RESEARCH ARTICLE

Predictors of Colorectal Cancer Knowledge among Adults in the United Arab Emirates

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Abstract

Objective: To assess knowledge regarding colorectal cancer (CRC) and to identify its predictors in the UAE. **Materials and Methods:** A cross sectional study was conducted among subjects ≥ 50 years-old, using a validated self-administered questionnaire. Awareness of CRC risk factors, warning signs/symptoms (S/S), and screening methods was evaluated with a level of knowledge score for various areas. Low (poor) knowledge was defined as a score below the corresponding average value. The Chi-square test and logistic regression were used in the statistical analysis. **Results:** The percentage of respondents who had poor knowledge score concerning risk factors, warning S/S and screening were 81.7%, 84.7% and 94.1% respectively. Male and lower education level subjects had significantly higher probability of low knowledge related to risk factors and warning S/S. Also respondents without a family history of CRC or personal history of polyps had a significantly higher probability of low knowledge concerning warning S/S compared to those who had a positive history. Significantly higher probability of low knowledge concerning screening methods was noted among non-Arabs and subjects with a lower education level. **Conclusion:** Most of the respondents had poor knowledge. Gender, education level, family and personal history and ethnicity were found to be significant predictors of CRC knowledge.

Keywords: Colorectal cancer- knowledge- adult

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Introduction

Globally, colorectal cancer (CRC) is the 3rd most common cancer (IARC 2012) with an increasing prevalence in some countries (Center et al., 2009). In the Gulf countries, the disease is the second prevalent cancer and data on cancer incidence between 1998-2007 indicated late first diagnosis for about 60% of the registered patients (Al-Madouj et al., 2011). In the Unite Arab Emirate, CRC is respectively the 2nd and 4th most prevalent cancer among national males and females for the same period (Al-Madouj et al., 2011), and in both genders combined, it was the 2nd most common cancer at 2008 (Loney et al., 2013) .

Screening for colorectal cancer is an effective measure for decreasing mortality, improving the quality of life and reducing the burden of the disease in the population (Leddin et al., 2004; Zauber, 2015). Researchers Hewitson et al., (2008) and Zauber (2015) demonstrated the success of screening with fecal occult blood test (FOBT) in bringing down colorectal mortality. Systematic reviews indicated a 16% reduction in the risk of CRC death by FOBT method (Hewitson et al., 2008). However, effectiveness of any screening test depends on the test uptake by the target population (Commonwealth of Australia, 2005; Weller et al., 2009). Public awareness about CRC risk factors, warning signs, and screening tests would have significant impacts on the uptake of screening programs (McCaffery et al, 2003; Zheng et al., 2006; Koo et al., 2012; Bradley et al, 2015).

In the United Arab Emirates, the CRC screening program is implemented in 2014. Health Authority of Abu Dhabi (HAAD, 2014) suggested a desirable level for CRC screening uptake to be more than 65%. Increased public awareness about CRC can improve compliance to available screening services (Gimeno Garcia et al., 2014). Before developing any CRC awareness programs, it is essential to identify the level of public knowledge about cancer and screening tests. This study aimed to evaluate the knowledge about colorectal cancer and to assess factors associated with cancer awareness among adults in the UAE.

Materials and Methods

This cross sectional study included adults aged 50 years or older, living in the UAE and attending Thumbay Hospital in Ajman, UAE. Convenience sampling approach

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was used to recruit the participants A self-administered questionnaire was developed and its' content was validated by three experts in the field. The questionnaire consisted of questions related to the socio-demographic characteristics and family history of CRC or colonic polyps. The knowledge about CRC was examined for three areas namely the risk factors (18 items), warning signs/symptoms (9 items) and screening methods (10 items). The knowledge score in each area was assessed. Poor knowledge is defined as a knowledge score below the average value for each corresponding domain. The SPSS version 21 was used for statistical analysis. Chi-square test, simple and multiple logistic regression analysis were used. The study was approved by Ethics Committee of the Gulf Medical University and informed consent was obtained before enrollment of participants in the study.

Results

The study included 404 participants with a mean (SD) age of 55.01 (5.21) ranging between 50 and 77 years. Table 1. Shows participants characteristics. Respondents were mostly 50-54 years old (60.3%), males (80.2%), Arabs (51.2%), non-Arabs (93.6%), married (93.6%), having secondary level of education (45.8%), and health insurance (54.4). Family history of CRC and personal history of polyp were reported by 6.6% and 2.7% of the participants, respectively.

