



Research Article

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## *Saudi Patients' Knowledge, Behavior, Beliefs, Self-Efficacy and Barriers Regarding Colorectal Cancer Screening*

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### ABSTRACT

**Background:** Colorectal cancer is a common type of cancer in Saudi Arabia and globally. Timely screening is needed to improved treatment outcomes. The success of colorectal cancer (CRC) depends on the compliance by the targeted population. The aim of this study is to determine how patients' knowledge, beliefs, behavior, self-efficacy, and barriers affect CRC screening. **Materials and Methods:** A cross-sectional study design was used. A total of 925 patients were recruited as participants from 38 hospitals in Riyadh, Jeddah, Makkah, Dammam, Al Ahsa, and Albaha. Data was collected using questionnaire delivered to the participants. **Results:** Most of the participants (over 95%) were aware of CRC. More than half knew about CRC screening. However, response to screening programs was low due to the lack of knowledge, fear, and insufficient patient awareness programs. **Conclusion:** Majority of the patients are willing to get regular CRC screening. However, there are low rates of actual screening due to fear and embarrassment, lack of knowledge, and other barriers. Healthcare workers need to intervene by creating enough public awareness.

**Key words:** Colorectal cancer, Screening, Prevention, Knowledge.

### INTRODUCTION

Cancer is a current healthcare problem in the whole world as it kills millions of people every year [1,2]. Several types of cancers develop in almost all body organs. Names are given depending on the body part affected [3]. This research will focus on one type of cancer that begins in the rectum or colon hence known as colorectal cancer. The cancers can also be referred to as colon or rectal cancer, depending on where it first appears. The name colorectal is used to generalize the two because they share many common features. Colorectal cancer starts when

the cells of either colon or rectum begin to divide rapidly and abnormally to the extent that the growth gets out of control to form cancerous tissues [4]. The abnormal growth then spreads to other parts of the body. Right now, many people die from colorectal cancer. Many deaths are due to late diagnosis when the disease has reached advanced stages. This means that early diagnosis through screening can help reduce the deaths. However, patient factors such as beliefs, knowledge, behavior, and self-efficacy determine diagnosis patterns.

There are several types of cancerous tissues that have been named worldwide. Colorectal cancer (CRC) is one of the most common tumors globally as it affects many people, and it is spread all over. Globally, colorectal cancer represents 10% of all cancers in male human beings. It is the third most common type in this population. About 9.2% of female cancer patients have CRC, making it the second most type of cancer among females [5]. According to a study by [4], CRC is the second most prevalent type of cancer in Saudi Arabia. Among males, it is the most common type of malignancy reported in the country; while, it is only second to breast cancer in females. CRC leads to about 112000 deaths per year in the East Mediterranean region (EMRO), with a total yearly prevalence being 246000. The World Health Organization (WHO) reported that in 2012, the five-year prevalence of CRC in the region was 705,000. Saudi Arabia is among the countries hit hard by colorectal cancer as it ranks second among the EMRO countries and 69<sup>th</sup> globally. For this reason, there is a need to conduct an extensive study on the prevalence of CRC in the country, causes, and possible solutions. About 8.3 people per 100000 citizens are diagnosed with CRC. It also leads to nearly 12.5% of male deaths and 11.1% of female deaths in Saudi Arabia [5].

Colorectal cancer screening has proven to be effective in reducing disease prevalence and related mortality. Several studies conducted on CRC recommend screening as one of the best control measures because it is cost-effective and also leads to improved treatment outcomes. However, the recommendation has not been sufficiently implemented, especially among the Gulf Cooperation Countries (GCC) and in the developing countries [5]. In the United States, colorectal cancer screening usage was at 53.8% in 2002, and it has been increasing steadily over the years. The United States Preventive Services Taskforce (USPTF) gives recommendations on how the screening should be done. A fecal occult blood testing should be done every year, sigmoidoscopy is done at least once every five years, and colonoscopy is done every ten years. Through the three tests, it becomes easy to detect CRC early enough to begin treatment on time and improve the outcomes [6]. The procedures are updated regularly with the latest recommendations requiring that additional tests such as colonography, fecal immunochemical test, flexible sigmoidoscopy, and multi-targeted stool DNA test be added to the screening techniques.

