KNOWLEDGE, ATTITUDES, AND PRACTICES TOWARD COLORECTAL CANCER SCREENING AND ITS BARRIERS AMONG THE GENERAL POPULATION OF HAFR AL-BATIN, SAUDI ARABIA

Raed Nahar Almutairi¹, Salem Mutair Matar Alsulaimani¹, Mohammed Abdulaziz Aldaw¹, Mohammed Mathkar Alharbi¹, Hussam Owaydhah Alharbi¹, Omar Mana Aldhafeeri¹, Abbas Taher Hassan Alowa¹, Abdullah Nasser Mohammed Alharbi¹, Saif Mamdouh Aldhafeeri¹, Abdulaziz Nahar Almutairi¹, Faisal Sulaiamn Alanzei¹, Bader Mubarak Almutairi², Ashfaq Ahmad^{1*}

¹Department of Pharmacy Practice, College of Pharmacy, University of Hafr Al Batin, Hafr Al Batin, 39524, Saudi Arabia; ²Buraydah Private colleges, College of Pharmacy, Department of Pharmacy practice, Buraydah, Qassim, Saudi Arabia

Abstract

Background: Colorectal cancer (CRC) is one of the leading causes of death and incidents worldwide, including in Saudi Arabia. It is considered one of the preventable cancers through the adoption of healthier lifestyles and diets. This study aims to explore the knowledge, attitudes, and practices related to CRC among the population of Hafr Al-Batin and identify the barriers that hinder the participant from participating in colorectal cancer screening.

Methods: The study included 787 participants from the population of Hafr Al-Batin. Data were collected through a self-administered, validated questionnaire and analyzed using SPSS version 27 to derive key insights.

Results: The study results indicate that 207 individuals (26.3%) had a high level of knowledge about colorectal cancer screening, 312 individuals (39.6%) had a medium level of knowledge, and 268 individuals (34.1%) had a low level of knowledge. A significant majority,490 individuals (62.2%), strongly agree on the importance of knowing about colorectal cancer, and 533 individuals (67.7%) strongly agree that CRC diagnosed at an early stage can be treated more effectively. Regarding barriers to colorectal cancer screening, the primary issue reported was fear or anxiety about discovering colorectal cancer, with 516 respondents (65.6%) expressing this concern. Education level and gender were statistically associated with knowledge about colorectal cancer (p-value <0.05).

Conclusion: The study highlights the low participation in early colorectal cancer screening, despite its recognized importance, due to barriers like fear, anxiety, and logistical challenges. It calls for targeted solutions, including awareness programs, improved access to services, and financial support, to overcome these obstacles and boost screening rates.

Keywords: Colorectal cancer; cancer screening; barriers; knowledge; attitudes; practices studies, Hafr Al-Batin

Introduction

Manuscrito recibido: 15/03/2025

Manuscrito aceptado: 25/03/2025

Correo-e: ashfaqa@uhb.edu.sa

*Corresponding Author: Ashfaq Ahmad, Department of

Al Batin, Hafr Al Batin, 39524, Saudi Arabia

Pharmacy Practice, College of Pharmacy, University of Hafr

Colorectal cancer (CRC) ranks as the third most diagnosed cancer and the fourth leading cause of cancer-related deaths globally. By 2030, the incidence of CRC is projected to rise by 60% [1]. In 2020 alone, there were approximately 1.9 million newly diagnosed cases of CRC and about 935,000 deaths attributed to this disease. Furthermore, the Saudi Cancer Incidence Report of 2018 indicates that CRC is the most common cancer among men, accounting for 15.3% of cases, and the third most common among women, accounting for 9.8% of cases [2]. CRC remains a significant global health challenge, with its burden continuing to rise in many parts of the world. The global incidence statistics show that the highest incidence was recorded in Europe, Australia, and New Zealand. In the USA, the rate of new cases per 100,000 people every year was 36.6, and the deaths were 13.1 per 100,000. The prevalence was estimated at 1,388,422 million. If we look at the incidence of CRC in the Middle East before the age of 50, we find the following rates per 100,000 individuals: Jordan (6.6), Palestine (6.2), Libya (6.1), Oman (5.9), Saudi Arabia (5.6), and Syria (5.0). [3-5].

