Original Paper

Colorectal Cancer (CRC) Awareness in Lebanon among the Young, Highly Educated Population

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Abstract

The number of individuals diagnosed with colorectal cancer (CRC) is rising, coinciding with increased efforts to raise awareness about preventive healthcare. Awareness of CRC is crucial for early detection and higher survival rates. Although progress has been made globally, significant disparities still exist, especially in low- and middle-income regions like the Arab world. Lebanon's increasing CRC rates demand urgent, targeted actions to raise awareness, promote screening, and ultimately decrease mortality. This study involved 1,229 volunteers. The questionnaire consisted of two parts: the first assessed participants' willingness to undergo early screening and their knowledge of CRC signs, symptoms, and risk factors (including colonoscopy and FIT tests). The second gathered socio-demographic information such as age, gender, education level, living area, and marital status. Data analysis was conducted using IBM SPSS software, version 26.0. Results showed that among those with a university education, 50.6% had never been screened, 13.7% had performed fecal testing, 16.4% had colonoscopies, and 19.3% had undergone both procedures. These figures are lower than the global rates of 38.4% for colonoscopies and 27.0% for fecal testing. Moreover, only 53.2% of respondents who were aware of CRC believed that risk could be reduced. Alarmingly, among highly educated individuals, 45.7% shared the negative attitude found in less educated groups. The findings suggest that effective CRC awareness campaigns should be incorporated into educational curricula, and CRC screening awareness initiatives should be made mandatory in schools. Healthcare providers should be encouraged to recommend FIT as a primary screening method, especially for asymptomatic individuals aged 45 and older or those at moderate risk. Community health centers, NGOs, and the Ministry of Public Health play vital roles in distributing FIT kits, especially in underserved or rural areas.

Introduction

Cancer is a significant concern for public health as it is one of the principal causes of morbidity. A recent report on cancer facts and trends by Siegel, Wagle, Cercek, et al. (2023) indicates that Colorectal Cancer (CRC) is rapidly shifting toward more advanced stages and affecting younger individuals. While the overall rates of colorectal cancer have decreased over the past 10 years, rates among individuals younger than 50 years have increased by about 2% annually (American Cancer Society, 2025). Similarly, according to the 2023 Colorectal Cancer Statistics, "CRC is the third most commonly diagnosed cancer and the second leading cause of cancer-related deaths worldwide" (Bray, Laversanne, Sung, et al., 2024; Sung, Siegel, Laversanne, et al., 2025). The death rate from CRC has been declining in older adults for several decades, due to several possible reasons. One reason is the increased detection and removal of colorectal polyps through screening before they can develop into cancer. Screening facilitates early detection of many colorectal cancers, making them easier to treat (The American Cancer Society medical and editorial content team, 2025). Additionally, the Presidential message on colorectal cancer awareness month by President Donald Trump (Peters & Woolley, 2025) states that "Every year, 150,000 Americans are diagnosed with—and 50,000 die from—colorectal cancer, making it the leading cause of cancer death among Americans aged 18 to 49. To reduce casualties caused by cancer, all means available to us should be utilized, and one of these potential means is raising awareness about the risk factors as well as screening programs available for cancers like colorectal cancer" (para 2). According to a study from the American Institute of Cancer Research (2017), "42 percent (659,640 cancer cases) of cancer cases and 45 percent of cancer deaths (265,150 cancer deaths) in the US are related to modifiable risk factors and may thus be avoided" (para 4). For CRC, modifiable risk factors include alcohol consumption, obesity, smoking, and intake of processed and red meats, while non-modifiable risk factors include a personal history of inflammatory bowel disease, a family history of colorectal cancer, and age. Nemer, Hejase, Hejase, et al. (2016) and Surya (2020) confirmed these factors in their CRC awareness studies. However, Aleissa, Drelichman, Mittal, & Bhullar (2024) posit that "CRC screening continues to be an unfulfilled requirement due to multiple obstacles, including insufficient knowledge among healthcare professionals, patient-specific issues, systemic challenges, and restrictions in existing diagnostic approaches." Therefore, CRC remains a significant public health challenge in terms of prevention and early detection. Despite its high incidence, CRC is highly preventable and treatable when detected early. Selim, Hossein, Hassan, & Mohammed (2021) state that "CRC is a preventable disease, and it is estimated that about 75% of CRC cases could be avoided with a healthy lifestyle" (p. 40).