The screening programs require huge allocations in terms of financial and logistic resources making it challenging, especially in developing countries. Before starting a screening project, these factors should be put into consideration. Also, patient factors such as knowledge, awareness, and beliefs must be studied and put into consideration when discussing and planning for CRC screening. According to [5], there is low public awareness for CRC in Saudi Arabia and other Asian countries. The general public is educated enough on the prevalence and dangers of CRC, the available screening opportunities, and how often one should get checked. Lack of public awareness of various diseases leads to morbidity and mortality because they are diagnosed late after progressing to symptomatic stages.

Improving the public's knowledge and promoting preventive practices and beliefs have helped in the management and control of many diseases. There is a belief that by educating the public on CRC and regular screening, the impacts of colorectal cancer will greatly reduce. Other interventions should include improving access to healthcare and removing possible barriers to an early screening. The barriers that were identified include patient behaviors screening, lack of knowledge, beliefs, and self-efficacy among patients [6]. The aim of this study, therefore, was to evaluate patients' knowledge, behaviors, beliefs, self-efficacy, and barriers regarding colorectal cancer screening in Saudi Arabia.

## MATERIALS AND METHODS

### Data Collection

This study used a cross-sectional approach to collect and analyze data. It was done in 38 hospitals from the cities of Riyadh, Makkah, Jeddah, Al Ahsa, and Albaha in Saudi Arabia. A total of 925 from the 38 hospitals participated in the research.

To calculate the sample size, the opinions of experienced gastroenterologists were used to determine the patients with prior baseline knowledge about colorectal cancer. This is because there was not sufficient data to be used in this regard. Also, the rule of 10 outcome events per predictor variable was used, and the final sample size of 925

patients was considered sufficient to provide reliable and accurate data. All the participants were between the age of 50 years and 75 years old. This is in accordance with the UPSTF recommendation. Also, the patients were required to be attendees of family medicine clinics.

Due to a large number of participants and their difference in socioeconomic and residential factors, they were divided into four different categories. The categories were based on the hospital locations and the socioeconomic classes of the patients. This led to 38 major categories of patients. All adults who were willing to be surveyed were included but only those in the 50-75 years age. Also, they had to be residents of the identified cities mentioned above. Data was collected using questionnaires that were distributed in hardcopy to the participants using convenient sampling method. The questionnaire was then transferred to an excel file.

### Survey Instrument

The questionnaire questions were developed after conducting a literature review to ensure that they were consistent with this study's objectives. The document was then translated into Arabic language and three bilingual gastroenterologists hired to review the contents. The health belief model (HBM) is a socio-psychological model which is used to explain individual behaviors to seek health care by focusing on attitudes, behaviors, susceptibility, beliefs, and barriers. The purpose of this study was to explain patients' behaviors regarding CRC screening. Therefore, the model was appropriate in considering the mentioned factors and how they affect the patients' ability to seek early screening. The data collected from the participants included age, gender, education level, marital status, demographics, employment status, history of CRC among family and friends, and monthly income. There was a section that inquired about the patients' knowledge of CRC and CRCS. This section included questions on colorectal cancer, signs and symptoms, risk factors of the disease, any knowledge of screening opportunities and techniques, types of tests conducted, perceived risks, and barriers to screening. The patients also answered questions on how they think screening should be done, the frequency, and appropriate age that screening needs to start. The test options presented to the patients included colonoscopy, fecal occult blood tests, computed tomographic colonography, and flexible sigmoidoscopy.

The knowledge scores were recorded based on how correct the participants answered questions in the questionnaire. This would make an analysis of the data and making conclusions easy because the scores became continuous variables during the analysis. The age bracket in the inclusion criteria was 50-75 years. This is the age recommendation proposed by the US Preventive Services Task Force and the American College of Gastroenterology. However, it should be noted that Saudi Arabia has no nationally recommended CRC screening age. In this study, the UPSTF age bracket was used, and responses from those who met the criteria were considered during the analysis. A correct response was worth one point, and incorrect one would earn zero scores. The maximum possible score based on this method and questions was 26.

### Statistical Analysis

The data analysis methods used included descriptive statistics such as standard deviation (SD), mean, and minimum and maximum values. Frequency distributions helped in analyzing categorical variables. The t-test and Fisher's exact tests were also used to test the hypothesis. The STATA 11.2 software was useful during the data analysis. The adopted statistical significance threshold was  $P = 0.05$ .

## RESULTS

### Demographics and Historical Data

A total of 925 patients from 38 hospitals in Saudi Arabia participated in the study that was conducted between 02/10/2019 to 14/11/2019.

