KNOWLEDGE, ATTITUDE, AND PRACTICE OF COLORECTAL CANCER SCREENING AMONG PRIMARY HEALTH CARE PHYSICIANS IN TAIF CITY, KINGDOM OF SAUDI ARABIA, 2019

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Abstract:
Background: Colorectal cancer (CRC) screening is an important tool for early diagnosis and prevention; however, global screening rates remain low. Several CRC screening standards have recently been revised. Methodology: This was a cross-sectional study conducted in a period started on February 1, 2019. A Self-administered Questionnaire was distributed to PCPs in Taif city, Saudi Arabia, to assess the knowledge, attitude, and practice towards CRC cancer screening. Results: 216 PCPs were included in the study; 65.1% were males and with a mean age (30±4). Age (P=0.000), marital status (P=0.001), years of experience (P=0.000), job title (P=0.000), and monthly income (P=0.000) were significantly associated with knowledge scores. Age (P=0.003), years of experience (P=0.006), job title (P=0.002), and the monthly income (P=0.018) were significantly associated with the attitude scores. Conclusion: We demonstrated high knowledge levels and positive attitudes towards CRC screening among PCPs in Taif city, Saudi Arabia. However, knowledge about the stopping age of screening and FOBT home knit was relatively low. Besides, attitudes towards the effectiveness of double-contrast barium enema were also low. The current findings established a significant association between age, years of experience, job title, and monthly income with higher scores of knowledge and attitudes.

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INTRODUCTION:

Cancer is the second leading cause of death globally and is responsible for an estimated 9.6 million deaths in 2018.[1] colorectal cancer (CRC) is the third most common cancer diagnosed among men, as well as approximately one million new cases of Colon cancer, identified every year and nearly a million deaths. [2] While it is the second most common in women[3], Colon cancer is a major reason behind morbidity and increased mortality rate around the world. Developed countries like Australia, New Zealand, the USA, Canada, and Western Europe are accounted for the major portion of Colon cancer diagnosis and deaths. In contrast, countries like China, India, Africa, and South America are at the lowest risks of Colon cancer.[3] Even if it is a marked global variation in CRC incidence,13 higher rates are reported in developed countries than developing ones.[14] Despite that, there was an estimated 2-4 fold increase in the disease incidence over the past few decades.[15]

The CRC screening is the process of detecting early-stage CRCs and precancerous lesions in asymptomatic people with no prior history of cancer or precancerous lesions.[4] Several guidelines on CRC screening have recently been updated.[5] Despite the proliferation of CRC screening guidelines or perhaps because of the lack of consensus, only an estimated 10% to 50% of the eligible population have been screened.[6] Given that primary care practices are major sites for providing health promotion and screening services, some underutilization may be attributable to physician nonadherence to CRC screening guidelines.

Public awareness and health care practices were inadequate for appropriate prevention and early detection.[44] Physician underuse of CRC screening may be a result of the perception that the evidence to support screening is inconclusive,[45] lack of familiarity with CRC screening guidelines[46], failure to routinely assess CRC risk, inappropriate use of CRC screening (33) or of procedures such as digital rectal examinations that are not recommended, or absence of a screening policy.[6,20]

In Saudi Arabia, Colon cancer ranks first in males and third in females in Saudi Arabia among all other cancer types. Kingdom of Saudi Arabia is considered to be with a low incidence rate in case of Colon cancer, but over the last ten years, the number of Colon cancer diagnosed patients and rate of mortalities due to this disease has been increasing significantly.[7,8] The Cancer Incidence Report in 2014 illustrated that CRC is the 2nd most common cancer in Saudi Arabia. By genders, it is the most common cancer in Saudi males and the 3rd common cancer in Saudi females,[8] with a steady rise in incidence over the past few years. [9] Moreover, the overall survival rate in Saudi patients (44.6%) is lower than that reported all over the world.[10] The National Guidelines for CRC Screening recommend initiating screening at the age of 45 years.[7] Unfortunately, CRC screening uptake is lower than that of other screening-amenable cancers worldwide. [11] In Saudi Arabia, despite the availability of resources for diagnosis of CRC, there is a lack of consistent, organized screening programs on the national level. Moreover, the knowledge of the population is less than required to encourage the spread of screening behavior.[12]

