

Original Research Article

Assessment of colorectal cancer lifestyle risk factors distribution and colonoscopy utilization among a sample from the south of Saudi Arabia

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ABSTRACT

Background: To assess the distribution of colorectal cancer lifestyle risk factors, utilization of colonoscopy for colorectal cancer screening among a sample from Jazan region, Saudi Arabia.

Methods: Presented study was a case control study conducted in King Fahad central hospital and Prince Mohammad Bin Nasser hospital in Jazan region. This study involved three groups where patients diagnosed with colorectal cancer, their first degree relatives and patients visiting other clinics were recruited. Data was collected via a structured questionnaire including data about lifestyle factors associated with colorectal cancer, such as eating behaviour, physical activity level, tobacco product consumption, and khat chewing behaviour and data about utilization of colonoscopy for screening purposes.

Results: A total of 148 individuals participated in this investigation including 56 patients diagnosed with colorectal cancer. Fourteen colorectal cancer patients (25%) were diagnosed with the disease below the age of 50. Utilisation of colonoscopy was the lowest among the first degree relatives of the colorectal cancer patients. First degree relatives of the colorectal cancer patients had higher levels of body mass index, lower consumption of fruits, vegetables and whole grain products and had higher levels of red meat consumption in comparison to participants in the other study groups.

Conclusions: The distribution of colorectal cancer risk factors among first degree relatives in our sample might indicate a need to target this group to increase awareness about the prevention of the disease and utilisation of screening services for colorectal cancer.

Keywords: Colorectal cancer, Lifestyle, Colonoscopy, Screening, Saudi Arabia

INTRODUCTION

Colorectal cancer is a prevalent form of cancer worldwide. According to the world cancer report, colorectal cancer is among the five most frequently diagnosed types of cancers among men and women around the globe.¹ The risk of developing colorectal cancer has been reported to be influenced by several behavioural factors, such as diet, alcohol intake and

physical inactivity, and to occur more frequently in high-income countries.²

Saudi Arabia is a high-income country where cancer is one of the leading contributors to mortality. Non-communicable diseases are a major cause of mortality in Saudi Arabia where 10% of mortalities in the country are due to cancers.³ According to the cancer incidence report in Saudi Arabia, colorectal cancer was the most common

type of cancer among males and the third most common among females in 2015.⁴

Colorectal cancer can have several clinical presentations. Symptomatic cases of colorectal cancer can suffer from changes of bowel habits, abdominal pain, rectal bleeding, blood in stool or dark stool.^{5,6} However, early cases of colorectal cancer can be asymptomatic which signifies the importance of screening for the disease to enable early detection.⁶

Several countries have implemented national screening programmes for colorectal cancer screening. However, the colorectal screening programme in Saudi Arabia is currently lacking.⁷ Nonetheless, the Saudi Centre for evidence-based healthcare has developed the National guidelines for colorectal cancer screening in Saudi Arabia.⁸ Based on the Saudi guidelines for colorectal cancer screening, screening is recommended for average-risk asymptomatic individuals at the age of 45 where colonoscopy is presumed as a gold standard screening tool.⁸

The colorectal cancer awareness month is a yearly campaign implemented by the Saudi Arabian ministry of health (MoH) in March since the year 2016.⁹ However, evidence concerning the utilisation of screening services for colorectal cancer in Saudi Arabia is currently limited. According to Khoja et al., the use of a colonoscopy for screening of colorectal cancer among a sample of elderly Saudi individuals in 2006 and 2007 was less than 1%.¹⁰ Nonetheless, no other investigations were detected reporting utilization of colonoscopy for screening of the disease. The limited evidence concerning the use of colorectal cancer screening among Saudis may indicate a need for further assessment. In this investigation, we aimed to assess the distribution of colorectal cancer risk factors among patients and first degree relatives of the patients, to assess the utilisation of colonoscopy for colorectal cancer screening and to assess factors associated with the utilisation of colonoscopy among a sample in a peripheral region in Saudi Arabia.

METHODS

This study was a case control study conducted in the Jazan region, South of Saudi Arabia and on the northern borders of Yemen. Data was collected from two regional hospitals where colorectal cancer cases are followed up, namely King Fahad central hospital and Prince Mohammad Bin Nasser hospital. Data was collected between August and September 2019.