Studies have shown that CRC is the most common cancer in males, while in women, it is the third most common type of cancer [1]. This is especially true in Riyadh, which has 21.8 per 100,000, and the eastern region, which has 19.2 per 100,000. These regions are considered to have the highest incidence in Saudi Arabia, while the Baha Region has the lowest [1]. Screening for CRC is conducted on individuals who do not exhibit symptoms to detect early-stage cancers and precancerous lesions; this can aid in reducing the incidence and mortality rate associated with the disease [6]. Cancer takes a long time to develop, and many people with early-stage cancers are asymptomatic. Therefore, early cancer detection can raise the likelihood of a successful course of treatment [7]. Colonoscopy, followed by flexible sigmoidoscopy, is considered the most effective method for screening for CRC, as per the guidelines established by Saudi Arabia. If colonoscopy is not feasible, it is recommended to perform a flexible sigmoidoscopy with an annual guaiac occult blood test or fecal immunochemical test [8]. Screening should start at age 45 for individuals at average risk of CRC and can be done through a colonoscopy every ten years, a fecal immunochemical test or guaiac fecal occult blood test every year, or a sigmoidoscopy every five years [9, 10].

Participation in CRC screening worldwide is relatively low, despite the significant role it plays in reducing incidence and mortality rates associated with colorectal cancer. Over the past two decades, various factors affecting screening participation have been identified. These can be grouped into patient-

level factors, including sociodemographic and psychosocial aspects, as well as healthcare system and provider-related barriers [11]. Inadequate knowledge, embarrassment, and fear are common barriers that prevent individuals from undergoing screening [1]. Specific obstacles include fear of the procedure, lack of clinical symptoms, and anxiety about the potential results [12]. The barriers to CRC screening contribute to several serious consequences. First, the lack of public awareness about CRC has been linked to delayed diagnosis, which often results in more severe disease and worsened patient outcomes [13]. Additionally, CRC imposes a substantial economic burden worldwide, with Medicare treatment costs in the United States alone exceeding \$7 billion. These issues underscore the importance of effective CRC screening programs, aimed at reducing the disease burden by removing adenomatous neoplasia and detecting CRC at an earlier, more treatable stage [14].

CRC is a prevalent and increasingly significant health concern worldwide, including in Saudi Arabia, where rising CRC rates underscore the urgent need for effective screening programs. Although screening is widely recognized as beneficial for early detection and prevention, gaps in knowledge, attitudes, and practices related to CRC screening remain evident, as highlighted in the literature. In Hafr Al-Batin, a city in the Eastern Province of Saudi Arabia, there is a lack of comprehensive data on these factors, which may contribute to low participation rates. This study aims to assess the knowledge, attitudes, and practices of CRC screening among the people of Hafr Al-Batin and identify the barriers that hinder participation, addressing a critical gap in understanding and facilitating improved screening uptake.

Materials and Methods

Study Design and Setting

a cross-sectional research design with a self-administered validated questionnaire carried out in Hafr Al-Batin, a city located in the Eastern Province of Saudi Arabia. Hafr Al-Batin is known for its cultural and historical significance and is an important center for education and healthcare in the region. Conducting a study on colorectal cancer screening and its barriers in this specific area can provide valuable insights into the knowledge, attitudes, and practices of the local population regarding this important healthcare issue. We aim to study the general population of Hafr Al-Batin as our target population. To date, there have been no documented instances of conducting a study like this in Hafr Al-Batin. According to the latest Saudi Census 2022 results, Hafr Al-Batin has a total population of 467,007. Therefore, according to the Cochran sample size formula, which is expressed as follows:

n = Z2(1 - p)/d2

A sample size of at least 384 participants would be necessary to meet 95% confidence, a margin of error of 5%, and an assumption of a population proportion of 0.5. Nevertheless, the study included a sample of 787 respondents. A convenience sampling technique was used in this study due to its practicality and efficiency in reaching a large number of participants within the specified timeframe and available resources.

The researchers utilized a non-probability convenience sampling approach for participant selection. Moreover, the research included both male and female Saudi nationals, aged 18 and above, residing in Hafr Al-Batin, who consented to be part of the study. The research excluded people residing outside Hafr Al-Batin region, healthcare professionals, individuals with a history of colorectal cancer, and those under 18 years of age. Data collection was carried out from 1st April to 1st August 2024.