Accordingly, it demonstrated the importance of CRC screening tool to detect the precancerous stage or to detect the disease on its early stage for a better outcome. As Per knowledge, early detection of diseases should be started from Primary Health Care Physicians (PCP) by screening, that's why current study aims to explore their knowledge, attitudes, and practice regarding CRC screening to identify the barriers and factors that limit of applying of CRC screening recommendations.

The risk factors of CRC include the age of patients (50 years and older), family history, obesity, physical inactivity, metabolic syndrome, smoking, and non-alcoholic fatty liver disease.[15,16] Early diagnosis of CRC by screening programs has been proven to reduce the disease's incidence and mortality.[17,18] Premalignant adenomatous polyps can be discovered and removed by screening.[19] Among all cancers, CRC is ideal for screening due to its high incidence rates and long duration between early and advanced stages.[20]

The CRC Screening differs from surveillance. The surveillance refers to the interval use of colonoscopy in patients with previously detected CRC or precancerous lesions and interval colonoscopy in patients performed to detect dysplasia in persons with inflammatory bowel disease affecting the colon. Surveillance recommendations from the Multi-Society Task Force of Colorectal Cancer on surveillance after cancer [21] and removing precancerous lesions [22] are available in other documents. Screening is also distinct from diagnostic examinations, which refer to the investigation of patients with symptoms or positive screening tests other than colonoscopy.

Colonoscopy is generally the test of choice for diagnostic examinations,[4] where colonoscopy is often referred to as the CRC screening gold standard because it allows an examination of the complete colon, and it can remove precancerous polyps immediately.[5] The Available CRC screening modalities include fecal occult blood testing (FOBT) that can either be guaiac-based (GFOBT) or immunochemical (FIT). Research including randomized controlled trials has shown that annual FOBT reduces CRC mortality by approximately 30%,[23,24,25,26] while both annual and biennial FOBT screenings reduce CRC incidence.[27] However, those reductions can be obtained only if a positive FOBT is followed by more invasive investigations such as colonoscopy. Flexible sigmoidoscopy (FS) has been shown to decrease CRC incidence by 30% and CRC-related mortality by 50%.[28] However, whilst randomized controlled trials demonstrated that FS screening reduces CRC incidence and mortality.[28] Similar high-quality evidence is lacking for screening colonoscopy. Other potential screening methods include a double-contrast barium enema (DCBE), CT colonography, video capsule colonoscopy, and stool DNA (SDNA) testing. However, their exact respective roles in CRC screening remain even less well recognized.

Even elder people or persons aged 75 years or more are much prone to CRC; **Bénard** et al., in their systematic review of colorectal cancer screening guidelines for average-risk adults, showed that average-risk individuals between 50 and 75 years should undergo CRC screening. Recommendations for optimal surveillance intervals, preferred tests/test cascade, as well as the optimal timing when to start and stop screening differ regionally and should be considered for clinical decision making. Furthermore, local resource availability and patient preferences are important to increase CRC screening uptake, as any screening is better than none.[5]

Unfortunately, CRC screening uptake is lower than that of other screening-amenable cancers worldwide.[11] The barriers associated with low CRC screening rates are investigated in several studies: lower educational attainment, limited English proficiency, recent immigration, lower acculturation, lack of health insurance,[29] lack of physician recommendation,[30] fear of abnormal results, and lower perceived susceptibility.[31] Additional barriers to CRC screening include lack of knowledge, language, transportation, time,[29] and patient-physician language discordance.[32] Other factors affecting screening compliance can be grouped into the patient, health care system, provider, and policy

factors.[33] Numerous patient barriers to CRCS have been identified in the literature; including personal fears, financial problems, lack of knowledge about the symptoms, signs, risk factors, outcome of the disease, and the benefits of screening.[34 - 37] However, fewer studies have been able to identify the barriers from the health care providers' perspectives.[38,39]

