT kit completion among this same cohort.</p> <p>screening cards.</p> <p>Fatalism was a negative predictor of FOBT card return (OR= .83; CI: .73-.95).</p> <p>Barriers: Medical mistrust, fear, and fatalism were barriers to screening.</p> <p>Facilitators: Hope, religion, belief in accuracy of screening tests, and CRC knowledge facilitated screening.</p>
Gwede et al., 2010	Exploring Disparities and Variability in Perceptions and Self-Reported Colorectal Cancer Screening Among Three Ethnic Subgroups of U.S. Blacks	Cross-sectional	Surveys	Southeast	To explore perceptions of colorectal cancer (CRC) and self-reported CRC screening behaviors among ethnic subgroups of U.S. blacks	100	48	62	Inclusion: Men and women 50 and older non-Hispanic black or African American with no personal history of any cancer who resided in Hillsborough County in medically underserved areas. Ancestry from US, English speaking Caribbean or Haiti, and ability to read and understand English. Foreign-born immigrants must have lived in US for at least 2 years.	In pooled adjusted analyses, CRC screening was significantly associated with age, education, health insurance status, and provider recommendation (regardless of ethnic subgroup)
Halbert et al., 2011	Cultural, Economic, and Psychological Predictors of Colonoscopy in a National Sample	Cross-sectional	Survey	National	To evaluate the direct and interactive effects of socioeconomic, health care variables, psychological characteristics, and cultural values on colonoscopy use.	39	47	582	Inclusion: Individuals at least 18 years of age and self-identify as African American, White American, or Hispanic. Exclusion: Personal history of any type of cancer.	Aging (OR= 1.40; CI: 1.11-1.77; p= .004), having health insurance (OR= 2.82; CI: 1.35-4.29; p= .01), self-efficacy (OR= 2.41; CI: 1.35-4.29; p= .003), and increased religious values (OR= .79; CI: .61-1.02; p= .07) were significantly associated with CRC screening.
Halbert et al., 2016	Neighborhood Satisfaction and Colorectal Cancer Screening in a Community Sample of African Americans	Cross-sectional	Surveys	Southeast	To evaluate the association between social determinants (e. g., psychological characteristics, perceived social environment, cultural beliefs such as present temporal orientation) and colorectal cancer (CRC) screening among African Americans.	100	44	262	Inclusion: African American men and women aged 50-75 who are residents in Philadelphia metropolitan area. Exclusion: Personal history of colorectal, breast, or prostate cancer. Experiencing symptoms of these diseases or had an abnormal screening result.	Aging (OR= 1.75; CI: .24-2.48, p= .002), income level (OR= 2.09; CI: 1.07-4.06; p= .03), provider recommendation (OR= 10.78; CI: 4.85-29.94; p= .0001), and self-efficacy (OR=2.73; CI: 1.40-5.35; p= .003) were significantly associated with increased CRC screening.
Holmes-Rovner	Colorectal Cancer Screening Barriers in Persons with Low Income	Qualitative	Focus Groups	Midwest	To provide insight into barriers to screening in this population,	47	42	21	Inclusion: Patients who had previously refused CRCS	Barriers: Medical mistrust, lack of instructions for FOBT, fear, racism, lack of reminders, and aversion to handling stool were barriers to

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
et al., 2002					especially those who previously refused screening					screening. Facilitators: Provider recommendation facilitated screening.
Holt et al., 2009	Use of focus group data to develop recommendations for demographically segmented colorectal cancer educational strategies	Qualitative	Focus Groups	Southeast	To identify recommendations for the development of educational interventions to increase CRC screening, using an audience segmentation strategy	58	39	165	Inclusion: White and African American men and women over the age of 50 who do not have a previous history of CRC or gastrointestinal problems and reside in Jefferson and Madison counties	Barriers: CRC knowledge deficit, fatalism, lack of provider recommendation, and insurance challenges were barriers to screening. Facilitators: Having social support, and provider's recommendation, receiving messages of hope, and community-based screening programs were facilitators of screening.
James et al., 2002	Perceived barriers and benefits to colon cancer screening among African Americans in North Carolina: how does perception relate to screening behavior?	Cross sectional study	Survey	Southeast	To examine perceptions of barriers and benefits to CRC screening in a sample of predominantly older African American church members residing in North Carolina.	98	28	397	Inclusion: Adults aged over 18 years, reported attending church at least once per month. Adults 50 and older included in final analysis.	Barriers: Not receiving a doctor's recommendation, pain, cost, feelings of embarrassment, and test preparation were presented as barriers to screening. Facilitators: being a role model for family, having control over health, taking care of body (temple), following doctor's advice, and decreasing worry were facilitators of screening. Across the 3 screening modalities (FOBT, sigmoidoscopy, and colonoscopy), aging and perceived benefits were significant predictors for colonoscopy (OR= 1.06; CI: 1.02-1.09 & OR= 1.27; CI: 1.10-1.48 respectively). Perceived barriers were a significant predictor of FOBT (OR= .91; CI: .86-.97). Age, perceived benefits, and perceived barriers were predictors of sigmoidoscopy (OR= 1.07; CI: 1.04-1.11, OR= 1.11; CI: 1.01-1.23, OR= .92; CI: .87-.97).
James et al., 2011	Knowledge and attitudes about colon cancer screening among African Americans.	Qualitative	Focus groups; Interviews	Not disclosed	To explore knowledge and attitudes about colorectal cancer (CRC) screening among African American patients aged 45 and older at a community health center serving low-income and uninsured patients.	100	31.6	38	Inclusion: Adults 45 years or older	Barriers: CRC knowledge deficit, medical mistrust, cost, preparation for screening test, discomfort, and fear were barriers to screening. Facilitators: Having a family history of cancer, social influence, and early detection facilitated screening.

