



## Original article

## Knowledge, Attitudes and Practices of Primary Care Physicians in Colorectal Cancer Screening, Jeddah, Saudi Arabia 2012

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## ARTICLE INFO

## Keywords:

Colorectal Cancer,  
 Screening,  
 Primary Health Care,  
 Knowledge,  
 Attitude,  
 Practice,  
 Saudi Arabia

## ABSTRACT

Background: CRC ranks as 2nd leading cause of cancer mortality, and accounts for approximately 9 % of cancer deaths in US. In Saudi Arabia, CRC accounting for 10.4% of all newly diagnosed cases in year 2010. It ranked first among male population and third among female population. Although CRC is lethal diseases, but it is preventable forms of cancer if early detected. PHC doctors are the cornerstone of CRC screening. Objectives: To assess knowledge, attitudes, and practices of PHC physicians regarding CRC screening in MOH, Jeddah, Saudi Arabia, 2012. Subjects and methods: A cross-sectional comparative study was adopted. It involved all PHC doctors practicing in Jeddah PHC facilities belonging to MOH, at the period of the study, 2012. A validated self-administrated questionnaire has been used for data collection. The questionnaire consists of main three parts; Recommendations for CRC screening, (2) CRC screening performance and follow up, and (3) Practice and personal characteristics. Results: 106 PHC physicians completed this study out of 127, giving a response rate of 83.5%. Almost 93.4% of participants aged < 50 years. Females represent 63.2% of them. Most of physicians (91; 86.7%) recommended Fecal occult blood test for CRC screening while colonoscopy, flexible sigmoidoscopy, and to much less extent double contrast barium enema was recommended by (73; 68.9%), (56; 53.3%), and (23; 21.7%) physicians, respectively. About half of the physicians (55; 52.9%) reported that they have ordered or performed FOBT to screen for CRC. Lack of trained staff to conduct either follow-up with invasive endoscopy screening other than FOBT were cited by 73.3% and 64.8% of the physicians, respectively as major obstacles for CRC screening. Conclusion: knowledge and a positive attitude toward FOBT is high and consistent with increasing support for population based FOBT screening in asymptomatic patients > 50 years old. The majority of our sample indicated that they would recommend such screening tool. However, the practice is suboptimal.

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## 1. Introduction

Globally, the incidence rate of Colorectal Cancer (CRC) per country varies over 10-folds, while the highest incidence rates in North America, Australia, and northern and western Europe; yet the developing countries have lower rates, especially Africa and Asia. These geographic variations are correlated to variations in dietary habits and environmental exposures that are mandated over a background of genetically determined vulnerability. [1]

Date from United States of America (US) indicates that CRC causes almost 9 % of cancer related mortality and ranks as the 2nd cardinal cause of malignancy related mortality. One third of CRC patients will die of this illness. CRC occurrence and related deaths have been steadily but slowly falling in the US. CRC has a lifetime occurrence of 5% in typical risk patients, 90 % of cases present beyond 50 years of age. It was estimated that in 2010 approximately 142,600 cases of CRC will be diagnosed. Males have higher incidence than females in a ratio of 125:100 US CRC and African Americans higher than whites by 20 %. Patients having predisposing specific inherited conditions have higher rate of CRC development and consequently, higher incidence. [2]

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In Spain, CRC is the leading cancer regarding occurrence and second in terms of cancer related fatalities in males and females. Yearly, 25,600 new CRC patients are diagnosed [3] with reported CRC related deaths of 13,416 cases in 2007. Despite the Spanish yearly adjusted CRC incidence rates are below the mean of the 25-member states of European Union (EU-25) in males, and markedly in females, Spain's adjusted CRC fatality rates are more than the average for the EU-25 in males, but less in females. [4]

Aging is a main risk factor for sporadic CRC. Large bowel cancer is rarely diagnosed below 40 years old; CRC occurrence starts to increase dramatically between 40 and 50 years old, and age-specific incidence rates increase in each subsequent decade afterwards. [5]

In Saudi Arabia, as per the first report of National Cancer Registry, Between JAN 1994 and DEC 1996 there were 915 cases of CRC among Saudis. It accounted for 5.5% of all cancers that were newly diagnosed. ASR was 4.5/100,000 population. The ASR was 4.6/100,000 for men and 4.4/100,000 for women. CRC ranked in fifth position for both men and women. There were 512 men and 403 women, in a 1.3:1 ratio. The mean age at diagnosis was 57.4 years for men and 55 years for women. [6]

