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Research Article

**THE AWARENESS OF COLORECTAL CANCER AMONG SAUDI
POPULATION IN THE WESTERN REGION****¹Dr. Mohammad Eid Mahfouz, ²Asma Waqit Alghamdi**

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Abstract:

Background: Colorectal cancer (CRC) is part of the top-ranking cancers in Saudi Arabia, and frequently patients are diagnosed at advanced disease stages. This study aims to explore the awareness of lifestyle, CRC symptoms and signs, common risk factors, and screening strategies according to demographic characteristics in the Western region of Saudi Arabia.

Methodology: This is a cross-sectional, questionnaire-based study conducted in the Western Region of Saudi Arabia. Altogether 440 adult participants (aged 20 years and above) were included in this study, of these 364 (82.7%) participants were women and 76 (17.2%) were men. Data collected included demographics, participants' knowledge of symptoms, risk factors and screening for CRC. The data collected were entered in an excel sheet and then analyzed by SPSS program.

Results: It was encouraging that 330 (75%) of the total participants surveyed for the study recognized bowel disease as a CRC risk factor and their primary source of information was the internet (231, 52.5%). Although very few respondents know the warning signs and symptoms of CRC, the majority of participants 358 (81.3%) were aware of CRC screening for people > 50 years. High total awareness score was associated with used health professionals as an information source ($p < 0.001$).

Conclusion: The population survey revealed low awareness of CRC warning signs and symptoms, lifestyle and risk factors in general population in Western Saudi Arabia. Low total awareness score was associated with female gender. The results emphasize the importance of continuing public education, particularly about the link between lifestyle behaviors and CRC, as well than available screening strategies.

Keywords: Screening; awareness; knowledge; Saudi Arabia; colorectal cancer.

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INTRODUCTION:

Colorectal cancer (CRC) is the fourth most common cause of cancer-related mortality and the third most frequent cancer in both men and women worldwide [1,2]. The number of CRC cases is expected to increase to 22 million per year within the next two decades, and its burden is expected to escalate to more than 2.2 million new diagnosis and 1.1 million cancer deaths by 2030 [3].

Quick increases in both CRC incidence and mortality have been observed in many medium-to-high income countries in Asia, including Saudi Arabia [5-8]. According to the Saudi Cancer Registry issued in 2014, CRC is the first and third most common cancer in men and women, respectively. CRC incidence has been increased since 2002, and the eastern region of Al-Ahsa has the highest incidence of CRC in the country. Saudi population is more likely to present at an advanced stage with up to 24% of patients presenting with advanced disease and distant metastasis at initial diagnosis and presents at a younger age, especially among Saudi women. Compared to other high-income countries, survival rates in Saudi population (44.6%) are low [9-11].

CRC is a multifactorial and largely preventable disease. Risk factors for CRC include older age, family history, low dietary fiber, high saturated fat intake, red meat consumption, obesity, physical inactivity, metabolic syndrome, diabetes mellitus, smoking, non-alcoholic fatty liver disease, and geographic location [12, 13]. CRC risk can be reduced through lifestyle modifications and screening programs [14, 15].

Recent investigations on cancer prevention estimate that 14% of CCRs could be prevented by the avoidance of excess weight, 12% by increased physical activity, and 27% by increasing fiber intake and decreasing red and processed meat [16]. Screening strategies have also been proven to decrease both the incidence and mortality of CRC with a 5-year survival rate as high as 90% if the disease is detected early [17]. CRC screening is a multidisciplinary approach to aids detect early-stage CRCs and precancerous lesions in asymptomatic people without a history of cancer or precancerous lesions. Screening programs include noninvasive like fecal occult blood testing or FOBT and invasive options like flexible sigmoidoscopy and colonoscopy. Combinations of invasive and non-invasive options are also possible, and according to Saudi national guidelines for CCR screening should probably be initiated at the age of 45 years [18, 19].