Public awareness is crucial for early diagnosis and survival, yet worldwide awareness remains inconsistent and often insufficient (A. Hejase, Nemer, Hejase, et al., 2018 (Lebanon); Selim, Hossein,

Hassan, & Mohammed, 2021 (Egypt); Alabed, Samha, Nahhat, et al., 2025 (Syria); UICC, 2025 (Switzerland); Cherian & Kurian, 2024 (India); News USA, 2025 (USA); Abreu Lopez, Pinto-Colmenarez, Caliwag, et al., 2024 (Multinational), among others). CRC mainly affects older adults, though it can occur at any age. Abreu Lopez et al. (2024) state that "Although survival rates for patients over 65 years of age have improved significantly, they have declined in adults younger than 50 years of age, as screening is not encouraged in this population" (p. 1). It generally begins as tiny groups of cells known as polyps within the colon. Polyps generally aren't cancerous, but a few can eventually turn into colon cancer. Because polyps frequently lack symptoms, physicians advise routine screening tests to identify and eliminate them, aiding in the prevention of colon cancer (Cleveland Clinic, 2022). The main problem is that many people underestimate the importance of CRC screening. Despite evidence showing that colorectal cancer screening programs can lower mortality rates, under-screening remains a major issue. For example, in a survey of 1,000 American adults, about half reported prioritizing household chores, such as laundry and childcare, over life-saving colorectal cancer screenings (News USA, 2025). In Lebanon, Hejase & Hejase (2025) report that their sample of 307 Lebanese individuals demonstrates poor health preventive practices, especially regarding CRC. "78.7% did not do Colonoscopy and/or Sigmoidoscopy, 88.7% did not consider Colorectal Cancer (CRC) tests like Fecal Immunochemical test (FIT)/Cologuard/Others, and 72.4% did not do any stool tests like FIT" (p. 9).

Importance of Awareness in CRC Prevention

Awareness of CRC is crucial because the disease often develops slowly and remains without symptoms in its early stages. When detected early and localized, the 5-year survival rate can exceed 90%, but this significantly decreases in late-stage diagnoses (American Cancer Society, 2024). Low awareness leads to late-stage presentation, poor adherence to screening guidelines, and higher mortality. A well-informed population is more likely to adopt preventive behaviors, such as dietary changes and participation in screening programs (Hejase & Hejase, 2025). Therefore, public knowledge of risk factors, symptoms, and available screening methods is vital for early detection. The present study aims to investigate knowledge, awareness, and barriers to colorectal cancer (CRC) screening from a sample of the general population in Lebanon.

Global Awareness Levels and Challenges

Several studies (Nemer, Hejase, Hejase, et al., 2016; Dolatkhah, Somi, Dastgirihave, et al., 2022; Abreu Lopez et al., 2024; and others) have shown that many individuals are unaware of CRC risk factors, symptoms, or screening guidelines. A systematic survey-based study by McVeigh, Lowery, Waldron, et al. (2013) found that awareness of CRC symptoms, such as rectal bleeding, unexplained weight loss, or changes in bowel habits, was significantly lower compared to breast or lung cancer. Furthermore, many people are unaware of recommended screening intervals or available testing options.

Screening uptake is highly dependent on awareness. In countries with well-organized screening programs and public health campaigns, such as the United States and several European countries, participation rates are substantially higher (WHO, 2020). However, even in high-income settings, disparities persist across socioeconomic and ethnic groups (Abreu Lopez et al., 2024).

Numerous studies reveal that public awareness about CRC remains low, particularly in developing countries (Tfaily, Naamani, Kassir, et al., 2019). There are significant gaps in knowledge regarding CRC symptoms, risk factors (e.g., family history, diet, sedentary lifestyle), and recommended screening practices (Eka Rusdi Antara, 2024). Screening is generally viewed as significant, yet numerous participants feel indifferent since they do not recognize a personal benefit in getting screened, resulting in a lack of adequate motivation to pursue screening. This diminished motivation seems to stem mainly from a perceived absence of symptoms, absence of risk factors, or an overall feeling of good health (Le Bonniec et al., 2023). There are many common barriers to awareness and screening, such as:

- Lack of knowledge about the disease and its asymptomatic progression (Tfaily, Naamani, Kassir, et al., 2019).