Instrument: KAP Questionnaire Related to CRC and CRC Screening

Structure of the KAP Questionnaire

The questionnaire development process was guided by the study's aims and objectives. The survey was structured into five distinct sections to comprehensively explore various aspects of colorectal cancer. These sections include socio-demographics, knowledge, attitudes, practices, barriers, and information sources. By addressing these key areas, the survey aimed to provide a comprehensive understanding of colorectal cancer and its associated factors.

The questionnaire comprised a total of 23 knowledge questions designed to assess participants' understanding of colorectal cancer and its early screening. Additionally, it will include five questions related to attitudes, three questions about practices, five questions regarding barriers, and one question on sources of information on colorectal cancer. possible answers to most of these questions were "yes;" "no," and "I do not know." Correct responses were assigned a score of 1, while incorrect responses or "I do not know" were assigned a score of 0. In addition, we assessed the five attitude questions using a Likert scale ranging from strongly disagree (score 1) to strongly agree (score 5). The Cronbach's alpha of the knowledge part was 0.80, demonstrating good reliability.

Validity and Reliability of the Instrument

The use of the KAP questionnaire for CRC was drafted, and its validity was developed in three main phases: a literature review phase of the study and

modification of variables and dimensions, expert review and comment in a pilot study for quantitative reliability.

A review of the literature was performed to select the most pertinent studies, and questionnaires from three key literature sources were included [1, 2]. The English version of the KAP questionnaire was translated into Arabic by an expert who is fluent in both languages. Afterwards, the draft was reviewed by five clinical experts. (two family physicians, two internal medicine physicians, and one gastroenterology consultant) Their responsibilities involved assessing the accuracy and suitability of the items and domains related to KAP in CRC and its screening. They were instructed to rate each item on a scale from 1 to 4 for relevance, with a higher score indicating greater relevance of the item. Modifications were made when narrative feedback was provided for a specific item. Content validity was assessed through quantitative analysis. The items were adjusted until the final content validity index reached 0.86, demonstrating good reliability. The finalized version was then tested in a pilot study, which involved 30 subjects to assess test-retest reliability and to evaluate the study's flexibility and practicality.

Statistical Analysis

Following data collection, the information was entered into Excel spreadsheets to facilitate data cleaning. This involved removing duplicate entries and incomplete questionnaires. Subsequently, the data underwent coding in preparation for statistical analysis. Statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) Version 27. Categorical variables were depicted using numbers and percentages, while continuous variables were presented as mean and standard deviation. The statistical association of categorical variables was determined using the Chi-square test, and the p-values below 0.05 were deemed statistically significant.

Ethical considerations

This study received ethical approval from the Committee at Hafr Al-Batin University, with reference number HPO-05-FT-24-07. Within the framework of ethical considerations, confidentiality and informed consent were key priorities. Participants were assured of the strict confidentiality of their information throughout the study and were given the right to cease or withdraw their consent.

Results

Table 1 below indicates that a total of 787 participants-534 men (67.9%) and

Table 1. Demographic Characteristics of the Participants (N=787).

Variable	Category	n (%)
Gender	Male	534(67.9%)
	Female	253(32.1%)
Age	18-34	596(75.7%)
	35-44	107(13.6%)
	45-54	67(8.5%)
	55 and above	17(2.2%)
Nationality	Saudi	757(96.2%)
	Non-Saudi	30(3.8%)
Education Level	High school and below	151(19.2%)
	Diploma	87(11.1%)
	Bachelor	515(65.4%)
	Masters and PhDs	34(4.3%)
Marital Status	Married	261(33.2%)
	Not Married	526(66.8%)
Employment Status	Full-Time Employed	288(36.6%)
	Part-Time Employed	40(5.1%)
	Retired	18(2.3%)
	Unemployed	441(56.0%)
How frequently have you visited a healthcare provider for a	Regularly (at least once every 6 months)	89(11.3%)
routine check-up or preventive care in the past year?	Occasionally (once or twice a year)	198(25.2%)
	Rarely (less than once a year)	248(31.5%)
	Never	252(32.0%)
What are the sources of information that you rely on when	Relatives and friends	80(10.2%)
seeking information about colorectal cancer screening?	Social Media	134(17.0%)
	TV and Radio	6(0.8%)
	Awareness Campaigns	39(5.0%)
	healthcare professional	77(9.8%)
	Internet	177(22.5%)
	Booklets	10(1.2%)
	Ministry of Health or World Health Organization	264(33.5%)

Data has been presented as n and %.