Because CRC is one of the few cancers that can be cured when detected early, increased physician delivery of screening would reduce CRC incidence, morbidity, and mortality.[6] Involvement of primary health care (PHC) and family physicians in screening program implementation has been recommended by several studies[39,40] as they have a major role in screening practice due to their frequent contact with large groups of the population. Continuing medical education (CME) has been used as an educational strategy to change physician performance in their patients' healthcare outcomes.[41]

Studies have demonstrated that physician involvement in health promotion can influence patient health decision-making and behavior. [42] CRC screening rates have been shown to increase when the physician's and patient's language is in concordance.[32] Many physicians in solo practice or work in small groups may join an individual practice association (IPA). Such networks can bring these physicians together to deliver quality population-based care.[43]

CRC is the 2nd most common cancer in Saudi Arabia (National health information system, 2015).[8] CRC was a serious and preventable disease when it is detected early.[17,18] Lack of knowledge and attitudes are factors that might affect physician's adherence to CRC screening recommendations, so assessing these factors might be helpful.[44] This subject was studied previously in the Kingdom of Saudi Arabia; it was not studied in the Taif region.[44]

AIM OF THE STUDY
- To assess knowledge, attitude, and practice of PCPs regarding CRC screening.

OBJECTIVES
1. To assess knowledge, attitude, and practice of PCPs regarding CRC screening.
2. To determine if there is a relationship between knowledge, attitude, and practice of PCPs regarding CRC screening.
3. To identify the barriers that affect PCPs from adherence to the CRC screening recommendations.
4. To identify if there is a relationship between some demographic characteristics and their

knowledge, attitude, and practice regarding CRC screening.

METHODOLOGY:

STUDY AREA
The study was conducted in Taif governorate, in the western region of Saudi Arabia. It is located in the Makkah Province at an elevation of 1700-2500 meters above sea level. The Makkah State or Mecca State is the most populous state in Saudi Arabia. It has an area of 153,128 km² and a population of 8,557,766 (2017 survey). In Taif city, there are 136 primary health care centers (19 inside the city and 117 outside it) that serve about 1,200,000 people,[48] and is the unofficial summer capital. This study was conducted in primary health care centers located inside Taif city.

STUDY DESIGN
The current research used a cross-sectional approach to investigate the knowledge, attitude, and practice of PCPs regarding CRC screening in Taif City. Therefore, the study was conducted in eight weeks period started on February 1, 2019, after taking approval from all entities requested

STUDY POPULATION
All PCPs working on Primary Health care Centers inside Taif city regardless of age, gender, nationality, title, and level of training.

ELIGIBILITY CRITERIA
INCLUSION CRITERIA
All physicians working at PHCs inside Taif City regardless of age, gender, nationality, title, and level of training.

EXCLUSION CRITERIA
Physicians that were not present at the study period. All Physicians were working in hospitals. All Physicians who were not working in the ministry of health. Dentists.

SAMPLE SIZE
According to the Directorate of Health Affairs, the number of doctors working in PHCs is 126 doctors. However, the researcher used Epi info ® (version 7.2.2.6) to determine the sale size required, which was calculated = 96 at 95% confidence level. To add a strong point for the research, it decided to include all physicians in the analysis, where all of them will be tried to be surveyed.

DATA COLLECTION TOOL
A Self-administered Questionnaire was utilized. It is modified and used previously by *Demyati* [39.] This questionnaire included data on participant demographics, level of training, perception, knowledge, and attitude toward screening for CRC guidelines, and practice was administered and completed by all participants. Questions were in line with the Centers for Disease Control and Prevention (CDC) and USPSTF guidelines recommendations.

