

RESEARCH ARTICLE

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Barriers and Facilitators to Colorectal Cancer Screening: Providers' Perspective

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Abstract

Background: Colorectal cancer ranks as the third most prevalent cancer worldwide and the second most prevalent cancer in Saudi Arabia. Additionally, it stands as the second leading cause of cancer-related mortality globally. There is an increasing incidence of colorectal cancer worldwide. However, there is a notable decrease in incidence in high-income countries due to effective screening programs. **Objective:** The aim of this study was to identify the facilitators and barriers to the utilization of colorectal cancer screening from healthcare providers' perspective. **Methods:** A qualitative study was conducted at multiple centres using semi-structured interviews to explore the perspectives of primary healthcare physicians, gastrointestinal physicians, and colorectal surgeons on colorectal cancer screening in Dammam, Al-Khobar, and Al-Qatif in the Eastern Province of Saudi Arabia. Forty participants were involved in this study, leading to the identification of several barriers and facilitators to colorectal cancer screening. **Results:** Health system-related barriers included the unavailability of screening methods, such as FIT tests, or endoscopy units in some centres, high patient load, and the absence of a national screening program. Facilitators included easy access to screening guidelines, collaboration between hospitals, and the presence of female endoscopists. Individuals-related barriers encompassed patient unwillingness to screen, fear, lack of awareness, social and cultural factors, and inconvenience. Alternatively, the presence of a family history of colorectal cancer, GI symptoms, and higher education levels were considered as facilitators. **Conclusion:** This study emphasizes the importance of implementing structural changes within the healthcare system, alongside raising awareness, and educating citizens. It also stresses the utilization of the effective strategies identified in this study regarding patient-provider communication to target individuals-related barriers and enhance screening rates.

Keywords: Colorectal cancer- Screening- Barriers- Facilitators

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Introduction

Colorectal cancer (CRC) ranks as the third most prevalent cancer worldwide, constituting approximately 10% of all cancer diagnoses and standing as the second leading cause of cancer-related mortality globally. Estimates from 2020 indicate that over 1.9 million new cases of CRC emerged, resulting in more than 930,000 deaths attributed to the disease worldwide [1]. The incidence of CRC has shown a consistent upward trend globally, particularly in developing nations adopting Westernized lifestyles. Factors such as obesity, sedentary habits, consumption of red meat, alcohol intake, and tobacco use are identified as primary contributors to this increase in CRC cases [2]. Nevertheless, there has been

a notable decline in CRC incidence rates in high-income countries, largely attributable to the implementation of effective screening programs. Early-stage cancers typically exhibit higher survival rates compared to those diagnosed at advanced stages. Therefore, timely diagnosis plays a pivotal role in enhancing survival rates [1].

In Saudi Arabia, CRC ranks as the second most prevalent cancer, representing a significant health concern [3]. Particularly alarming is its status as the deadliest cancer among males in the country [2]. Over the decade spanning from 2006 to 2016, both colon and rectal cancer incidences in Saudi Arabia have shown notable increases, with a rise of 8% and 7%, respectively. Furthermore, a substantial portion of CRC cases, totalling 25.7% between 2006 and 2016, were diagnosed at an advanced stage [3].

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Despite the increasing incidence of CRC in Saudi Arabia, there is currently no nationwide program for CRC screening [4]. According to the recommendations of the United States Preventive Services Task Force (USPSTF), screening should commence in asymptomatic adults aged 50 to 75 (grade A recommendation), with consideration also given to starting at age 45 (grade B recommendation) [5]. In Saudi Arabia, while a nationwide program has not been implemented, guidelines recommend initiating screening at the age of 45. Screening modalities include the guaiac faecal occult blood test (gFOBT), faecal immunochemical test (FIT), flexible sigmoidoscopy (FS), and colonoscopy. While colonoscopy alone every 10 years is the preferred option, if not available, FS every 5 years, annual gFOBT, or annual FIT should be considered, with FIT being preferred over gFOBT [6, 7]. Multiple cross-sectional studies conducted in Saudi Arabia have explored the attitudes, knowledge, and practices of primary healthcare (PHC) physicians regarding CRC screening. In a study conducted in Riyadh in 2022, physicians reported common barriers to CRC screening [8]. These included patients' lack of awareness about screening, patients' failure to complete screening tests, absence of workplace screening policies and procedures, and a lack of reminder systems in the workplace [8]. Similarly, a study in Taif in 2019 found that some patients lacked awareness of CRC screening, which emerged as a significant barrier [9]. Additionally, physicians reported encountering patients who refused to discuss CRC screening. Another study conducted in Jeddah in 2016 found that while 95.3% of physicians acknowledged the effectiveness of screening for asymptomatic average-risk patients, only 45% actually adhered to the screening recommendations, highlighting the need for further investigation into the reasons behind this lack of adherence [10]. These studies are limited by their cross-sectional design and the absence of exploration into providers' perspectives on CRC screening through open-ended questions. Currently, there is a scarcity of research in Saudi Arabia addressing this issue. Therefore, the objective of this study is to identify the facilitators and barriers to the utilization of CRC screening from the providers' perspective.