Table 2,3 and 4 showed the knowledge about risk factors, warning signs/symptoms and screening methods of colorectal cancer respectively. The present results showed that 59.4%, 74.8% and 53.5% of the respondents did not have any knowledge about risk factors, warning signs/ symptoms and screening methods of colorectal cancer respectively. Only, 24.8%, 23.5%, 14.6%, and 13.9%, knew that bleeding per rectum, melena, change in bowel habits, and weight loss respectively are possible warning symptoms or signs for CRC.

Table 1. Participants' Characteristics

Variables	Sub-Categories	Number	%
Gender	Males	324	80.2
	Females	80	19.8
Ethnicity	Arab	207	51.2
	Non-Arab	197	48.8
Nationality	Emirati	26	6.4
	Non Emirati	378	93.6
Marital status	Unmarried	23	6.4
	Married	336	93.6
Education level	≤ Secondary	237	61
	Graduate/PG	152	39
Age (years)	50-54	243	60.3
	55-59	96	23.8
	≥60	65	15.9
Family history of CRC	Yes	26	6.6
	No	369	93.4
Personal history of polyp	Yes	11	2.7
	No	381	97.2

Table 2. Distribution of Participants by Knowledge about Risk Factors for Colorectal Cancer

Risk Factors Items	Correct knowledge		Incorrect/ don't know	
	No	%	No	%
Aging	101	25.7	292	74.3
Family history of CRC	67	17.4	318	82.6
Alcohol consumption	120	30.2	278	69.8
Smoking	105	27	284	73
Obesity, overweight	63	16.4	321	83.6
Low physical activity	61	15.9	323	84.1
Low Fruit and vegetable intake	86	22.4	298	77.6
Low fiber intake	88	23	295	77
High fat intake	90	23.5	293	76.5
Red and processed meat	90	23.3	296	76.7
Intake of smoked foods	63	16.4	290	75.7
Intake of salt cured food	58	15.1	325	84.9
Family history of multiple cancers	110	28.1	281	71.9
Personal history of chronic bowel disease	117	30.1	227	69.9
Familial History of a grape-like growth on the inside wall of the colon or rectum	69	17.9	317	82.1
Personal history of grape-like growth on the inside wall of the colon or rectum during the teen years	66	17.2	318	82.8
Personal history of breast cancer	101	26	288	74
Personal history of diabetes	27	7	361	93

Analysis of knowledge scores about colorectal cancer in different domains showed that the percentage of participants who had poor knowledge scores for CRC risk factors, waning signs and screening methods were 81.7%, 84.7% and 94.1% respectively.

The association between poor knowledge scores about colorectal cancer risk factors, warning signs/ symptoms and screening methods and demographic variables is shown in Table 5. Significant associations are found between poor knowledge and: gender (higher proportion

Table 3. Distribution of Participants by Knowledge about Warning Signs for CRC

Warning Signs Items	Correct knowledge		Incorrect/ don't know	
	No	%	No	%
Rectal bleeding	100	24.8	304	75.2
Blood in stool (bright red, black or very dark).	95	23.5	309	76.5
Change in bowel habit, especially in the shape of the stool	59	14.6	345	85.4
A lump in the abdomen	30	7.4	374	92.6
Unexplained extreme tiredness	39	9.7	365	90.3
Weight loss without dieting	56	13.9	384	86.1
Feeling that bowel does not completely empty after using the lavatory'.	28	6.9	376	93.1
Cramping pain in the lower abdomen	81	20	323	80
Pain in back passage	51	12.6	353	87.4

Table 4. Distribution of Participants by Knowledge about CRC Screening

CRC Screening Items	Correct knowledge		Incorrect/ don't know	
	No	%	No	%
Heard about CRC Screening program/tests	116	28.7	288	71.3
Know the methods used for Screening	31	7.7	373	92.3
Heard about FOB test	65	16.1	339	83.9
Know the appropriate age to start FOB test	8	2.0	396	98
Know how often FOBT be performed	2	0.5	402	99.5
Know who are to be included in FOBT	117	29.0	287	71
Heard about Colonoscopy	155	38.4	249	61.6
Know the appropriate age to start Colonoscopy	15	3.7	389	96.3
Know how often Colonoscopy be performed	2	0.5	402	99.5
Specify other methods for screening of CRC	5	1.2	399	98.8

in males vs. females), education level (higher proportion in lower vs. higher education level), family history of CRC (higher proportion in persons who didn't have history vs. that in persons who had history of CRC). Ethnicity is significantly associated with poor knowledge scores about colorectal cancer warning signs/ symptoms and screening methods (higher proportions in non-Arab vs. Arab in both domains). The Age has not demonstrated significant association with knowledge scores in all domains.