DATA COLLECTION TECHNIQUE
Using printed Hard Copy of the English version of the questionnaire to conduct the study between February and March 2019 among doctors working in primary health care centers inside Taif city by submitting the questionnaire to all of them.

DATA ENTRY AND ANALYSIS
Data collected was treated, coded, and analyzed by using a statistical package for the social science program (SPSS®), Version 26.

ETHICAL CONSIDERATIONS
1. Getting approval from the family medicine program
2. Permission from the regional Research and Ethical Committee to be given to PHCs and conduct the study.
3. All the subjects participated voluntarily in the study.
4. Permission from the directorate of health affairs in Taif.
5. Privacy of physician information and confidentiality was maintained.

RESULTS:
Table (1) shows the sociodemographic characteristics of 126 PCPs. Most participants (65.1%) were males with an age range from 25-44 years and a mean age of (30±4). The majority of them were Saudi (72.2%), and nearly half of them were single (50.8%). More than half of the physicians (52.4%) have medical qualifications of MBBS, and 46.8% were board or had a Ph.D. degree. Over half of the participants (55.6%) spent 3-10 years of experience, and only 7.9% spent more than 10 years. The majority of them (87.3%) were residents, 7.9% were specialists, and 4.8% were consultants. Over half of them (54.8%) have monthly income ranges from 15-19 thousand SR, 24.6% have less than 10 thousand SR, and only 6.3% have ≥ 30 thousand SR.

Table (2) presents the knowledge item scores of the physicians. The majority of the participants (94.4%) knew that fifty years of age is the starting age of screening for colorectal cancer, less than half of them (45.2%) were aware of the stopping age for screening, and nearly a quarter of them (25.4%) knew that seventy-five years of age is the stopping age for

screening. Regarding the awareness about (FOBT), 65.9% knew about guaiac FOBT, 71.4% knew about the immunochemical testing, 53.2% were aware of FOBT office car, 23.8% were aware of FOBT home kit, and 40.5% knew about ordering 3 samples for each FOBT. As for the screening interval for each screening modality, only 4% knew about the annual FOBT. More than half of them (54%) knew about the flexible sigmoidoscopy every 5 years, and 11.9% knew about it colonoscopy every 10 years. The mean knowledge score was (4.9±2.3) with minimum and maximum scores from (1-10).

Table (3) presents the attitude score items towards CRC. The majority of the physicians (97.6%) believed that CRC screening is effective for the asymptomatic average-risk patient, 90.5% believed that FOBT is effective, 90.5% believed that flexible sigmoidoscopy is effective, all of them (100%) knew that colonoscopy is effective, 83.3% believed that colonoscopy is the best available screening test, 78.6% preferred structured screening program over opportunistic, 56.3% knew about CT-colonography and only (34.9%) believed that double-contrast barium enema is effective. The mean attitude score was (6.3±1.1) with minimum and maximum scores from (4-8).

Table (4) investigates the associations between knowledge score and sociodemographic characteristics. Age and marital status were significantly associated with knowledge score with (P=0.000) and (P=0.001). Older and divorced participants aging over 35 years recorded the highest knowledge score with (6.7±2.4) and (7.5±0.7). There was a significant association between years of experience (P=0.000), job title (P=0.000), and monthly income (P=0.000), and knowledge score. Participants with 10 years or more of experience, consultants, and those who have monthly income ≥ 30 thousand SR recorded the highest knowledge score with (8±2.4), (9.8±0.4), and (8.9±1.8), respectively.

Table (5) presents the associations between attitude score and sociodemographic characteristics. Age and years of experience were significantly associated with the attitude score (P=0.003) and (P=0.006). Older participants aging ≥ 35 years (7.1±1.1) and those with ≥ 10 years of experience (7.1±1.1) recorded the highest attitude scores. Job title (P=0.002) and the monthly income (P=0.018) were significantly associated with the attitude score. Consultants and those who have a monthly income ≥ 30 thousand SR recorded the highest knowledge score with (7.8±0.4) and (7.5±0.8).