- Cultural and psychological factors, including stigma, fear of diagnosis, and embarrassment about colon-related symptoms (Power, Wardle, & Von Wagner, 2011; Dolatkhah et al., 2022).

- Cultural and socioeconomic challenges (Abreu Lopez et al., 2024).

- Stigma and embarrassment related to bowel habits (Warner, Bodson, Mooney, et al., 2018; Dolatkhah et al., 2022).

- Fear and fatalistic beliefs about cancer (Tfaily et al., 2019; Lee, Ewing, & Holmes, 2023).

- Lack of physician recommendation for screening (Lee, Ewing, & Holmes, 2023; Eka Rusdi Antara, 2024).

- Lack of standard screening and diagnostic facilities, leading to frequent delays in cancer diagnosis (Eka Rusdi Antara, 2024).

- Low health literacy (Hejase & Hejase, 2025).

- Accessibility issues, such as cost, transportation, and availability of screening methods.

In Arab countries, including Lebanon, awareness of CRC is notably low (A. Hejase, Nemer, Hejase, et al., 2018; Lebanon; Althobaiti & Jradi, 2019; Saudi Arabia; Selim, Hossein, Hassan, & Mohammed, 2021; Egypt; Alabed, Samha, Nahhat, et al., 2025; Syria; etc.). Cultural sensitivity, literacy, lack of facilities, physician attitude and education, fear, and modesty often prevent individuals from discussing gastrointestinal health or undergoing screening. In Lebanon, based on available CRC incidence data obtained from the Lebanese National Cancer Registry (2020), CRC was the third most common cancer (7.08%, tying for third place with bladder cancer, each with 950 cases registered in 2020) after breast (21.23%) and trachea-bronchus & lung (9.61%) cancers. Similarly, CRC was the fifth most common cancer among men (7.73%) after prostate, trachea-bronchus & lung, bladder, and non-melanoma skin cancers. Additionally, CRC was the second most common cancer in women (6.53%) after breast cancer (38.86%) (ibid). The Lebanese Ministry of Public Health has made efforts to promote cancer

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prevention, but most campaigns mainly focus on breast or cervical cancer. Awareness of CRC and access to screening, especially in rural or underserved communities, remain limited.

Currently, public education and preventive efforts are still developing; however, unfortunately, CRC is overlooked and not prioritized in the Ministry of Public Health (MoPH) agenda. This was evident when the National CRC campaign stopped shortly after its launch in 2019 (MoPH, 2019; Najmeddine, 2024). Nevertheless, the initiatives of the NGO SAID (118 various key activities over 3 years) created a notable impact regarding CRC awareness within the Lebanese community (A. Hejase, Hejase, Nemer, et al., 2020).

CRC Awareness in the Arab World

In the Middle East and North Africa (MENA) region, including Lebanon, CRC incidence is rising, yet awareness and screening remain low. A study conducted in Lebanon in 2016 (Nemer et al., 2016) highlights the lack of knowledge about CRC, where over 59% of respondents have never heard of it. Similarly, the study shows a lack of knowledge about CRC screening, with only up to 57.17% of respondents claiming familiarity despite having heard of CRC. Another study by Sibai et al. (2018) found that many adults in Lebanon lacked basic knowledge of CRC risk factors and screening guidelines. Barriers such as fear, cultural taboos, and the absence of routine medical check-ups hinder proactive health behaviors (Tfaily et al., 2019). Moreover, A. Hejase et al. (2020) assert that a local NGO (SAID), which engaged in 118 effective activities over three (3) years, contributed significantly to CRC awareness among the Lebanese citizens (over all Lebanese territory), with a growth of awareness levels over time. Conversely, a study in the KSA revealed that nearly half of the participants (48.8%) were not interested in attending CRC awareness seminars, while only 33.6% expressed interest. Moreover, just 33.3% of respondents knew of any tests or examinations used to detect CRC (Imran, Baig, Alshuaibi, et al., 2023). Another study conducted at the College of Medicine and Health Sciences in Oman among undergraduate medical students showed a low level of awareness among premedical students, with awareness increasing in subsequent academic years (Ranganath, Lujaina, Al Saidi, et al., 2022).

Moreover, CRC awareness campaigns in the Arab world have traditionally focused more on breast cancer. CRC remains less visible in public health messaging, contributing to late-stage diagnoses and lower survival rates. A 2020 survey in Jordan, Saudi Arabia, and the UAE revealed that only 30-40% of adults knew that CRC could be detected early through screening (Al-Shammari, 2020).

