National survey of barriers to colorectal cancer screening in Jordan

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Abstract

Background: Colorectal cancer is among the leading malignancies globally and in Jordan. It causes significant morbidity and mortality. It can be detected early, but uptake of colorectal cancer screening in Jordan is substantially low.

Aim: To determine the underlying barriers to the uptake of colorectal cancer screening in Jordan.

Methods: A cross-sectional study was conducted in the northern, central and southern regions of Jordan using self-administered questionnaire that evaluated the barriers and attitudes towards colorectal cancer screening among adults aged 45 years and above living in Jordan. The data was analyzed using SPSS version 25.0.

Results: Of the 1477 participants enrolled in the study, 29.1% reported the lack of information about screening as a major barrier to uptake, followed by the fear of any potential complications due to the test (10%), embarrassment associated with colonoscopy (7.8%), and fear of the result (7.4%). Only 9% of the study participants had taken the colonoscopy test for colorectal cancer screening.

Conclusion: Lack of information about colorectal cancer screening, misconceptions and embarrassment drive the low uptake of colorectal cancer screening in Jordan. There is a need for nationwide education and awareness on colorectal cancer screening to address the barriers reported in this study and increase screening uptake.

Keywords: colorectal cancer, screening, uptake, barrier, attitude, colonoscopy, fear, embarrassment, Jordan

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Background

Colorectal cancer (CRC) is one of the most common cancers: it was the third most common cancer and second leading cause of cancer-related deaths worldwide for both genders in 2020 *(1)*. CRC notably affects males more commonly, with a male:female ratio of 1.25:1. In Jordan, CRC is the second most common cancer, accounting for 10.7% of cancer cases in Jordan and for 9.8% of all cancer-related deaths in Jordan in 2016 *(2)*.

CRC usually develops from a pre-existing non-malignant polyp that generally requires 5–15 years for malignant transformation. Because of this prolonged time interval, CRC is known to be one of the few malignancies that may be prevented in many ways, including modification of lifestyle changes and early detection. Multiple methods exist to screen for CRC, including faecal occult blood test (FOBT), flexible sigmoidoscopy and colonoscopy. For example, annual FOBT screening has been shown to decrease CRC mortality significantly *(3)*. Screening by flexible sigmoidoscopy substantially reduced CRC incidence *(4)*. CRC screening has been shown to reduce overall health care costs *(5)*.

Despite well-established evidence of the benefits of screening, which has made many countries to adopt a national CRC screening programme, many barriers remain. For example, in the United Kingdom, anticipated pain and embarrassment are among the most commonly cited reasons for avoiding screening *(6)*. In Finland, males and individuals younger than 60 years tend to refuse screening more often than older individuals *(7)*.

Even though CRC ranks highly in Jordan in both incidence and mortality, there is no national CRC screening programme, partly due to lack of data on the barriers to screening among the at-risk Jordanian population.

Objective

This study aimed to identify the key barriers to CRC screening and colonoscopy uptake in Jordan. The results may provide insight to policymakers for establishing a national CRC screening programme in Jordan.

Methodology

A population-based cross-sectional study using a self-administered questionnaire was conducted across Jordan by enrolling participants from the northern, central and southern regions of the country. Our exclusion criteria included participants younger than 45 years and those with an active or previous history of colorectal cancer.

The questionnaire was administered by qualified healthcare workers, who underwent comprehensive data collection training for cross-sectional studies. The questionnaire was administered across most of the Jordanian provinces and considered the population distribution across the regions. Potential participants were approached in a variety of settings, including mosques, hypermarkets, parks, schools and government institutions via a simple random convenience sampling method.

Verbal consent was obtained from the participants after explaining the concept and aim of the study and the right of the individual to withdraw from participation at any time. The healthcare workers were readily available to the participants during questionnaire administration to respond to any concerns. The study was conducted ethically in accordance with the World Medical Association Declaration of Helsinki in addition to obtaining an IRB approval from the IRB board of the Abdali Hospital (2021900001).

Questionnaire

The questionnaire was developed through a multiple-step process. A review of similar studies was initially conducted before producing a preliminary questionnaire, which was reviewed by a gastroenterologist and a medical research expert. The questionnaire was pretested among 30 individuals different backgrounds who were not included in the study to ensure that the questions were easy to understand and appropriate for purpose. The final version of the questionnaire in Arabic was approved for the study, along with an English version for non-Arabic-speaking participants.

The questionnaire consisted of 27 questions: 25 multiple-choice and 2 fill-ins (date of birth and name of city/village/camp of residence). The questions were about demographics, presence of comorbidities, smoking status, family history of colon cancer, knowledge of screening methods, and barriers to participation in colorectal cancer screening.