The patient population used in the study was 925 with age ranging from 50-75 years. Majority were female patients (55.1%). About 67% had education level of at least high school. This means that a majority was well-educated. Other patient characteristics considered at the beginning of the study were occupations, marital status, race/ethnicity, and medical history. There were mixed results with most patients being married, a good number being employed with a few being retired, and less than a half of the patients having being screened before.

**Table 1:** The Participants' Demographic Characteristics

Characteristic	Percentage	Mean
<b>Patient Population</b> (n= 925)		
Males	44.9%	
Females	55.1%	
<b>Age</b> Age Categories		
50-60	471 (50.9%)	
61-70	310 (33.5%)	
71-75	144 (15.6%)	
<b>Marital Status</b>		
Married	472 (51%)	
Single	200 (21.6%)	
Divorced/Widowed	253 (27.4%)	

### Awareness and Knowledge of CRC and CRC Screening

From the questionnaire data, more than 95% of the patients were aware of colorectal cancer. Some had encountered it among family members or friends. This means that awareness levels were high. Also, about 75% knew about CRC screening and its importance. However, many of the participants had no knowledge of different screening tests available in their locations and country. About 43% of the participants reported that the knowledge they got on CRC screening were due to regular awareness programs by the healthcare officials. This indicates that the government and healthcare organizations' efforts were not sufficient enough in raising patients' awareness and knowledge on CRC and CRC screening.

### Confidence to Participate in Screening

Majority of the participants (more than 84%) of the patients indicated that they would be interested in participating in screening and knowing their CRC status. However, this number was not reflected in the actual screening data due to various reasons. Some had the fear that discovering that they have the disease would affect them more. Others had fear in the screening processes following a popular perception that some of the tests are painful and embarrassing.

Out of the respondents, 22% of the patients admitted that they had received fecal occult blood test (FOBT) before, 50% reported that they had never had the test while the rest were not sure.

Education levels played a big part in the patients' knowledge, behaviors, and self-efficacy. First, knowledge about CRC and its screening was decreased as the education levels dropped. Most of the participants who knew about CRC and its impacts as well as screening methods were the highly educated individuals. Majority of the population (65%) of the graduate participants had actually made attempts to get CRC screening. Most of the patients agreed that the authorities were not doing enough to help the lowly educated individuals to have good knowledge on colorectal cancer. More than 90% of the educated patients (above high school levels) indicated that they would readily get CRC screening despite the available barriers because they believed that the process would help in early disease detection and improve the chances of recovering from colorectal cancer for those who test positive. Almost all the patients agreed that healthcare workers had a role of creating sufficient awareness and so far in Saudi Arabia, there was much to improve.

## DISCUSSION

Amidst an increase in cancer incidences, many screening tests are conducted worldwide. Colorectal cancer is a highly prevalent type of cancer, and there are several screening programs which vary depending on the instrumentation used and the specific tests involved. The most common tests done are colonoscopy, immunochemical-based fecal occult blood tests, and sigmoidoscopy. In Saudi Arabia, it is among the leading prevalent tumor diseases. This means that there should be several screening programs conducted at least annually in the country. CRC in the country appears at an earlier age than in Western European countries or North America. It is also detected at advanced stages in the country, leading to an increase in morbidity and mortality. The five-year survival rate due to CRC is poor in Saudi Arabia and the EMRO region [5]. There is insufficient evidence

on whether having public screening programs such as national CRC screening would help to improve the treatment outcomes.

There is sufficient evidence on the effectiveness of CRC screening in reducing the unwanted impacts. However, compliance rates are very low in Saudi Arabia. The recommendations to have regular screening tests on CRC are either not publicized enough in the country or are ignored by the authorities and the general public. The rate at which the targeted population responds to the programs determines whether it succeeds or fails. In this study, patients visiting family medicine clinics were the targeted population. The study aimed to identify factors that determine their observed reaction. The main factors that affect patients' participation in CRC screening programs include knowledge of the disease, its risk factors and impacts, beliefs, behaviors, self-efficacy, and barriers [7]. Other barriers include poor access to healthcare resources, lack of time, financial constraints, and distance one has to travel to reach the screening center.