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Jandorf et al., 2013	Culturally targeted patient navigation for increasing African Americans' adherence to screening colonoscopy: A randomized clinical trial.	RCT	Pre- and post- assessments; assessment one gathered general sociodemographic data about age, race/ethnicity, employment status, income, and education.	Northeast	To examine patient navigation, delivered in three ways (peer-patient navigation, pro-patient navigation, and STD), to address the low adherence to physician recommended screening colonoscopy by African American patients. We also examined the potential impact of sociodemographic, medical, and intrapersonal factors as predictors of screening completion.	100	32	350	Inclusion: African American patients more than 50 years of age without active gastrointestinal symptoms, significant comorbidities, or a history of inflammatory bowel disease or colorectal cancer were included. Exclusion: Patients must not have undergone colonoscopy within the past 5 years (based on the clinical practice at our institution) or have been current with other forms of colorectal cancer screening (e.g., FOBT, flexible sigmoidoscopy)	Significant predictors of CRC screening were income (OR= 2.85; CI: 1.469-5.472; p= .002), self-efficacy (OR= 2.396; CI: 1.136-5.057; p= .022), social influence (OR= .514; CI: .289-.913; p= .023), black identity (OR= 1.656; CI: 1.046-2.622; p= .021), and fear (OR= .699; CI: .507-.964; p= .029).
Janz et al., 2003	Colorectal cancer screening attitudes and behavior: A population-based study.	Cross sectional study	Telephone interviews/surveys	Midwest	Gathered a population-based sample that includes adequate numbers of black and white men and women to allow for comparisons between gender and race sub-groups; examined CRC screening attitudes, beliefs, and practices related to individual screening tests (separately and in combination) as opposed to focusing on a single test; used a theoretical framework to explore attitudes, beliefs, and practices about colorectal cancer in general and each screening test in particular; broadened the scope of the research to examine whether subjects had ever heard about, ever had, and/or were current with recommended screening guidelines for the various CRC screening tests	48.5	50.4	355	Inclusion: Black and White men and women aged 50-79, resided in Genesee County, MI, household telephone Exclusion: Prior history of CRC, colorectal surgery to remove polyp, inflammatory bowel disease, or familial adenomatous polyposis	Significant predictors of CRC screening by modality: FOBT: Aging (OR= 1.04; CI: 1.01-1.08; p= .020), specific barriers (OR= .45; CI: .25-.83; p=.011), and salience and coherence (OR= 3.32; CI: 1.54-6.69; p=.002). Sigmoidoscopy: Age (OR= 1.04; CI: 1.01-1.07; p=.025), susceptibility to develop CRC (OR= .78; CI: .62-.99), higher risk (OR= 1.24; CI: 1.01-1.52; p= .037), general benefits (OR= 2.27; CI: 1.24- 4.18; p= .008), and specific barriers (OR= .42; CI: .23-.77; p= .005). Colonoscopy: family history (OR= 3.02; CI: 1.29-7.09; p= .011), specific barriers (OR= .44; CI: .20-.96; p= .038), and salience and coherence (OR= 2.70; CI: 1.20-6.08; p= .017).
Jones et al., 2010	The relative importance of patient-reported barriers to colorectal cancer screening	Cross sectional study	Mailed questionnaire/survey	Southeast	Systematically measuring the factors that a diverse group of primary care patients identified for not being screened for CRC, and the relative importance.	30	39.7	3357	Inclusion: Patients of 12 family medicine practices in Virginia Ambulatory Care Outcomes Research Network, Age 50-75, Office visit in last 2 years	Rank order results (with mean item scores on scale 1 to 5) suggested that the top 5 barriers to screening adjusted for type of screening modality were: not receiving a provider's recommendation (2.51), CRC screening knowledge deficit

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	% AA	% Men	N	Inclusion/Exclusion	Summary of Findings
										(2.35), costs (2.25), decreased perceived risk (2.16), and embarrassment (2.12).
Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	%Men	N	Inclusion/Exclusion	Summary of Findings
Jones et al., 2010	Patient-reported barriers to colorectal cancer screening: A mixed-methods analysis	Mixed methods	Survey, focus groups	southeast	(1) What does a diverse group of patients identify as the most important barrier to CRC screening when asked in an open-ended survey question? (2) What barriers are identified for CRC screening generally and for each of four recommended screening tests when patients discuss barriers in a focus group setting?	Survey -35% Focus groups - 43%	Survey - 34% Focus groups - 38%	Survey - 317 Focus groups - 40	Inclusion: Survey adults 50-75 attended two family practice located in downtown Richmond and Fairfax, VA. Focus groups adults 45-75 practices above and rural practice in Front Royal, VA. Patients who completed health assessment survey in past year.	Barriers: Barriers to CRC screening included fear, unpleasant preparation, CRC screening knowledge deficit, pain, costs, and lack of time.
12 Kelly 2007	Colorectal cancer screening in 3 racial groups.	Cross sectional study	survey	Southeast	to understand the predictors of CRC screening in a triracial (i.e., African American, European American, and Native American) rural population.	25%	25%	171 (final analysis)	Inclusion: Adults 51 and older, alive, women not in ROSE project.	Factors that significantly predicted CRC screening uptake were having a provider's recommendation (OR= 8.45; CI: 2.20-32.40), personal history (OR= 11.24; CI: 1.68-75.15), CRC knowledge (OR= 1.72; CI:1.16-2.56). CRC screening knowledge (OR= 4.59; CI: 1.66-12.64) and having a provider's recommendation (OR= .17; CI: .05-.54) significantly predicted adherence to FOBT screening.
Lawsin et al., 2007	Colorectal cancer screening among low-income African Americans in East Harlem: a theoretical approach to understanding barriers and promoters to screening.	Cross sectional study	surveys	Northeast	This study aims to enhance the understanding of factors associated with adherence to CRC screening recommendations and stage of adoption for CRC screening among a sample of low-income AAs at average risk for CRC in a primary care setting in East Harlem using measures guided by the TTM as well as the construct of fatalism.	100%	43%	111	Inclusion: African American by self-report, over the age of 51 (allowing for 12 months to comply with CRC screening guidelines), accessible by residential telephone, English speaking, and at average risk for CRC.	Barriers: Fear, cost, lack of insurance, aversion to bowel prep, previous negative clinical experience, lack of access to screening were barriers to screening. Facilitators: Use of resources, celebrity endorsement of screening, mass media outreach, receiving incentives, and culturally tailored messages facilitated screening.
May et al., 2014	Addressing low colorectal cancer screening in African Americans: Focus groups reveal insights for developing an effective intervention	Qualitative research	Focus groups	West	To inform the development of patient-oriented interventions to improve uptake of CRC screening among African Americans by conducting focus groups and exploring the knowledge, attitudes, beliefs, needs, and preferences of African Americans regarding CRC risk and screening.	100%	34%	38	Inclusion: African American male or female aged 45-76.	Barriers: Fear, cost, lack of insurance, aversion to bowel prep, previous negative clinical experience, lack of access to screening were barriers to screening. Facilitators: Use of resources, celebrity endorsement of screening, mass media outreach, receiving incentives, and culturally tailored messages facilitated screening.

