RESEARCH ARTICLE

Colorectal Cancer Risk Awareness and Screening Uptake among Adults in the United Arab Emirates

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Abstract

   United Arab Emirates initiated the colorectal cancer (CRC) screening on 2013. Yet, one of the barriers to participation in CRC screening is lack of knowledge about the importance of CRC, its risk factors, and the benefits that could be gained through screening. We aimed in this study to identify knowledge, attitude, and behavioral factors among the public that are associated with willingness to undergo CRC screening. A structured bilingual questionnaire in English and Arabic was designed by a multidisciplinary team and through a review of the literature. The survey consisted of four functional domains: socio-demographic characteristics, knowledge, attitude, and practice related questions. It was encouraging that more than 65% of the total participants surveyed for the study were aware of CRC and their main source of information was media (395, 66%). However, the majority (379, 64%) were thinking that CRC is not common, and did not hear of the screening test for CRC (401, 67%). An overall evaluation of the answers revealed a poor level of knowledge on risk factors of CRC, and only 40% correctly identified fecal occult blood as main test for CRC prevention. Surprisingly, 95% of participants mentioned that the CRC screening was not recommended to them by a physician. This is the first report analyzing the awareness, attitude and practice of UAE population and assessing the barriers for CRC screening. Our results demonstrate that better education and communication of the benefits of early detection of CRC should be addressed to improve the screening in UAE population. There is need for campaigns and educational programs, both for health care providers and public. Media might play a significant role in this aspect and new policies need to focus more on increasing community awareness on cancer preventive measures in UAE.

Keywords: Screening- colon cancer- knowledge- attitude- United Arab Emirates

Introduction

   Colorectal cancer (CRC) ranks as the third most common cancer in the world (Siegel et al., 2017). Worldwide, CRC is the third most common cancer among men and the second among women, and it is the fourth leading cause of cancer-related mortality worldwide (Herbst and Kolligs, 2012). Cancer is the third leading cause of death in the United Arab Emirates (UAE) after cardiovascular diseases and accidents (Statistics centre - Abu Dhabi, 2011). In UAE, Colorectal cancer is the first and fourth most common cancer in males and females respectively (HAAD cancer registry).

   Several randomized controlled trials and observational studies have shown that screening is an effective and cost-effective tool for reducing CRC mortality (Schoen et al., 2012; Segnan et al., 2011). Multiple risk factors have contributed to the increase in the incidence of CRC, including age, Obesity, a diet low in fruit and vegetable,

physical inactivity, smoking, economic status, sedentary lifestyle and geographic location (Yi-Sheng et al., 2009; Purnell et al., 2010; Gimeno-García, 2012; Agnoli et al., 2013). Using screening for CRC can also help in early detection and removal of premalignant adenomatous polyps. According to the American Cancer Society, if CRC is diagnosed at an early stage, the survival rate can be more than 90% (US colorectal cancer facts and figures: 2017-2019).

   United Arab Emirates initiated to CRC screening on 2013 based on international evidence-based guidelines (NHS Cancer Screening Programmes; European guidelines for quality assurance in colorectal cancer screening and diagnosis). Yet, one of the barriers to participation in CRC screening is lack of knowledge about the impact of CRC, its risk factors, and the benefits that could be gained through screening (Gimeno-Garcíaet al., 2011; Schroy et al., 2008; Senoreet et al., 2010). We aimed in this study to identify knowledge, attitude, and behavioral factors

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among the public that are associated with willingness to undergo CRC screening. This is the first report analyzing the awareness, attitude and practice of UAE population and assessing the barriers for CRC screening.

Materials and Methods

Study Design

This Cross-sectional survey was conducted in Dubai, from September 2017 to February 2018.

Study Procedure

Convenience sampling approach was used to recruit the participants. Participants for the study were recruited from various places such as the shopping malls, areas of work and other social centers using convenience sampling. The participants living in UAE and willing to provide a written informed consent were selected for the study. The participants were assured of the confidentiality of the information provided and protection of their rights to privacy, mandated by the research ethics guidelines of the human research ethics committees. The inclusion criteria mandated participants to be Adults ≥ 18 years, having fair cognitive skills, ability to read and understand in English or Arabic (e.g. the local language). Both, UAE citizens (nationals) and expatriates were included in the study. Participants that had inadequate mental health and were unable to meet any of the above criteria were excluded from the study.