The barriers affect different populations and groups of people differently. For example, ethnic groups and countries respond differently to CRC screening recommendations. A multinational study was conducted by [7] involving 14 countries from the Asian Pacific region indicated that adults aged 50 years and above had a response rate of 27%. The study further indicated that the Philippines had the highest response rate of 69%, followed by Australia at 48%, and Japan at 38%. India had the lowest uptake of CRC screening at 1.5% [7]. The differences are due to various environmental factors.

The data collected during this study indicated that at least 68% of the participants were willing to undergo CRC screening. This percentage was higher in people who had a history of colorectal cancer in their families. The results are consistent with previous study reports indicating that patients are willing to get regular screening for CRC. There was no gender variation in the willingness to get screened for colorectal cancer as male and female participants. Also, the preferred screening methods were consistent in both genders. The findings would be of help if there were enough CRC screening programs implemented. However, there is a big difference in the willingness to undergo screening and the actual process of getting CRC screening. A similar study done in Spain indicated that 78.8% of patients aged 50 years old and above were willing to get screened. However, only 12% had actually made attempts to undergo the process [7]. This shows that there are certain barriers to being screened for CRC. Demographic factors such as marital status and employment have little impact on the target populations' willingness to get CRC screening. The financial burden has been implicated by all the studies as one of the barriers.

For this study, the financial burden was not a major factor because health care is partly catered for by the government hospitals meaning that patients do not incur the total amount required to get a screening test. However, the response rates were still low. The patients have to wait in lines and probably travel for a long distance before getting to healthcare or CRC screening center. Even though the cost was not a major factor, the patients still had to travel to the screening venues and use other resources to have the process done. This means that the socioeconomic factor cannot be completely ignored in a subsidized program.

HBM provides possible constructs that determine the willingness and ability to accept CRC screening. Most of the participants indicated fear and embarrassment as potential barriers to getting screened for CRC. About 29% of the patients indicated that they would not want to find out that they have CRC in any event that they do [7]. Most of the participants also indicated that the thought of being diagnosed with CRC at any stage would scare them. The elements of fear and embarrassment have been addressed in many qualitative studies as it affects the ability to accept many screening procedures and diagnostic tests. With regard to CRC screening, the patients indicated fear of realizing that they have CRC as well as the perception that some of the tests such as colonoscopy are painful procedures. Creating public awareness and conducting sufficient patient education can be effective in reducing fears. Healthcare workers with knowledge on CRC and the need to do regular screenings need to be at the frontline in advising the public to get regular screenings. Many people avoid screening because they lack knowledge of colorectal cancer and the benefits of early diagnosis, as well as the risks involved.

The study found that education level did not significantly determine the screening acceptance rates. Participants with different levels of education had similarly high rates of willingness to get regular CRC screening. Most of the participants seemed to understand or imagine the risks involved and agreed that regular and timely screening would be good. However, getting involved in the actual process of CRC screening partly depended on education levels. Participants with low education levels indicated low rates of getting screened [8]. This could be due to the lack of actual knowledge of the disease and associated risks. Another possible explanation is that highly educated patients have a better knowledge of the test processes and how they improve treatment outcomes.

Self-efficacy is important to every medical process as it improves the patients' belief in their ability to complete various tasks. Patients need to have self-efficacy to participate in disease prevention and self-management. Many patients did not believe in their own ability to participate in CRC prevention. Some did not have knowledge of what they are expected to do to help in the screening programs. Healthcare workers are needed to create awareness and educate the patients about their roles in improving their health. Here, the general public has a responsibility to ensure that they are regularly screened for colorectal cancer [5]. The patients will feel more confident in their own ability if they are assured by the healthcare workers that their ability and efforts are of high value. Also, some participants were not ready to get CRC screening due to various fears. Difference in education levels was evident here as the educated participants with good understanding of the disease readily welcomed the idea of regular screening. This is another indication that regular patient education and awareness programs will improve response to CRC screening in Saudi Arabia.

Beliefs and behaviors are factors that determine compliance with medical practices. In this study, the participants indicated that they had a belief in regular screening and its benefits in reducing morbidity and mortality due to colorectal cancer. In some cases, religious and cultural beliefs prevent people from getting involved in medical programs or seeking treatment from healthcare facilities [9]. The problem identified during the study is that many participants had perceptions that some screening processes are painful and embarrassing, making them decide against getting CRC screening.