Author/Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	%Men	N	Inclusion/Exclusion	Summary of Findings
Mitchell et al., 2013	Social determinants associated with colorectal cancer screening in an urban community sample of African American men	Cross sectional study	Surveys	Midwest	To understand the influence of social determinants on the CRC screening behaviors of African American men, and to identify predictors of screening behavior within the sample	100%	100%	558	Inclusion Criteria: African American male 18 years and older and read and write in English.	Being over the age of 55 (OR= 3.68; CI: 2.422-5.603), being employed (OR= .634; CI: .421-.955), having insurance (OR= 2.010; CI: 1.299-3.109), and having a regular doctor (OR= 1.63; CI: 1.033-2.488) significantly predicted CRC screening uptake.
Myers et al., 2014	Increasing colon cancer screening in primary care among African Americans.	Randomized controlled trial	Surveys	Northeast	To test the impact of a preference-based tailored navigation intervention strategy vs a standard mailed intervention strategy on screening adherence.	100%	31.5%	761	Inclusion: African American aged 50-75, no prior diagnosis of colorectal neoplasia or irritable bowel disorder, visited a participating practice within the previous two year, complete contact information, not compliant with American Cancer Society CRC screening guidelines.	Barriers: Factors reported for nonadherence of CRC screening were low perceived importance of screening, lack of time, lack of transportation, fear, lack of insurance, CRC screening knowledge deficit.
O'Malley et al., 2004	Patient and provider barriers to colorectal cancer screening in the primary care safety-net.	Qualitative research	Focus groups	Southeast	To identify, through patient and provider focus groups, the promoters and barriers to colorectal cancer screening for low-income and uninsured patients in a typical urban primary care safety-net clinic.	85%	55%	6 providers 40 patients	Inclusion: Patients over 50 who speak English, uninsured, clinic patient for primary care, give informed consent and the following staff members who have worked at clinic at least 3 years: providers, physicians, nurse coordinators, social workers, intake workers, physician assistant, and nurse practitioner	Barriers: From the patient perspective, barriers to screening included embarrassment, food restriction with FOBT, lack of CRC screening knowledge, not having insurance, fear, fatalism, and low self-efficacy. Providers noted barriers were time constraints and lack of written policy within organization about CRC screening. Facilitators: Facilitators to screening were relatively uncomplicated screening with FOBT, explanation of test, receiving reminders from providers, chart alerts for providers, and standardized flow sheets to help in clinic.
Palmer et al., 2008	Colorectal cancer screening and African Americans: findings from a qualitative study.	Qualitative research	Interviews	Southeast	The overall purpose of this study was to identify factors influencing adherence to CRC screening among African Americans	100%	50%	36	Inclusion: 50 years of age or older, did not have a history of CRC, and identified themselves as being African American or Black.	Barriers: Medical mistrust, fear, cost, lack of insurance, and competing priorities were barriers to screening. Facilitators: Provider recommendations and having a peace of mind after screening were facilitators.
Powe, 1995	Fatalism among elderly African Americans. Effects on colorectal cancer screening.	Cross sectional study	Surveys	Southeast	To report on the relationship between race and fatalism. In addition, the relationship between fatalism and participation in FOBT will be explored.	61%	22%	192	Inclusion: Age 50 and older, orientation to correct date and location.	Fatalism (OR= 1.3; p= .0006) was the only significant predictor of nonadherence to CRC screening in the adjusted model.
Author/Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	% Men	N	Inclusion/Exclusion	Summary of Findings

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Table 1 (continued)

Author/Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	% Men	N	Inclusion/Exclusion	Summary of Findings
Purnell et al., 2010	Social and cultural factors are related to perceived colorectal cancer screening benefits and intentions in African Americans.	Cross sectional study	Surveys	Midwest	Examined the relationship between social and cultural factors (i.e., group-level perceptions of susceptibility to colorectal cancer, African American acculturation, physician ethnicity, and group-based medical mistrust) and perceived benefits, perceived barriers, and intention to be screened for colorectal cancer.	100%	35%	198	Inclusion: aged 45 and older Exclusion: Individuals with a personal history of cancer at any site, chronic colorectal disease (e.g., Crohn's disease or ulcerative colitis), or currently being treated for a life-threatening disease or severe mental disorder (e.g., schizophrenia, dementia, Alzheimer's disease), and pregnant women.	Individuals with race concordant physicians and low levels of medical mistrust (F= 2.55; p<0.0) had greater intent to complete CRC screening. Those with low sociocultural group susceptibility and high levels of traditionalism had higher intent to screen (F= 6.69; p<0.01).
Rogers et al., 2018	Predictors of Intention to Obtain Colorectal Cancer Screening Among African American Men in a State Fair Setting.	Cross sectional study	Surveys	Midwest	To explore whether male role norms, knowledge, attitudes, and perceptions influence intention to screen for colorectal cancer among 297 African American men.	100%	100%	297	Inclusion: 18-65 African American, resided in Minnesota, and understand and speak English.	Predictors that were significantly associated with intent to screen were age ($\beta= 1.916$, $p< .0001$), perceived subjective norms ($\beta= 1.364$, $p< .0001$), and perceived barriers ($\beta= -.853$, $p< .0001$).
Rogers et al., 2020	Psychosocial determinants of colorectal Cancer screening uptake among African American men: understanding the role of masculine role norms, medical mistrust, and normative support.	Qualitative research	Focus groups	Midwest	To explore the psychosocial determinants of CRC screening uptake among African-American men aged 45–75 years living in Minnesota, Ohio, and Utah.	100%	100%	84	Inclusion: Black or African American men aged 45-75, born in US spoke English, working telephone, lived in Minnesota, Ohio, or Utah.	Barriers: Medical mistrust, masculine role norms, and negative sexual connotation were barriers to screening. Facilitators: Normative support with encouragement to seek healthcare was a facilitator of screening.
Rogers et al., 2021	Factors associated with colorectal cancer screening intent and uptake among adult Non-Hispanic Black men.	Cross sectional study	Surveys	Midwest	To explore the association of masculinity barriers to medical care (MBMC) constructs developed by the study's first author, along with other psychological factors such as knowledge, attitudes, beliefs, and social support, with CRC screening intention and uptake	100%	100%	319	Inclusion: Non-Hispanic Black men aged 45-75, born in US, reside in Minnesota, Ohio, and Utah, telephone or computer/tablet with internet access.	Study participants with better social support and those who were not married had greater intent to be screened for CRC sooner than later ($\beta=0.21$, CI: .00-.42; $p=0.04$ and ($\beta= -0.48$, CI: -.89- -.07; $p=0.02$, respectively). A positive unit change in knowledge about CRC screening (OR=1.30, CI: 1.01-1.66; $p=0.03$) and chronological age (OR=1.41, CI: 1.04-1.89 $p=0.02$) were associated with increased likelihood of taking a blood stool test at home. One unit increase in Masculinity Barriers to Medical Care was associated with greater odds of having an endoscopy CRC screening exam (OR= 3.56; CI: 1.41-8.99; $p= .01$).
Author/Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	%Men	N	Inclusion/Exclusion	Summary of Findings

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Table 1 (continued)