Survey Design (Evaluation tools)

A structured questionnaire was designed and developed by a multidisciplinary team and through a review of the literature from relevant studies (Al Wutayd, 2015; Christou and Thompson, 2012; Ibrahim and Khayyat, 2014; Otiniano et al., 2013). The evaluation tool was then pre-tested among 20 adults to assess ease of understanding and time required for completion. Bilingual questionnaire in Arabic and English is represented in APPX I. The survey consisted of four functional domains: socio-demographic characteristics, knowledge, attitude, and practice related questions. The demographic data included gender, age, nationality, marital status, educational level, occupation, perception of health status, personal history and family history of CRC based on recommendations of earlier studies (Al Wutayd, 2015; Christou and Thompson, 2012; Ibrahim and Khayyat, 2014; Otiniano et al., 2013; AL-Hammadi, 2017; Christou and Thompson, 2012; Ibrahim and Khayyat, 2014). The scoring of the answers was based on literature review (Sessa et al., 2008; Connie et al., 2017). Questionnaires were administered during face-to-face interviews conducted in Arabic or English by physician researchers.

Data analysis and statistics

All collected data were entered into SPSS version 22 (IBM Corp., Released 2011, Armonk, NY, US) for statistical analysis. Descriptive statistics were computed for the socio-demographic variables. The overall responses to each item of the survey was recorded as percentage of the total. The percentage differences in the total responses were determined using the Chi-square test and statistical significance recorded for non-parametric data. For all tests, alpha (α) was set at 0.05.

Ethics statement

The study was approved by the institutional review board of Dubai Health Authority, Dubai. Participants were not compensated. All participants gave written informed consent before participation. Aggregate reporting of data assured to enhance confidentiality and accurate reporting by the respondents. Anonymity of participation was also guaranteed by return of completed survey constructs to an administrator; independent and blinded to the study hypothesis. A code linking respondents to their surveys was kept isolated from the investigators.

Results

Majority of our respondents were <29 years (265, 44%), Non-UAE national (309, 52%), had at least high school certificate (351, 59%), married (338, 56%), had managerial or professional occupation (271, 45%), and had no personal history (580, 97%) or family history (541, 91%) of colon cancer. Table 1 shows brief of demographic information of the participants.

It was encouraging that more than 65% of the total participants surveyed for the study were aware of CRC and their main source of information was media (395, 66%). However, the majority (379, 64%) were thinking that CRC is not common, and did not hear of the screening test for CRC (401, 67%). An overall evaluation of the answers revealed a poor level of knowledge on risk factors of CRC, with most of the respondents giving wrong answers (Table 2). The awareness of respondents for several risk factors was 10% for gender, 30% for age, 40% for physical inactivity, 37% for obesity, 45% for cigarette smoking, 55% for alcohol consumption, 51% for family history of colorectal cancer, 45% for colonic ulcers and inflammation, and 40% for Fatty meals and red meats as risk factors for CRC (Table 2). The results of the knowledge about the preventive measures showed that only 40% correctly identified fecal occult blood (FOBT) as main test for CRC prevention (Table 2).

When we assessed the knowledge of participants in association with their sociodemographic characteristics, there was a significant difference between UAE nationals and non-UAE national on the level of knowledge (p<0.001); with non-UAE nationals having better knowledge. In addition, occupation was playing role on level of knowledge with managerial and intermediate occupation having better knowledge on CRC than others (Table 3). In terms of information, 60% of the respondents recalled receiving information regarding CRC and the most common sources had been the media (66%).

With regard to the attitude, 88% and 90% respectively responded that it is possible to prevent CRC and to treat the cancer in case of an early diagnosis. When we asked about their willingness to be screened for CRC, 87% of the participants responded positively. Yet, when assessing the attitude of participants toward CRC screening, there was a significant difference between males and females

Table 1. Descriptive Demographic Characteristics of Participants (n = 600).

Variable	n (%)
Gender	
Male	251 (42)
Female	349 (58)
Age (Years)	
<29	265 (44)
30-39	208 (35)
40-49	93 (15)
≥50	34 (6)
Nationality	
UAE	291 (48)
Non-UAE	309 (52)
Education level	
Illiterate	13 (2)
Primary and secondary school.	133 (22)
High school	351 (59)
College and higher degrees	103 (17)
Marital status	
Single	243 (41)
Married	338 (56)
Divorced / Widowed	18 (3)
Occupation*	
Student	88 (15)
Housewife	35 (6)
Business owner	12 (2)
Managerial or professional occupation	271 (45)
Intermediate occupation	149 (25)
Lower supervisory or technical occupation	21 (4)
Semi-routine occupation	20 (3)
Perception of Health Status	
Good/Excellent	240 (40)
Poor/ Fair	345 (58)
I don't know	13 (2)
Personal history of Colorectal Cancer	
Yes	19 (3)
No	580 (97)
Family history of Colorectal cancer	
First degree relative	26 (4)
Second degree relative	29 (5)
None	541 (91)

*Managerial or professional occupation: doctor, accountant, teacher, nurse, Intermediate occupation: secretary, nursery nurse, clerical worker, Small employer or own account worker, Lower supervisory or technical occupation: plumber, mechanic, train driver, Semi-routine occupation: postal worker, van driver, waiter, porter.