Study population

The age of the target population was set at 45 years or older, as recent guidelines by the American Society of Gastroenterology recommend screening from the age of 45 rather than 50 *(8)*. The population size of this age range was 1 806 880, according to Jordan's estimated population in 2019. The sample size calculation was done with confidence level set at 95, confidence interval set at 3; the determined sample size was 1066.

Our minimum expected sample size for the study was 1066. Accordingly, we approached 2000 participants, of whom 1607 agreed to participate in the study, with a participation rate of 80.4%. Among the participants, 130 were excluded because their age was below 45 or they refused to answer all the questions. Consequently, 1477 participants were enrolled. At this sample size, the confidence interval was 2.55.

Outcomes

The aim of this study was to obtain data on the barriers to colorectal cancer screening among Jordan's population. We also aimed to gain insight into the population's awareness of screening methods. This was done in relation to factors such as marital status, employment, educational level, insurance and gender. The study assessed which factors could have influenced screening among those who underwent colorectal cancer screening and the attitude of participants towards screening methods.

Data analysis

Data from 1477 participants were obtained and a descriptive analysis was performed. All categorical data, such as age group, gender and other factors were presented as counts and percentages. The mean and standard deviation were calculated for continuous data, such as age. Chi-square (χ^2) tests were done to investigate the proportional differences. The significant association was set at $P \leq 0.05$. SPSS for Windows 25.0 was used for the analysis.

Results

Demographics

In our sample, 942 (62.6%) participants were male, with a mean age of 57.2 ± 8.23 years. More than half of the participants (831, or 56.3%) were from the Central Region of Jordan, whereas 30.8% and 12.9% were from Northern and Southern regions of the country, respectively (see Figure 1).

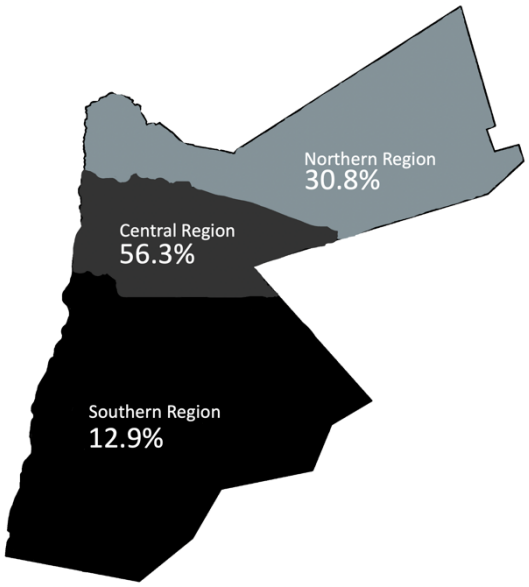
Notably, 87.3% of the participants were married at the time of enrolment and were more likely to be an employer/employee (43.1%, *n*=637) or a retiree (23.8%, *n*=352). The predominant educational level among participants was bachelor's degree.

Although the most common type of insurance coverage in our sample was provided by the Ministry of Health (41.3%, n=610) followed by Royal Medical Services (19.6%, *n*=290), 17.1% (*n*=253) of our participants were not medically insured.

Knowledge of screening

The majority of participants (61.7%, *n*=911) were unaware of the availability of screening tools for early CRC detection and prevention. Of those who were aware, 39.6% (*n*= 224) were informed by a physician, 23.7% (*n*=134) by a friend or relative, and 35.7% (*n*=202) through awareness campaigns.

Figure 1 Distribution of sample size across regions in Jordan



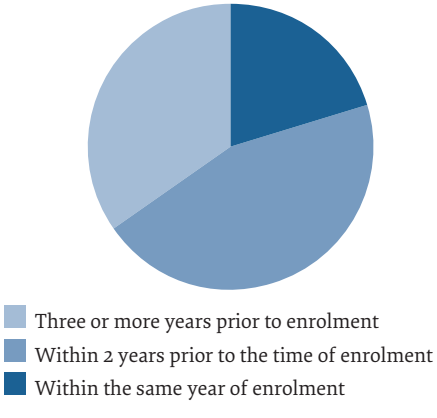
Among participants who were aware of CRC screening, their level of education was significantly associated: individuals with a postgraduate degree and those with a bachelor's degree were most likely to be aware of screening tools for CRC (P<0.001). Males were more likely to be informed by a physician, in contrast to females, who tend to be informed through awareness campaigns (P<0.001).

Participants who underwent colonoscopy screening

Among the participants, 9% (n=133) underwent colonoscopy screening. Most of those who underwent screening had done it within 2 years prior to enrolment in our study (45.1%), whereas 20.3% had done it within the same year of enrolment, and 34.6% did it 3 or more years prior to enrolment (Figure 2).