Author/Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	%Men	N	Inclusion/Exclusion	Summary of Findings
Rogers et al., 2022	Masculinity Barriers to Ever Completing Colorectal Cancer Screening among American Indian/Alaska Native, Black, and White Men (Ages 45-75).	Cross sectional study	Survey	Not disclosed	To determine whether masculinity barriers to medical care influence early-detection CRC screening completion among Black and AIAN men aged 45 to 75 years compared with White men.	23%	100%	435	Inclusion: Males 18-75 years old (45 and older in analysis), Black, AIAN, or White.	A unit increase on the subscales <i>being strong</i> (OR= .46; CI: .23-.94) and <i>having negative attitudes toward medical professionals and exams</i> (OR= .43; CI: .21-.86) were associated with decreased CRC screening. While being aged 60 and older was consistent in higher odds of screening across all models.
Shokar et al., 2008	Factors associated with racial/ethnic differences in colorectal cancer screening.	Cross sectional study	Survey	Southwest	To (1) simultaneously examine the association between a wide range of variables and CRC screening in a multiethnic population of African American, Hispanic, and non-Hispanic white participants attending a primary care clinic, and (2) to determine the contribution of these factors to racial/ethnic differences in CRC screening.	34.6%	36.9%	560	Inclusion: Patients 50-80 years old non-Hispanic white, African American, or Hispanic. Exclusion: History of CRC or high risk of CRC (familial adenomatous polyposis syndrome, hereditary nonpolyposis CRC, or ulcerative colitis).	Factors that were associated with up-to-date screening were being 65 years or older (OR= 2.88; CI: 1.68-4.95), higher educational levels (OR= 2.07; CI: 1.09-3.92), having CRC screening awareness (OR= 3.32; CI: 1.47-7.53), and having a doctor's recommendation (OR= 3.86; CI: 2.30-6.50).
Sly et al., 2013	Identifying barriers to colonoscopy screening for nonadherent African American participants in a patient navigation intervention.	Qualitative research	Interviews	Not disclosed	Explores the contextual details related to noncompletion among previously navigated patients and why PN was not effective for these individuals.	100%	25%	16	Inclusion: 50 years and older, no previous colonoscopy, no medical comorbidities which would make them ineligible for colonoscopy, referred to screening colonoscopy by PCP and recruited during routine visit at a primary care clinic, had previously participated in the larger patient navigation intervention study, agreed to be contacted for future studies, had not completed a scheduled colonoscopy, and were able to be contacted.	Barriers: CRC screening knowledge deficit, fear, fatalism, competing priorities, and patient navigation challenges were barriers to screening.
Tabbarah et al., 2005	Barriers and facilitators of colon cancer screening among patients at faith-based neighborhood health centers.	Cross sectional study	Survey	Midwest	To examine CRC screening among patients of two such faith-based health centers and determine what attitudes, social influences, perceived consequences, and facilitating conditions influence CRC screening and if there are racial differences in self-reported CRC screening rates.	47%	37%	375	Not specified	Participants who endorsed having a physician's recommendation for screening (OR=10.12; CI: 3.36-30.46) and frequent visits to physician (OR= 3.31; CI: 1.06-10.35) had greater odds of CRC screening.
Taylor et al., 2003	Colorectal cancer screening among African Americans: the importance of physician recommendation.	Cross sectional study	Survey	West	To examine the impact of physician recommendation and selected patient beliefs on colorectal cancer screening participation	100%	41%	74	Inclusion: African American aged 50-79, English speaking, and completed primary care clinic visit at Harborview Medical Center in previous 12 months	Patients who received a physician's recommendation were more likely to complete CRC screening (p < .001)

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Table 1 (continued)

Author/ Year	Title	Research Method	Data Collection Method	US Region	Study Aim	%AA	%Men	N	Inclusion/Exclusion	Summary of Findings
Torke et al., 2004	African American patients' perspectives on medical decision making.	Qualitative research	Interviews	Southeast	To explore the important issues for African American patients as they consider a medical decision.	100%	28%	25	Inclusion: Patients at least 50 years old and discussed flexible sigmoidoscopy with provider Exclusion: Had a contraindication to flexible sigmoidoscopy, including previous flexible sigmoidoscopy or colonoscopy within 5 years, a history of heme-positive stool samples or rectal bleeding, iron deficiency anemia, colon cancer, or a current unstable medical problem, history of dementia or did not speak English.	Barriers: Fear, pain, and knowledge deficit about CRC screening were barriers. Facilitators: Provider recommendation and perceived benefits were facilitators of screening.
Tseng et al., 2009	Predictors of colorectal cancer knowledge and screening among church-attending African Americans and Whites in the Deep South.	Cross sectional study	Survey	Southeast	To understand the relationship between CRC knowledge, risk factors and the use of recommended CRC screening tests among a church-based sample of African American and White men and women.	83.74%	34.96%	123	Inclusion: Adults 45 and older for African Americans and 50 and older for White Americans.	Participants who noted having a family history of CRC (OR= 2.55; CI: .99-6.60) and higher educational level (OR= 1.23; CI: 1.02-1.49) had greater odds of completing CRC screening.
Wilkins et al., 2012	Racial disparities and barriers to colorectal cancer screening in rural areas.	Cross sectional study	Survey	Southeast	To examine CRC screening rates and barriers to CRC screening in a rural population	19.5%	27.6%	567	Inclusion: Adults aged 50-79.	African American respondents indicated that they had insufficient time with physicians (p= .018), challenges with high screening costs (p= .005), greater uncertainty with completing FOBT screening tests (p< .001), bowel preparation concerns for sigmoidoscopy (p< .001), and for colonoscopy the barriers were fear, transportation, and preparation (p= .003).
Wong et al., 2013	Barriers and facilitators to adherence to screening colonoscopy among African Americans: a mixed-methods analysis.	Qualitative research	Interviews	Northeast	to better understand the specific reasons for adherence to colonoscopy among African Americans who have attended a community-based educational program about CRC screening.	100%	45%	29	Inclusion: Adults 50 and older, self-identified as African American, no history of CRC, Crohn's disease, or ulcerative colitis, and no family history of CRC.	Barriers: CRC knowledge deficit, lack of physician recommendation. Fear or embarrassment of colonoscopy, perceived inconvenience with colonoscopy were barriers to screening. Facilitators: Having a physician's recommendation, being more aware about CRC screening, and presence of other medical conditions facilitated screening.

Table 2
Systematic search strategy with MeSH and search terms.