Logistic regression analysis was done (Table 6) to find factors that can influence the probability of having poor knowledge scores for colorectal cancer risk factors, warning signs and screening methods after adjusting for the confounding effects of other variables included in the models. The present study showed that gender, education level, family and personal history and ethnicity are significant predictors of CRC knowledge while age was not a significant predictor of CRC knowledge

The present results showed that after adjusting for the confounding effect of other variables, in comparison to females, males had 3.4 and 7.3 times higher probability of poor knowledge scores for risk factors and warning signs respectively. Moreover, in comparison to higher educational level participants, lower education level subjects had 3.6; 4.8 and 5.9 times higher probability of poor knowledge scores for risk factors, warning signs and screening methods respectively. Non-Arabs had three times higher probability of having poor knowledge for screening methods compared to Arabs. Participants who had no family history of CRC and personal history of polyp had 11.1 and 5.8 respectively higher probability of having poor knowledge for warning signs respectively.

Discussion

Public awareness about colorectal cancer is an essential element in the prevention of the disease (CDC, 2017). The present results demonstrated great lack of awareness about CRC. The majority of participants were not aware about CRC risk factors and warning signs (59.4% and 74.8%

Table 5. The Association Poor Knowledge Scores about Colorectal Cancer Risk Factors, Warning Signs/ Symptoms and Screening Methods and Demographic Characteristics

Variables	Sub-Categories	Total No.	Participants with poor Colorectal cancer knowledge score in different domains		
			Risk Factors	Warning Signs/ Symptoms	Screening Methods
			No. (%)	No. (%)	No.(%)
Gender	Males	324	276 (85.2) *	288 (88.9)*	308 (95.1)
	Females	80	54 (67.5)	54 (67.5)	72 (90.0)
Ethnicity	Arab	207	163 (78.7)	166 (80.2)*	189 (91.3)*
	Non-Arab	197	167 (84.8)	176 (89.3)	191 (97.0)
Nationality	Emirati	26	19 (73.1)	21 (80.8)	24 (92.3)
	Non Emirati	378	311 (82.3)	321 (84.9)	356 (94.2)
Marital status	Unmarried	23	20 (87.0)	21 (91.3)	23 (100.0)
	Married	336	265 (78.9)	277 (82.4)	313 (93.2)
Education level	≤ Secondary	237	211 (89.0) *	217 (91.6)*	232 (97.9)*
	Graduate/PG	152	104 (68.4)	110 (72.4)	133 (87.5)
Age (years)	50-54	243	198 (81.5)	205 (84.4)	228 (93.8)
	55-59	96	76 (79.2)	80 (83.3)	90 (93.8)
	≥60	65	56 (86.2)	57 (87.7)	62 (95.4)
Family history of CRC	Yes	26	13 (50.0) *	7 (26.9)*	25 (96.2)
	No	369	309 (83.7)	326 (88.3)	346 (93.8)
Personal history of polyp	Yes	11	8 (72.7)	5 (45.5)*	9 (81.8)
	No	381	312 (81.9)	325 (85.3)	359 (94.2)

The proportion of poor knowledge (shown) Vs non-poor knowledge was tested; *P<0.05; PG: Postgraduate

Table 6. Logistic Regression Analysis: Predictors of Lower Knowledge Scores for Colorectal Cancer (CRC) Risk Factors, Warning Signs/ Symptoms and Screening Methods