253 women (32.1%) participated in the study. In regard to age, 18–34 accounted for 596 (75.7%) of the total number of participants, followed by 35–44 with 107 (13.6%), 45–54 with 67 (8.5%), and 55 years and above with 17 (2.2%). The majority of the participants 757 (96.2%) were Saudi nationals, while 30 (3.8%) were non-Saudi nationals. A total of 515 (65.4%) had a bachelor's degree, 151 (19.2%) had completed high school or less, 87 (11.1%) had a diploma, and 34 (4.3%) held a master's or doctoral degree. In terms of marital status, 526 participants (66.8%) were single, while 261 participants (33.2%) were married. There was variation in the employment status: 288 (36.6%) were full-time workers, 40 (5.1%) were part-timers, 18 (2.3%) were retired, and 441 (56.0%) were jobless. When asked how often they had gone to a doctor in the previous year for routine check-ups or preventive care, 89 (11.3%) said they had done so forequently (at least once every six months), 198 (25.2%) said they had done so esporadically (once or twice a year), 248 (31.5%) said they had done so less

than once a year, and 252 (32.0%) said they had never done so. When it came to the source of information used to learn about colorectal cancer screening, most of the respondents 264, or 33.5% cited the World Health Organization or the Ministry of Health; 177, or 22.5% the internet; 134 (17.0%) social media; 80, or 10.2% relatives and friends; 77, or 9.8% healthcare professionals; 39, or 5.0% awareness campaigns; 10 or 1.2%, booklets; and, finally, only 6 (0.8%) TV and radio. Table 1: Demographic Characteristics of the Participants (N=787).

Table 2 shows that out of the 787 participants, 577 (73.3%) reported having heard of CRC. More than half of the participants 458 (58.2%) believed that colon cancer is fatal. When asked about the age at which CRC screening should start, the responses varied, with 272 (34.6%) believing that screening is only necessary for individuals with symptoms. Additionally, 568 (72.2%) thought that there are ways and means to prevent the occurrence or progression of

Table 2. Prevalence of the General knowledge about Colorectal Cancer Screening (N=787).

Variables	Category	n (%).
Did you heard about colorectal cancer (CRC) ?	Yes	577(73.3%)
	No	180(22.9%)
	l don't Know	30(3.8%)
Do you think colon cancer is fatal?	Yes	458(58.2%)
	No	99(12.6%)
	l don't Know	230(29.2%)
Are you familiar with any screening/diagnostic test that are used to detect colon cancer?	Yes	250(31.8%)
	No	403(51.2%)
	l don't Know	132(17.0%)
At what age do you think CRC screening starts?	20 Yrs.	141(19.9%)
	30 Yrs.	181(23.0%)
	50 Yrs.	184(23.4%)
	70 Yrs.	9 (1.1%)
	l don't Know	272(34.6%)
Colorectal cancer screening is only necessary for individuals who have symptoms?	Yes	272(34.6%)
	No	352(44.7%)
	l don't Know	163(20.7%)
Do you think there are ways and means to prevent the incidence or progression of CRC?	Yes	568(72.2%)
	No	48(6.1%)
	l don't Know	171(21.7%)
Do you think if one member of the family diagnosed with CRC increases the risk factor for another	Yes	297(37.8%)
member to develop the disease?	No	304(38.6%)
	l don't Know	186 (23.6%)
Do you think that Obesity and lack of exercise are considered risk factors for colon cancer?	Yes	476(60.5%)
	No	117(14.9%)
	l don't Know	194(24.6%)
Do you think that fat low-fat high-fiber diet is a risk factor for colon cancer?	Yes	186(23.6%)
	No	398(50.6%)
	l don't Know	203(25.8%)
Do you think that blood in stool is one of the symptoms related to colon cancer?	Yes	391(49.7%)
	No	112(14.2%)
	l don't Know	284(36.1%)
Do you think that chronic abdominal pain and cramps is a symptom related to colon cancer?	Yes	370(47.0%)
	No	136(17.3%)
	l don't Know	281(35.7%)
Colonoscopy is a method for early diagnosis of colon cancer.	Yes	429(54.5%)
	No	46(5.8%)
	l don't Know	312(39.7%)
Blood detection in the bowel sample is a method for early diagnosis of colon cancer.	Yes	362(46.0%)
	No	78(9.9%)
	l don't Know	347(44.1%)
Flexible sigmoidoscopy is a method used for early diagnosis of colon cancer.	Yes	324(41.2%)
	No	59(7.5%)
	l don't Know	404(51.3%)
Is colonoscopy the most accurate test to check for polyps in the colon and rectum?	Yes	320(40.7%)
	No	53(6.7%)
	l don't Know	414(52.6%)

Data has been presented as n and %.