Despite advances in cancer screening and treatment protocols, CRC remains a significant health problem in Saudi Arabia, and early detection is commonly based on individual efforts to pursue screening [20]. Studies addressing the level of CRC awareness among Saudi patients have shown that knowledge of disease is directly related to screening program participation and that public awareness of screening benefits among Saudi population is below the internationally reported [21-23]. Khayyat et al. reported that deficiency of knowledge of CRC screening was primarily influenced by the level of education and not by age or gender [24].

This cross-sectional study aimed to assess the level of awareness of CRC warning signs and symptoms, lifestyle, common risk factors, as well to explore the level of knowledge towards CRC screening according to age, gender, and lifestyle among adults in the Western Region of Saudi Arabia.

MATERIALS AND METHODS:

In this quantitative cross-sectional study, a survey was conducted on individuals, with the purpose of evaluating their level of awareness and knowledge of CRC symptoms, risk factors, and screening strategies. Participants were recruited for the study from Western Saudi Arabia and data was collected throughout two months. The study excluded individuals aged less than 20 years. A total of 440 questionnaires were completed and analyzed.

The survey items were developed by a thorough literature review and were based on standard awareness questionnaire form developed by Zubaidi et al. in 2015 [25], and the American Cancer Society 2018 guideline for CRC screening [26]. The questionnaire consists of items assessing the participants' knowledge of symptoms and risk factors for CRC, respectively. The respondents were asked "What are the symptoms of bowel cancer?" and "What are the risks factors for bowel cancer?" The questions scored answers on a list undisclosed to the respondents, and each correct response scored one point based on answer keys which are universally agreed, evidence-based and guideline-accepted. The correct answers for CRC symptoms included per rectal bleeding; blood in stool; change of bowel habit (diarrhea or constipation); abdominal or anal pain; gastrointestinal upset; anemic symptoms; weight loss and tiredness. The correct responses for risk factors for bowel cancer included advanced age; male gender; family history of CRC; Bowel disease (e.g. Ulcerative colitis, Crohn's disease); Diabetes; low intake of fruits or vegetables; high intake of fatty food; frequent intake of meat; obesity; smoking;

Drinking alcohol; Physical inactivity and stress. knowledge scores ranged from 0 (poorest) to 8 (best) for CRC symptoms and from 0 (poorest) to 13 (best) for CRC risk factors. The questionnaire also recorded demographic information, including age, sex, educational levels, marital status, occupation, perceived necessity of CRC screening for people aged 50 years or older.

This study was approved by the Ethics committee. And The data collected were entered in an excel sheet and then analyzed using the software Statistical Package for Social Sciences (SPSS) version 22. For analyses, education level was grouped as follows: primary or below; secondary; and tertiary or above. Other variables analyzed include gender, diet (weekly consumption of vegetables, red meat and fat meals), physical activity (weekly exercise). Age was stratified by decade as follows: 30-39 years; 40-49 years; 50-59 years; 60-69 years; and > 70 years. All categorical variables were presented as frequencies and percentages while continuous variables were presented as means and standard deviations. Chi-squared tests were performed for comparison of proportions, and independent t-tests for differences in mean and multinomial logistic regression analysis was carried out to adjust the factors. A P value of < 0.05 was considered statistically significant, and all p-values were two-tailed.

RESULTS:

A total of 440 individuals participated in the study out of the 500 who were invited (response rate = 88%). Analysis of sociodemographic characteristics per region is detailed in Table (1), including the frequency (N), percentage (%), and p values. Among participants, 364 (82.7%) were women and 76 (17.2%) men. Their ages ranged from 30 to more than 70 years old, 309 (70.2%) belonged to the age of a group of 30-39 years, and 388 (88.1%) had a tertiary or above level of education. Around 90% of participants never smoked cigarettes and never drink alcohol, and more than the half or participants on average eat vegetables once weekly or more (Table 3). Only 154 (35%) used health professionals as an information source.