The Role of FIT in Increasing Screening Uptake

The Fecal Immunochemical Test (FIT) is an affordable, non-invasive method used to detect hidden blood in stool, an early indicator of colorectal cancer. FIT has become a globally recommended screening tool, particularly in resource-limited areas (Song & Li, 2016). It requires no dietary restrictions or bowel prep, making it more acceptable for many patients. According to Gómez-Molina,

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Suárez, Martínez, et al. (2024), "Among the advantages of this type of test, its higher sensitivity stands out." Additionally, Issaka, Somsouk, Chen, et al. (2019) argue that studies show promoting FIT can significantly increase screening rates, especially among populations hesitant to undergo colonoscopy. Furthermore, Lee, Luo, Chou, et al. (2023) state that "Studies such as the one done in the USA among African Americans living in the Black Belt area showed that only more than half of study participants heard of FIT, indicating that health education on different types of CRC screening especially FIT is needed to improve CRC awareness." Unlike colonoscopy, FIT does not require bowel prep or sedation and can be completed at home, making it particularly suitable for populations with limited access to specialized healthcare services.

In Lebanon, however, awareness of FIT as a valid screening option is still low (BMC, 2017; Moussallem, Jreij, Yeretzian, et al., 2022; Hejase & Hejase, 2025). Many individuals either are not aware of CRC screening at all or associate it solely with colonoscopy, which they may avoid due to cost, discomfort, or fear. By increasing public knowledge about FIT and making it more accessible through primary care and public health campaigns, Lebanon could see a significant increase in early detection rates.

Research Purpose and Merit

This study aims to assess Colorectal Cancer (CRC) Awareness in Lebanon among the Young, highly educated population.

The merit of this paper is manifold. It enriches the theoretical foundations by adding to the body of knowledge new facts from Lebanon. To the best of our knowledge, no research has been conducted in Lebanon about the current subject, therefore making it innovative, in addition to which involves a reasonable sample size, allowing for generalization of findings.

Materials and Methods

This work is a quantitative, explorative, and deductive study. It uses a survey strategy and a positivist philosophy to collect primary data and to perform the necessary analysis and synthesis tasks.

Sampling and Sample Size

A convenience sampling technique was employed depending on the willingness of respondents to engage. Cochran's formula was applied to calculate the sample size (Hejase & Hejase, 2013). With a 3.87% margin of error, a confidence level of 99% (Z=2.58), and a 50% attribute distribution regarding the respondents' sex (p=0.50 and q=1-p=0.50), the estimated sample size was about 1112 individuals. A 50% attribute distribution was selected because it provides the most cautious estimate, thereby maximizing the necessary sample size. This assumption was based on the scarce information available about the anticipated response patterns in our target population. Moreover, to validate the sufficiency of our sample, we obtained an approximation reliability error value from Hardwick (2022), supported by

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additional studies (Chehimi and Hejase, 2024; Rammal, et al., 2024, 2025; Masoudi and Hejase, 2023; H. Hejase, Fayyad-Kazan, Hejase, et al., 2023). With a population size of 10,000 or greater (at α = 5%) and a sample size exceeding 1,000, the reliability error for this study at the 95% confidence level is approximately ± 3.5%. This suggests that in 96.5 of every 100 survey repetitions, the results will vary by no more than 3.5%. This level of reliability is ideal for this exploratory research.

Questionnaire Design

The questionnaire of the study included two primary sections: The socio-demographic traits of participants (Sect. 2: Age, gender, education level, location of residence, and marital status), along with awareness of CRC indicators, symptoms, risk elements, and readiness for early screening initiatives (Sect. 1: Symptoms and screening for colorectal cancer, focusing primarily on colonoscopy and FIT tests). The questionnaire was distributed through convenient social connections. The study was conducted from February 2025 to May 2025. Participants who initially declared their unawareness of CRC were asked to omit all questions related to Section 1 and fill in their socio-demographic data. The paper questionnaire was administered to a sample of 1,250 individuals; however, 1229 valid questionnaires resulted. 21 questionnaires were eliminated due to half-filled and wrongly filled cases. Therefore, a response rate of 98.32% was obtained. Data analysis was performed using IBM SPSS version 26.0 software, including descriptive statistics, chi-square tests, and the calculation of knowledge scores.