Materials and Methods

Study Design and Subjects

A qualitative study was conducted across multiple centres using semi-structured interviews to explore providers' perspectives on CRC screening. The inclusion criteria stipulated that participants must be PHC physicians, gastrointestinal (GI) physicians, or colorectal surgeons practising at healthcare facilities, both public and private, located in Dammam, Al-Khobar, and Al-Qatif cities within the Eastern Province of Saudi Arabia.

To capture a diverse range of perspectives on CRC screening, a purposive sampling approach was employed, recognizing that factors such as gender, professional background, and working centre may influence healthcare providers' viewpoints. The aim was to ensure the acquisition of comprehensive data representing various demographics and contexts. The goal was to recruit at

least 10 males and 10 females; at least 10 with <10 years and 10 with ≥ 10 years working experience; at least 10 working in the public sector and 5 working in the private sector; and at least 10 from primary care centres and 10 from secondary and tertiary care centres. Given the qualitative nature of this study, data saturation, indicating the point where no new information emerges, determined the sample size, which comprised 40 participants. The interviews were conducted between February and March 2024. It was conducted in English, reflecting the English language medium of instruction in medical education in Saudi Arabia.

The study adhered to Good Clinical Practice (GCP) guidelines and met all relevant regulatory standards. Ethical approval was obtained from the Institutional Review Board at Imam Abdulrahman bin Faisal University (IRB-UGS-2023-01-137), Dammam Health Network (FAM-47-2024-02), Al-Khobar Health Network (FAM-08-2024-01), and Qatif Central Hospital (QCH-SREC0 7/2024) before the study commenced. Participation was voluntary, and participants provided informed consent by signing a document detailing the study's purpose and potential ethical considerations.

Materials

The research team developed an interview guide tailored for semi-structured interviews aimed at identifying barriers and facilitators to CRC screening, drawing insights from existing literature [11, 12, 13]. The guide is divided into 5 main sections:

1. Introduction to the study
2. Participant demographic information
3. Barriers to CRC screening-related questions
4. Facilitators of CRC screening-related questions
5. Patient-provider communication-related question

Procedures

After obtaining ethical approval, all necessary materials and resources required for conducting the experiment were gathered, including recording equipment, interview guides, and consent forms. A pilot test was conducted on 5 PHC physicians at the Family and Community Medicine Center at Imam Abdulrahman University (IAU). Their feedback was utilized to refine the clarity of the interview guide, prompting adjustments as needed. Subsequently, visits were made to healthcare centres, and coordination was done with department secretaries to identify available participants. Priority was given to reaching out during times that aligned with their usual workflow, aiming for minimal disruption. Healthcare providers were informed that the interview was designed to be concise, with an estimated duration of no more than 20 minutes. A clear overview of the study's purpose and objectives was provided, and emphasis was placed on the significance of their professional insights in enhancing the understanding of CRC screening practices. Finally, the interviews were conducted after obtaining informed consent by signing a document detailing the study's purpose and potential ethical considerations.

