

RESEARCH ARTICLE

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Knowledge of Colorectal Cancer Symptoms and Risk Factors in the Kingdom of Bahrain: a Cross- Sectional Study

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Abstract

Background: Colorectal cancer (CRC) is second in incidence rates in both genders in the Kingdom of Bahrain, with the number of new CRC cases sharply increasing in the last two decades. This study aimed to assess the levels of knowledge regarding CRC among people living in the Kingdom. **Methods:** A cross-sectional survey design was used to recruit a convenient sample of 505 adults aged 25 years or above. Face to face structured interviews were conducted to supplement data gained from the questionnaire. **Results:** The mean age of participants was 37 (± 10.43) years. Changes in bowel habits were the most commonly identified symptoms (46%) followed by lower abdominal pain (44%). Family history was the most commonly identified risk factor (38%) followed by smoking (28%). The overall score of knowledge of CRC was 56 (± 18.4). The scores for symptoms and risk factors were 59 (± 26.2) and 53 (± 17.5) respectively. It was found that female participants had better knowledge 59 (± 17) than males 54 (± 19) ($P = .001$). Participants with high levels of education had better knowledge (63%) compared with other groups, although this was not statistically significant ($P = .067$). **Conclusion:** This study indicates poor knowledge among people living in Bahrain regarding CRC symptoms and risk factors. Strategies and educational initiatives need to be implemented to enhance the general public's awareness in this respect.

Keywords: Level of knowledge- colorectal cancer- symptoms- risk factors

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Introduction

Cancer is a significant health problem worldwide in both developed and developing countries. It is the second leading cause of death following heart diseases in United States, United Kingdom, Italy, Germany and many other European countries (Center of Disease Control and Prevention, 2017; Office for National Statistics UK, 2016; Eurostat, 2013). It has also been reported that cancer is the fourth leading cause of death in the Eastern Mediterranean Region (World Health Organization, 2013). Lung, prostate, breast, and colon are the most common types of cancer that affect both men and women. In 2012, over eight million individuals died worldwide from cancer; furthermore, the number of deaths is expected to increase to 14.6 million by 2035 (World Center Research Fund International, 2015). Based on a report from the International Agency for Research on Cancer (2014), 14 million new cancer cases occurred internationally in 2012. Moreover, the number of cancer cases is expected to increase to 22 million per year within the next two decades.

Worldwide colorectal cancer (CRC) is the third most common diagnosed cancer in men, and the second most common in women (International Agency for Research on Cancer, 2018). Colorectal Cancer is an adenocarcinoma,

which may start as a benign polyp, but then becomes malignant, and invades and destroys healthy tissue, which extends into the surrounding structures. The incidence of the disease increases with age, and it is higher in people with a family history of the disease (Smeltzer et al., 2012). Based on a cancer registry report, CRC was the most common cancer among male nationals of the Gulf Cooperation Countries (GCC) aged between 45-59 years (12.8%) in the period between 1998 and 2007 (Gulf Center for Cancer Control and Prevention, 2011). A number of risk factors have been identified for CRC. The most significant factors include obesity, smoking, a sedentary life style, a high fat/low fiber diet, and a family history of inflammatory bowel disease (American Cancer Society, 2017).

In Bahrain, the number of new cases of CRC has increased very rapidly over the last two decades. The situation in the country is congruent with the global incidence in that CRC has the second highest cancer among men and women after lung and breast cancers respectively (Ministry of Health –Bahrain, 2015).

Several research studies around the globe have examined the public awareness and level of knowledge about CRC (Gimeno-García et al., 2011; Mhaidat et al., 2016; Iman et al., 2016; Taha et al., 2015;

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Mansour-Ghanaei et al., 2015; Zubaidi et al., 2015; Chong et al., 2015; Wong et al., 2013; McVeigh et al., 2013). The level of knowledge of the participants in these studies ranged from inadequate to adequate.