Our findings revealed that individuals who had a postgraduate degree were most likely to undergo a colonoscopy screening compared to participants with lower educational levels (P<0.001). Individuals with a family history of CRC were significantly associated with previously undergoing a screening colonoscopy (P=0.005). Participants who have had a screening colonoscopy were also more likely to have medical insurance (P=0.014).

Figure 2 Time of colonoscopy screening



Moreover, individuals who have had a screening colonoscopy were significantly more knowledgeable about the availability of CRC screening tools (P<0.001) and more often informed about CRC screening by a physician (P=0.001). However, there was no significant difference based on gender and employment status. Table 1 summarizes the characteristics of patients who underwent screening colonoscopy in comparison to those who did not. Table 2 summarizes the relationship between the level of education and the presence of prior knowledge of screening and its modalities in association with the key reported barriers.

Attitudes towards screening colonoscopy

Among participants who answered, "I do not have enough information" (29.1) when asked if they would undergo a screening colonoscopy, employment status was statistically significant: unemployed individuals and housewives were more likely to choose this answer.

Prior CRC screening knowledge was also significant: participants who were unaware of the availability of CRC screening tools were more likely to choose this answer (P<0.001). However, there was no significant association with gender or educational status (see Table 3).

There was a statistically significant association between refusal to undergo screening colonoscopy due to "fear of the results" and gender: females were more likely to fear the results of the screening test (P<0.001). On the contrary, there was no significant association between fear of test results and region, marital status, educational level or prior knowledge about screening colonoscopy (see Table 4).

Among participants who refused screening colonoscopy because of embarrassment, there was a significant lack of prior knowledge of screening (P=0.003). There were no significant associations between embarrassment of colonoscopy and gender, marital and educational status (see Table 5).

Among participants who answered, "I fear complications of the procedure" when asked if they would undergo a screening colonoscopy (10%), educational status was significant: participants who only finished primary/elementary school were more likely to refuse screening colonoscopy due to fear of complications compared to college graduates (P<0.001).

Participants with no previous knowledge of CRC screening were also more likely to fear complications (P<0.001) (see Table 6).

Figure 3 shows all of the reported barriers to CRC screening and their prevalence among the participants.

Faecal occult blood test as a screening tool

Of the study participants, 6.5% (n=94) had previously undergone FOBT for CRC screening purposes. These

Table 1 Characteristics of participants who underwent colonoscopy screening and those who did not

Variable	Category	Colonoscopy (%)	No Colonoscopy (%)	N (%)	*P* value
N	Total	133(9)	1344(91)	1477(100)	
Gender		133(9)	1344(91)	1477(100)	0.066
	Male	93(69.9)	831(61.8)	924(62.2)	
	Female	40(30.1)	513(38.2)	553(37.4)	
Marital status*		133(9)	1336(91)	1469(100)	0.245
	Single	2(1.5)	59(4.4)	61(4.2)	
	Married	123(92.5)	1167(87.4)	1290(87.9)	
	Divorced	1(0.8)	29(2.2)	30(2)	
	Widowed	7(5.3)	81(6.1)	88(6)	
Education*		132(9)	1342(91)	1474(100)	<0.001
	Primary/elementary	17(12.9)	321(23.9)	338(22.9)	
	High school diploma	24(18.2)	266(19.8)	290(19.7)	
	College diploma	22(16.7)	248(18.3)	2700(18.3)	
	Bachelor's degree	42(31.8)	390(29.1)	432(29.3)	
	Master's/PhD	27(20.5)	117(8.7)	144(9.8)	
Employment*		133(9)	1342(91)	1475(100)	0.607
	Office job	62(46.6)	575(42.8)	637(43.2)	
	Tradesperson	12(9)	90(6.7)	102(6.9)	
	Unemployed	7(5.3)	53(3.9)	60(4.1)	
	Housewife	23(17.3)	254(18.9)	277(18.8)	
	Retired	25(18.8)	427(24.4)	352(23.9)	
	Unemployed due to illness	4(3)	43(3.2)	47(3.2)	
Family history of CRC		43(32.3)	294(21.9)	337(22.8)	0.005
Prior screening knowledge*		108(81.2)	458(34.2)	566(38.4)	<0.001
Knowledge of method*		104(18.6)	456(81.4)	560(100)	0.001
	Physician	59(56.7)	165(36.2)	224(40)	
	Friend/relative	18(17.3)	116(25.4)	134(23.9)	
	Awareness campaign	27(26)	175(38.4)	202(36.9)	
Insurance*		132(9)	1342(91)	1474(100)	0.014
	No insurance	14(10.6)	239(17.8)	253(17.2)	
	Ministry of Health	53(40.2)	557(41.5)	610(41.4)	
	Military	25(18.8)	265(19.7)	290(19.7)	
	University hospital	12(9.1)	52(3.8)	64(4.3)	
	Private company	28(21.2)	229(17.1)	257(17.4)	