### Strengths of the Study

This study was conducted in 38 different hospitals with a sample size of 925 patients. This size is large enough to collect sufficient data on the patient factors that determine the willingness and ability to get CRC screening. By spreading the search area to six towns and 38 hospitals, possible information bias was reduced. This means that the study results can be applied in a large area. A cross-sectional study design ensured that more than one variable could be studied at the same time and used to make appropriate conclusions [6].

### Limitations

The study was conducted within a short time limit of one month. With a sample size of 925 patients and such a large study area, this time was too short of collecting and analyzing data. This means that the report could be prone to some minor errors, as every process was conducted in a hurry. Secondly, all the participants were recruited from urban settings. The results are, therefore, the bias in favor of urban practices and beliefs. There is a perception that rural residents have low rates of willingness to undergo CRC screening.

### CONCLUSION

Colorectal cancer is among the most common causes of morbidity and mortality in the whole world [10]. In Saudi Arabia, it is the leading cause of malignancy in men and the second most common cancer in women. Therefore, healthcare efforts should be put toward managing and controlling the disease. Saudi Arabia has low rates of participation in CRC screening programs. This behavior is reflected in the high prevalence and resultant deaths due to CRC. Some of the factors that contribute to the low screening rates include lack of sufficient knowledge due to poor public awareness, beliefs, and perception that the tests are painful, fear, and embarrassment. In a study conducted on 925 patients from 38 hospitals across six urban settings in the country, it was found that despite many people having some knowledge about colorectal cancer and its screening, The number that gets screened annually is very low. The healthcare workers in the country need to create more awareness and collaborate with other stakeholders to organize more screening programs in Saudi Arabia.

### REFERENCES

1. Rezavandi S, Masoumpoor A, Farahani AS, Nasiri M. The Relationship between Spiritual Intelligence and Depression in Parents of Children with Cancer. *Journal of Biochemical Technology*. 2018;9(3):45.
2. Imran M, Bawadekji A, Nayeem N. Preparation and in Vitro Anticancer Activity Evaluation of Some Coumarin Derivatives. *Pharmacophore*. 2019 Aug 28;10(4).
3. Shrihari TG. Beta Endorphins-Novel Holistic Therapeutic Approach to Chronic Inflammation Associated Cancer. *International Journal of Pharmaceutical And Phytopharmacological Research*. 2018 Oct 1;8(5):35-8.
4. Hamza A, AISolami F. Antitumor Activity of Silver Nanoparticles and Alpha-Lipoic Acid Combinations in Colorectal Cancer Induced Experimentally. *Pharmacophore*. 2018 Mar 1;9(2):45-51.

5. Ferlay J, Shin HR, Bray F, Forman D, Mathers C, Parkin DM. Estimates of worldwide burden of cancer in 2008: GLOBOCAN 2008. *International journal of cancer*. 2010 Dec 15;127(12):2893-917.
6. Khoja A, Aljawadi M, Al-Shammari SA, Bokhari NN, Aldarwish AA, Mardini WK, Khoja TA. Utilization of Colorectal Cancer Screening among Saudi Elderly Population: A Study from the Saudi National Survey for Elderly Health. *Asian Pacific journal of cancer prevention: APJCP*. 2018;19(12):3401.
7. Almadi MA, Mosli MH, Bohlega MS, Al Essa MA, AlDohan MS, Alabdallatif TA, AlSagri TY, Algahtani FA, Mandil A. Effect of public knowledge, attitudes, and behavior on willingness to undergo colorectal cancer screening using the health belief model. *Saudi journal of gastroenterology: official journal of the Saudi Gastroenterology Association*. 2015 Mar;21(2):71.
8. Zubaidi AM, AlSubaie NM, AlHumaid AA, Shaik SA, AlKhayal KA, AlObeed OA. Public awareness of colorectal cancer in Saudi Arabia: A survey of 1070 participants in Riyadh. *Saudi journal of gastroenterology: official journal of the Saudi Gastroenterology Association*. 2015 Mar;21(2):78.
9. Woo H, Lee J, Lee J, Park JW, Park S, Kim J, Oh JH, Shin A. Diabetes mellitus and site-specific colorectal cancer risk in Korea: a case-control study. *Journal of preventive medicine and public health*. 2016 Jan;49(1):45.
10. Kotadiya RM, Savant NP, Upadhyay UM. Colon Targeted Moringa Gum Compression Coated Tablets of Capecitabine: A Factorial Approach. *Pharmacophore*. 2019 Apr 1;10(1).