Findings from the literature revealed that a lack of knowledge concerning the risk factors and the recognition of the early symptoms influenced the participation in screening programs, and late disease diagnosis (Koo et al., 2012; Hasan et al., 2017; Taheri-Kharamah et al., 2015). As such, awareness of the disease contributes positively to the participation in the screening programs (Brandt et al., 2012).

According to Gulf Center for Cancer Control and Prevention (2011), 60% of CRC cases were diagnosed in later stages of the disease. Early diagnosis would increase the survival rate. The American Cancer Society (2017), reported that the five years relative survival rate for patients diagnosed with rectal cancer at stage IIIC is 58% whereas the rate is 12% for stage IVC, in which the cancerous cells migrate to other organs and invade the lymphatic system. Hence, it is essential that people at risk for developing the disease are aware of the risk factors, symptoms, and screening tests. The level of knowledge and awareness among the general public regarding CRC in some of the Gulf Cooperation Countries (GCC) and Bahrain, in particular, was insufficient.

Aim

This study assessed the level of knowledge among people living in the Kingdom of Bahrain regarding the symptoms and risk factors of CRC.

Research Questions

1. What is the level of knowledge amongst people living in the Kingdom of Bahrain about CRC symptoms and risk factors?
2. Is there a relationship between the demographic characteristics and the level of knowledge about CRC symptoms and risk factors?

Materials and Methods

Study design, setting and sampling

This was a quantitative, descriptive, cross-sectional study of a convenience sample from the general public in the Kingdom of Bahrain. Research participants were aged 25 or above. Data was collected over a period of one year between August 2015 and August 2016. Participants were recruited for the study from public areas (Shopping malls, beaches, football stadiums) in different geographical regions in the Kingdom of Bahrain. Permission was obtained from the management office of shopping malls to use their facilities to conduct the interview. The participants were approached by the trained interviewers during their presence in the general public areas for entertainment or shopping. The study excluded individuals with cognitive and sensory impairments and those who did not understand the Arabic or English language as they would not be able to comprehend the interview questions. The total population of Bahrain was 1.4 million in 2016, with individuals above the age of

25 years accounting for 600,000 thousand (Information eGovernment Authority, 2017). Considering 5% margin of error and 95% confidence level, 384 was the required sample size to represent people above age 25 years who live in Bahrain.

Study instrument

Face to face semi-structured interviews guided by a validated questionnaire were conducted by trained interviewers to gather data from the study participants. The interview took between ten and fifteen minutes to complete. The questionnaire was developed by the University College London and Cancer Research in the UK in 2008 and was designed to examine the general public's awareness of CRC in the United Kingdom (Power et al., 2011). The questionnaire has satisfactory internal reliability with Cronbach's alpha of 0.84 for all components. The test-retest reliability was over $r = 0.7$. Sixteen bowel cancer experts reviewed the questionnaire to ensure the construct validity. This questionnaire is composed of thirteen questions and is divided into two sections. Section A consists of eight questions investigating the demographic characteristics of the participant including age, gender, nationality, level of education, family history of CRC, along with questions regarding whether the participants heard or read about colonoscopy before. Section B consists of five main questions that focus on ascertaining how much knowledge the participant has regarding the early symptoms and risk factors of CRC.

As far as the actual contents of the questionnaire are concerned, Question One was an open-ended question aimed to measure the number of CRC symptoms a respondent could recall. The respondents were asked, "There are many warning symptoms of Colorectal (bowel) cancer? Please name as many as you can think of" Question Two was closed-ended and contained nine statements designed to measure the number of warning symptoms a respondent could recognize when prompted. Respondents were asked "The following may or may not be warning signs for Colorectal cancer" and participants were then instructed to select one of three choices (yes, no, I don't know). Question Three explored the participant's public knowledge regarding how age is related to CRC. Respondents were asked, "Who is most likely to develop bowel cancer?" and participants were then instructed to select one of four choices. Question Four was open-ended and aimed to measure the number of CRC risk factors a respondent could recall.