MeSH/Subject Headings Used	Search Terms
"African Americans"[Mesh] AND ("Male"[Mesh] OR "Men"[Mesh]) AND "Social Determinants of Health"[Mesh] AND "Colorectal Neoplasms"[Mesh] AND ("Colonoscopy"[Mesh] OR "Early Detection of Cancer"[Mesh])	(((((("African Americans"[Mesh] OR "Blacks"[Mesh:NOEXP] OR "Black American*" [tw] OR "Black-American"[All Fields] OR "Afro American"[All Fields] OR "Afro-American"[All Fields] OR ("African descent"[tw] AND American*[tw]) OR "African-American"[All Fields] OR (Black*[tw] AND American*[tw]) OR ("African Ancestry"[tw] AND American*[tw])) AND ("Men"[Mesh] OR "Male"[Mesh] OR men [tw] OR male[tw] OR males[tw])) OR ("Black men"[All Fields] OR "African-American Men"[All Fields])) AND (Colonoscopy[Mesh] OR "Colorectal Neoplasms/diagnosis"[Mesh] OR "Sigmoidoscopy"[Mesh] OR ("Colorectal Neoplasms"[Mesh] AND ("Mass Screening"[Mesh] OR screen[tw] OR Screened[tw] OR "Early detection of cancer"[Mesh])) OR Cologuard[tw] OR Colonoscopy[tw] OR "colorectal screening"[All Fields] OR "Bowel scope"[All Fields] OR "Fecal Immunochemical Test"[All Fields])) AND ("clinical competence"[Mesh] OR "Community Networks"[Mesh] OR "Community-Institutional Relations"[Mesh] OR "Decision Making"[Mesh] OR "Delivery of Health Care"[Mesh] OR "Health Knowledge, Attitudes, Practice"[Mesh] OR "Insurance, Health"[mesh] OR "Health Services Accessibility"[Mesh] OR "Health Literacy"[Mesh] OR "Patient Compliance"[Mesh] OR "Physician-Patient Relations"[Mesh] OR Barrier*[tw] OR Obstacle*[tw] OR Challenge*[tw] OR Hindrance*[tw] OR Limitation*[tw] OR Deterrent*[tw] OR Impediment*[tw] OR Interference[tw] OR Roadblock*[tw] OR Facilitator*[tw] OR Promoter*[tw] OR Enabler*[tw] OR Supporter*[tw] OR Motivation*[tw] OR Attitud*[tw] OR Practice*[tw])) NOT (cervical OR lung OR prostate OR skin)) NOT cervical NOT lung NOT prostate NOT skin)))

CRC screening, emotional and cognitive factors, aging, patient-provider communication, interpersonal relationships, access to screening, and outreach efforts (Table 3).

3.1.1. Individual

Several individual-level themes emerged. The most common barrier to CRC screening at this level was lack of CRC and CRC screening knowledge. (Brouse et al., 2004; Cortes et al., 2018; Dyer et al., 2019; Greiner et al., 2005a; Jones et al., 2010a; O'Malley et al., 2004; Sly et al., 2013; Wong et al., 2013) For example, participants lacked understanding of the difference between CRC and prostate cancer as well as the availability of multiple options for CRC screening (O'Malley et al., 2004; May et al., 2014). This lack of knowledge influenced overall CRC screening uptake (Alvidrez et al., 2019; Brouse et al., 2004). Similarly in one study, participants were unaware of the need for screening if they were asymptomatic (Jones et al., 2010a).

Using a structured CRC knowledge test to assess understanding, five studies reported that those with lower scores had lower screening uptake (Crookes et al., 2014; Rogers et al., 2021; Shokar et al., 2008; Lawsins et al., 2007). Eight of the 16 qualitative studies (50 %) found lack of knowledge was a barrier to screening (Greiner et al., 2005a; O'Malley et al., 2004; Sly et al., 2013; Wong et al., 2013; May et al., 2014; Jones et al., 2010b; Holt et al., 2009; Torke et al., 2004). In those studies, Black Americans were found to have lower CRC knowledge compared to their non-Hispanic White counterparts, subsequently impacting their uptake of CRC screening (Shokar et al., 2008; Burgess et al., 2011). Crookes et al. also found that participants who did not get a colonoscopy had lower pre- and post-test knowledge scores compared to those who completed the procedure (Crookes et al., 2014). With stool-based testing, higher knowledge predicted the use of FIT (OR: 3.19) and FOBT (OR: 4.59) (Lawsins et al., 2007). Both Black and White women incorrectly associated CRC with being a man's disease or one that occurs in men who have sex with men, demonstrating knowledge deficits regarding this disease (Holt et al., 2009; Holmes-Rovner et al., 2002).

Lack of knowledge was attributed to the healthcare provider failing to provide CRC screening information to patients (Sly et al., 2013; May et al., 2014). In a qualitative study conducted by Greiner et al. one focus group participant noted "...this is the first time I ever just had a discussion on [colorectal cancer], or ever talked about it with anyone." A participant in a study by Sly and colleagues expressed frustration, stating, "Physicians never tell you anything about what the test consist of. They just say we think you should have this test done...give you the paperwork and...make the appointment and that's it. You really don't know what the test consists of" (Sly et al., 2013). Additionally, two studies identified the inability to follow test instructions as a barrier to CRC screening (Brouse et al., 2004; Holmes-Rovner et al., 2002). Black men reported that the instructions and implications for testing should be "more explicit" (Holmes-Rovner et al., 2002). Participants in the Brouse et al. study acknowledged difficulty navigating FOBT instructions and following the dietary restrictions (Brouse et al., 2004).

Emotional and cognitive factors such as fear, fatalism, embarrassment, health literacy, and past experiences with cancer were found to be barriers to being up to date with CRC screening. Participants in several studies expressed fear around having the CRC screening, including concerns about experiencing pain or discomfort during invasive screening (i.e., colonoscopy) (Brouse et al., 2004; Cortes et al., 2018; Dyer et al., 2019; Jones et al., 2010a; Sly et al., 2013; May et al., 2014; Holt et al., 2009; Torke et al., 2004; James et al., 2011). In Torke et al., one participant expressed feeling, "...frightened, you know, a little nervous [about] the feeling of it...whether or not it would hurt, which I wouldn't know because I never had one." (Torke et al., 2004) Another participant from that same study remarked, "I've always thought of [colonoscopies] being painful." (Torke et al., 2004)

Fear often resulted in the belief that cancer was inevitably fatal and beyond intervention (i.e., fatalism). This sense of fatalism diminished engagement with healthcare providers. The perception of having no control over one's health outcomes concerning cancer was more common among Black Americans compared to White Americans (Shokar et al., 2008; Powe, 1995). Fear and fatalism were measured across five cross-sectional studies, and each found that fear was negatively associated with CRC screening (Crookes et al., 2014; Burgess et al., 2011; Powe, 1995; Jandorf et al., 2013; Greiner et al., 2005b). Participants also voiced concerns about the potential findings of CRC screening, which often negatively influenced their willingness to undergo the procedure (Cortes et al., 2018; Greiner et al., 2005a; Jones et al., 2010a; O'Malley et al., 2004; Sly et al., 2013; May et al., 2014; Bass et al., 2011; Palmer et al., 2008). In Greiner et al. a focus group participant stated, "I've had several friends die because they were just what you just said – fear. Fear of going to the hospital, fear of what they might find out." (Greiner et al., 2005a)