Knowledge of warning signs and symptoms

Awareness of warning signs and symptoms was analyzed base in gender (Table 2). Among 440 participants, 284 (64.5%) recognized blood in stool as a warning sign for CRC and only 148 (33.6%) recognized anemia as possible warning signs of bowel cancer. Total Symptoms' Awareness Score (out of 8) was mean 4.09 (SD 2.17) and Saudi men

achieved higher scores than women, 5.08 (SD 2.26) in men versus 3.87 (SD 2.09) in women.

Awareness of risk factors

Awareness of risk factor was analyzed base in gender (Table 2). The most recognized risk factors were bowel disease 330 (75%), followed by smoking 226 (51.3%), alcohol 223 (50.6%), and a family history of CRC 191 (43.4%). On the other hand, only 45 of the participants (10.2%) recognized diabetes as a risk factor of CRC. Total risk factors' Awareness Score (Out of 13) was mean 4.65 (SD 3.03).

The association between different factors and total awareness score was identified by regression analysis and presented in (Table 4). Low total awareness score was associated with female gender. The difference was statistically significant (regression coefficient - 0.57; 95% CI 0.34-0.92; p = 0.024). On the other hand, high total awareness score was associated with used health professionals as an information source and the difference was statistically significant (regression coefficient 2.35; 95% CI 6.01-18.37; p < 0.001).

Recognition for CRC Screening

Regarding CRC screening for people > 50 years, the majority of participants 358 (81.36%) were aware of the screening program, while 69 individuals (15.68%) were not, and only 13 individuals (1.95%) from the Western region were uncertain about screening strategies. Colonoscopy and fecal occult blood test were the two most commonly heard methods of screening (42.9% and 33.1% respectively), followed by CT colonography (31.6%).

DISCUSSION:

It is well-known that the lack of cancer awareness in the population can have deleterious outcomes on time to first presentation and referral to secondary care and overall survival [27-29]. In Saudi Arabia, CRC is the first most common cancer in men and the third most common in women [9, 10]. It is critical to understand and recognize public awareness regarding CRC among the Saudi population to develop more effective and successful public policies for prevention and early diagnosis.

A substantial scientific evidence pointed towards a low level of knowledge of CRC in the general Saudi population [11, 20, 22-25]. Zubaidi et al. reported the presence of misconceptions regarding the understanding of CRC in general public of Riyadh region, however misconceptions regarding accepted screening protocols and symptoms were less among older individuals and those with higher education level [21]. Furthermore, other similar studies

conducted in other regions of Saudi Arabia have shown similar findings [20, 22-25].

Awareness of CRC screening modalities among Saudi people can differ based on age, levels of education, and gender. As reported by other authors, Saudi men respondents were more likely to answer correctly in our study too [11, 23, 30]. However, other studies have reported better knowledge and awareness about CRC in women [21, 31].

Our results showed that public awareness about bowel disease 330 (75%), smoking 226 (51.3%), and alcohol 223 (50.6%) as risk factors for CRC, which is consistent with findings from a previous study by Khayyat et al. [24] performed in the Western Region of Saudi Arabia. Predictors of an increased chance of participating in CRC screening include higher education, higher income, not being a current smoker, and psychosocial variables such as self-efficacy, family support for CRC screening and firm intention to be screened [32, 33].

Health literacy rates are directly correlated with knowledge and awareness about CRC and CRC screening and preventive actions [34]. This study showed that in the majority of respondents, cancer information was received from the internet (52.5%) and only 35% of respondents used health professionals as an information source, which might explain the low awareness of CRC warning signs and symptoms, particularly among women.

Low rates of CRC screening among general Saudi population is not a local but a cultural phenomenon. Arabic immigrants to the USA were also noted to have a low rate of CRC screening [35]. Previous studies on populations with ethnic minority background have ethnic differences in cancer symptom awareness and barriers to seeking medical help [36-38] which were not explored in our study. Future studies about ethnic differences in Saudi Arabia are required in order to more precisely identify the populations that need additional, targeted educational programs.