In 2010, according to last report of National Cancer Registry, the incidence changed as 1033 cases of CRC accounting for 10.4% of cancers newly identified. CRC ranked first among men and third among women. It affected 541 (52.4%) men and 492 (47.6%) women in a 110:100 ratios. The overall ASR was 9.6/100,000. ASR for men was 9.9/100,000 and for women 9.2/100,000. [7] In 2008, according to international cancer screening network, Annual CRC Deaths per 100,000 in Saudi Arabia in male 10.1 while in female 6.9. [8]

Although CRC is lethal diseases, but it is also one of the most avoidable forms of malignancy. [9] Screening reduces both the number CRC deaths and most importantly the occurrence of CRC itself through the detection of precancerous polyps. Available screening tools in average-risk adults > 50 years old include non-invasive yearly fecal occult blood test (FOBT) or invasive every 5-year Flexible Sigmoidoscopy (FS) alone or combined with yearly FOBT, every 5-year Double Contrast Barium Enema (DCBE) or every 10-year Colonoscopy (CS). [10]

Although screening rate for CRC is increasing in the US during the previous years, still screening for CRC in general below nationwide targets, even with the fact that CRC screening reduces mortality. US data from 2006 indicate CRC screening rate was 60.8

% of adults >50 years old. Higher screening rates were noted among insured adults, well educated, non-Hispanic, or have access to medical attention. Almost 50% of diagnosed CRC cases in the US during 2004 -2006 were advanced stage, especially in elderly population and in African American. [11-12]

The role of primary healthcare physicians is important in every stage of CRC screening, from requesting or carrying out the proper screening test to providing appropriate recall and follow-up of patients with positive screening for CRC. Doctors face different potential obstacles to recommend and perform CRC screening for the mainstream of their age-fitting patients. Those obstacles comprise being confused over guidelines for screening, deficiency of tracing and reminding mechanism, insufficient facilities, and screening cost. [13] Patients seldom initiate dialogue about CRC screening with physicians, so physicians face slight burden from patients to do CRC screening. Discussing CRC screening with a physician strongly promotes screening, but doctors might not be driven to start these dialogues due to either patients are not in favor of screening or time constrains and overwhelming routine care concerns. [14]

Primary Healthcare (PHC) physicians are cornerstone to CRC screening. Knowing more about physicians' knowledge, attitudes, and practices regarding CRC screening is an essential primary step to recognizing screening obstacles to adapt interventions and improve CRC screening practices. [15]

#### **Rationale and Objectives:**

CRC is a common, invasive and preventable disease if detected in premalignant stage and screening by PHC physician enables detection in early stage to decrease morbidity and mortality. Unfortunately, CRC screening by physicians is overlooked due to multiple obstacles. Up to the researcher knowledge, no similar study has been conducted in Saudi Arabia to evaluate physicians' knowledge, attitudes and practices towards CRC screening by PHC physician. We aimed to explore the need to improve CRC screening perception at the PHC facilities. The study objectives were:

- To assess knowledge, attitudes and practices of CRC screening among physicians working in Ministry of Health (MOH) PHC center located in Jeddah city during 2012.
- To evaluate PHC physicians' demographic variables and its correlations to recommendation for CRC screening.
- To identify obstacles for CRC screening and recommend corrective actions that can improve CRC screening.

#### **Methodology**

We conducted a cross sectional survey targeting PHC physicians working in 38 PHC centres of the MOH in Jeddah, at the period of the study 2012 we included all doctors that were anticipated to be 145 doctors. We excluded the dentists and non-consenting physician. We utilized Self-administered questionnaire which have been validated in previously published study. [16] Permission was taken to use the questionnaire. The questionnaire consists of main three parts; I. Recommendations for CRC screening. II. CRC screening performance and follow up, and III. Physician Practice and personal characteristics.

The data collection form evaluated physicians' attitudes (focusing on recommended test, starting age of screening and testing interval) with FOBT, FS, CS, and DCBE in asymptomatic, average-risk patients. Doctors' responses were checked against American Cancer Society (ACS) guidelines. Physicians suggesting screening tests were considered as being in line with guidelines if they specified that fifty years old is optimal age to start screening and proposed the frequency of screening test as recommended by guidelines. For each screening strategy, the data collection form asked the doctors if they did the test and the follow-up they do for a screening positive patients. Also, doctors were questioned if they implemented any process to boost FOBT kit return or to ensure that patients referred to another provider to perform endoscopy had completed the test. For both questions, doctors who used such process were asked to outline the process they practised. The data collection form also evaluated the apparent rank of colorectal cancer screening and perceived obstacles to screening.

We conducted Pilot study was conducted over one of the PHC in National Guard in Jeddah over 2 weeks that helped us in adaptation of this study.