Data Analysis

The semi-structured interviews were recorded in audio format and transcribed verbatim by the research team. Unique codes were assigned to each transcript to maintain privacy and aid in data analysis. With 40 participants in the study, 40 transcripts were generated. Each transcript was then systematically organized according to the interview guide questions, which consisted of 11 specific questions related to CRC screening. This approach ensured that there were 40 datasets for each question, facilitating a comprehensive understanding of the data. The data underwent processing in accordance with Braun and Clarke's six phases of thematic analysis [14]. We identified meaningful segments of the data and labelled them with initial codes, which were agreed upon through discussion. These initial codes were then organized to uncover potential themes within the data. Following that, we engaged in a rigorous review and refinement process to ensure the themes accurately represented the content and were coherent and relevant. Once finalized, each theme was clearly defined and accompanied by illustrative excerpts from the interview data.

Results

The main characteristics of the participants are summarized in Table 1, while Figure 1 illustrates the thematic map resulting from thematic analysis, outlining healthcare providers' perspectives on barriers and facilitators of CRC screening. The themes that

emerged refer to: 1) healthcare system-related barriers, 2) individuals-related barriers, 3) healthcare system-related facilitators, 4) individuals-related facilitators, and 5) patient-provider communication.

Table 1. Characteristics of the Participants

Characteristics	n	%
Gender		
Male	23	57.5
Female	17	42.5
Age (years)		
<30	4	10
30-40	20	50
>40	16	40
Specialty		
PHC physicians	15	37.5
GI physicians	13	32.5
Colorectal surgeons	12	30
Working sector		
Private	8	20
Public	32	80
Work experience (years)		
<5	5	12.5
5-10	11	27.5
10-15	8	20
>15	16	40