* *Not all participants answered this question.*

participants were found to be more knowledgeable and aware of the role of screening in the prevention of CRC ($P<0.001$). The key barriers to using FOBT as a screening tool were identified as lack of knowledge and awareness of FOBT, fear of the test, particularly among individuals with no prior knowledge about screening methods, lack of belief in the benefit of screening, and inability to afford the test.

Discussion

Jordan lacks an established CRC screening programme or well-structured and comprehensive awareness campaigns targeted towards CRC screening. There are many reasons for the absence of these vital healthcare initiatives and programmes. Only few studies have been conducted in Jordan on the barriers to CRC and those studies targeted age groups that were partially or fully out of the scope of CRC screening at the time of the study and, in some instances, only included a small sample size *(9–11)*. Coupled with the fact that Jordan is a lower-middle-income country with limited resources, these factors may help explain the lack of comprehensive national screening and awareness programmes.

Our study included 1477 participants from all Jordanian regions, exceeding previous studies in Jordan, and provides a more general indication of the barriers to CRC screening in the country *(9,10)*.

Table 2 Relationship between level of education, prior knowledge of screening methods and key reported barriers

Variable	Category	N (%)	Yes (%)	No (%)	*P* value
Lack of information as a barrier to screening:					
Education*		1474(100)	429(29.1)	1045(70.9)	0.204
	Primary/elementary	338(22.9)	116(27)	222(21.2)	
	High school diploma	290(19.7)	79(18.4)	211(20.2)	
	College diploma	270(18.3)	75(17.5)	195(18.7)	
	Bachelor's degree	432(29.3)	121(28.2)	311(29.8)	
	Master's/PhD	144(9.8)	38(8.9)	106(10.1)	
Prior screening knowledge*		566(100)	110(25.6)	456(43.7)	<0.001
Knowledge method*		560(100)	108(19.3)	452(80.7)	0.045
	Physician	224(40)	33(30.6)	191(42.3)	
	Friend/relative	134(23.9)	26(24.1)	108(23.9*)	
	Awareness campaign	202(36.2)	49(45.4)	153(33.8)	
Fear of the results as a barrier to screening:					
Education*		1474(100)	109(7.4)	1365(92.6)	0.077
	Primary/elementary	338(22.9)	17(15.6)	321(23.5)	
	High school diploma	290(19.7)	29(26.6)	261(19.1)	
	College diploma	270(18.3)	21(19.3)	249(18.2)	
	Bachelor's degree	432(29.3)	36(33)	396(29)	
	Master's/PhD	144(9.8)	6(5.5)	138(10.1)	
Prior screening knowledge*		566(100)	42(38.5)	524(38.4)	0.981
Knowledge method*		560(100)	42(7.5)	518(92.5)	0.917
	Physician	244(40)	17(40.5)	207(40)	
	Friend/relative	134(23.9)	9(21.4)	125(24.1)	
	Awareness campaign	202(36.1)	16(38.1)	186(35.9)	
Embarrassment from colonoscopy as a barrier to screening:					
Education*		1474(100)	115(7.8)	1359(92.2)	0.267
	Primary/elementary	338(22.9)	26(22.6)	312(23)	
	High school diploma	290(19.7)	29(25.2)	261(19.2)	
	College diploma	270(18.3)	25(21.7)	245(18)	
	Bachelor's degree	432(29.3)	27(23.5)	405(29.8)	
	Master's/PhD	144(9.8)	8(7)	136(10)	
Prior screening knowledge*		566(100)	59(51.3)	507(37.3)	0.003
Knowledge method*		560(100)	57(10.2)	503(89.8)	0.109
	Physician	224(40)	30(52.6)	194(38.6)	
	Friend/relative	134(23.9)	12(21.1)	122(24.3)	
	Awareness campaign	202(36.9)	15(26.3)	187(37.2)	
Fear of complications as a barrier to screening:					
Education*		1474(100)	148(10)	1326(90)	<0.001
	Primary/elementary	338(22.9)	59(39.9)	279(21)	
	High school diploma	290(19.7)	27(18.2)	263(19.8)	
	College diploma	270(18.3)	15(10.1)	255(19.2)	
	Bachelor's degree	432(29.3)	37(25)	395(29.8)	
	Master's/PhD	144(9.8)	10(6.8)	134(10.1)	
Prior screening knowledge*		566(100)	35(23.6)	531(40.1)	<0.001
Knowledge method*		560(100)	34(6.1)	526(93.9)	0.095
	Physician	224(40)	13(38.2)	211(40.1)	
	Friend/relative	134(23.9)	13(38.2)	121(23)	
	Awareness campaign	202(36.1)	8(23.5)	194(36.9)	