Predictors of knowledge about risk factors (Multiple logistic regression model prediction=81.4%)		N	COR	95% CI	P	AOR	95% CI	P
Gender	Female	80	1			1		<0.001
	Male	324	2.769	1.582-4.843	<0.001	3.409	1.842-6.307	
Education level	Graduate/Postgraduate	152	1			1		
	Secondary or less	237	3.746	2.200-6.376	<0.001	3.678	2.075-6.517	<0.001
Family history of CRC	Yes	26	1					
	No	369	5.15	2.275-11.658	<0.001	-	-	-
Predictors of knowledge about Warning Signs/ Symptoms (Multiple logistic regression model prediction =88.1%)								
Gender	Female	80	1			1		
	Male	324	3.852	2.152-6.895	<0.001	7.391	3.413-16.007	0.001
Education level	Graduate/Postgraduate	152	1			1		
	Secondary or less	237	4.143	2.320-7.398	<0.001	4.816	2.307-10.055	<0.001
Family history of CRC	Yes	26	1			1		
	No	369	20.578	8.176-51.796	<0.001	11.189	3.682-33.999	<0.001
Personal history polyp	Yes	11	1	2.056- 23.595	0.002	1	1.147-29.379	0.033
	No	381	6.964			5.806		
Ethnicity	Arab	207	1					
	Non Arab	197	2.07	1.174-3.650	0.012	-	-	-
Predictors of knowledge scores about Screening Methods (Multiple logistic regression model prediction =93.8%)								
Education level	Graduate/Postgraduate	152	1			1		
	Secondary or less	237	6.629	2.419-18.162	<0.001	5.907	2.065-16.895	0.001
Ethnicity	Arab	207	1	1.178-7.805	0.022	1	1.113-8.258	0.03
	Non Arab	197	3.032			3.031		

respectively). Cancer awareness in our study, is poorer than those reported in Malaysia, where 38% and 32% of participants demonstrated no knowledge about warning signs and risk factors, respectively (Su et al., 2013). Only 7% of the studied respondents were aware that diabetics have higher risk of developing CRC, in agreement with the results of Almadi et al., 2015 study in Saudi Arabia. The present data showed that 25.7% knew that aging is a risk factor for CRC, this is lower than that reported in earlier studies from Spain (59%) and Turkey (57.1%) (Gimeno-García et al., 2011; Baran et al., 2016).

Poor knowledge about warning signs and symptoms was also noticed in this study and only, 24.8%, 23.5%, 14.6%, 13.9%, knew that bleeding per rectum, melena, change in bowel habits, and weight loss respectively are possible warning symptoms or signs for CRC. These percentages are lower than the corresponding values of 41.2%, 27.8%, 38.2%, and 32.2% respectively reported by a study in Saudi Arabia (Almadi et al., 2015). Population survey in the UK (Power et al., 2011) demonstrated similar poor awareness and on asking participants to recall CRC warning signs and symptoms only 23.1%, 15.4% and 4.1% of the respondent reported change in bowel habit, blood in stools and unexplained weight loss as warning signs and symptoms of CRC.

The current finding demonstrated profound lack of knowledge about screening tests where only 16% of respondents had heard about FOBT, and this is lower than earlier studies in Turkey (45%) (Gulten et al., 2012) and Spain (38.5%) (Carrasco-Garrido et al., 2014).

We found that gender (being males compared to females) and lower education level were significant predictors of lower CRC knowledge, this finding is comparable with a survey in Saudi Arabia (Zubaidi et al., 2015) where better knowledge was found among women and higher education level respondents. Similarly, in a survey done in the UK (Power et al., 2011), women were also found to have significantly higher knowledge of signs and symptoms than men. It should be stated here, that the previously mentioned survey (Power et al., 2011), demonstrated that in addition to gender, ethnicity was also a significant predictor of the CRC knowledge, a finding that is consistent with the current study. The latter finding indicated that the education tools that are to be used to increase awareness of the public about CRC, should consider the ethnic specific structure of the population.

The present data showed that age is not a significant predictor of CRC knowledge and this agrees with a survey in the Western Region of Saudi Arabia (Khayyat and Ibrahim, 2014).

In line with others findings Yim et al., (2012); Wong et al., (2013) family history of CRC and personal history of polyps are identified as a significant predictor for CRC knowledge. Yim et al., (2012) found that patients with a personal history of polyps and family history of CRC were predictors of better knowledge and perceptions regarding

CRC screening.

Limitation

Results of this study cannot be generalized since it includes only patients attending one health care setting. However, it provides baseline information for directing future educational activities with regard to CRC screening.

In conclusion, most of the respondents had poor knowledge about CRC and screening tests. Gender, education level, family and personal history and ethnicity are significant predictors of CRC knowledge.

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