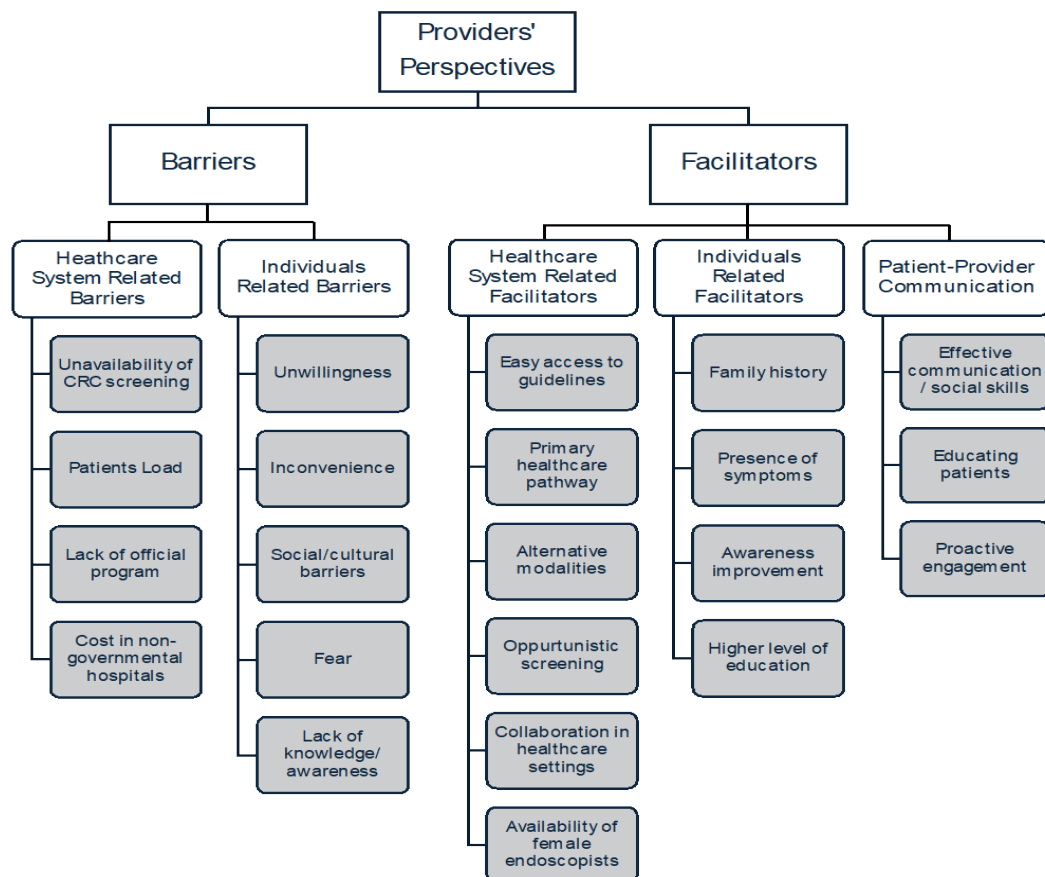


Figure 1. Illustrates the Thematic Map Resulting

Theme 1: Healthcare System-Related Barriers

Every health ministry aspires to establish an effective and comprehensive healthcare scheme. However, healthcare at an organizational and infrastructural level may still encounter several hurdles, particularly in preventive care and cancer screening. In this study, the main reported barriers within the healthcare system were the unavailability of screening methods, high patient loads, lack of an official national program, and the cost of screening in non-governmental institutes.

In terms of screening methods, several participants reported the unavailability of FIT tests in PHC centres. Another issue highlighted was the absence of an endoscopy unit to conduct screening colonoscopies. Consequently, individuals seeking screening may be required to travel long distances to healthcare centres in other cities. However, even in cases where screening resources are abundant, another challenge emerges patient load at the centre. Overwhelmed healthcare facilities may find it difficult to accommodate the increasing demand for screening measures, leading to extended waiting periods for CRC screening appointments.

“Being available. This means that anyone who wants to do a colonoscopy has to refer him to Riyadh Jeddah or Dammam, this is an issue. Screening should be available in villages like Abha, Al-Ahsa, and everywhere. So, it is available and easy to access anywhere.” – C1.

“Sometimes primary healthcare run of FIT test so cases accumulate... When they finish primary healthcare they come here or come directly. For those who come here there is a limitation of slots, usually, it is competitive not only screening colonoscopy but colonoscopy is used for other diseases like anaemia, IBD, all of these are competitive with screening for CRC.” – I3.

A significant challenge in Saudi Arabia is the absence of a national screening program. Consequently, some participants in the study rely on international guidelines for CRC screening, while others base their decisions on the patient's symptoms and high-risk features. This leads to delayed detection of CRC, resulting in increased mortality rates and treatment costs for the country.

“There is no national screening program in Saudi Arabia... this is a challenge, ... and we know it is a very successful program because we detect the polyps in a benign stage and we can remove it... For our patients, because there is no national screening program, we discover them in a late stage.” – B2.

In private hospitals, cost-related issues may discourage individuals from seeking screening services, especially with health insurance companies refusing to cover the cost of CRC screening. Consequently, individuals are required to bear the financial burdens associated with screening procedures.

“Lastly, since this is a private hospital, insurance coverage is zero for screening protocols for colorectal cancer; ZERO. There is not any single insurance company that covers colonoscopy although it is mentioned in the insurance policies by the Health Insurance Authority. It is not that they refuse it, but it is not covered although it is mentioned. For example, A patient comes/she is 45 or 47 and recommend he is medically free he wants screening

colonoscopy, zero approval rate.” – C2.

Theme 2: Individuals-Related Barriers

Individual-related barriers vary from patient to patient, including unwillingness to undergo screening, social and cultural barriers, fear, lack of knowledge and awareness, and patient inconvenience.

One of the most significant factors contributing to patients' unwillingness to undergo CRC screening is their perception of its unnecessary, particularly when they are asymptomatic. Additionally, patient inconvenience represents another barrier, which includes factors such as bowel preparation for colonoscopy, stool sampling, and time constraints, especially considering that the sample delivery process may be limited to certain lab working hours.

“Community acceptance of doing colonoscopic examination or doing at least FIT test. Usually, they think it is unnecessary and we have to convince them, and sometimes even after trying to they are not really convinced.” – B1.

“Some patients say, “I don't have symptoms why should I do bowel preparation the whole day I take laxatives and stay beside the toilet.” – H1.

Some individuals decline to participate in screening due to finding certain aspects, such as submitting a stool sample or undergoing a colonoscopy, deeply embarrassing. This discomfort is often more pronounced among female patients due to the personal nature of these procedures, highlighting the need for female endoscopists.