CRC, while 297 (37.8%) believed that having one family member diagnosed increases the chance of incidence in other family members. Furthermore, 476 (60.5%) recognized obesity and lack of exercise as risk factors for colon cancer, while only 186 (23.6%) agreed that a low-fat, high-fiber diet is a risk factor. When asked about symptoms related to colon cancer, 391 (49.7%) identified blood in stool, and 370 (47.0%) recognized chronic abdominal pain and cramps as symptoms. Regarding early detection methods, 429 (54.5%) correctly identified colonoscopy, while 362 (46.0%) recognized blood detection in stool samples. Additionally, 324 (41.2%) identified flexible sigmoidoscopy as a method of early detection. However, only 320 (40.7%) agreed that colonoscopy is the most accurate test for checking for polyps.

Figure 1 below shows that the Ministry of Health or World Health Organization stands out as the most frequently utilized source, with 264 (33.5%) individuals relying on these organizations for information. The Internet follows as another prominent source, attracting a significant portion of users, 177 (22.5%). Social media also plays a considerable role, with many individuals, 134 (17.0%) turning to these platforms for health information. Healthcare professionals are a moderately popular source, reflecting the trust placed in medical experts. In contrast, awareness campaigns and TV and radio are less frequently relied upon. Booklets and relatives and friends are among the least popular sources, attracting minimal engagement. Figure 1: A horizontal bar graph showing sources of information about colorectal cancer screening.

Figure 2 below shows that a substantial portion of respondents, representing 32%, visited healthcare facilities for check-ups "rarely" (defined as less than once a year), while an equal 32% indicate that they "never" participated. Meanwhile, exactly a quarter (25%) of the respondents reported engaging in the activity "occasionally," or once or twice per year. The smallest segment, accounting for 11%, participates "regularly," meaning at least once every six months. Figure 2: Pie chart depicting the frequency of routine healthcare visits for check-ups and preventive care in the past Year. Figure 3 below illustrates that the majority of respondents (73.30%) were aware of Colorectal Cancer Screening, while 22.90% had not heard of it.

Table 3 demonstrates that 718 participants (91.2%) agreed that it is necessary to know about colorectal cancer. When asked if they thought that patients







Figure 2. Pie chart depicting the frequency of routine healthcare visits for check-ups and preventive care in the past Year



Figure 3. Pie- Chart depicting the awareness of colorectal cancer.



Figure 4. Pie-chart depicting the practice of colorectal cancer screening.

with colorectal cancer who were diagnosed early on would receive better care, 716 participants (90.9%) agreed. Regarding the perceived efficacy of colorectal cancer screening, 669 individuals (85.0%) thought it was very effective. Finally, 704 participants (89.4%) indicated that they would get an early test for colon cancer if their doctor recommended it.

Table 4 demonstrates that, in terms of practice, just 72 people (9.1%) stated they had received early screenings for colon cancer, while 180 respondents (22.9%) indicated that they had ever considered getting screened for the disease. In regards to obstacles to colorectal cancer screening, 516 people (65.6%) said they were afraid or anxious about discovering colorectal cancer through screening. Furthermore, 274 people (34.8%) reported that it was difficult to get an appointment with a physician for screening, 242 people (30.7%) indicated that they faced financial constraints or a lack of healthcare facilities for colorectal cancer screening, and 373 people (47.4%) reported that colonoscopy is an extremely embarrassing procedure.

Figure 4 below indicates that only 9.10% of the respondents had undergone early check-ups, while the majority (90.9%) had not conducted early check-ups for colon cancer.

Table 5 shows that 207 individuals (26.3%) had a high level of knowledge concerning colorectal cancer screening, 268 individuals (34.1%) had a low level of knowledge, and 312 individuals (39.6%) had a medium level of knowledge concerning colorectal cancer screening.

Table 6 demonstrates that awareness regarding colorectal cancer screening varied considerably among participants based on gender, education level, and work situation. Comparing males and females, the females exhibited higher knowledge levels compared to males (p=0.001). Individuals holding a Ph.D. and bachelor's degree demonstrated greater levels of knowledge than those with high school and diploma levels of education (p=0.004). Furthermore, there was a strong correlation found between employment status and knowledge levels; part-time workers had less knowledge than the unemployed, full-time workers, and retired adults (p=0.08).