To assess colonoscopy use for screening of colorectal cancer among different groups of individuals, three groups were sampled in this investigation. Firstly, patients were included if they were diagnosed with colorectal cancer and were following up in surgery clinics. Patients who were approached and agreed to participate were recruited and taken as the case group.

Secondly, first degree relatives of colorectal cancer patients who agreed to participate were selected. Finally, a comparison group of patients from other clinics in the hospital was randomly selected to assess their colorectal cancer screening pattern. Subjects were excluded in this investigation if they were under 18. Estimating sample size was difficult due to the expected limited number of cases diagnosed with colorectal cancer. Nonetheless, an effort to recruit all attending patients was made.

Patients were approached during their waiting time at follow-up clinics. Contact information of first degree relatives of recruited patients were provided by participating patients. First degree relatives who were approached were recruited in the investigation afterwards. All subjects who agreed and consented to participate were interviewed to complete the questionnaire. The interviews were conducted via trained medical students.

Data was collected via a structured questionnaire which was developed after consulting the relevant literature. The first section of the questionnaire inquired about demographic variables and family history of colorectal cancer and the use of colonoscopy to screen for colorectal cancer during the past 10 years. The second section inquired about lifestyle factors associated with colorectal cancer, such as eating behaviour, physical activity level, tobacco product consumption, and khat chewing behaviour where the questionnaire items pertaining to this section were adopted from the colorectal cancer risk assessment tool, global physical activity questionnaire and eating habit questionnaire.¹¹⁻¹³ Khat is a plant that is frequently chewed in the Jazan region and has been linked to the occurrence of different types of cancer, including gastrointestinal cancers.^{14,15} The questionnaire was reviewed via a panel of experts in surgery and epidemiology to assess the content of the questionnaire and piloted on a sample of 10 participants from each group.

The statistical package for the social sciences (SPSS) (version 25) was used for data analysis. The demographic variables of the participants were assessed using descriptive statistics, including frequency counts and percentages for categorical variables and means and standard deviations (SDs) for the continuous variables. To overcome the difficulty of performing statistical tests due to the low number of participants in certain categories, grouping of variables was performed where the cut-off points were estimated via means or medians. To enable comparison of characteristics of subjects who underwent colorectal screening and those who did not, Chi square test or First Exact test were applied. A p value of 0.05 was presumed as statistically significant for the applied tests.

RESULTS

A total of 148 individuals agreed to participate in this investigation. Demographic characteristics of the

participants are displayed in (Table 1). A total of 56 patients diagnosed with colorectal cancers were recruited. An effort was made to ensure matching of the participants in all groups. However, several patients did not have first degree relatives available for recruitment, thus leading to a smaller number of participants in the first degree relatives group. Median age was higher

among the colorectal cancer group. The proportion of males was higher among the first degree relatives group. A majority of the sample were living in rural areas within the region. Finally, colorectal cancer patients seem to have lower education levels in comparison to other study groups.

Table 1: Demographic characteristics of 148 participants from Jizan region, Saudi Arabia.

Variables	Colorectal cancer patients n=56	First degree relatives n=42	Other patients n=50
	N (%)	N (%)	N (%)
Age, median (range)	65 (22-95)	38 (23-84)	43 (24-89)
Gender, N (%)			
Males	26 (46)	27 (64)	20 (40)
Females	30 (54)	15 (36)	30 (60)
Living area, N (%)			
Urban	13 (23)	10 (24)	18 (36)
Rural	43 (77)	32 (76)	32 (64)
Education level, N (%)			
Intermediate or less	39 (70)	17 (41)	22 (44)
High school/ University	17 (30)	25 (59)	28 (56)

Table 2: Distribution of colorectal cancer risk factors among 148 participants from Jazan region, Saudi Arabia.