“The patient usually avoids giving stool samples. They have some embarrassment...socially, there is embarrassment especially the females to do colonoscopies because it is exposed to private areas...so, one, sometimes female have some barriers because it's a male physician. This is what I noticed.” – C3

A common psychological barrier is fear, which manifests in various forms. The most frequently mentioned fears include fear of the screening colonoscopy itself and fear of the results. Less commonly mentioned are concerns about sedation, pain, or potential complications arising from the procedure.

“They show fear of discovering cancer or polyps or tumours. And, also fear of the main procedure is it painful is their anaesthesia.” – B3.

“Another concern is complications of the procedure. Once you said, we will do a colonoscopy, but the probable complications 1 in 100 times infection, bleeding, perforation, the patient will go back, some of them are like this.” – C3

Furthermore, a lack of knowledge and awareness significantly impedes CRC screening uptake. A substantial portion of the population remains uninformed about the importance of CRC screening, the appropriate age to begin screening, and the processes involved. This gap in understanding is exacerbated by misinformation about the risks and benefits of screening.

“Lack of knowledge for his screening for the population they don't know when to, you have to explain to them from the beginning what is screening why are we doing it.” – B3

"Wrong concept about screening protocols... 'this test is harmful' ... 'it is bad' ... 'someone had a side effect or complication because of colonoscopy' ..." – C2

Theme 3: Healthcare System Related Facilitators

Several facilitators within the healthcare system were highlighted. Firstly, easy access to established guidelines, such as those provided by the Saudi guidelines, the American Academy of Family Physicians, and the American College of Gastroenterology, was emphasized. Additionally, adhering to the PHC pathway was identified as an efficient and effective screening strategy by many. Moreover, opportunistic screening serves as another facilitator, whereby physicians recommend screening for CRC to patients who meet the criteria during routine checkups, irrespective of the reason for their visit.

"FIT test in primary health care positive patients are referred this is regarding primary healthcare pathway. From our side, any patient above the age of 45 the low-risk general population we use to refer for colonoscopy from our clinic." – J1

"I tell them any patient above the age of 45 regardless of his indication may come for reflex for example or comes for abdominal pain. Not related to colon cancer screening but I usually clearly tell them they need to go to the primary healthcare and do their FIT test yearly." – G3

Additionally, providers offering a range of screening modalities, from less invasive options like FIT to more invasive procedures such as colonoscopy, provide patients with the opportunity to choose based on their preferences.

"You can do one of the options for the screening. Number 1 is screening colonoscopy, number 2 is CT colonography we do this in the hospital in specific cases, and 3 is stool test FIT test and occult blood test. The majority 70-80% will disagree with colonoscopy, so we go from the bottom of the list rather than the top." – C2.

Most healthcare providers noted collaborative efforts within healthcare settings in various forms. This collaboration took shape through partnerships between PHC physicians, GI physicians, or colorectal surgeons, either through referrals or direct communication. Additionally, collaboration extended to different departments within the same hospital, involving GI physicians, colorectal surgeons, radiologists, histopathologists, dietitians, and nursing staff.

Lastly, the presence of female endoscopists was highlighted as a factor encouraging female patients to consider undergoing colonoscopy.

Theme 4: Individuals-Related Facilitators

Individual-related factors play a pivotal role in CRC screening, serving as both facilitators and barriers. The current emphasis is on examining the facilitators, which encompass various elements including family history, presence of symptoms, improvement of individual awareness, and higher levels of education.

Family history of CRC serves as a crucial determinant for screening recommendations, guiding healthcare providers in identifying individuals at higher risk. Additionally, symptoms suggestive of CRC, such as unexplained iron deficiency anaemia, per rectal bleeding,

or changes in bowel habits, prompt healthcare providers to prioritize screening, especially for patients over the recommended age for screening.

"Because we don't have national guidelines, my strategy is to follow the guidelines as well as the history and examination of the patient. For example, a patient coming with anaemic symptoms, PR bleeding, has a strong family history and is above 40 years of age. So this is my strategy." – B2.

Healthcare providers also emphasized the importance of improving individual awareness through health awareness campaigns and encouragement from screened relatives. These initiatives not only raise awareness but also prompt patients to inquire about screening options during consultations.