Discussion

The goal of this study was to assess knowledge, attitudes, and practices toward

Variables	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
It is important for me to know about colorectal cancer.	490(62.2%)	228(29.0%)	59(7.5%)	3(0.4%)	7(0.9%)
Colorectal cancer diagnosed in an early stage can be treated better.	533(67.7%)	183(23.2%)	55(7.0%)	10(1.3%)	6(0.8%)
Colorectal cancer screening is highly effective in diagnosing colorectal cancer?	439(55.8%)	230(29.2%)	105(13.3%)	6(0.8%)	7(0.9%)
l will certainly undergo early screening of colon cancer if my doctor advises me.	507(64.4%)	197(25.0%)	53(6.8%)	22(2.8%)	8(1.0%)

Table 3. Prevalence of the Attitude of Colorectal Cancer Screening (N=787).

Data has been presented as n and %.

Table 4. Prevalence of the Practices and Barriers to Colorectal Cancer Screening (N=787).

Variables	Category	n (%)
Practices		
Have you done early checkups for colon cancer?	Yes	72(9.1%)
	No	715(90.9%)
Have you ever thought about undergoing screening for early detection of colon cancer?	Yes	180(22.9%)
	No	607(77.1%)
Barriers		
I feel fear and anxiety about finding colorectal cancer through screening.	Yes	516(65.6%)
	No	271(34.4%)
Do you suffer from the lack of healthcare facilities or financial constraints towards colorectal	Yes	242(30.7%)
cancer screening?	No	545(69.3%)
Is it difficult to get an appointment with a physician?	Yes	274(34.8%)
	No	513(65.2%)
Is colonoscopy is very embarrassing procedure?	Yes	373(47.4%)
	No	414(52.6%)

Data has been presented as n and %.

Table 5. Level of Knowledge about Colorectal Cancer Screening (N=787).

Levels of Knowledge	Low n (%)	Medium n (%)	High n (%)
Prevalence	268(34.1%)	312(39.6%)	207(26.3%)

Table 6. Association between Demographic Factors and Knowledge about Colorectal Cancer Screening (N=787).

Variables	High n (%)	Medium n (%)	Low n (%)	P-Value*
Gender				0.001
Male	132(24.7%)	188(35.2%)	214(40.1%)	_
Female	75(29.6%)	124(49.0%)	54(21.4%)	
Age				0.829
18-34	153(25.7%)	234(39.2%)	209(35.1%)	
35-44	27(25.3%)	47(43.9%)	33(30.8%)	
45-54	22(32.8%)	25(37.3%)	20(29.9%)	
55 and above	5(29.4%)	6(36.3%)	6(36.3%)	
Nationality				0.485
Saudi	200(26.4%)	297(39.2%)	260(34.3%)	
Non-Saudi	7(23.3%)	15(50.0%)	8(26.7%)	
Education level				
High school and below	41(27.2%)	58(38.4%)	52(34.4%)	
diploma	11(12.6%)	30(34.5%)	46(52.9%)	
bachelor	144(28.0%)	210(40.8%)	161(31.2%)	
Masters and PhDs	11(32.4%)	14(41.2%)	9(26.4%)	
Marital Status				0.824
Married	72(27.6%)	103(39.5%)	86(33.0%)	
Not Married	135(25.7%)	209(39.7%)	182(34.6%)	
Employment Status				0.08
Full-Time Employed	57(23.3%)	104(36.1%)	117(40.6%)	
Part-Time Employed	9(22.5%)	13(32.5%)	18(45.0%)	
Retired	3(16.7%)	7(38.9%)	8(44.4%)	
Unemployed	128(29.0%)	188(42.6%)	125(28.4%)	

Data has been presented as n and %. A P-value <0.05 was considered Statistically Significant.

colorectal cancer screening and its barriers among the population of Hafr Al-Batin, Saudi Arabia. Based on the study findings, the distribution of knowledge levels among participants revealed that 268 (34.1%) participants had low knowledge, 312 (39.6%) had medium knowledge, and 207 (26.3%) had high knowledge concerning colorectal cancer screening. These findings are slightly different from a study conducted among the medical students in Saudi Arabia, which reported that only 47.5% of the participants knew about colorectal cancer and its screening methods, with more than half (52.5%) having inadequate knowledge [15]. On the other hand, a study in India reported a slightly higher number of 71.3% of the participants knowing about CRC risk screening [16]. However, these disparities could be attributed to differences in knowledge classification and the varying characteristics of the populations studied.