(p<0.0001), different age groups (p<0.008), educational level (p<0.005), and occupation (p<0.001) on this aspect (Table 4). Not surprisingly, respondents with higher educational level and those younger than 39 years were significantly more likely to have positive attitude. Finally, the practice of CRC screening was also significantly

Table 2. Assessing the Knowledge, Attitude and Practice of Colon Cancer Screening in UAE (n=600)

Respondent's knowledge of risk factors, signs and symptoms of colon cancer	n (%)
Have you ever heard of Colorectal / Bowel Cancer before?	
Yes	359 (60)
No	241 (40)
What is your main source of information?	
Media	395 (66)
Books and brochures	153 (25)
Doctor	123 (21)
Family and friends	247 (41)
Do you think Colorectal Cancer is common?	
Yes	217 (36)
No	379 (64)
Have you ever heard of screening tests for Colorectal Cancer?	
Yes	196 (33)
No	401 (67)
Which of the following are symptoms for Colorectal Cancer?	
Dark colored stool	192 (32)
Change in bowel habits (diarrhea/constipation)	329 (55)
Loss of weight for no reason	268 (45)
Persistent abdominal pains	312 (52)
Unexplained tiredness / weakness	214 (36)
Loss of appetite	191 (32)
No symptoms	53 (9)
Which of the following are risk factors for Colorectal Cancer?	
Age	179 (30)
Physical inactivity	235 (40)
Gender	61 (10)
Obesity	224 (37)
Cigarette smoking	273 (45)
Alcohol consumption	268 (45)
Family history of colorectal cancer	305 (51)
Hypertension	56 (9)
Diabetes mellitus	59 (10)
Colonic polyps	259 (43)
Colonic ulcers	270 (45)
Colonic inflammation	292 (49)
Iron deficiency	42 (7)
Aspirin	44 (7)
Fatty meals and red meats	241 (40)
Fruits and vegetables	21 (3)
What is the appropriate age to start screening for Colorectal cancer?	
40-49 years	505 (84)
50-59 years	73 (12)
60-69 years	12 (2)
70-79 years	5 (1)

Table 2. Continued

Respondent's knowledge of risk factors, signs and symptoms of colon cancer	n (%)
Which of the following are methods to screen Colorectal Cancer?	
Colonoscopy	346 (58)
Fecal occult blood	240 (40)
Abdominal ultrasound	217 (36)
Sigmoidoscopy	187 (31)
Blood tests	329 (55)
Respondent's attitude toward screening for colon cancer	n (%)
Do you believe that Colorectal Cancer can be prevented?	
Yes	527 (88)
No	62 (12)
Is colorectal cancer treatable if detected early?	
Yes	527 (90)
No	62 (10)
Would you get screened for Colorectal Cancer?	
Yes	521 (87)
No	75 (13)
Which screening method would you prefer?	
Colonoscopy	256 (43)
Sigmoidoscopy	111 (18)
Fecal occult blood	219 (37)
Respondent's practice on screening for colon cancer	n (%)
Did any physician recommend a screening test for you?	
Yes	29 (5)
No	569 (95)
Were you ever screened for Colorectal Cancer?	
Yes	30 (5)
No	567 (95)
If not, what is the reason?	
I wasn't offered this screening test	419 (70)
Lack of time	74 (12)
Lack of resources	84 (14)
Not willing	111 (19)

different between different age groups (p<0.0001), nationalities (p<0.04), having personal or family history of CRC (p<0.0001 and p<0001 respectively) (Table 5).

When we asked the question of "In your opinion, is colorectal cancer treatable if detected early", the effect of education was significant on the knowledge (p<0.0001). Furthermore, when we questioned the participants on "If advised by your doctor, would you get screened for Colorectal Cancer"; there was a significant influence of education (p<0.01) and occupation (p<0.03) on the answer (Table 6). Performing of 2-tailed Correlation test with significant at the 0.05 level, showed a significant correlation between knowledge and attitude (p<.04); and attitude with practice (p<0.0001).