Limitation of the study

Even though urban and rural areas were both targeted in this study, the majority of participants were women from the Western region. Therefore, the result of our study cannot be generalized to the whole Saudi population. Larger scale study is needed to be performed in different regions to obtain a diversified sample and more accurate results.

CONCLUSION:

The population survey revealed low awareness of CRC warning signs and symptoms, lifestyle and risk

factors in the Western Saudi Arabia. The results emphasize the importance of continuing public education, particularly about the link between lifestyle behaviors and CRC in Saudi women. It is crucial to conduct public health initiatives to increase CRC awareness and to enhance the overall knowledge of CRC screening modalities.

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Tables

Table 1. Sociodemographic characteristics of the study participants

Variable		Sex						P-value
		Male		Female		Total		
		N	%	N	%	N	%	
Age	30-39	61	80.26%	248	68.13%	309	70.23%	0.004*
	40-49	4	5.26%	65	17.86%	69	15.68%	
	50-59	5	6.58%	41	11.26%	46	10.45%	
	60-69	6	7.89%	10	2.75%	16	3.64%	
	> 70	0	0.00%	0	0.00%	0	0.00%	
Educational Level	Primary or below	0	0.00%	3	0.82%	3	0.68%	0.714
	Secondary	8	10.53%	41	11.26%	49	11.14%	
	Tertiary or above	68	89.47%	320	87.91%	388	88.18%	
Marital Status	Married	21	27.63%	134	36.81%	155	35.23%	0.215
	Single	55	72.37%	222	60.99%	277	62.95%	
	Divorced	0	0.00%	7	1.92%	7	1.59%	
	Widowed	0	0.00%	1	0.27%	1	0.23%	
Occupational status	Full time	17	22.37%	73	20.05%	90	20.45%	0.001*
	Part Time or retired	2	2.63%	12	3.30%	14	3.18%	
	Housewife	0	0.00%	50	13.74%	50	11.36%	
	Un employed	55	72.37%	196	53.85%	251	57.05%	
	Un employed	2	2.63%	33	9.07%	35	7.95%	
Smoking Cigarettes	Never	55	72.37%	356	97.80%	411	93.41%	< 0.001**
	I used to smoke, but I quit	8	10.53%	4	1.10%	12	2.73%	
	1 Pack/Day	13	17.11%	3	0.82%	16	3.64%	
	2 Packs/Day	0	0.00%	1	0.27%	1	0.23%	
Drinking alcohol	Never	71	93.42%	363	99.73%	434	98.64%	< 0.001**
	Once or twice per year	4	5.26%	0	0.00%	4	0.91%	
	A few times a month	1	1.32%	0	0.00%	1	0.23%	
	Three or more times per week	0	0.00%	1	0.27%	1	0.23%	