* *Not all participants answered this question.*

Table 3 Characteristics of the participants who reported the lack of information as a barrier to screening

Variable	Category	Yes (%)	No (%)	N (%)	*P* value
Gender		429(29.1)	1048(70.9)	1477(100)	0.178
	Male	257(59.9)	667(63.6)	924(62.5)	
	Female	172(40.1)	381(36.4)	553(37.4)	
Education*		429(29.1)	1045(70.9)	1474(100)	0.204
	Primary/Elementary	116(27)	222(21.2)	338(22.9)	
	High School Diploma	79(18.4)	211(20.2)	290(19.7)	
	College Diploma	75(17.5)	195(18.7)	270(18.3)	
	Bachelor's Degree	121(28.2)	311(29.8)	432(29.3)	
	Master's/PhD	38(8.9)	106(10.1)	144(9.8)	
Employment*		429(29.1)	1045(70.9)	1475(100)	0.016
	Office Job	169(39.4)	468(44.7)	637(43.2)	
	Tradesman	33(7.7)	69(6.6)	102(6.9)	
	Unemployed	26(6.1)	34(3.3)	60(4.1)	
	Housewife	94(21.9)	183(17.5)	277(18.8)	
	Retired	91(21.2)	261(25)	352(23.9)	
	Unemployed due to illness	16(3.7)	31(3)	47(3.2)	
Prior screening knowledge*		110(25.6)	456(43.7)	566(100)	<0.001
Knowledge method*		108(19.3)	452(80.7)	560(100)	0.045
	Physician	33(30.6)	191(42.3)	224(40)	
	Friend/Relative	26(24.1)	108(23.9*)	134(23.9)	
	Awareness Campaign	49(45.4)	153(33.8)	202(36.2)	

** Not all participants answered this question.*

Table 4 Characteristics of participants who reported fear of the results as a barrier to screening

Variable	Category	Yes (%)	No (%)	N (%)	*P* value
Gender		109(7.4)	1368(92.6)	1477(100)	<0.001
	Male	48(44)	876(64)	942(62.6)	
	Female	61(56)	492(36)	553(37.4)	
Education*		109(7.4)	1365(92.6)	1474(100)	0.077
	Primary/elementary	17(15.6)	321(23.5)	338(22.9)	
	High school diploma	29(26.6)	261(19.1)	290(19.7)	
	College diploma	21(19.3)	249(18.2)	270(18.3)	
	Bachelor's degree	36(33)	396(29)	432(29.3)	
	Master's/PhD	6(5.5)	138(10.1)	144(9.8)	
Employment*		109(7.4)	1366(92.6)	1475(100)	0.031
	Office job	45(41.3)	592(43.3)	637(43.2)	
	Tradesperson	5(4.6)	97(7.1)	102(6.9)	
	Unemployed	4(3.7)	56(4.1)	60(4.1)	
	Housewife	33(30.3)	244(17.9)	277(18.8)	
	Retired	21(19.3)	331(24.2)	352(23.9)	
	Unemployed due to illness	1(0.9)	46(3.4)	47(3.2)	
Family history of CRC*		23(21)	314(23)	337(100)	0.657
Prior screening knowledge*		42(38.5)	524(38.4)	566(100)	0.981
Knowledge method*		42(7.5)	518(92.5)	560(100)	0.917
	Physician	17(40.5)	207(40)	244(40)	
	Friend/relative	9(21.4)	125(24.1)	134(23.9)	
	Awareness campaign	16(38.1)	186(35.9)	202(36.1)	

** Not all participants answered this question.*

Table 5 Characteristics of participants who reported embarrassment from colonoscopy as a barrier to screening