Table (6) shows the physicians' encounters when talking to asymptomatic, average-risk patients about CRC screening. Most of the participants (62.7%) sometimes not having enough time to discuss screening with their patients, more than half of them (56.3%) sometimes their patients do not want to discuss CRC screening, and less than half of them (46.8%) sometimes their patients have difficulty understanding the information they present about CRC screening. Nearly (59.7%) reported that usually their patients are unaware of CRC screening, and 38.9% of their patients do not perceive CRC as a serious health threat.

Table (7) presents the physicians' barriers to CRC screening for asymptomatic, average-risk patients in their practice. Of the included physicians, 36.5% reported that usually there is no policy and procedure in my workplace for screening, more than half of them (57.9%) reported that usually there is no reminder system in the workplace, nearly half of them (50.8%) accounted that sometimes their patients do not follow through to complete CRC screening tests, 45.2% said that there is a shortage of trained providers to conduct screening other than FOBT, and 38.1% reported that there is a shortage of trained providers to conduct follow-up of positive screening tests with invasive endoscopic procedures.

Table (1): Description of Sociodemographic characteristics of the participants (N=126)

Parameter		No.	Percent
Age, y	• **25-**	61	48.4%
	• **30-**	47	37.3%
	• **≥35**	18	14.3%
	• **Mean±SD (Min-Max)**	30±4 (25-44)	
Gender	• **Male**	82	65.1%
	• **Female**	44	34.9%
Nationality	• **Saudi**	91	72.2%
	• **Non-Saudi**	35	27.8%
Marital status	• **Single**	64	50.8%
	• **Married**	60	47.6%
	• **Divorced**	2	1.6%
Medical qualifications of physicians	• **MBBS**	66	52.4%
	• **Diploma or master (Family medicine)**	1	0.8%
	• **Board or Ph.D. (Family medicine)**	59	46.8%
Years of experience	• **<2 Years**	46	36.5%
	• **3-10 Years**	70	55.6%
	• **>10 Years**	10	7.9%
Job title of a physician according to Saudi council	• **Resident**	110	87.3%
	• **Specialist**	10	7.9%
	• **Consultant**	6	4.8%
Monthly income (thousand SR)	• **< 10**	31	24.6%
	• **10 – 14**	3	2.4%
	• **15 -19**	69	54.8%
	• **20 - 29**	15	11.9%
	• **≥30**	8	6.3%

Table (2): Knowledge score items (N=126)

Knowledge item	Correct answers (n)	Correct answers (%)
• **Fifty years of age as starting age for screening**	119	94.4%
• **Awareness about stopping age for screening**	57	45.2%
• **Seventy-five years of age as stopping age for screening**	32	25.4%
Awareness about Fecal Occult Blood Testing (FOBT):		
• **Guaiac FOBT**	83	65.9%
• **Fecal immunochemical testing**	90	71.4%
• **FOBT office card**	67	53.2%
• **FOBT home kit**	30	23.8%
• **Ordering 3 samples for each FOBT**	51	40.5%
Screening interval for each screening modality		
• **FBOT annually**	5	4.0%
• **Flexible sigmoidoscopy every 5 years**	68	54.0%
• **Colonoscopy every 10 years**	15	11.9%
• **Mean knowledge score, Mean±SD (Mix-Max)**	4.9±2.3 (1-10)	

Table (3): Attitude score items (N=126)

Attitude items	Correct answers (n)	Correct answers (%)
• CRC screening is effective for asymptomatic average-risk patient	123	97.6%
• FOBT is effective	114	90.5%
• Flexible sigmoidoscopy is effective	114	90.5%
• Colonoscopy is effective	126	100.0%
• Double-contrast barium enema is effective	44	34.9%
• CT-colonography	71	56.3%
• Preferring structured screening program over opportunistic	99	78.6%
• Colonoscopy is the best available screening test	105	83.3%
• Mean attitude score, Mean±SD (Mix-Max)	6.3±1.1 (4-8)	