"My patients usually tell me that the health campaigns in malls and hospitals are very beneficial to like to open a bulb in the mind and think about the screening and come and ask us if we saw a campaign about screening, do we have to do colonoscopy do I have to, this is a good thing." – B3.

"If his colleague or relative told him he would believe him immediately. Community awareness is very essential, and awareness campaigns are very excellent." – C2.

Furthermore, patients with a higher level of education tend to be more proactive in seeking CRC screening, reflecting positively on their willingness to undergo recommended screening tests.

"I see patients positively agreeing to screen and some patients are also asking about screening since the education is better." – G2.

Theme 5: Patient-Provider Communication

Effective communication between healthcare providers and patients plays a crucial role in encouraging patients to undergo CRC screening. Participants identified several strategies that are effective in facilitating patient acceptance of CRC screening. Firstly, effective communication skills are essential, including using general statements to introduce screening, such as 'everyone above the age of 45 should do it', and selecting words carefully, avoiding words that might be confusing or intimidating. Additionally, timing is crucial, with providers choosing moments when patients are most likely to agree and allowing them time to consider the screening until their next appointment. In private hospital settings, offering open appointments can also enhance acceptance. Lastly, it is important to reassure patients and clarify that the screening test is conducted for preventive purposes.

"You see if you talk to anyone about cancer, they get afraid, why did you tell me about this, what did I say that makes say this? It's hard. You should start with a generalized statement like everyone above the age of 45 should do it, and not toward the symptoms like because you have this. Unless they have a family history it's different. I'll make sure he undergoes screening even if he gets scared. Just to make sure that I help him/her." – C1.

Educating patients comprehensively about CRC screening, covering procedure specifics, benefits, risks, facts, and statistics, and emphasizing their entitlement to request it at any time is of great importance in encouraging

them to undergo screening. Additionally, offering real patient experience can be helpful in clarifying the screening process. Lastly, taking a proactive approach with high-risk patients by consistently encouraging them, even in the face of refusal, may be helpful in changing their minds. Employing a more assertive approach, such as highlighting potential risks, may be necessary to persuade them to undergo CRC screening.

"I tell them that they are now at the age of screening and explain to them why we do this test and explain to them the benefits and risks." – A1.

"Give them facts, give them real facts, real patient experience. The way you explain the procedure to the patient clears their thought to clear their misunderstanding about the procedure this is what will make them accept the procedure." – C2.

Discussion

This study highlights the perspectives of PHC physicians, GI physicians, and colorectal surgeons regarding the barriers and facilitators of CRC screening in the cities of Dammam, Al-Khobar, and Al-Qatif within the Eastern Province of Saudi Arabia. These insights offer valuable guidance for implementing targeted strategies aimed at addressing distinct challenges and reinforcing facilitators, ultimately improving the overall effectiveness of CRC screening in Saudi Arabia. The identified barriers and facilitators span three key levels: 1) healthcare system level, 2) individual level, and 3) patient-provider communication level, offering a comprehensive understanding of the dynamics influencing CRC screening.

The unavailability of CRC screening options, such as FIT in PHCs, and the lack of endoscopy units for screening colonoscopies emerged as significant barriers in this study. Participants reported the inconvenience faced by individuals seeking screening, who often had to travel long distances to healthcare centres in other cities. This also puts a strain on healthcare facilities providing the services, resulting in high patient loads and extended waiting periods for CRC screening appointments. A report from the Saudi Ministry of Health (MoH) on a pilot stool-based CRC program rolled out in 2017 exposed various operational challenges, including a supply-demand mismatch in FIT testing and limitations in manpower and facilities [15]. This emphasizes the importance of optimizing healthcare system capacity and resources to meet the rising demand for CRC screening services. Additionally, Mohammad Alharbi et al. have shown that FIT is preferred by the general population in Saudi Arabia more than FOBT or colonoscopy [16]. Such preferences highlight the need for tailored screening programs that align with the population's preferences and needs.