Table 2. Assessment of Different CRC Awareness Levels

Variables		Sex					
		Male		Female		Total	
		N	%	N	%	N	%
Per rectal bleeding	No	26	34.21%	171	46.98%	197	44.77%
	Yes	50	65.79%	193	53.02%	243	55.23%
Blood in stool	No	18	23.68%	138	37.91%	156	35.45%
	Yes	58	76.32%	226	62.09%	284	64.55%
Change of bowel habit (diarrhea or constipation)	No	22	28.95%	179	49.18%	201	45.68%
	Yes	54	71.05%	185	50.82%	239	54.32%
Abdominal or anal pain	No	33	43.42%	192	52.75%	225	51.14%
	Yes	43	56.58%	172	47.25%	215	48.86%
Gastrointestinal upset	No	34	44.74%	191	52.47%	225	51.14%
	Yes	42	55.26%	173	47.53%	215	48.86%
Anemia	No	33	43.42%	259	71.15%	292	66.36%
	Yes	43	56.58%	105	28.85%	148	33.64%
Tiredness	No	37	48.68%	222	60.99%	259	58.86%
	Yes	39	51.32%	142	39.01%	181	41.14%
Weight loss	No	19	25.00%	153	42.03%	172	39.09%
	Yes	57	75.00%	211	57.97%	268	60.91%
Symptoms' Awareness Score (Out of 8): Mean (SD)		5.08 (2.26)		3.87 (2.09)		4.08 (2.17)	
Advanced age	No	22	28.95%	241	66.21%	263	59.77%
	Yes	54	71.05%	123	33.79%	177	40.23%
Male gender	No	45	59.21%	304	83.52%	349	79.32%
	Yes	31	40.79%	60	16.48%	91	20.68%
Family history of CRC	No	24	31.58%	225	61.81%	249	56.59%
	Yes	52	68.42%	139	38.19%	191	43.41%
Bowel disease (e.g. Ulcerative colitis, Crohn's disease)	No	14	18.42%	96	26.37%	110	25.00%
	Yes	62	81.58%	268	73.63%	330	75.00%
Diabetes	No	61	80.26%	334	91.76%	395	89.77%
	Yes	15	19.74%	30	8.24%	45	10.23%
Low intake of fruits or vegetables	No	38	50.00%	259	71.15%	297	67.50%
	Yes	38	50.00%	105	28.85%	143	32.50%
High intake of fatty food	No	40	52.63%	243	66.76%	283	64.32%
	Yes	36	47.37%	121	33.24%	157	35.68%
Frequent intake of meat	No	39	51.32%	286	78.57%	325	73.86%
	Yes	37	48.68%	78	21.43%	115	26.14%
Obesity	No	37	48.68%	269	73.90%	306	69.55%
	Yes	39	51.32%	95	26.10%	134	30.45%
Smoking	No	23	30.26%	191	52.47%	214	48.64%
	Yes	53	69.74%	173	47.53%	226	51.36%
Drinking alcohol	No	35	46.05%	182	50.00%	217	49.32%
	Yes	41	53.95%	182	50.00%	223	50.68%
Physical inactivity	No	38	50.00%	292	80.22%	330	75.00%

	Yes	38	50.00%	72	19.78%	110	25.00%
Stress	No	60	78.95%	278	76.37%	338	76.82%
	Yes	16	21.05%	86	23.63%	102	23.18%
Risk factors' Awareness Score (Out of 13): Mean (SD)		6.74 (3.55)		4.21 (2.72)		4.65 (3.03)	
Regular CRC screening for People > age;50	No	4	5.26%	65	17.86%	69	15.68%
	Yes	71	93.42%	287	78.85%	358	81.36%
	2	1	1.32%	12	3.30%	13	2.95%
Colonoscopy	No	28	39.44%	133	46.34%	161	44.97%
	Yes	43	60.56%	154	53.66%	197	55.03%
Fecal occult blood test	No	42	59.15%	171	59.38%	213	59.33%
	Yes	29	40.85%	117	40.63%	146	40.67%
CT colonography	No	52	73.24%	174	60.63%	226	63.13%
	Yes	19	26.76%	113	39.37%	132	36.87%
Barium enema	No	66	92.96%	245	85.37%	311	86.87%
	Yes	5	7.04%	42	14.63%	47	13.13%
Screening Awareness Score (Out of 5): Mean (SD)		2.22 (0.84)		2.02 (1.16)		2.06 (1.11)	
Total Awareness Score (Out of 26): Mean (SD)		14.04 (5.67)		10.10 (4.81)		10.78 (5.18)	

Table 3. Descriptive Statistics of Different Information Sources and Life Styles

Variables		Sex					
		Male		Female		Total	
		N	%	N	%	N	%
TV/newspapers	Yes	7	9.21%	56	15.38%	63	14.32%
	No	69	90.79%	308	84.62%	377	85.68%
Internet	Yes	29	38.16%	202	55.49%	231	52.50%
	No	47	61.84%	162	44.51%	209	47.50%
Relatives	Yes	9	11.84%	47	12.91%	56	12.73%
	No	67	88.16%	317	87.09%	384	87.27%
health professionals	Yes	50	65.79%	104	28.57%	154	35.00%
	No	26	34.21%	260	71.43%	286	65.00%
health magazines	Yes	9	11.84%	22	6.04%	31	7.05%
	No	67	88.16%	342	93.96%	409	92.95%
How many portions of vegetables do you eat on average?	Rarely	26	34.21%	124	34.07%	150	34.09%
	≥ once weekly	50	65.79%	240	65.93%	290	65.91%
How many days	0 - 2 days per	12	15.79%	103	28.30%	115	26.14%