Respondents were asked, "What do you think might cause a person to develop colorectal (bowel) cancer?" Question Five was closed-ended and consisted of twelve positively worded statements designed to measure a participant's level of agreement with each item regarding the risk factors of CRC.

Respondents were asked, "The following may or may not increase a person's chance of developing bowel cancer. How much do you agree that each of these can increase a person's chance of developing bowel cancer?" The level of agreement was rated on a Likert scale from 1 (strongly disagree) to 5 (strongly agree). For our study,

the questionnaire was translated into Arabic via a back to back translation approach.

Ethical Considerations

Ethical approval from the Ethics Committee of the Royal College of Surgeons in Ireland- Medical University of Bahrain was granted before data collection commenced. The participants were provided with the information about the aim, purpose and procedure of the study. Each participant gave verbal consent before the data collection. Furthermore, the study did not gather any information that could lead to identifying the participants. The participants were assured that their participation in the study was voluntary and they could withdraw from the study at any time. The data of the study was saved in a locked file cabinet at the primary investigator's office and will be kept for three years until September 2019. All data output files are password protected.

Statistical Analysis

The IBM Statistical Package for Social Science (SPSS) Statistics 22.0 software was used to analyze the data. Descriptive statistics including frequency, percentage, mean, and standard deviation were used to describe sample characteristics and the level of knowledge found. Parametric testing including Independent t-test and ANOVA were used to compare subgroups and detect if there was any statistically significant difference in the mean total score of knowledge. Parametric testing was used because the data of the primary study variable (being the overall level of knowledge) was normally distributed.

Results

Five hundred and five (505) adults between the ages 25 and 73 participated and were interviewed in the present study. Table 1 illustrates the demographic characteristics and family history of the respondents regarding CRC. The mean age of participants was 37 (± 10.4). The Bahraini respondents represented 83% of the study sample. The majority of participants were male (59%). Of the interviewed participants, 60% ($n = 257$) had completed university education either with a diploma or Bachelor's degree qualification. It was revealed that 60% of the participants had heard and read about a colonoscopy. Twenty-two and fortytwo respondents had a history of CRC in close family or other family members respectively.

Recall of symptoms and risk factors for CRC

Table 2 describes the percentages of respondents' identifying (recalling) early symptoms and risk factors of CRC. The recall of symptoms and risk factors were measured through Question One and Question Four. In Question One, out of twelve warning symptoms of CRC, changes in bowel habits was the most commonly recalled symptoms (46%) followed by lower abdominal pain (44%). Nearly one quarter (22%) of participants identified rectal bleeding as a symptom of CRC. Only did 1%, 3% and 4% of respondents respectively recalled a lump in the lower abdomen, lower back pain, and anal

Table 1. Sample Demographic Characteristics and History of CRC (N=505)

Variable	Count	%
Gender		
Male	297	58.8
Female	208	41.2
Nationality		
Bahraini	419	83
Arab	37	7.3
Asian	36	7.1
Western	2	0.4
Others	11	2.2
Level of Education		
Illiterate	5	1
Read and Write	46	9.1
Secondary Qualification	153	30.3
Diploma/degree	257	50.9
Post-graduate	44	8.7
History of CRC (Yourself)		
Yes	7	1.4
No	488	96.6
Don't know	6	1.2
Prefer not to say	3	0.6
History of CRC (Partner)		
Yes	1	0.2
No	490	97
Don't know	4	0.8
Prefer not to say	5	1
History of CRC (Close family member)		
Yes	22	4.4
No	466	92.5
Don't know	13	2.6
Prefer not to say	3	0.6
History of CRC (Other family member)		
Yes	41	8.1
No	402	79.6
Don't know	55	11.2
Prefer not to say	3	0.6
History of CRC (Close friend)		
Yes	31	6.1
No	438	86.7
Don't know	32	6.3
Prefer not to say	3	0.6

pain as a warning symptom of CRC. Loss of weight and rectal bleeding were recognized by respondents as symptoms for CRC by only 21% and 22% of participants respectively. Regarding question four, family history was the most commonly identified risk factor (38%) followed by smoking (28%). Only 2%, 4% and 6 % of respondents respectively named consumption of red meat, a low fiber diet, and older age as significant risk factors for CRC.