There is currently no nationwide screening program for CRC in Saudi Arabia [4]. Healthcare providers in this study noted that this poses a significant challenge. This lack of a formal program contributes to disparities in access to screening services and impedes efforts to promote early detection and prevention of CRC. As per data from the Saudi Ministry of Health (MOH), merely

9% of CRC cases are detected in their early stages [17]. Additionally, Mosli et al. have observed a rising trend in the incidence of CRC in Saudi Arabia [18]. Consequently, there is a compelling rationale for instituting a nationwide CRC screening program, as demonstrated by successful models like Ireland's Screening Service (NSS). In Ireland, individuals aged 60 to 69 are routinely offered a FIT test every two years, with home test kits mailed directly to them. Positive FIT results prompt follow-up colonoscopies in accredited units, with the program proving effective in detecting early-stage cancers and reducing mortality rates while remaining cost-effective. Challenges in implementation include boosting participation rates and enhancing colonoscopy capacity [19, 20]. In Saudi Arabia, collaborative efforts among healthcare providers, policymakers, and stakeholders are crucial to developing and implementing a comprehensive CRC screening program tailored to the country's specific capacity and needs.

As the multidisciplinary nature of CRC screening entails, collaborative efforts among healthcare providers can ensure seamless coordination in recommending, conducting, and following up on CRC screening. Especially notable are collaborative efforts between PHC physicians and GI physicians or CRC surgeons, which facilitate the PHC pathway. As mentioned in the literature, the utilization of PHC played a significant part in the early detection of cancer [21, 22]. Their role included discussing, recommending, and screening eligible patients who were following up in PHC centres by FIT test or FOBT, subsequently referring patients with positive results to hospitals or larger centres for colonoscopy. On the same note, offering screening to eligible patients in the clinic regardless of the presenting complaint, which is the concept of opportunistic screening, increases the reach of screening and allows for more educational opportunities. However, it is perceived in the literature that a more programmed and structured approach, such as outreach mail by sending an SMS to all screening-eligible individuals rather than the opportunistic approach, provides higher screening rates [23]. Nonetheless, it requires formulating or adopting such a program and implementing it in the current healthcare settings.

As mentioned, most participants in this study agreed that they faced no difficulty reaching CRC screening guidelines and references. Easy access to evidence-based CRC screening guidelines enables healthcare providers to make informed recommendations regarding screening modalities, initiation age, frequency, and follow-up protocols. Despite this, Alabdulkader et al. showed that only 10% reported that their physician recommended the screening for them [24]. Fairly similar results were shown in Alduraywish et al. with 77.1% of participants reporting a lack of physician recommendation and Mosli et al. [10] which also showed a significant lack of knowledge in physicians who do not practice or recommend the screening [25]. Surprisingly, this study did not show that healthcare providers perceive themselves as a barrier either by not recommending or lack of knowledge.

At an individual level, several barriers were highlighted in this study as to why individuals refuse to undergo CRC

screening. Unwillingness to screen, as they deny the need for screening because they are asymptomatic, is a major barrier to consider. Although unlikely to be attributed to a single cause, as most barriers mentioned in this study are contributing factors to their unwillingness, the most important ones are the lack of knowledge and awareness about the meaning of screening and prevention, as well as the ability of the healthcare provider to explain these concepts. The absence of signs and symptoms was among the top perceived barriers to CRC screening in studies assessing the knowledge about CRC screening in the general population, indicating the misconception of what screening really is [24, 25]. Also, in a study conducted in Saudi Arabia, less than 50% of participants knew that it is possible to detect CRC before developing signs or symptoms [26].

While certain CRC screening modalities may not be convenient for all patients, the availability of alternative screening methods helps alleviate this barrier. As a result, recommending the test should be tailored to each patient's risk profile and their preference for a particular screening method. Keeping in mind that providing a stool sample in the case of FIT test, or bowel preparation with colonoscopy, are restricting factors for accepting screening. Furthermore, while the act of providing a stool sample is perceived as embarrassing by some, colonoscopy can be particularly embarrassing due to the exposure of the private area during the procedure, similar to physicians' point of view according to Ploukou et al. [11] The issue of embarrassment is faced more by female patients, especially when they have a male treating healthcare provider. The gender difference is also observed in a study conducted to identify barriers to CRC screening in Saudi adults [25]. This might pose an additional barrier if there are no female gastroenterologists in the centre.