Participants' Consent

The specific aim of the research and the informed consent (Nijhawan, Janodia, Muddukrishna, et al., 2013), ensuring the confidentiality and anonymity of personal information, along with the voluntary nature of participation, were presented in the initial section of the survey. Participants were made aware of the research objectives and were assured that their responses would remain confidential; consequently, all participants voluntarily shared their answers and had no objections or concerns, whether physical or emotional, throughout this process. No medical tests, clinical trials, or procedures were required or performed.

Results and Findings

Demographics

As previously mentioned, the study included 1,229 participants, 47.44% of whom were females and 52.56% were males. The average age (at last birthday) was 26.96 years with a standard deviation of 9.675 years. The range of respondents' ages was between 15 and 75 years. The median and mode ages were 24 years and 20 years, respectively. These figures indicate that participants are relatively young. Moreover, the collected educational background of the respondents points to the fact that they are highly educated, with more than 80% of the respondents holding university and higher studies. Thus,

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the sample constitutes a young, highly educated group of respondents that fulfills the purpose of the current study (see Figure 1).
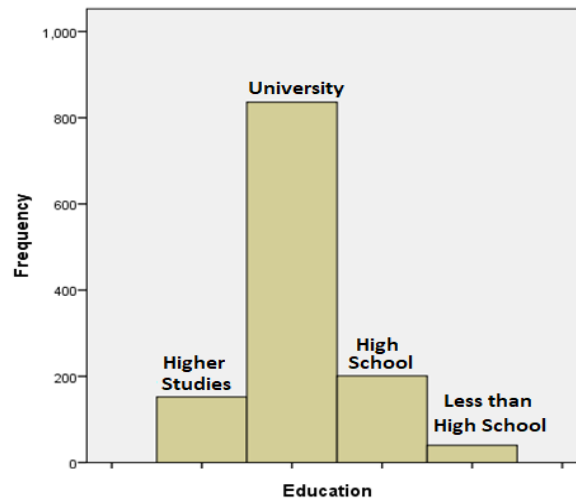

Figure 1. The Distribution of the Respondents' Educational Level

Table 1 shows that among the participants in the study, 53.95% of respondents have heard of this type of cancer. Of those who had heard about CRC (660 respondents), only 67.27% (444 respondents) had heard of screening tests to diagnose colon cancer. Likewise, Table 2 illustrates that 32.73% of participants knew about CRC, but lacked knowledge about CRC screening. Chi-square tests were employed to assess the association between categorical variables. In general, the study shows that the Lebanese young and highly educated population has inadequate knowledge of CRC. Knowledge scores and their significance are presented in the following discussions.

Table 1. How "CRC Awareness" Relates to the Respondent's Education Level

| | | Education: Two Categories | | Total |
		School Education	University Education	
Heard of CRC	**Yes** Count	87	576	663
	% Within the Education Category	36.1%	58.3%	53.9%
	No Count	154	412	566
	% Within the Education Category	63.9%	41.7%	46.1%
Total	Count	241	988	1229

For the data presented in Table 1, a chi-square test of independence was performed to examine the relation between "Heard of CRC" and the education category. The relation between these variables was statistically significant, χ^2 (1, N = 1229) = 38.43, p = 0.000 ($< \alpha=1\%$). This indicates that the proportion

of respondents who have a school education is not the same as that with a university education. Respondents with university education or higher were likely more aware of CRC than those with lower levels of education.

Table 2. How "CRC Screening Awareness" Relates to the Respondent's Education Level

		Education: Two Categories		Total
		School Education	University Education	
Heard of CRC Screening	Yes — Count	55	389	444
	% Within the Education Category	63.2%	67.9%	67.27%
	No — Count	32	184	216
	% Within the Education Category	36.8%	32.1%	32.73%
Total	Count	87	573	660

Table 2 shows how educational level influences CRC screening. This table presents the cross-tabulation between "Heard of CRC screening" and the educational level of those respondents who had heard of CRC. A chi-square test of independence was performed to examine the relation between "Heard of CRC Screening" and the education category. The relation between these variables was not statistically significant, χ^2 (1, N = 1229) = 0.748, p = 0.387 (> α=5%). This indicates that the proportion of respondents who have a school education is relatively the same as that with a university education. Education does not affect knowledge about CRC screening.