In regard to attitude, the findings of the study reveal that 718 participants (91.2%) agreed that it is necessary to know about colorectal cancer, and 716 participants (90.9%) agreed that they thought that patients with colorectal cancer who were diagnosed early on would receive better care. Regarding the perceived efficacy of colorectal cancer screening, 669 individuals (85.0%) thought it was very effective. Finally, 704 participants (89.4%) indicated that they would get an early test for colon cancer if their doctor recommended it [1]. Like these findings, a study in Riyadh Saudi Arabia reported that 75.3% of participants were ready to take an early test for colon cancer if their physician recommended them to do so. Further, in a study in South Africa involving healthcare professionals, most participants (81%) indicated that they would be willing to advise patients to get CRC screenings [17].

In terms of practices, the study reveals that only a small number of 72 (9.1%) of the participants stated that they had received early screenings for colon cancer, while 180 respondents (22.9%) indicated that they had ever considered getting screened for the disease. In regard to obstacles to colorectal cancer screening, 516 people (65.6%) said they were afraid or anxious about discovering colorectal cancer through screening. Furthermore, 274 people (34.8%) reported that it was difficult to get an appointment with a physician for screening, 242 people (30.7%) indicated that they faced financial constraints or a lack of healthcare facilities for colorectal cancer screening, and 373 people (47.4%) reported that colonoscopy is an extremely embarrassing procedure. In consistency with this finding, a study in Pakistan reported that only 24.4% of the respondents had previously participated in colorectal cancer screening. They also reported the main barriers to colorectal cancer screening as anxiety associated with the screening process and the fear of discovering colorectal cancer [18]. Further, a qualitative systematic review conducted in the USA reported the most often mentioned obstacles were the high expense of screening and lack of insurance coverage, the discomfort or shame associated with screening, the lack of information, the perception that CRC screening was necessary, and the absence of a doctor's recommendation [19].

The associated factors with the level of knowledge regarding colorectal cancer screening included gender, education level, and occupation. Comparing males and females, the females exhibited higher knowledge levels compared to males (p=0.001). Individuals holding a Ph.D. and bachelor's degree demonstrated greater levels of knowledge than those with high school and diploma levels of education (p=0.004). Furthermore, a strong association was found between employment status and knowledge levels; part-time workers had less knowledge than the unemployed, full-time workers, and retired adults (p=0.08). These findings concur with the findings obtained in a study by Alshammari et al. in Saudi Arabia which reported the main factors associated with the knowledge of colorectal cancer screening as gender and education level [1]. In support of these findings, a study in Singapore reported factors that expose individuals to knowledge, such as education and occupation, greatly contribute to the level of revealed expertise regarding colorectal cancer screening [20].

There were certain limitations to the study. The self-reported nature of the study exposed several variables, including socioeconomic status, to measurement errors and reporting bias. Selection bias also may have been exacerbated by nonresponse bias. The cross-sectional nature of the study design means that the findings cannot be extended to the entire population, especially those in other regions.

Conclusion

Although a majority of participants recognized the importance of early diagnosis and were willing to undergo screening if recommended by a physician, a small percentage actually participated in screening. To address this gap, targeted awareness campaigns should be implemented through trusted platforms such as the Ministry of Health website, local health centers, and social media. These campaigns should focus on reducing fear and anxiety related to screening while emphasizing the benefits of early detection. Additionally, logistical barriers such as difficulty in accessing appointments should be addressed by collaborating with healthcare providers and policymakers to improve scheduling systems, extend clinic hours, and provide mobile screening units in