The researcher distributed the self-administered questionnaire during the working hours while he was available to clarify any issue and the questionnaires were collected in the same day. This was done over one-month period.

The data was collected and verified by hand then coded before data entry. Statistical Package for Social Sciences (SPSS) software version 19.0 was used for data entry and analysis. Descriptive statistics (number and percentages) and analytic statistics using Chi Square tests ( $\chi^2$ ) to test for the association and/or the difference between two categorical variables were applied. Statistical significance was considered with p-value < 0.05.

Ethical considerations: we obtained approval of Joint program of family and community medicine permission to conduct the research. Only physicians with written consent were included. Also the confidentiality of participants was maintained and they received feedback regarding correct answers.

## Results

Out of estimated 145 physicians, 127 were available to participate in the survey. Obtained results reflect the responses of 106 PHC doctors who accepted to do the survey, giving a response rate of 83.5%.

### Subjects demographics

The study included 106 physicians. Almost all physician (99, 93.4%) aged <50 years. Females represent 63.2% of respondents. Majority of respondents were Saudi (73.6%). Marginally more than half of them (50.9%) were general practitioners while 40.6 were Family Medicine. The experience level was < 5 years in more than half of them (54.7%). Table (1) presents physicians' demographics in details.

**Table 1:- Demographics of the physicians (n=106).**

Characteristics	No.	%
<b>Age in years</b>		
25-29	36	34.0
30-34	27	25.5
35-39	15	14.2
40-44	12	11.3
45-49	9	8.5
≥50	7	6.6
<b>Gender</b>		
Male	39	36.8
Female	67	63.2
<b>Nationality</b>		
Saudi	78	73.6
Non-Saudi	28	26.4
<b>Specialty</b>		
Family medicine Board certified	22	20.8
Family medicine resident	21	19.8
General practitioner	54	50.9
Family medicine diploma	3	2.8
Other	6	5.7
<b>Experience in years</b>		
≤5	58	54.7
6-10	19	17.9
>10	29	27.4

### Physicians' recommendations for CRC screening tests

Majority of physicians recommended CRC screening tests. CRC screening tests recommendations are arranged into descending manner from FOBT, CS, FS and DCBE being recommended by 86.7%, 68.9%, 53.3% and 21.7% respectively. According to respondents, CRC screening tests were recommended for patients less than 50 years' old for FOBT (51.6%), DCBE (44.0%), FS (23.2%) and CS (16.4%) reflecting deviation from the CRC screening guidelines. Also there were confusion about the frequency of testing up to underutilization of FOBT in 53.3% and tendency over utilize invasive techniques more frequently. Table 2 summarise PHC physicians' recommendations for CRC screening.

**Table 2:- Recommendations of CRC screening test**

Physicians Recommendation	Tests for CRC screening			
	FOBT No. (%)	FS No. (%)	CS No. (%)	DCBE No. (%)
<b>Recommended screening Test</b>				
Yes	91 (86.7)	56 (53.3)	73 (68.9)	23 (21.7)
No	14 (13.3)	49 (46.7)	33 (31.1)	83 (78.3)
<b>Recommended starting age</b>				
≤ 40 years' old	38 (41.8)	9 (16.1)	6 (8.2)	10 (40.0)
41-49 years' old	9 (9.9)	4 (7.1)	6 (8.2)	1 (4.0)
≥ 50 years' old	44 (48.4)	43 (76.8)	61 (83.6)	14 (56.0)
<b>Recommended frequency</b>				
test Yearly	43 (46.7)	6 (10.7)	11 (15.1)	2 (8.3)
2-4 Years 6-10 (19)	30 (32.6)	17 (30.4)	20 (27.4)	6 (25.0)
≥5 Years	19 (20.7)	33 (58.9)	42 (57.5)	16 (66.7)

Correlation between physicians' demographics and recommendations for CRC screening:

As illustrated in table 3, physician's age, gender, nationality, specialty and experience were not significantly associated with their CRC screening recommendations.