So, education level seems to have a significant impact on knowledge scores related to CRC awareness. However, individuals with higher levels of education, such as university and higher degrees, have CRC screening knowledge that is not significantly different from the scores of those with lower levels of education; the differences are insignificant. This finding suggests that CRC education initiatives should be more directed to educated individuals so that they will be motivated to contribute to raising community awareness about CRC screening, and that CRC screening awareness initiatives should be made mandatory in schools.

Table 3. How "Heard of CRC" Relates to Sex

			Sex		Total
			Female	Male	
Heard of CRC	Yes	Count	293	370	663
		% within Gender	50.3%	57.3%	53.9%
	No	Count	290	276	566
		% within Gender	49.7%	42.7%	46.1%
Total		Count	583	646	1229

The cross-tabulation between "Head of CRC" and sex is presented in Table 3. A chi-square test of independence was performed to examine the relationship between the two variables. The relation between them was statistically significant, χ^2 (1, N = 1229) = 6.07, p = 0.014 (< α=1%). This indicates that the proportion of respondents who have heard of CRC is not the same across sexes. Table 3 shows that males are more aware of CRC than females.

In the current study, sex was statistically significant in participants' knowledge of CRC, with males possessing higher knowledge. This was in contrast to other earlier research, with females often possessing a greater understanding of CRC (Alaqel et al., 2021; El Muhtaseb et al., 2025).

Table 4. How "Heard of CRC Screening" Relates to Gender

			Sex		Total
			Female	Male	
Heard of Screening	Yes	Count	196	248	444
		% within Sex	67.6%	67.0%	67.3%
	No	Count	94	122	216
		% within Sex	32.4%	33.0%	32.7%
Total		Count	290	370	660

Table 4 presents the cross-tabulation between "Heard of CRC screening" and sex for those respondents who claimed to be aware of CRC (660 respondents out of 1229). A chi-square test of independence was performed, and the relation between these variables was not significant, χ^2 (1, N = 660) = 0.023, p = 0.879 (> α=5%). This indicates that the proportion of respondents who have heard of CRC screening is relatively the same across sexes. Table 4 shows that males and females exhibit almost the same proportions (≈ 67% for familiarity with screening and ≈ 33% for unfamiliarity with screening).

Table 5. How "Heard of CRC Screening" Relates to Marital Status

			Marital Status			Total
			Single	Married	Div/Sep/Wid	
Heard of CRC	Yes	Count	378	254	31	663
		% within Heard of CRC	51.4%	59.2%	47.7%	53.9%
	No	Count	357	175	34	566
		% within Heard of CRC	48.6%	40.8%	52.3%	46.1%
Total		Count	735	429	65	1229

Table 5 depicts the cross-tabulation between "Heard of CRC" and marital status for all 1229 respondents who participated in the study. A chi-square test of independence was performed, and the

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relation between these variables was significant, χ^2 (2, N = 660) = 7.678, p = 0.022 (< α=5%). This indicates that the proportion of respondents who have heard of CRC screening is not the same across marital statuses. Table 5 shows that single, married, and divorced/separated/widowed respondents exhibit different proportions of awareness (≈ 51% for singles, ≈ 59% for married respondents who were the most aware, and ≈ 48% for divorced/separated/widowed respondents who were the least aware).

The question about the source of CRC information was asked to those respondents who claimed to have heard about CRC (660 respondents). Table 6 shows that the majority of the respondents' information about CRC comes from the Internet. Very few (6.97%) attributed their information to CRC awareness campaigns. This is an indication that CRC NGOs and health organizations need to put more effort into spreading CRC knowledge among the population.

Table 6. Respondents' Sources of CRC Information

My information about CRC comes from	Number of "Agrees" among 660 respondents	Percent
Physician	216	32.73%
Nurse	225	34.09%
Friend	223	33.79%
Family	205	31.06%
Newspaper	170	25.76%
Magazine	112	16.97%
Media	135	20.45%
Internet	244	36.97%
Awareness Campaigns	46	6.97%
Education	10	1.5%

Table 7 shows the percentages of participants knowledgeable about CRC who recognized various symptoms and risk factors associated with it. Among the seven symptoms linked with CRC, the most acknowledged were 'Blood in stool' (74.85%), 'Flatulence' (50.45%), and 'No sports' (32.27%). Conversely, the least acknowledged symptoms were 'Gases' (18.48%), 'Digestive system disease' (24.09%), and 'Diabetes' (24.70%). Additionally, Table 8 shows how CRC-aware respondents identified the most common CRC risk factors, including 'Family history' (69.39%), 'Age' (45.00%), and 'Stress' (33.94%). Less frequently recognized risk factors by participants were 'Alcohol' (27.42%), 'Smoking' (26.97%), and 'Obesity' (20.91%).