Several studies cited embarrassment or a general aversion to CRC screening (Brouse et al., 2004; Cortes et al., 2018; Dyer et al., 2019; O'Malley et al., 2004; May et al., 2014; Holt et al., 2009; James et al., 2011; Bass et al., 2011; Rogers et al., 2020). FOBT-specific barriers included not wanting to handle stool during the collection process (Brouse et al., 2004; O'Malley et al., 2004; Holt et al., 2009; Bass et al., 2011). A participant in the Bass et al. study noted, "[FOBT is] gross...It takes too much work. You have to be real consistent, responsible. You have to have a whole lot of things to follow that kind of schedule" (Bass et al., 2011). Across 6 studies, male participants perceived the colonoscopy procedure as linked to homosexual activity, which they felt threatened their masculinity. This aversion to rectal probing was particularly pronounced among Black men (Earl et al., 2022; Cortes et al., 2018; Jones et al., 2010b; Holt et al., 2009; Bass et al., 2011; Rogers et al., 2020). In a study by Wilkins et al., White Americans reported facing more emotional challenges, such as embarrassment and difficulty choosing between screening options, compared to their minoritized counterparts (Wilkins et al., 2012).

Health literacy is crucial for effective engagement in care, particularly when choosing CRC screening options. A positive relationship

Table 3
Summary of key findings and primary care strategies.

Key Themes	Authors (Year)	Key Findings	Strategies & Rationale
CRC Knowledge	Brouse et al. (2004) Burgess et al. (2011) Cortes et al. (2018) Crookes et al. (2014) Dyer et al. (2019) Greiner et al. (2005) Holt et al. (2009) Jones et al. (2010) (O'Malley et al., 2004) Jones et al. (2010) (Holt et al., 2009) Kelly et al. (2007) Lawsin et al. (2007) May et al. (2014) O'Malley et al. (2004) Rogers et al. (2021) Sly et al. (2013) Shokar et al. (2008) Torke et al. (2004) Wong et al. (2013)	Lower CRC screening knowledge scores were negatively associated with screening uptake. Health literacy, especially among Black men, was crucial for understanding the need for screening. Providers with less knowledge of screening guidelines tended to recommend screening less often.	Use structured tools to assess health literacy: Identifying patients' health literacy levels helps tailor communication to their understanding, ensuring they grasp the importance of CRC screening. Provide culturally inclusive instructive materials: Materials that reflect the cultural context of the target audience are more relatable and effective in conveying the message. Implement evidence-based CRC screening interventions, like patient navigation programs: These programs guide patients through the screening process, increasing adherence and understanding. Tailor health messaging and images that are culturally inclusive: These programs guide patients through the screening process, increasing adherence and understanding. Start screening interventions and outreach for Black men in their 40s: Early intervention can lead to earlier understanding, detection and prevention, particularly in high-risk groups.
Patient-Provider Interactions	Agho et al. (2012) Brouse et al. (2004) Burgess et al. (2011) Cortes et al. (2018) Cronan et al. (2008) Crookes et al. (2014) Davis et al. (2012) Earl et al. (2022) Gonzales et al. (2023) Greene et al. (2006) Greene et al. (2012) Greiner et al. (2005) Gwede et al. (2011) Holmes-Rovner et al. (2002) James et al. (2011) Mitchell et al. (2013)	Patients reported that poor communication, counseling, and education from primary care providers reduced their CRC screening uptake, with limited time during visits being a major barrier. Medical mistrust, often arising from past experiences and negative systemic events, further decreased uptake. Conversely, having a regular provider, receiving a screening recommendation, and being given a stool kit in the office were all positively linked to increased screening uptake.	Evaluate and improve communication practices: Enhancing communication ensures that patients receive clear, culturally competent information, which can improve their understanding and compliance. Build trust and foster shared decision-making: Establishing trust and involving patients in their care decisions increases their confidence in the healthcare system and adherence to recommended screenings. Adopt evidence-based decision-making: Using the latest evidence and clinical support tools helps providers make informed recommendations that improve patient outcomes. Implement a whole-team approach: Engaging the entire healthcare team in the screening process distributes the workload and ensures comprehensive patient support. Customize health information technology tools: Tailoring tools to meet the specific needs of the care team enhances coordination and efficiency in managing screening efforts.

(continued on next page)

Table 3 (continued)

Key Themes	Authors (Year)	Key Findings	Strategies & Rationale
	Palmer et al. (2008) Purnell et al. (2010) Rogers et al. (2020) Shokar et al. (2008) Tabbarah et al. (2005) Taylor et al. (2003) Wilkins et al. (2012)		
Key Themes	Authors (Year)	Key Findings	Strategies & Rationale
Access to Screening	Bazargan et al. (2009) Christy et al. (2016) Halbert et al. (2011) Holt et al. (2009) James et al. (2011) Jones et al. (2010) May et al. (2014) Mitchell et al. (2013) O'Malley et al. (2004) Palmer et al. (2008) Tseng et al. (2009)	Challenges with access to screening significantly hindered CRC screening uptake, encompassing financial difficulties, transportation issues (both private and public), and the distance to care facilities. In contrast, having health insurance was positively associated with increased screening rates, and the availability of stool-based kits further improved screening uptake.	Provide financial navigation to patients: Offering financial navigation helps patients understand their insurance coverage, identify financial assistance programs, and reduce out-of-pocket costs, thereby eliminating financial barriers to colorectal cancer screening. Partner with endoscopic providers: Collaborating with endoscopic providers ensures more streamlined and timely access to screening procedures. This partnership can facilitate quicker referrals, reduce wait times, and improve overall patient adherence to screening schedules. Implement organized population-based screening: Structured screening programs, especially those using stool-based kits, can reach a broader population efficiently. These programs can systematically identify and remind eligible patients, increasing screening rates and early detection.

between health literacy and awareness of CRC screening has been found for Black men (Agho et al., 2012). Higher educational levels are also positively associated with CRC screening uptake (Greiner et al., 2005a; Shokar et al., 2008; Curbow et al., 2015; Green and Kelly, 2004; Tseng et al., 2009).