Table 2. Recall of CRC Symptoms and Risk Factors

CRC Symptoms	Recall (%)	CRC Risk Factors	Recall (%)
Changes in bowel habit	46	Family history	38
Lower abdominal Pain	44	Smoking	28
Rectal bleeding	22	High fat diet	20
Loss of weight	21	Lack of physical activities	13
Fatigue	20	Consumption of alcohol	12
Loss of appetite	15	Stress	12
Blood in stool	15	Being over weight	11
Feeling Bloating	8	Older age	6
Anal Pain	4	Low fiber diet	4
Lower back pain	3	Bowel diseases	4
Lump in the abdomen	1	Consumption of red or processed meat	2
Delay bowel emptying	0.4	Type 2 DM	2

Table 3. Score of Knowledge about CRC

Variable	Score (%)	SD
Knowledge about CRC symptoms	59	26.2
Knowledge about CRC risk factors	54	17.5
Overall Knowledge about CRC	56	18.5

Overall Knowledge of CRC

Table 3 outlines the data concerning knowledge of CRC. The level of knowledge score regarding the symptoms of CRC and its risk factor onset was calculated in percentage. We assigned a score only for a participant’s correct response to each close-ended questions, those being Question Two, Question Three, and Question Five. The correct answers were added together, then the percentage was calculated. Scores ranged from zero to 100. One hundred indicated the highest level of knowledge about CRC symptoms and risk factors. The overall score of knowledge about symptoms and risk factors of CRC was 56 (±18.5).

The lowest actual score was zero and the highest was 95. The actual score regarding knowledge about symptoms was 59 (±26.2) and was 53 (±17.5) for risk factors.

The relationship between demographic characteristics and the level of knowledge

Table 4 shows the relationship between demographic characteristics of participants and overall knowledge of CRC. Independent t-test and ANOVA assessed the differences in knowledge amongst different groups. From the descriptive analysis, the female participants above 46 years old; participants with post-graduate education; western citizens; and participants with a history of CRC had a higher score of knowledge regarding risk factors and symptoms. However, the differences were not statistically significant. It should be noted that a difference was only statistically significant at the level .05 with gender (t = -3.37, df = 503, p=0.001), and the previous history of CRC (df = 30,473, F= 3.17, p=0.000).

Table 4. Relationship between Demographic Characteristics and level of Knowledge about CRC

Variable	Overall knowledge of CRC		
	Score (%)	SD	P value
Gender			
Male	54	19	0.001 ^a
Female	59	17	
Age			
25-45 years	56	18	0.117 ^a
46-75 years	59	19	
Illiterate	45	26	
Level of Education			
Read and write	55	20	0.067 ^a
Secondary certificate	54	18	
Diploma/degree	57	18	
Post-graduate	62	22	
Nationality			
Bahraini	56	18	0.301 ^a
Arab	61	17	
Asian	58	23	
Western	74	3	
Other	57	26	
History of CRC			
Yes	69	15	0.000 ^a
No	57	18	
Do not know	38	21	
Prefer not to say	13	15	

^aP ≤ 0.05

Discussion

This is the first study to assess the level of knowledge among the general public in the Kingdom of Bahrain concerning the symptoms and risk factors of CRC. Some studies previously conducted in the region used a self-administered questionnaire to assess the general public’s awareness of CRC (Khayyat et al., 2014; Ahmadi et al., 2016). The information bias associated with self-administered questionnaires is prevalent and thus, can potentially influence the study outcome (Cook, 2014). In these, respondents may access the information about CRC symptoms and risk factors before they answer the questionnaire, which may result in false-positive findings. This study is one of the few studies that used the semistructured face-to-face interview to minimize any information bias associated with a self-administered questionnaire.