Table (4): Knowledge score in association with sociodemographic characteristics (N=126)

Parameter		Knowledge items	
		Mean±SD (Min-Max)	*P-value*
Age, y	• 25-	4±2 (1-9)	
	• 30-	5.3±2.1 (1-9)	**0.000***
	• ≥35	6.7±2.4 (3-10)	
Gender	• Male	5.2±2.2 (1-10)	0.140**
	• Female	4.4±2.4 (1-10)	
Nationality	• Saudi	4.9±2.5 (1-10)	0.766**
	• Non-Saudi	4.9±1.9 (1-9)	
Marital status	• Single	4.2±1.9 (1-9)	
	• Married	5.6±2.5 (1-10)	**0.001***
	• Divorced	7.5±0.7 (7-8)	
Medical qualifications of physicians	• MBBS	4.7±2.1 (1-9)	
	• Diploma or master (Family medicine)	6±. (6-6)	0.350*
	• Board or Ph.D. (Family medicine)	5.2±2.5 (1-10)	
Years of experience	• <2 Years	3.7±2 (1-9)	
	• 3-10 Years	5.2±1.9 (1-9)	**0.000***
	• >10 Years	8±2.4 (5-10)	
Job title of a physician according to Saudi council	• Resident	4.6±2.1 (1-9)	
	• Specialist	5.3±1 (4-7)	**0.000***
	• Consultant	9.8±0.4 (9-10)	
Monthly income (thousand SR)	• < 10	4.7±2.1 (1-9)	
	• 10 – 14	4.3±1.2 (3-5)	
	• 15 -19	4.4±2.1 (1-9)	**0.000***
	• 20 - 29	5.5±1.9 (3-9)	
	• ≥30	8.9±1.8 (6-10)	

*Kruskal Wallis test was used.
**Mann-Whitney U test was used.

Table (5): Attitude score in association with sociodemographic characteristics (N=126)

Parameter		Attitude items	
		Mean±SD (Min-Max)	*P-value*
Age, y	• 25-	6±1.2 (4-8)	**0.003**[*]
	• 30-	6.4±1 (4-8)	
	• ≥35	7.1±1.1 (5-8)	
Gender	• Male	6.4±1.1 (4-8)	0.677[**]
	• Female	6.3±1.2 (4-8)	
Nationality	• Saudi	6.3±1.1 (4-8)	0.973[**]
	• Non-Saudi	6.3±1.1 (4-8)	
Marital status	• Single	6.1±1.2 (4-8)	0.081[*]
	• Married	6.6±1.1 (4-8)	
	• Divorced	5.5±0.7 (5-6)	
Medical qualifications of physicians	• MBBS	6.2±1.2 (4-8)	0.305[*]
	• Diploma or master (Family medicine)	7±. (7-7)	
	• Board or Ph.D. (Family medicine)	6.4±1.1 (4-8)	
Years of experience	• <2 Years	5.9±1.2 (4-8)	**0.006**[*]
	• 3-10 Years	6.5±1 (4-8)	
	• >10 Years	7.1±1.1 (5-8)	
Job title of a physician according to Saudi council	• Resident	6.2±1.1 (4-8)	**0.002**[*]
	• Specialist	6.6±0.5 (6-7)	
	• Consultant	7.8±0.4 (7-8)	
Monthly income (thousand SR)	• < 10	6.4±1.1 (4-8)	**0.018**[*]
	• 10 – 14	5.3±1.2 (4-6)	
	• 15 -19	6.2±1.1 (4-8)	
	• 20 - 29	6.4±1.2 (4-8)	
	• ≥30	7.5±0.8 (6-8)	

*Kruskal Wallis test was used.
**Mann-Whitney U test was used.