Several studies identified past negative experiences, whether personal or through social networks, as barriers to CRC screening (Dyer et al., 2019; Jones et al., 2010a; May et al., 2014). Participants mentioned complications experienced during past CRC testing, such as pain and reactions to anesthesia, as reasons to avoid it (Jones et al., 2010a). One participant discussing a previous colonoscopy stated, “I don't want to go through it again...I don't like hospitals and I am terrified of needles. I am really terrified of needles when they give you the IV...” (Dyer et al., 2019)

Challenges in accessing screening were identified at both the individual and organizational levels. Several studies highlighted financial barriers, including procedure-related costs and concerns about medical insurance (Jones et al., 2010a; O'Malley et al., 2004; May et al., 2014; James et al., 2011; Palmer et al., 2008; Tseng et al., 2009). Participants found out-of-pocket expenses to be cost-prohibitive with one noting, “I have to pay the co-payments out of my pocket, Medicare only pays 80%” (Palmer et al., 2008). Unsurprisingly, health insurance was positively linked to increased screening uptake (Mitchell et al., 2013; Halbert et al., 2011). A participant in Holt et al. highlighted the challenges Black men encounter regarding health insurance, stating, “Do you know how many Black men have a job with medical coverage? There are not that many. So, I think what society has to do is come up with better accessibility for the majority of the people because the majority don't have access to adequate health care” (Holt et al., 2009). Individuals who perceived greater barriers to screening generally had lower rates of screening uptake (Holt et al., 2009; Bazargan et al., 2009).

Growing older was the single most influencing factor in being up to date with CRC screening. There was a positive association between age and screening in every study where it was measured (Rogers et al., 2022; Greiner et al., 2005a; Crookes et al., 2014; Rogers et al., 2021; Shokar et al., 2008; Burgess et al., 2011; Greiner et al., 2005b; Curbow et al., 2015; Mitchell et al., 2013; Halbert et al., 2011; Janz et al., 2003; Chablani et al., 2017; Halbert et al., 2016; James et al., 2002; Born et al., 2009; Rogers et al., 2018). In Rogers et al., older adults (60–75) were more than 3 times likely to complete screening than those in the younger bracket of age eligibility (Rogers et al., 2022).

3.1.2. Interpersonal

Interpersonal barriers commonly reported for CRC screening were patient-provider communications, time constraints, and social relationships. Limited or lack of communication from health care providers resulted in patients not clearly understanding instructions for screening tests and testing procedures (Brouse et al., 2004; Holmes-Rovner et al., 2002; Greene et al., 2012). The time and commitment required to complete screenings were significant factors affecting screening uptake. Black male veterans specifically noted that a lack of time would prevent them from getting a sigmoidoscopy (Belue et al., 2011). Additionally, Black patients also reported that physicians did not spend enough time discussing screening tests with them, which further led to decreased screening uptake (Wilkins et al., 2012). In an intervention study conducted in primary care practices in Philadelphia, of the 243 participants who did not complete screening, 14 % reported lack of time for an appointment as a barrier (Myers et al., 2014).

The most important predictor for CRC screening uptake at this level, regardless of sociodemographic characteristics or socioeconomic status, was having a provider recommendation. (Earl et al., 2022; Crookes et al., 2014; Burgess et al., 2011; Agho et al., 2012; Davis et al., 2012; Gonzales et al., 2023; Taylor et al., 2003; Gwede et al., 2011; Cronan et al., 2008) Davis et al. found that in addition to providers recommending the test, providing a stool-based screening test to the patient in-office increased the odds of completion (RR = 95.5; CI: 44.1, 206.9)

(Davis et al., 2012). Relatedly, patients having a regular provider was positively associated with increased colorectal cancer screening uptake (Shokar et al., 2008; Mitchell et al., 2013; Greene et al., 2012; Tabbarah et al., 2005).

3.1.3. Community/Organizational

Lack of routine screening offering from healthcare providers, reminders, follow-up on test results with next steps, and decreased access to quality healthcare to obtain screening were noted barriers (May et al., 2014; Holmes-Rovner et al., 2002; Palmer et al., 2008; Tseng et al., 2009). Not having access to reliable transportation decreased up to date status (Palmer et al., 2008). Living further away from a healthcare site was negatively associated with returning the FIT kit in a study completed by Christy et al (Christy et al., 2016).

Community support, cultural norms, and a sense of collectivism among Black Americans were identified as key factors promoting screening uptake (Halbert et al., 2011; Brittain et al., 2012). Additionally, community-based screening programs targeting CRC have been shown to positively impact overall screening rates (Holt et al., 2009).

3.1.4. Societal

Nine studies identified medical mistrust as a barrier to CRC screening (Cortes et al., 2018; Greiner et al., 2005a; Holmes-Rovner et al., 2002; James et al., 2011; Palmer et al., 2008; Rogers et al., 2020; Wilkins et al., 2012; Greene et al., 2012; Purnell et al., 2010). Medical mistrust was associated with more frequent emergency room visits and missed preventive care (Purnell et al., 2010). Black respondents reported more challenges with their providers, related to mistrust or not having proper time to discuss their care, compared to White respondents (Wilkins et al., 2012; Greene et al., 2012). The motives of the healthcare provider were often questioned by comments such as, “You know, because doctors don't get much money from Medicare, I really think that has a lot to do with their treatment of me or of patients because they don't get paid that much money” (Palmer et al., 2008). Another stated, “One of the biggest problems...is that there is no African American physician here” (Holmes-Rovner et al., 2002). In one study it was noted that Black American patients with providers of a different race had higher levels of mistrust and indicated less intent to screen (Purnell et al., 2010).

Societal-level facilitators for CRC screening were related to culturally adjacent marketing strategies such as celebrity endorsements for the promotion of CRC screening and the use of mass media for screening campaigns (O'Malley et al., 2004; Wong et al., 2013; May et al., 2014).

4. Discussion

This mixed systematic review synthesized and evaluated available evidence on the multilevel determinants of CRC screening in Black men. By using a mixed methods approach, the review triangulated quantitative and qualitative findings to identify known determinants that have impacted CRC screening uptake among Black men with higher CRC-specific mortality and morbidity in comparison to other groups. Findings in this study highlight the abundance of data gathered on individual and interpersonal levels determinants. Gaps remain in identifying influences at the community and organizational levels.

At the individual level, barriers included knowledge deficits, emotional and cognitive factors, past negative experiences with cancer, and financial burdens. Facilitators at this level were higher education/health literacy and aging. Interpersonal barriers included lack of communication from providers and time constraints, while having a provider recommendation was the most effective facilitator.

Few community/organizational determinants were studied and remain less understood. Community-level barriers encompassed lack of transportation and inadequate quality healthcare facilities nearby. Facilitators included community support, influential cultural norms, and community-based screening programs. At the societal level, racism and medical mistrust were significant challenges, whereas appropriately

tailored messages helped improve screening uptake.

Key themes and significant findings from the review (see Table 3) offer actionable strategies for primary care organizations, including: 1) enhancing CRC screening knowledge within the patient population, 2) improving patient-provider interactions, and 3) reducing barriers to accessing screening.