Variables	Colorectal cancer patients n=56	First degree relatives n=42	Other patients n=50
	N (%)	N (%)	N (%)
BMI, N (%)			
Less than 25	37 (66)	13 (31)	12 (24)
25 or more	19 (34)	29 (69)	36 (72)
Physical activity, N (%)			
Less than monthly engagement	38 (68)	15 (36)	34 (68)
Monthly engagement or more	18 (32)	27 (64.3)	12 (24)
Vegetables and fruits consumption, N (%)			
Once or less weekly	38 (68)	29 (69)	22 (44)
More than once weekly	18 (32)	13 (31)	28 (56)
Daily consumption of whole grain, N (%)			
Yes	32 (57)	14 (33)	20 (40)
No	24 (43)	28 (67)	30 (60)
Weekly consumption of red meat, N (%)			
Yes	31 (55)	24 (57)	17 (34)
No	25 (45)	18 (43)	33 (66)
Khat chewing*, N (%)			
Never chewer	44 (80)	34 (81)	38 (79)
Ever chewer	11 (20)	8 (19)	10 (21)
Chewed tobacco use, N (%)			
Never	46 (82)	39 (93)	45 (90)
Ever	10 (18)	3 (7)	5 (10)
Smoking, N (%)			
Never	37 (66)	36 (85)	41 (82)
Current/former	19 (34)	6 (15)	9 (18)

*3 missing cases for Khat chewing

The distribution of colorectal cancer risk factors among the study groups is depicted in (Table 2). Lower levels of

BMI are detected within the colorectal cancer patients which can be explained by the influence of the disease on

body weight. However, a majority of the first degree relatives were overweight or obese. First degree relatives of the patients seem to have a higher level of physical activity in comparison to the colorectal cancer patients and other patients. However, first degree relatives of the patients reported unhealthy eating behaviour with lower levels of vegetables, fruits, and whole grain product consumption in comparison to other study groups. Additionally, consumption of red meat was higher among the colorectal cancer patients and their relatives in comparison to other patients. Finally, Khat chewing behaviour was similar among the study groups while tobacco chewing, or being current or former smokers, was highest among the colorectal cancer patients group in comparison to the remaining groups.

Use of colonoscopy to screen for colorectal cancer is summarised in (Table 3). The highest level of using colonoscopy to screen for colorectal cancer was reported among the colorectal cancer patients group, followed by the other patients group. This could be explained by the presence of symptoms among patients within these groups leading to use of colonoscopy. Furthermore, the use of colonoscopy among the healthy first degree relatives of the colorectal cancer patients is very low, where 95% of participants among this group never used colonoscopy. Although the low utilisation of colonoscopy among the first degree relatives of the colorectal cancer patients can be explained by the lower median age in comparison to the participants in the other groups, we cannot neglect the fact that 14 colorectal patients (25% of the colorectal cancer patients group) were 50 years old or younger which may indicate a screening need at a younger age in the studied community.

Table 3: Use of colonoscopy to screen for colorectal cancer among a sample of 148 individuals from Jazan, Saudi Arabia.

History of using colonoscopy during the past ten years	Colorectal cancer patients n=56	First degree relatives n=42	Other patients n=50
Yes, N (%)	30 (54)	2 (5)	12 (24)
No, N (%)	26 (46)	40 (95)	38 (76)

The association between demographic characteristics and utilisation of colonoscopy for screening of colorectal cancer is shown in (Table 4). Among the studied variables, only age was statistically significant where older subjects were more likely to use colonoscopy in comparison to other groups ($p < 0.05$). Furthermore, use of colonoscopy was higher among males, those with lower education levels, those in urban areas, and those with no family history of colorectal cancer, but with no statistical significance ($p > 0.05$).

To assess the influence of age on colonoscopy screening pattern upon classifying the sample according to family

history of the disease, the study sample was restricted to those who were older than 45 and the findings are displayed in (Table 5). It seems that having a family history of colorectal cancer was not a motivator to seek colonoscopy among the participants who were 45 years or older. The proportion of subjects who had had a colonoscopy during the past 10 years was similar among those with and without family history of the disease.

Table 4: Assessment of association of demographic characteristics with utilization of colonoscopy for screening of colorectal cancer among a sample of 148 individuals from Jazan, Saudi Arabia.

Variables	Use of colonoscopy to screen for colorectal cancer		P value*
	Yes, N (%)	No, N (%)	
Age (years)			0.00008
Less than 50	12 (16)	65 (84)	
Older than 50	32 (45)	39 (55)	
Gender			0.236
Males	25 (34)	48 (66)	
Females	19 (25)	56 (75)	
Education level			0.170
Intermediate or less	27 (35)	51 (65)	
High school and higher	17 (24)	53 (76)	
Residence area			0.467
Urban	14 (34)	27 (66)	
Rural	30 (28)	77 (72)	
Family history of colorectal cancer			0.109
Yes	14 (23)	47 (77)	
No	30 (35)	55 (65)	

*Chi square test

Table 5: Use of colonoscopy to screen for colorectal cancer among a sample of 82 participants whom are 45 and older in Jazan region.