**Table 3:-Correlation between physicians` demographics and recommendations for CRC screening (n=105)**

Physicians` demographics	Recommendation test for CRC screening				p-value*
	FOBT No. (%)	FS No. (%)	CS No. (%)	DCBE No. (%)	
<b>Age in years</b>					
25-45 (89)	77 (86.5)	45 (50.6)	62 (68.9)	19 (21.1)	0.895
>45 (16)	14 (87.5)	11 (68.8)	11 (68.8)	4 (25)	
<b>Gender</b>					
Male (39)	33 (84.6)	19 (48.7)	33 (84.6)	9 (23.1)	0.558
Female (66)	58 (87.9)	37 (56.1)	40 (59.7)	14 (20.9)	
<b>Nationality</b>					
Saudi (77)	69 (89.6)	45 (58.4)	57 (73.1)	17 (21.8)	0.899
Non-Saudi (28)	22 (78.6)	11 (39.3)	16 (57.1)	6 (21.4)	
<b>Specialty</b>					
FM Board certified (22)	21 (95.5)	15 (68.2)	15 (68.2)	3 (13.6)	0.237
FM resident (20)	19 (95)	9 (45)	15 (71.4)	4 (19)	
General practitioner (54)	42 (77.8)	27 (50)	37 (68.5)	15 (27.8)	
FM diploma (3)	3 (100)	3 (100)	3 (100)	0 (0)	
Other (6)	6 (100)	2 (33.3)	3 (50)	1 (16.7)	
<b>Experience (years)</b>					
≤5 (57)	48 (84.2)	31 (54.4)	40 (69)	13 (22.4)	0.362
6-10 (19)	17 (89.5)	7 (36.8)	12 (63.2)	2 (10.5)	
>10(29)	26 (89.7)	18 (62.1)	21 (72.4)	8 (27.6)	

**CRC screening practice and follow-up activities:****FOBT**

Despite much of physicians (86.7%) declared that they recommend FOBT for CRC screening, slightly more than half of the physicians (55; 52.9%) declared that they have ordered or performed FOBT. Fifteen physicians (27.3%) have mentioned that they have process to ensure that patients who are given FOBT kits complete and return. This process was either reminder telephone call in 20% and chart notice to return kit at next visit in 80% of the physicians. When they asked about their recommendation to an otherwise healthy patient as initial follow up for a positive FOBT, almost two thirds of them (65.9%) answered that they will repeat FOBT while 29.3% answered that they will refer to another physician outside their practice. None of the participants answered that they will perform colonoscopy or double contrast barium enema.

**Flexible sigmoidoscopy:**

Physicians declared that they have not ordered or performed Flexible sigmoidoscopy to screen for CRC. Most of them (70.8%) opted that they referred patients to another health care provider.

**Colonoscopy:**

Physicians also declared that they have not ordered or performed colonoscopy to screen for CRC. Most of them (79%) opted that they referred patients to another health care provider.

**Comparing cancers screening interventions:**

Physicians rated the importance screening for the most common cancer sites for average risk patients of appropriate age. Table 4 shows that the majority of the physicians rated breast cancer screening as very important (92.4%) followed by CRC screening (71.4%). Next to CRC screening Cervical Cancer screening ranked third (66.7%) while less than half of them (46.7%) rated prostate cancer as very important. This difference was statistically significant,  $p < 0.001$

**Table 4: - Comparing cancers screening interventions (n=105).**

	Unimportant No. (%)	Moderately important No. (%)	Very important No. (%)
<b>Breast</b>	0 (0.0)	8 (7.6)	97 (92.4)
<b>Colorectal</b>	1 (1.0)	29 (27.6)	75 (71.4)
<b>Cervical</b>	3 (2.9)	32 (30.5)	70 (66.7)
<b>Prostate</b>	13 (12.3)	42 (40.0)	50 (47.6)

**Potential obstacles for CRC screening:**

Lack of trained staff to conduct screening tests other than FOBT and shortage of trained physicians to conduct follow-up with invasive endoscopic procedures were cited by 64.8% and 73.3% of the physicians, respectively as major obstacles for CRC screening. Low awareness of patients about screening or underestimation of colorectal cancer as a devastating life threat was reported as a major obstacle by 60% of the physicians. Primary care physicians do not enthusiastically recommend screening to their patients and patients' fear of detecting cancer were mentioned as obstacles for CRC screening by 59% and 51.4% of the physicians. The least reported major obstacles for CRC screening by physicians were patient embarrassment or worry about screening tests (41%) and Patients' misperception that screening is not effective (26.7%). This difference was statistically significant,  $p < 0.001$ .