4.1. Colorectal cancer screening knowledge

Findings suggest that having a lack of CRC knowledge increases the odds of not being up to date with screening and decreases patients' intent to screen. Arnold et al. found that receiving a nurse-led and literacy-informed screening intervention led to higher stool-based screening utilization than those in the literacy-informed only and enhanced care arms (Arnold et al., 2016). Likewise, having quality bowel preparation for colonoscopy has been linked to having higher health literacy scores (Erdogdu et al., 2020).

Healthcare organizations have found success in decreasing knowledge barriers and increasing CRC screening through patient navigation (PN) programs (Domingo and Braun, 2017). A Community Health Center in New York City enrolled Chinese American patients into a PN program which addressed barriers to screening and cultural and learning needs. The results of this program were successful with 76 % of the participants having received screening (Vora et al., 2017). A meta-analysis conducted by Dougherty and colleagues found that studies using a systematic PN intervention that addressed barriers and knowledge were associated with increased screening rates (Dougherty et al., 2018). Additionally, Roy et al. found in their systematic review that tailored PN approaches improved CRC screening uptake in Black Americans especially when combined with providing stool-based testing kits (Roy et al., 2021).

To address CRC screening knowledge deficits, we recommend primary care teams: 1) assess patients' health literacy and educational levels using standardized instruments, 2) provide instructive materials that are easily readable and written in language familiar to Black men, 3) implement evidence-based CRC screening interventions that effectively address the needs of Black men (e.g., patient navigation), 4) provide health messages and images that culturally align with the targeted patient population to improve engagement, and 5) implement interventions targeting men under 45 to bridge knowledge gaps promptly, as they typically have less interaction with the healthcare system compared to older adults.

4.1.1. Patient-provider interactions

The single most effective facilitator of CRC screening was having a provider recommendation, which was also affirmed by the National Institutes of Health (Steinwachs et al., 2010). Having an established primary care provider with consistent care improves patient-provider relationships. Fleming et al. discovered that patients who had in-person conversations with their health care providers were nearly 25 times more likely to complete the FIT test compared to those who did not engage in such communication (Fleming et al., 2018). Castañeda et al. also found that approaching patients immediately following a clinic appointment increased CRC screening, with 76 % of those with immediate contact completing screening compared to usual care (19 %) (Castañeda et al., 2018).

Effective interactions are integral in establishing shared decision making, which is a collaborative expression of patient-centered care, aiding patients in making decisions that best meets their needs and preferences (Montori et al., 2023). Screening test incongruity and decreased adherence are likely due to the lack of shared decision making between patients and their healthcare teams (Sepucha et al., 2023). Findings from a systematic review conducted by Coronado-Vásquez et al. indicated that when shared decision aids were used in primary care, patients exhibited significant decrease in decisional conflict and perceived barriers related to CRC screening (Coronado-Vásquez et al.,

2020). The lack of effective shared decision making and patient-provider communication has been associated with rushed clinic visits (Zoellner et al., 2021), ineffective health information technology tools (Kranz et al., 2018), and decreased awareness of screening guidelines (Lussiez et al., 2021).

To enhance patient-provider interactions, primary care teams should improve communication through regular training and incorporating feedback from Black male patients. Increasing patient visit times and using culturally appropriate decision aids will foster relationship-building and trust. Primary care teams should customize health information technology tools to better coordinate screening efforts by collaborating with experts to tailor their electronic health record systems, clinical support tools (e.g., reminders and alerts), and patient portals. Implementing a whole-team approach with defined roles to support the screening process, such as scheduling, follow-ups, and patient education, ensures that all team members are involved in the screening process, improving care coordination, patient adherence, and screening uptake.

4.1.2. Access to CRC screening

Access to screening is multidimensional ranging from the financial cost of testing to not having a healthcare provider within a reasonable travel distance. While primary care providers have been tasked with a heavy treatment burden there are only a few access barriers that they may directly influence. Providing stool-based screening kits have shown to significantly increase CRC screening uptake in primary care patients (Selby et al., 2022). This is especially true when organizations use a structured population health management approach, targeting at-risk individuals such as Black men (Doubeni et al., 2021).

To decrease access to CRC screening barriers, eligible patients must be assisted in applying for government-funded insurance as well as help with navigating payment systems to reduce out of pocket expenses (Zaire and Smith, 2023). Primary care teams should establish formal partnerships with endoscopic providers to create streamlined scheduling systems, including real-time appointment booking and prioritized slots for referred patients, to enhance access and reduce wait times for CRC screenings. Finally, healthcare teams should implement organized population-based screening programs using stool-based kits to boost adherence among average-risk patients.

5. Strengths and limitations

This study has several strengths, including the integration of both qualitative and quantitative studies, which allowed for a comprehensive investigation of the determinants of CRC screening and relevancy of the NIMHD Research Framework to guide the review. The broad date range of studies enabled us to examine whether determinants changed over time and across events, which they did not. Furthermore, incorporating studies which only included Black men enhances the generalizability of our findings to this at-risk group. These approaches collectively provided a robust foundation for our recommendations to primary care organizations and their healthcare teams.

However, there are several limitations to consider. Many studies utilized instruments that were either not validated or lacked sufficient detail, making it challenging to fully appraise their quality. Despite including only studies with Black male participants, many had a small sample size of Black men, underscoring the need for further research with this population. Lastly, the mixed review approach precluded statistical analysis of the results. Further research is necessary to explore the determinants of CRC screening in this population and to identify appropriate interventions in primary care.

6. Conclusion

Black men bear the highest CRC-specific mortality burden compared to any other gender, racial or ethnic group. Raising CRC screening rates

could be a viable strategy for reducing this unacceptable mortality burden. Several determinants of CRC screening must be considered. Primary care organizations are uniquely positioned to address many of these determinants through personalized approaches tailored to the needs of Black men.

To achieve meaningful improvements in CRC screening, primary care organizations should implement actionable strategies at the patient, provider, and organizational level. Key areas for intervention include CRC screening knowledge gaps, patient-provider interactions and reducing barriers to access. While many determinants of CRC screening extend beyond the scope of primary care teams alone, these teams can make a substantial impact on care delivery and coordination for Black men. This includes initiatives within organizations and collaborations with community partners that provide CRC screening services. Providing culturally appropriate, effective, and collaborative preventive care will ultimately improve screening adherence and CRC outcomes.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used Microsoft Copilot to enhance readability of the manuscript. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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CRediT authorship contribution statement

P.J. Zaire: Writing – review & editing, Writing – original draft, Validation, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **E. Miller:** Writing – review & editing, Writing – original draft, Formal analysis, Data curation. **A.P. Ewing:** Writing – review & editing, Validation, Supervision. **J. Hefner:** Writing – review & editing, Validation. **K. Wright:** Writing – review & editing, Validation. **L.H. Smith:** Writing – review & editing, Validation, Supervision, Project administration.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2024.102954>.

Data availability

No data was used for the research described in the article.

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