Table (6): Physicians' encounters when talking to asymptomatic, average-risk patients about CRC screening

Parameter	Never	Rarely	Sometimes	Usually
Not having enough time to discuss screening with my patients	14 (11.1%)	17 (13.5%)	79 (62.7%)	16 (12.7%)
My patients do not want to discuss colorectal cancer screening	10 (7.9%)	33 (26.2%)	71 (56.3%)	12 (9.5%)
My patients have difficulty understanding the information I present about colorectal cancer screening	15 (11.9%)	46 (36.5%)	59 (46.8%)	6 (4.8%)
My patients are unaware of colorectal cancer screening	0 (0%)	9 (7.1%)	43 (34.1%)	74 (58.7%)
My patients do not perceive colorectal cancer as a serious health threat	17 (13.5%)	27 (21.4%)	49 (38.9%)	33 (26.2%)

Table (7): Physicians' barriers to CRC screening for asymptomatic, average risk patients in your practice

Parameter	Never	Rarely	Sometimes	Usually
There is no policy and procedure in my work-place for screening	19 (15.1%)	17 (13.5%)	44 (34.9%)	46 (36.5%)
There is no reminder system in my work-place	3 (2.4%)	12 (9.5%)	38 (30.2%)	73 (57.9%)
My patients do not follow through to complete colorectal cancer screening tests	1 (0.8%)	15 (11.9%)	64 (50.8%)	46 (36.5%)
There is a shortage of trained providers to conduct screening other than FOBT	4 (3.2%)	25 (19.8%)	57 (45.2%)	40 (31.7%)
There is a shortage of trained providers to conduct follow-up of positive screening tests with invasive endoscopic procedures	4 (3.2%)	29 (23%)	48 (38.1%)	45 (35.7%)

DISCUSSION:

This study estimated the knowledge, attitude, and practice towards CRC screening among PCPs in Taif city, Saudi Arabia. We reported higher levels of knowledge of CRC among PCPs than another Saudi study conducted by **Demyati [39].** Many other studies have reported the importance of CRC screening [49, 50]. However, poor knowledge was demonstrated in the present study regarding the stopping age of screening, FOBIT home kit, and the screening interval for each screening modality. **Klabunde et al. [34]** also reported low knowledge levels regarding the stopping age for CRC screening. Another cross-sectional study reported that 57% of the participants had low levels of knowledge about CRC screening. The participants were most knowledgeable about the recommended age for initiating screening (62.7%) and the procedures not recommended for screening (90.8%). Furthermore, more than 55% did not know the frequency of performing specific screening procedures, the upper age limit at which screening is not recommended, and the patients at high risk for CRC [49].

While numerous studies have been identified the knowledge, attitude, and practices of PCPs toward CRCs screening, in 2010, a cross-sectional study was conducted by **Ramos et al.** among PCPs and nurses to assess their knowledge and attitudes regarding screening for CRC through a Questionnaire-based survey of PHC physicians and nurses in the Balearic Islands and is a part of the metropolitan area of Barcelona. 84% of all professionals believe that screening for colorectal cancer by FOBT is effective. Around 68% would recommend to their clients a colorectal cancer screening program based on FOBT and colonoscopy. About 31% are reluctant or do not know. Professionals perceive the fear of undergoing a colonoscopy as the main obstacle in getting patients

to participate. This test's invasive nature is the main reason behind their resistance to this program [48].

This study reported positive attitudes regarding CRC screening among PCPs with a mean score of (6.3±1.1), however poor attitudes were reported regarding the effectiveness of double-contrast barium enema. Another study reported that the main barriers to support the screening program among PHC professionals are lack of knowledge (nurses) and lack of time (physicians). On multivariate analysis, the factors associated with reluctance to recommend colorectal cancer screening were: believing that FOBT has poor sensitivity and is complicated; that colonoscopy is an invasive procedure; that a lack of perceived benefit could discourage client participation; that only a minority of clients would participate; thinking that clients are fed up with screening tests and being unaware if they should be offered something to ensure their participation in the program [42]. In 2016, a study was carried out by **Muliira et al. [49]** showed that participants regularly taking care of adults eligible for CRC screening (62%) and had positive attitudes toward CRC screening (83.1%).