Variable	Category	Yes (%)	No (%)	N (%)	*P* value
Gender		115(7.8)	1362(92.2)	1477(100)	0.233
	Male	68(57.4)	858(63)	942(62.6)	
	Female	49(42.6)	504(37)	553(37.4)	
Education*		115(7.8)	1359(92.2)	1474(100)	0.267
	Primary/elementary	26(22.6)	312(23)	338(22.9)	
	High school diploma	29(25.2)	261(19.2)	290(19.7)	
	College diploma	25(21.7)	245(18)	270(18.3)	
	Bachelor's degree	27(23.5)	405(29.8)	432(29.3)	
	Master's/PhD	8(7)	136(10)	144(9.8)	
Employment*		115(7.8)	1360(92.2)	1475(100)	0.013
	Office job	38(33)	599(44)	637(43.2)	
	Tradesperson	13(11.3)	89(6.5)	102(6.9)	
	Unemployed	3(2.6)	57(4.2)	60(4.1)	
	Housewife	33(28.7)	244(17.9)	277(18.8)	
	Retired	26(22.6)	326(24)	352(23.9)	
	Unemployed due to illness	2(1.7)	45(3.3)	47(3.2)	
Prior screening knowledge*		59(51.3)	507(37.3)	566(100)	0.003
Knowledge method*		57(10.2)	503(89.8)	560(100)	0.109
	Physician	30(52.6)	194(38.6)	224(40)	
	Friend/relative	12(21.1)	122(24.3)	134(23.9)	
	Awareness campaign	15(26.3)	187(37.2)	202(36.9)	

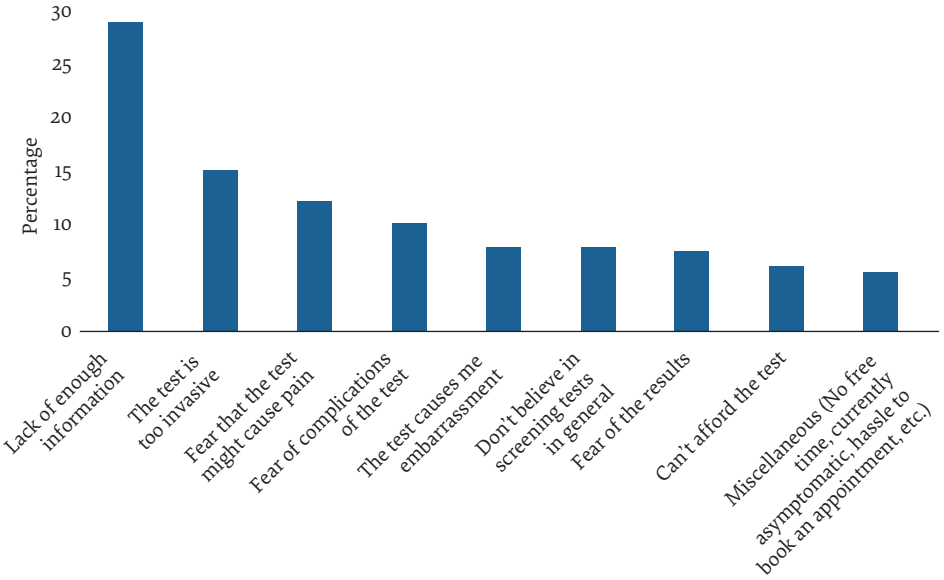
** Not all participants answered this question.*

Table 6 Characteristics of participants who reported fear of complications as a barrier to screening

Variable	Category	Yes (%)	No (%)	N (%)	*P* value
Gender		148(10)	1329(90)	1477(100)	0.317
	Male	87(58.8)	837(63)	924(62.6)	
	Female	61(41.2)	492(37)	553(37.4)	
Education*		148(10)	1326(90)	1474(100)	<0.001
	Primary/elementary	59(39.9)	279(21)	338(22.9)	
	High School diploma	27(18.2)	263(19.8)	290(19.7)	
	College diploma	15(10.1)	255(19.2)	270(18.3)	
	Bachelor's degree	37(25)	395(29.8)	432(29.3)	
	Master's/PhD	10(6.8)	134(10.1)	144(9.8)	
Employment*		148(10)	1327(90)	1475(100)	<0.001
	Office job	71(48)	566(42.7)	637(43.2)	
	Tradesperson	11(7.4)	91(6.9)	102(6.9)	
	Unemployed	6(4.1)	54(4.1)	60(4.1)	
	Housewife	34(23)	243(18.3)	277(18.8)	
	Retired	14(9.5)	338(25.5)	352(23.9)	
	Unemployed due to illness	12(8.1)	35(2.6)	47(3.2)	
Family history of CRC		27(18.2)	310(23.3)	337(100)	0.162
Prior screening knowledge*		35(23.6)	531(40.1)	566(100)	<0.001
Knowledge method*		34(6.1)	526(93.9)	560(100)	0.095
	Physician	13(38.2)	211(40.1)	224(40)	
	Friend/relative	13(38.2)	121(23)	134(23.9)	
	Awareness campaign	8(23.5)	194(36.9)	202(36.1)	

** Not all participants answered this question.*

Figure 3 Participants' reported barriers to screening



In Jordan, knowledge of the availability of CRC screening methods is low (around 20%) *(9–11)*. Approximately 38.3% of our study participants said they were aware of CRC screening, with 42.4% aware of both colonoscopy and FOBT as screening tools. Our sample's CRC screening knowledge, despite being higher than previous studies in Jordan, is lower than in developed countries, such as Spain and the United States *(12,13)*.