Use of colonoscopy during the past 10 years		
Family history of colorectal cancer	Yes, N (%)	No, N (%)
Yes	12 (44)	15 (56)
No	21 (38)	34 (62)

DISCUSSION

This investigation was a case control study conducted in the Jazan region, in southern Saudi Arabia to assess distribution of colorectal cancer risk factors among patients and first degree relatives of the patients, to assess the utilisation of colonoscopy for colorectal cancer screening and to assess factors associated with the utilisation of colonoscopy. First degree relatives of the colorectal cancer patients had higher levels of BMI,

lower consumption of fruits, vegetables and whole grain products and had higher levels of red meat consumption in comparison to participants in the other study groups. Tobacco product consumption was higher among the colorectal cancer patients group in comparison to participants in other groups. One quarter of the colorectal cancer patients were diagnosed with the disease below the age of 50 and utilisation of colonoscopy was the lowest among the colorectal cancer first degree relatives.

Studies assessing distribution of colorectal cancer risk factors among first degree relatives of the colorectal cancer patients in Saudi Arabia are currently lacking. However, a case control study conducted by Nashar and Almurshed, published in 2008, and conducted in Riyadh, involved 50 newly diagnosed colorectal cancer patients and comparing them to 50 healthy controls indicated higher frequency of meat consumption and lower consumption of vegetables and fruits and whole wheat products among the patients in comparison to healthy controls.¹⁶ Nonetheless, it is difficult to compare these findings to ours given that their sample was restricted to newly diagnosed patients. However, the pattern of higher consumption of red meat, and lower consumption of fruits and vegetables among the first degree relatives of the colorectal cancer patients was similar to those observed among the newly diagnosed colorectal cancer patients in the study conducted by Nashar and Almurshed.¹⁶

Studies assessing use of colonoscopy for colorectal screening in Saudi Arabia are limited. In a national cross-sectional study conducted between 2006 and 2007 and involving 2,946 Saudi participants who were older than 60, the utilisation of colonoscopy was less than 1%.¹⁰ In our investigation, the utilisation of colonoscopy was low among those with family history of the disease and higher among those who were diagnosed with colorectal cancer or patients following up in other clinics. This might suggest that asymptomatic cases are less likely to seek a colonoscopy even among those who are at higher risk. This notion is supported by a study assessing knowledge about prevention of colorectal cancer among a sample of 422 participants from the western region in Saudi Arabia where absence of clinical symptoms was one of the leading barriers of seeking screening for the disease.¹⁷

The young age of diagnosed patients with colorectal cancer in our sample is similar to the findings of another study. A study involving 279 colorectal cancer patients diagnosed between 2002 and 2014 indicated similar findings concerning age at diagnosis where the mean age of the patients was 57 years (SD; 13) and 22.5% of the patients were diagnosed with the disease below the age of 50.¹⁸ This notion is similar to our findings where 25% of the patients in our sample were diagnosed before the age of 50.

The lack of a National programme for screening of colorectal cancer helps to explain the low proportion of

first degree relatives of colorectal cancer patients who underwent a colonoscopy for screening of colorectal cancer. Colorectal cancer screening programmes are currently available in different countries, such as the UK, New Zealand, Australia, the Netherlands and Singapore.⁷ It is possible to argue that establishment of a national screening programme for colorectal cancer is likely to increase the use of colonoscopy among high risk individuals in the country.

Current study has multiple areas of strength and weaknesses. This investigation was able to recruit colorectal cancer patients and have them compared to first degree relatives of the colorectal patients and to another sample of patients visiting other clinics. This enabled comparison of distribution of colorectal cancer risk factors and utilisation of colonoscopy among different study groups. The main limitation of this investigation is related to the small sample size which restricted the ability to generalise the findings of this investigation to a broader prospective.

CONCLUSION

The distribution of colorectal cancer risk factors among first degree relatives in our sample might indicate a need to target this group given that their lifestyle risk factors might augment their familial risk factors and eventually increase the risk of developing colorectal cancer. More effort should be made to educate the community in the Jazan region concerning colorectal cancer risk factors and to increase awareness about the prevention of the disease and utilisation of screening services for colorectal cancer especially among high risk individuals such as relatives of the colorectal cancer patients.

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