per week on average do you eat red meat?	week						
	3 - 4 days per week	30	39.47%	137	37.64%	167	37.95%
	5 - 7 days per week	21	27.63%	92	25.27%	113	25.68%
	Rarely	13	17.11%	32	8.79%	45	10.23%
How many days per week on average do you eat fat meals?	0 - 2 days per week	2	2.63%	22	6.04%	24	5.45%
	3 - 4 days per week	11	14.47%	97	26.65%	108	24.55%
	5 - 7 days per week	28	36.84%	181	49.73%	209	47.50%
	Rarely	35	46.05%	64	17.58%	99	22.50%
How often do you get 30 minutes of vigorous exercise or 60 minutes of moderate exercise per week?	One or two times	35	46.05%	153	42.03%	188	42.73%
	Three or four times	26	34.21%	118	32.42%	144	32.73%
	Five or more times	8	10.53%	61	16.76%	69	15.68%
	Rarely/Never	7	9.21%	32	8.79%	39	8.86%

Table 4. Logistic Regression for Association between Different Factors and Total Awareness Score

Factor	Regression coefficients (β)	Standard error (S β)	Z-value	P-value	Odds ratio	95% Confidence Interval	
						Lower	Upper
Age (Compared to 30-39)							
30-39	-0.97	0.26	-3.70	< 0.001*	0.38	0.23	0.63
40-49	-0.64	0.31	-2.10	0.035*	0.53	0.29	0.96
50-59	-1.17	0.48	-2.45	0.014*	0.31	0.12	0.79
Sex							
Female	-0.57	0.25	-2.26	0.024*	0.56	0.34	0.92
Educational Level (Compared to 1 st or below)							
Secondary	-1.73	1.03	-1.68	0.093	0.18	0.02	1.33
Tertiary or above	-2.01	1.01	-1.98	0.047*	0.14	0.02	0.98
Eating Vegetables (Compared to Rarely/Never)							
\geq once weekly	0.45	0.18	2.43	0.015*	1.56	1.09	2.24
Eating Red Meat (Compared to Rarely/Never)							
0-2 Days per Week	-0.42	0.32	-1.33	0.185	0.66	0.35	1.22
3-4 Days per Week	-0.13	0.30	-0.44	0.662	0.88	0.49	1.57
5-7 Days per Week	0.06	0.31	0.19	0.853	1.06	0.58	1.93
Eating Fat Meals (Compared to Rarely/Never)							
0-2 Days per Week	-0.26	0.44	-0.59	0.557	0.77	0.33	1.82
3-4 Days per Week	-0.34	0.27	-1.27	0.206	0.71	0.42	1.21
5-7 Days per Week	-0.29	0.23	-1.27	0.203	0.75	0.48	1.17
Weekly Exercise (Compared to Rarely/Never)							
1 or 2 Times	-0.24	0.44	-0.55	0.582	0.79	0.33	1.85
3 or 4 Times	-0.32	0.27	-1.19	0.236	0.73	0.43	1.23
5 or More Times	-0.29	0.23	-1.24	0.214	0.75	0.48	1.18
Information Sources							
TV/newspapers	0.22	0.27	0.82	0.411	1.25	0.73	2.14
Internet	0.54	0.22	2.48	0.013*	1.72	1.12	2.66
Relatives	0.14	0.29	0.50	0.614	1.16	0.66	2.04
health professionals	2.35	0.29	8.24	< .001**	10.45	6.01	18.37
health magazines	1.01	0.35	2.92	0.003*	2.76	1.39	5.44