Our study revealed a positive association between the level of education and an individual's awareness of CRC screening. Those with a higher educational status were more knowledgeable about CRC screening, thus conflicting with Taha et al. results *(9)*, which found no such association.

Despite the fact that 30.9% of our sample was knowledgeable about the availability and use of colonoscopy as a screening tool, only 9% of the participants underwent colonoscopy screening. This suggests that many factors in a complex process – other than lack of knowledge – prevent individuals from undergoing screening. A study in neighbouring West Bank also yielded very low participation rates for CRC screening; only 7% of their sample had previously undergone colonoscopy screening. Similar participation rates elsewhere in the Eastern Mediterranean Region are expected due to significant overlap and similar sociocultural practices.

Turkey's engagement rate (20–30%) in CRC screening practices is substantially higher than Jordanian and Palestinian participation rates, but lower than some European countries *(14)*; for instance, 43% has been reported in the United Kingdom *(15)*. In Germany only 2–3% of individuals eligible for colonoscopy screening undergo the procedure *(16)*. These rates reinforce the notion that participation in CRC screening, particularly colonoscopy, is limited due to various barriers.

One of the widely noted barriers to CRC screening is limited knowledge of the availability of screening methods *(17–20)*. Approximately 29% of our sample had limited knowledge and information about CRC screening. One way to overcome this is improve awareness and knowledge through educational programmes, including the use of videos *(21)*.

Another barrier, particularly among females, was fear of the potential results of the procedure. This is because any positive results from testing could trigger anxiety *(17,21)*. This finding is consistent with other studies indicating that an individual's fear of positive results is a major barrier to CRC screening *(14,22,23)*. We did not find any studies indicating a compelling association between gender and fear of results.

Embarrassment is another barrier to colonoscopy, as the procedure involves exposure of intimate body parts; this embarrassment was particularly significant among individuals who were aware only of colonoscopy as a screening tool for CRC. This finding can be further explained by the fact that Jordan is a conservative country where people regard the exposure of intimate body parts, even for medical purposes, as repulsive. Embarrassment associated with colonoscopy is a universal barrier to CRC screening due to the nature of the procedure and, in some instances, procedures for preparing the bowel *(24)*.

Unlike FOBT, colonoscopy is an invasive procedure that can result in serious complications in very rare instances, primarily perforation and post-colonoscopy bleeding *(25)*. Despite the rarity of such events, one of the anxiety-triggering factors among individuals undergoing colonoscopy is the fear of complications. A systematic review revealed that around 53% among individuals undergoing colonoscopy reported a fear of complications. Among those who refused colonoscopy, 21–32% reported that fear and anxiety about developing complications after the procedure was the deciding factor

in avoiding colonoscopy *(25,26)*. This was also observed to a lesser extent in our study, where 148 (10%) participants said they would refuse to undergo colonoscopy screening due to fear of complications following the procedure.

Individuals who are only knowledgeable about colonoscopy as a screening method are also likely to refuse screening due to fear of complications. This indicates limited understanding of the procedure and its setting; the incidence of complications following colonoscopy is approximately 0.05% with an even lower prevalence in colonoscopies conducted for screening purposes *(25)*. Individuals who would still refuse colonoscopy, despite having accurate information about the procedure, may benefit from learning about FOBT, as it is non-invasive.

Our study revealed that participants who underwent colonoscopy for screening purposes (9%) were significantly more knowledgeable about CRC screening and had a higher educational level than those who did not undergo colonoscopy, further highlighting the importance of knowledge and education. A previous study in Jordan conducted by Taha et al. *(9)* reported similar results, where pre-existing knowledge of CRC and available screening tools were significantly associated with undergoing CRC screening.

We found a significant relationship between participants who underwent colonoscopy screening and those who were informed about CRC methods by a physician. This aligns with the findings of Honein-AbouHaidar et al. *(24)*, which indicate that primary care physicians' advice and recommendations positively influence CRC screening uptake.

We identified a strong association between participation in colonoscopy screening and a positive family history, which is consistent with findings from several studies indicating higher participation rates in CRC screening among first-degree relatives of CRC patients; Mack et al. *(27)* reported a participation rate of approximately 70% among first-degree relatives *(27–31)*.