References

- Basudan A M, A M Basuwdan, M Abudawood, R Farzan, et al., Comprehensive Retrospective Analysis of Colorectal Cancer Incidence Patterns in Saudi Arabia. Life, 2023; 13(11): p. 2198.
- Elwali N E, O Jarrah, S G Alzahrani, M B Alharbi, et al., Colorectal cancer in Saudi Arabia: The way forward. Asian Pacific journal of cancer prevention: APJCP, 2023; 24(1): p. 13.
- Morgan E, M Arnold, A Gini, V Lorenzoni, et al., Global burden of colorectal cancer in 2020 and 2040: incidence and mortality estimates from GLOBOCAN. Gut, 2023; 72(2): p. 338-344.
- Siegel R L, K D Miller, A Goding Sauer, S A Fedewa, et al., Colorectal cancer statistics, 2020. CA: a cancer journal for clinicians, 2020; 70(3): p. 145-164.
- Shamseddine A, L Chehade, L Al Mahmasani, and M Charafeddine, Colorectal cancer screening in the Middle East: what, why, who, when, and how? American Society of Clinical Oncology Educational Book, 2023; 43: p. e390520.
- Zayegh O, Z S Hmidi, A A Nawlo, A Al-Mouakeh, et al., Awareness and knowledge of colorectal cancer screening among medical students at the University of Aleppo: a cross-sectional study. Avicenna Journal of Medicine, 2022; 12(02): p. 054-060.
- 7. Gupta S, Screening for colorectal cancer. Hematology/Oncology Clinics, 2022; 36(3): p. 393-414.
- Imran M, M Baig, R O Alshuaibi, T A Almohammadi, et al., Knowledge and awareness about colorectal cancer and barriers to its screening among a sample of general public in Saudi Arabia. Plos one, 2023; 18(8): p. e0290269.
- Alsanea N, M A Almadi, A S Abduljabbar, S Alhomoud, et al., National guidelines for colorectal cancer screening in Saudi Arabia with strength of recommendations and quality of evidence: tripartite task force from Saudi Society of Colon & Rectal Surgery, Saudi Gastroenterology Association and Saudi Oncology Society. Annals of Saudi Medicine, 2015; 35(3): p. 189-195.
- Alzahrani K M, S M Fallatah, R A Almehmadi, J S Alghamdi, et al., Colorectal cancer and its screening among public in the Western region of Saudi Arabia. Cureus, 2022; 14(7).
- Gimeno Garcia A Z, N Hernandez Alvarez Buylla, D Nicolas-Perez, and E Quintero, Public awareness of colorectal cancer screening: knowledge, attitudes, and interventions for increasing screening uptake. International Scholarly Research Notices, 2014; 2014(1): p. 425787.
- Alduraywish S A, L A Altamimi, A A Almajed, B A Kokandi, et al., Barriers of colorectal cancer screening test among adults in the Saudi Population: a cross-sectional study. Preventive medicine reports, 2020; 20: p. 101235.
- Al-Hajeili M, H K Abdulwassi, F Alshadadi, L Alqurashi, et al., Assessing knowledge on preventive colorectal cancer screening in Saudi Arabia: A cross-sectional study. Journal of family medicine and primary care, 2019; 8(10): p. 3140-3146.
- Shahidi N and W Y Cheung, Colorectal cancer screening: opportunities to improve uptake, outcomes, and disparities. World journal of gastrointestinal endoscopy, 2016; 8(20): p. 733.
- Althobaiti A and H Jradi, Knowledge, attitude, and perceived barriers regarding colorectal cancer screening practices and risk factors among medical students in Saudi Arabia. BMC medical education, 2019; 19: p. 1-8.
- Shankar K K, Knowledge, attitude and practice survey of colorectal cancer among adult population in Tamil Nadu, India (A cross-sectional survey). 2018.
- Magwaza S, G Van Hal, and M Hoque, Knowledge attitude and practices of health care workers towards colorectal cancer screening in primary care settings in Durban, South Africa: a cross-sectional survey. Global Journal of Health Science, 2023; 15(3): p. 1-19.
- Hussain I, A Majeed, M F Rasool, M Hussain, et al., Knowledge, attitude, preventive practices and perceived barriers to screening about colorectal cancer among university students of newly merged district, Kpk,

Pakistan–A cross-sectional study. Journal of Oncology Pharmacy Practice, 2021; 27(2): p. 359-367.

- Wang H, S Roy, J Kim, P A Farazi, et al., Barriers of colorectal cancer screening in rural USA: a systematic review. Rural and remote health, 2019; 19(3): p. 1-10.
- 20. Ooi C Y, N S Hanafi, and S M Liew, Knowledge and practice of colorectal cancer screening in an urban setting: cross-sectional survey of primary care physicians in government clinics in Malaysia. Singapore medical journal, 2019; 60(11): p. 596.