The current study reported that age (P=0.000), years of experience (P=0.000), and job title (P=0.000) were significantly associated with the knowledge score of the physicians, as older participants, consultants, and those with 10 years or more of experience recorded higher knowledge scores. In 2014, **Demyati [39]** discovered that board-certified physicians had higher knowledge scores and were practicing CRC screening more when compared to other physicians. Physicians who reported practicing CRC screening scored more on the knowledge score than those not practicing. **Muliira et al. [49]** demonstrated no significant differences between nurses' and physicians' attitudes and knowledge. The participants' perceptions about professional training

(odds ratio [OR] = 2.17, P = 0.003), colonoscopy (OR = 2.60, P = 0.014), and double-contrast barium enema (OR = 0.53, P = 0.041), were significantly associated with knowledge about CRC screening. The inadequate knowledge levels among nurses and physicians may be one of the barriers affecting CRC screening. Enhancing HCPs' knowledge about CRC screening should be considered a primary intervention in the efforts to promote CRC screening and prevention [49]. Another study was conducted to evaluate the understanding of CRC among the Lebanese population and also reported a significant association between age (P=0.000) and the educational level (P=0.000) [51].

We also found that age (P=0.000), years of experience (P=0.000), job title (P=0.000), and monthly income (P=0.018) were significantly associated with higher attitude scores, as older participants, consultants, those with 10 years or more of experience and participants who have monthly income of ≥30 thousand SR recorded the most positive attitudes. A study conducted by Saudi physicians reported that barriers to understanding CRC screening were cited in higher rates among physicians not practicing CRC screening than practicing physicians. Lack of patient awareness was the most cited barrier that was consistent with or results [39]. **Mosli et al. [50]** also reported that PCPs with only a bachelor degree or less (OR = 0.72, 95% CI = 0.55–0.93, P = 0.011) were less likely to recommend screening for CRC. Another study reported that factors affecting CRC screening from a physician's perspective were individual's awareness towards a test; family support; fear of pain, test complications, and test results; preparation for the test; and embarrassment. Our survey indicates that Iranian physicians are ready to play an appropriate and supportive role in the context of CRC screening, yet further active engagement of physicians is needed [47].

In the current study, most of the participants reported not having enough time to discuss screening with their patients, and many of them reported that usually their patients not even aware of CRC screening or they do not want to discuss it with the physicians. Another study also reported that the majority of the patients (92.4%) are not aware of CRC screening, and most of them (60.7%) do not want to discuss it with the physicians [39]. As a result, the most cited barrier illustrated in the previous literature was the lack of knowledge of the patients [52].

This study also demonstrated that more than half of the participants reported that there is usually no reminder system in the workplace and accounted that sometimes their patients do not follow through to complete colorectal cancer screening tests. **Demyati [39]** reported a higher percentage than ours, as 86% did not have a reminder device at the workplace. The CRC screening will improve if this is considered, tackled, and strategies found to address these obstacles. Mortality is provided as part of an orchestrated program by screening [53].

CONCLUSION:

This study demonstrated high knowledge levels and positive attitudes towards CRC screening among PCPs in Taif city, Saudi Arabia. However, knowledge about the stopping age of screening and FOBT home knit was relatively low. Besides, attitudes towards the effectiveness of double-contrast barium enema were also low. The current findings established a significant association between age, years of experience, job title, and monthly income with higher scores of knowledge and attitudes; as older participants, participants with 10 years or more of experience, consultants, and monthly income ≥30 thousand SR recorded the highest scores. These results present a comprehensive of PCPs knowledge and attitudes regarding CRC screening among Saudi PCPs. Given the growing importance of these experts in delivering primary care in our state and elsewhere, such statistics are critical. Our findings indicate that PC NPCs are a ready, inspired, and underutilized population for CRC screening. The patients' unawareness about CRC cancer screening was the most significant reported barrier, followed by the fact that most of the patients do not want to discuss CRC with the physicians.

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