Limitations

The study may be limited by the use of a self-administered questionnaire and its quantitative nature rather than a qualitative or mixed methods design. Our sample was predominantly male. However, our study design was principally driven by a cultural aspect of Jordan, where asking an individual direct questions on something that is private or embarrassing is unacceptable. Accordingly, a quantitative study design with a self-administered questionnaire was determined to be the most culturally appropriate. The male-to-female ratio of our sample was also influenced by this. The focus of this study was predominantly on colonoscopy as a screening method and not other available screening tests, mostly due to its higher sensitivity.

Conclusion

Our findings show that, in addition to the lack of knowledge of CRC screening, there is a perceived fear of the results of the screening and complications that could arise following colonoscopy, and a feeling of embarrassment from the procedure. Therefore, nationwide awareness campaigns and screening programmes are needed to tackle these barriers. Findings from this study could be useful in designing such programmes.

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Enquête nationale sur les obstacles au dépistage du cancer colorectal en Jordanie

Résumé

Contexte : Le cancer colorectal figure parmi les principales affections malignes en Jordanie et dans le monde. Il est à l'origine d'une morbidité et d'une mortalité importantes et peut être détecté à un stade précoce, mais son taux de dépistage en Jordanie demeure très faible.

Objectif : Déterminer les obstacles sous-jacents au dépistage du cancer colorectal en Jordanie.

Méthodes : Une étude transversale a été menée dans les régions du nord, du sud et du centre de la Jordanie au moyen d'un questionnaire auto-administré qui a permis d'examiner les obstacles et les attitudes vis-à-vis du dépistage du cancer colorectal chez les adultes âgés de 45 ans et plus, vivant dans le pays. Les données ont été analysées à l'aide du logiciel SPSS version 25.0.

Résultats : Sur les 1477 participants inclus dans l'étude, 29,1 % ont indiqué que le manque d'informations sur le dépistage représentait un obstacle majeur à sa réalisation, suivi de la crainte de complications potentielles dues au test (10 %), de la gêne associée à la coloscopie (7,8 %) et de la crainte du résultat (7,4 %). Seulement 9 % des participants à l'étude avaient réalisé une coloscopie pour le dépistage de ce cancer.

Conclusion : Le manque d'informations, les préjugés et la gêne sont les principales causes du faible taux de recours au dépistage du cancer colorectal en Jordanie. Il est nécessaire de mettre en place un programme national d'éducation et de sensibilisation à ce sujet afin d'éliminer les obstacles mentionnés dans cette étude et d'augmenter le taux de recours au dépistage.

المسح الوطني للعوائق التي تحول دون فحص سرطان القولون والمستقيم في الأردن

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الخلاصة

الخلفية: يُعَد سرطان القولون والمستقيم من الأورام الخبيثة المنتشرة على مستوى العالم وفي الأردن. ويتسبب في معدلات كبيرة من المراضة والوفيات. ويمكن الكشف عن سرطان القولون والمستقيم في وقت مبكر، ولكن الإقبال على فحص سرطان القولون والمستقيم في الأردن منخفض إلى حدٍّ كبير.

الأهداف: هدفت هذه الدراسة الى تحديد العقبات الأساسية التي تحول دون الإقبال على فحص سرطان القولون والمستقيم في الأردن.

طرق البحث: أُجريت دراسة مقطعية في المناطق الشمالية والوسطى والجنوبية من الأردن باستخدام استبيان يُستكمل ذاتيًّا، لتقييم العوائق والمواقف تجاه فحص سرطان القولون والمستقيم لدى البالغين البالغة أعمارهم 45 عامًا فأكثر، الذين يعيشون في الأردن. وحُلِّلت البيانات بالإصدار 25,0 من برنامج SPSS.

النتائج: من بين المشاركين في الدراسة البالغ عددهم 1477 مشاركًا، أفاد 29,1٪ منهم أن نقص المعلومات عن الفحص يمثل عائقًا رئيسيًّا أمام الإقبال عليه، يليه الخوف من أي مضاعفات محتملة قد تنجم عن الاختبار (10٪)، والحرج المرتبط بإجراء تنظير القولون (7,8٪)، والخوف من نتائج الفحص (7,4٪). ولم يخضع لإجراء تنظير القولون للكشف عن سرطان القولون والمستقيم سوى 9٪ من السكان الذين شملتهم الدراسة.

الاستنتاجات: يؤدي نقص المعلومات عن فحص سرطان القولون والمستقيم والمفاهيم الخاطئة والحرج إلى انخفاض الإقبال على الخضوع لهذا الفحص في الأردن. وهناك حاجة إلى التثقيف والتوعية على الصعيد الوطني بشأن فحص سرطان القولون والمستقيم من أجل التغلب على العوائق المُبلَغ عنها في هذه الدراسة، وزيادة الإقبال على الخضوع للفحص.

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