Fear about various aspects of CRC screening, including the procedure itself, potential complications, anaesthesia, and pain, were mentioned as concerns that patients show, not only in this study but also in others assessing the barriers to CRC screening from a public perspective [24, 27, 28]. All these concerns are understandable, and addressing them requires proper communication. Training physicians in communication skills has been shown to improve patient participation in CRC screening, as highlighted in previous research [29]. On the other hand, fear of the result is the most significant concern. It's unclear why patients are hesitant to learn about serious conditions such as CRC, especially when early detection and management plans are available. However, one likely explanation, considering other barriers, is that patients fear a positive screening test result, which can be terrifying given the challenging journey of treating CRC.

Several studies conducted on CRC screening in Saudi Arabia have identified a knowledge gap regarding the topic among patients [24, 25, 26]. Healthcare providers in this study also highlighted the persistent lack of awareness, which continues to hinder screening acceptance. Despite the notable improvements attributed to health campaigns, it remains evident that these efforts are not conducted frequently or comprehensively enough. Therefore, healthcare providers should dedicate time to educating

their patients and addressing any inquiries they may have. Another effective strategy is to encourage individuals who have already undergone CRC screening, as they likely have a good understanding of the screening process, to inform their friends or relatives about it, this was also shown in other studies [25, 30].

The presence of symptoms suggestive of CRC may lead the patient to seek healthcare or may prompt the healthcare provider to do the screening. Thus, it may serve as a facilitator for screening. Yet this approach defies the purpose of the screening as preventive care. This was pointed out by only one participant: "Age, Alarming symptoms, someone has blood in stool other has weight loss, one has a change in bowel habit, one has unexplained iron deficiency. These are all alarming symptoms. This now is not screening colonoscopy, now it is diagnostic surveillance. Screening colonoscopy is patient asymptomatic with proper age group. No symptoms nothing." Furthermore, this particular issue was mentioned in Ploukou et al. [11] in Greece. This highlights the need for a national program.

In conclusion, the study aimed to identify numerous barriers and facilitators to CRC screening from a healthcare provider's perspective. Health system-related barriers, such as the unavailability of screening methods, high patient loads, and the lack of an official program, were identified. On the other hand, healthcare providers highlighted several facilitators they utilize to overcome these barriers, including following a PHC pathway, using opportunistic screening, and collaborating between different hospitals and departments within hospitals. However, relying solely on these facilitators is insufficient to address all challenges. At a governmental level, the implementation of a well-structured national CRC screening program would enhance access, ensure efficient resource allocation, and prove more cost-effective. In terms of individual-related barriers, such as fear, lack of knowledge and awareness, and inconvenience of screening modalities, these can be addressed from various angles. Increasing awareness and knowledge among the general population through health campaigns, correcting misconceptions, and providing accurate information can help mitigate these barriers. Additionally, providing individuals with the option to choose from different screening modalities based on their preferences may increase acceptance of CRC screening. Lastly, effective communication between healthcare providers and individuals by educating them about the various aspects of CRC screening, and addressing any questions or concerns, is essential in convincing individuals, especially those who are reluctant to undergo screening.

Application

This study underscores the critical need for implementing structural adjustments within the healthcare system. This involves optimizing healthcare system capacity and resources to meet the rising demand for CRC screening services, as well as establishing a comprehensive national CRC screening program. Additionally, it advocates for raising awareness through campaigns and encouraging participation through

screened relatives, along with educating citizens about the various aspects of CRC screening. Moreover, the study emphasizes the importance of training healthcare providers in communication skills to effectively address individual-related barriers identified in the study and ultimately improve screening rates.

Limitations and Recommendations

In interpreting the results, it is essential to consider methodological limitations. Despite achieving saturation of views in this study, there is a possibility that unexpressed views exist. Additionally, the study focused on urban areas rather than rural ones, potentially overlooking certain barriers or facilitators.

Author Contribution Statement

All authors contributed equally in this study.

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Approval

The research was given an IRB approval by Imam Abdulrahman bin Faisal University (IRB-UGS-2023-01-137), Dammam Health Network (FAM-47-2024-02), Al-Khobar Health Network (FAM-08-2024-01), and Qatif Central Hospital (QCH-SREC0 7/2024),

Conflict of interest

The authors report no conflict of interest.

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