Table 3. Variation in Knowledge Scores According to Sociodemographic Characteristics among Adults in UAE (n=600)

Variable	Poor knowledge	Adequate knowledge	High knowledge	P Value
	n (%)	n (%)	n (%)	
Nationality				
UAE	66 (55)	205 (50)	20 (28)	0.001
Non-UAE	53 (45)	204 (50)	52 (72)	
Occupation				
Student	22 (19)	58 (14)	8 (11)	0.003
Housewife	9 (8)	22 (5)	4 (6)	
Business owner	3 (3)	8 (2)	1 (1)	
Managerial or professional	41 (35)	197 (49)	33 (46)	
Intermediate occupation	35 (30)	97 (24)	17 (24)	
Lower supervisory or technical	3 (3)	9 (2)	9 (13)	
Semi-routine occupation	5 (4)	15 (4)	0	
Family history of Colorectal cancer				
First degree relative	5 (4)	20 (5)	1 (1)	0.05
Second degree relative	0	24 (6)	5 (7)	
None	113 (96)	363 (89)	65 (92)	

*p < 0.05, significance determined using Montecarlo 2 tailed significance at 95% CI. Only significant results are presented.

Table 4. Variation in Attitude Scores According to Sociodemographic Characteristics among Adults in UAE (n=600)

Variable	Negative Attitude	Positive Attitude	P Value
	n (%)	n (%)	
Gender			
Male	66 (57)	185 (38)	0.0001
Female	49 (43)	300 (62)	
Age (Years)			
<29	46 (40)	219 (45)	0.008
30-39	50 (43)	158 (33)	
40-49	19 (17)	74 (15)	
≥50	0	34 (7)	
Education level			
Illiterate	3 (3)	10 (2)	
Primary and secondary school.	39 (34)	94 (19)	
High school	60 (52)	291 (60)	
College and higher degrees	13 (11)	90 (19)	
Occupation			
Student	15 (13)	73 (15)	
Housewife	7 (6)	28 (6)	
Business owner	1 (1)	11 (2)	
Managerial or professional	40 (35)	231 (48)	
Intermediate occupation	36 (32)	113 (23)	
Lower supervisory/technical	11 (10)	10 (2)	
Semi-routine occupation	3 (3)	17 (4)	

*p < 0.05, significance determined using Montecarlo 2 tailed significance at 95% CI. Only significant results are presented.

Table 5. Variation in Practice Scores According to Sociodemographic Characteristics among Adults in UAE (n=600)

Variable	Poor practice	Good practice	P Value
	n (%)	n (%)	
Age (Years)			
<29	15 (50)	247 (44)	0.0001
30-39	3 (10)	205 (36)	
40-49	5 (17)	88 (16)	
≥50	7 (23)	27 (5)	
Nationality			
UAE	20 (67)	269 (47)	0.04
Non-UAE	10 (33)	298 (53)	
Personal history of Colorectal Cancer			
Yes	8 (27)	11 (2)	0.0001
No	22 (73)	556 (98)	
Family history of Colorectal cancer			
First degree relative	6 (20)	20 (4)	0.0001
Second degree relative	3 (10)	26 (5)	
None	21 (70)	517 (92)	

*$p < 0.05$, significance determined using Montecarlo 2 tailed significance at 95% CI. Only significant results are presented.

Table 6. Variation in Selected Knowledge, Attitudinal, and Practice Variables According to Sociodemographic Characteristics among Adults in UAE (n=600)

Variable	In your opinion, is colorectal cancer treatable if detected early		
	n (%)		P Value
	Yes	No	
Education level			
Illiterate/primary school	12 (2)	4 (6)	0.0001
High school	133 (22)	24 (39)	
University	351 (59)	27 (44)	
Postgraduate	103 (17)	7 (11)	

	If advised by your doctor, would you get screened for Colorectal Cancer		
	Yes	No	
Education level			
Illiterate/primary school	10 (2)	2 (3)	0.01
High school	104 (20)	28 (37)	
University	315 (61)	33 (44)	
Postgraduate	91 (18)	12 (16)	
Occupation	Yes	No	
Student	77 (15)	9 (12)	0.03
Housewife	31 (6)	4 (5)	
Business owner	12 (2)	0	
Managerial or professional	243 (47)	27 (36)	
Intermediate occupation	128 (25)	21 (28)	
Lower supervisory/technical	10 (2)	11 (15)	
Semi-routine occupation	17 (3)	2 (3)	

*$p < 0.05$, significance determined using Montecarlo 2 tailed significance at 95% CI. Only significant results are presented.