**Discussion:**

We are reporting here the results of first Saudi survey to measure Knowledge, Attitudes and Practices of Primary Care Physicians in Colorectal Cancer Screening and also identified key areas for intervention. The results represent the responses of 106 physicians in PHC centers Jeddah in 2012. The majority of physicians recommend use of FOBT in asymptomatic average risk patients and to less extent CS, FS and DCBE. Despite high recommendation of FOBT, only 52.9% of physicians are practicing it, similar figure has been reported in Australia.[17] This is higher than previous reports with figures ranging from 14-30% for GPs who recommend FOBT for asymptomatic standard risk patients.[18-21] However, in Spain, a higher figure has been reported (70%).[22]

Despite two-thirds of the physicians recommended Colonoscopy for CRC screening, yet, none of them have ordered or performed colonoscopy to screen for CRC. Most of them referred their patients to another provider. However, internationally, screening asymptomatic patients with colonoscopy appears to be increasing in frequency. Approximately 19% of Australian sample would recommend such a procedure. [17] In addition, the majority of their entire sample (97.4%) would recommend colonoscopy for patients with a significant family history, which is in agreement with the majority of current guidelines. [23,24] This is not in agreement with our sample that can be explained by the finding that most of our physicians reported shortage of skillful staff to perform follow-up with invasive endoscopic procedures or conduct screenings other than FOBT as major obstacles for CRC screening.



In Spain, health workers perceived the fear of undergoing colonoscopy as the most important obstacle to patients involved in a colorectal cancer screening program. This paralleled with their own hesitancy, since they considered colonoscopy as invasive and rather risky as screening test. The results of pilot study performed in Spain have shown colonoscopy was acceptable to almost 90% of those who got positive FOBT. [25] Despite this, physicians and patients should become fully conscious of complications and risks of colonoscopy before participating in screening program, [26] and should also recognize its benefits, since this may enhance participation among physicians and consequently patients too. [27]

In a study conducted by Hannon et al in USA, [16] women recommended CRC screening less than men. In our study, the difference between males and females was not significant. Also we could not detect any significant difference in demographic parameters and CRC screening recommendation, we think our results can represent current screening recommendation nationwide.

Other studies reported that younger, board certified physicians in larger practices were tend to follow guidelines' recommendations for screening. [28-30] In the current study, we could not detect significant differences regarding CRC screening recommendations in board certified or younger age physicians compared to others participants.

Some physicians opted to initiate screening beyond fifty years old or at extended intervals than outlined in guidelines. Underuse of screening ends up in fewer earlier stage or pre-invasive cancers being diagnosed. Evaluations of the efficiency and cost-effectiveness of CRC screening are typically based on a specified initiation age and screening intervals for each screening test. [31] For instance, increasing frequency of colonoscopy screening from every 10 to every 5 years was associated with marginal enhancement in survival outweighed by rising costs and complications. [32]

Physician responded to ranking of different cancers screening program importance in a way raising doubts regarding their awareness of available evidence emphasizing the effectiveness of screening programs in different malignancies. In contrast, when we asked them if they had requested or did any type CRC screening test to their patients over the previous year, almost half of them said yes for FOBT. Nonetheless, there was no accurate information among a considerable proportion of them about the age of starting and frequency. Mostly, they recommended screening for patients having symptoms suggestive of colorectal cancer.

Helping physicians adopt a system that encourages patients to complete and return FOBT kits would improve screening rates. [33] Patients can get "lost" at any of the stages of colorectal cancer screening (e.g., completing and returning FOBT kits. [34] One of the most common gaps occurs when patients do not complete and return FOBT kits. [35,36] Relatively few physicians used any tracking mechanism to ensure that home FOBT kits are returned. Several approaches that encourage patients to use FOBT home kits show promise, such as providing education by primary care nurses, [36] sending reminder letters signed by the primary care provider, [37] and mailing the FOBT kit prior to a primary care visit. [38] In the current study, physicians were more likely to use chart notice to return kit in the following visit.

Physicians in our survey inclined to recommend colonoscopy (68.9%) and less likely to recommend flexible sigmoidoscopy (53.3%). This finding is quite similar to has been reported by Hannon et al [16] as they reported that 80%. In A study conducted in National Cancer Institute, 2003 [39] 34% to 49% of the physicians recommended colonoscopy and 61% to 82% recommended flexible sigmoidoscopy, depending on specialty. [39] Internationally, Colonoscopy have become more popular in recent years, [40,41] so this finding likely reflects actual practice changes.

Among strengths of the current work is the high response rate (83.5%) compared to other surveys that involved GPs or family physicians, [17, 42, 43] where the response rate ranged between 50 and 60%. This high response rate enhances the generalizability of the results and lowers the degrees of bias. However, survey needed to be as brief as possible to maximize the response rate.

#### CONCLUSION:

Knowledge and a positive attitude toward FOBT is high and consistent with increasing support for population based FOBT screening in asymptomatic patients over 50 years of age. The majority of our sample indicated that they would recommend such screening tool. However, the practice is suboptimal. Physicians-related and patient-related obstacles have been reported by physician for practicing CRC screening.

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