The results of this present study indicated that the general public in the Kingdom of Bahrain lacks basic knowledge on the topic of CRC symptoms and risk factors. These findings were consistent with the findings of studies conducted in the region and worldwide, in both developed and developing countries.

The findings of this present study are shown to be even lower than those reported in other countries around the globe (Al Wutayd et al., 2015; Sessa et al., 2008;

Wong et al., 2013). Previous studies have reported that the lack of knowledge of CRC was found to be a barrier to screening adherence (Gimeno-García et al., 2011). This lack of knowledge is a predictor of intention to participate in CRC screening (Garcia et al., 2014).

The present study also revealed that knowledge about CRC was poorer when respondents were asked to recall rather than recognize symptoms and risk factors. For example, 6% of respondents recalled older age as significant risk factors for CRC. When given choices, 19% of the sample recognized that people older than sixty were at a higher risk for CRC. Overall, the respondents in the majority of reviewed studies were not able to recall the symptoms and risk factors of CRC, and this was also found in this study (Adlard et al., 2003; Breslow et al., 1997). Less than one-quarter of our respondents identified loss of weight, fatigue, loss of appetite, blood in the stool, anal pain, lower back pain, or a lump in the abdomen as a symptom of CRC. One important observation of the findings in this current study is that less than 15% of respondents identified stress, being overweight, old age, or low fiber diet as risk factors for CRC.

The respondent recall of CRC symptoms and risk factors was found to be quite variable among the reviewed studies. For example, in the study conducted by Gimeno-Garcia (2011), rectal bleeding (22.5%) as warning sign, and low fiber diet (29.5%) as a risk factor were most frequently reported. Our present study found that changes in bowel habits (46%) and family history (38%) were most often reported. Our present study also found that 13% of the sample recalled lack of physical activity as a factor which is a remarkable contrast when compared with 47% of respondents who identified this as a factor, in a study by Sessa and colleagues in 2008. Furthermore, more similar to the findings in Sessa was the fact that 20% of the sample in our study recalled high fat intake as a risk factor for CRC compared with the 24% identified by Sessa et al., (2008).

The findings from our study revealed that there was an association between gender and family history of CRC linked to a better level of knowledge. Additionally, participants with a history of CRC had a higher score of the level of knowledge in the current study. Females had better knowledge than males although the disease affects men more than women. Previous studies reported similar findings (Taha et al., 2015; Zubaidi et al., 2015; Wong et al., 2013; McCaffery et al., 2003). Although participants with a higher education scored higher than other groups, in our study knowledge is still considered low, and the difference in education was not statistically significant. In contrast, several studies reported a statistically significant association between the level of education and awareness of CRC symptoms and risk factors (Taha et al., 2015; Wong et al., 2013; Chong et al., 2015; Yardley et al., 2000).

Furthermore, our study found that participants above age forty-six had better knowledge compared with other age groups. This finding was consistent with the results of another study conducted in Jordan with 600 participants, and also a study in Iran with 1,557 participants (Taha et al., 2015; Mnsour-Ghannaei et al., 2015). One study in the United States of America found that the 20 to 29 years old

were less likely to know the relationship between family history, diet, and CRC (Rogers, 2015).

In conclusion, our present study focused only on the knowledge regarding symptoms and risk factors of CRC. However, it is vital to further explore through additional research the barriers, facilitators, and the willingness to participate in CRC screening among the general public. To determine the actual barriers and facilitators will allow for the development of strategies that will inform a range of professional healthcare workers of ways to encourage individuals at risk to participate in a screening program.

Furthermore, the findings from this study represent a solid foundation for the policymakers and educators to direct their efforts firmly toward the establishment of preventive measures and disease early detection strategies. In conclusion, there is a need for educational initiatives and awareness campaigns to enhance the general public's awareness of CRC symptoms and risk factors in the Kingdom of Bahrain.

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