Discussion

Health screening is a form of illness-detecting behavior. According to various behavior prediction theories, identifying the determinants of any health-seeking behavior is a key step in the development of successful interventions to change such behavior (Fishbein and Cappella, 2006). However, to implement screening for CRC at a population level is a much more complicated and delicate issue, requiring consideration of various factors such as costs, performance of the screening tool in a given population, public knowledge and acceptance of screening, and the infrastructure to support the programme over many years.

This study sheds light on adults in UAE concerning the level of knowledge, attitudes, and preventive practices on CRC and it provides information for educators and policy makers on what is necessary for guidance towards preventive campaigns. The results of this study indicates a general lack of knowledge and presence of some important gaps with more than 67% of respondents not aware of screening tests for Colorectal Cancer. In regard to the responses to individual items, it is of some concern that fewer than half of the subjects surveyed were able to define symptoms of CRC, and the percentages of those correctly answering the questions on risk factors ranged from 10% for gender to 51% for Family history of colorectal cancer, while 40% correctly identified FOBT as main test for the prevention of CRC. Previous studies conducted in other countries suggest a similar low level of knowledge about preventive measures. (Alex et al., 2005; Manning, 2006; Chong, 2015; Al-Thafar, 2017; Al-Sharif et al., 2018).

The UAE in the past forty-seven years has transformed from a traditional to a modern type of lifestyle. Not only the type of foods and eating habits have been transformed; the living habits also has been altered from extremely active to very sedentary lifestyle. The results from our study indicate the crucial need to have a structured CRC screening program, given the fact that 95% of participants mentioned that physicians did not recommend a screening test for them. However, 87% of adults surveyed inclined in terms of both knowledge and attitude to adapt to CRC prevention programs. The relatively low rate of participation and completion of CRC screening (5%) was disproportionate to the awareness and knowledge demonstrated in the completed questionnaires. Similar to our findings, other studies had also showed that CRC screening rates could fall short of recommended levels (Khayyat and Ibrahim, 2014; Al-Thafar 2017; Al-Sharif, et al., 2018). A US study between 1998 and 2004 reported that only 25% of Medicare beneficiaries were screened and that in 2005, half of those aged 50 years or older had never had a screening colonoscopy (Mitka, 2008) which may have obvious implications for population-based CRC screening programmes. Numerous patient barriers to CRC screening have been reported by different studies; including personal fears, financial problems, lack of knowledge about the symptoms, signs, risk factors, outcome of the disease, and the benefits of screening (Klabunde et al., 2006; Berkowitz et al., 2008; Sung et al., 2008; Koo et al., 2010). Thus, the policy makers in UAE should emphasize on further educating the community in these aspects. This study showed that media was the main source of knowledge for CRC screening among

participants (66%). Having seen media advertising on CRC screening was significantly associated with greater awareness and higher overall CRC knowledge scores, consistent with findings reported by Schroy et al. (Schroy et al., 2008).

In conclusion, this study is the first to examine Colorectal Cancer risk awareness and screening uptake among adults in the United Arab Emirates. Our results demonstrate that better education and communication of the benefits of early detection of CRC should be addressed to improve the screening in UAE population. There is need for campaigns and educational programs, both for health care providers and public. Majority (95%) of the respondents indicated that no physician recommended a screening test for them; hence, educating/ training doctors in primary health care sector should be a priority to increase health care providers' knowledge on screening services we already provide. Media might play a significant role in this aspect, as our results shows that the main source of information regarding CRC is from media (66%). Consequently, we recommend that healthcare administration and public health policy makers in the UAE to utilize media as an educational tool in order to increase the awareness of the community on of CRC and other screening amenities we have in UAE. Finally, new policies need to focus more on increasing community awareness on cancer preventive measures in UAE.

Limitations

This study has several limitations. It only focused on the knowledge of the adults in some common places in UAE. It may not be generalized to all target populations, especially the target adults who did not attend these common places might have different knowledge and attitude on this regards. Therefore, the results of this study should be interpreted with caution. This study used a cross-sectional design; thus, it only speculated on the causal relationship between the variables. It used convenience sampling, so the results might be unrepresentative of the population being studied. However, despite these limitations, the results of this study provide a basis for further planning future in-depth research prior to developing educational materials and planning training-based interventions for further boosting the implementation of the CRC screening in UAE.

Conflicts of interest

There are no conflicts of interest.

Acknowledgments

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