Table 7. The Percentages of Participants who Identified the Different CRC Symptoms

Symptom	Number of "Agrees" among 660 respondents	Percentage
Flatulence	333	50.45%
Blood in stool	494	74.85%
Change in bowel habit	194	29.39%
Gases	122	18.48%
Diabetes	163	24.70%
No Sports	213	32.27%
Digestive system disease	159	24.09%

Table 8. The Percentages of Participants who Identified the Different CRC Risk Factors

CRC Risk Factor	Number of "Agrees" among 660 respondents	Percentage
Age	297	45.00%
Family History	458	69.39%
Stress	224	33.94%
Smoking	178	26.97%
Alcohol	181	27.42%
Obesity	138	20.91%

All study participants (1229) were asked to identify where they would seek medical advice when they face a health disturbance (A respondent could identify more than one choice). Table 9 presents a summary of their answers, where it is evident that the majority consult a specialist physician (46%), a family doctor (46%), a primary care clinic (32%), a pharmacist (29%), or the Internet (26%).

Table 9. Sources where Respondents Seek Medical Advice when They Face a Health Disturbance

On facing a health disturbance	Count	Percentage
I consult the family doctor	521	42%
I consult a specialist physician	566	46%
I consult an herbalist	58	5%
I consult a pharmacist	353	29%
I go to a primary care clinic	391	32%
I consult the Internet	321	26%
I consult other means	0	0%

Table 10 presents the responses of those respondents who were aware of CRC when asked if they were

ready to carry out CRC screening even if they didn't have any symptoms. Out of 661 respondents who claimed to be aware of CRC, only 460 (69.6%) agreed. Likewise, Table 11 shows the distribution of responses provided by CRC-aware participants regarding any past CRC screening, where it is evident that the majority lack CRC screening (48.1%). Moreover, Table 12 includes the responses related to CRC-aware participants when asked if their future plans include doing any CRC screening tests.

Table 10. Responses to "Are you Ready to Undertake CRC Screening even if you don't have Symptoms?"

Are you ready to undertake CRC screening even if you don't have symptoms, knowing that screening may stop CRC	Frequency	Percent
Yes	460	69.6%
No	201	30.4%
Total	661	100.0%

Table 11. CRC Screening Undertaken by CRC-aware Respondents

Have you done any CRC screening in the past	Frequency	Percent
No Screening	318	48.1%
FIT	86	13.0%
Colonoscopy	114	17.2%
Both FIT & Colonoscopy	143	21.6%
Total	661	100.0%

Table 12. CRC-aware Respondents' Plans to do CRC Tests

Do you plan to do any CRC screening	Frequency	Percent
No screening plans	348	52.6%
Will do FIT	146	22.1%
Will do a Colonoscopy	104	15.7%
Will do both FIT & Colonoscopy	64	9.7%
Total	662	100.0%

Finally, the participants were asked if they think they can reduce CRC risk. Results show that among the CRC-aware respondents, 53.3% (351 out of 659) believe that yes, they can reduce CRC risk, while the remaining 46.7% (308 out of 659) believe that they cannot. Additionally, 179 participants (27.3%) responded with 'Yes' when asked if they have any relatives who suffer from CRC. The remaining 477 (72.7%) did not.

Participants who previously responded that they know relatives suffering from CRC were asked to be

specific about the number of CRC patients. Table 13 demonstrates that 171 respondents indicated that they have one member of their family diagnosed with colorectal cancer, 51 informed that two family members were diagnosed with CRC, 11 revealed that 3 family members were diagnosed, and 2 participants informed that among their family members, 4 were diagnosed with CRC. The total number of family members diagnosed with CRC is 235, where their mean age is 63.73 years and standard deviation 15.37 years (Median = 64.33 years). Figure 2 depicts a histogram that summarizes the ages of the total group.

Table 13. Respondents' Family Members Diagnosed with CRC

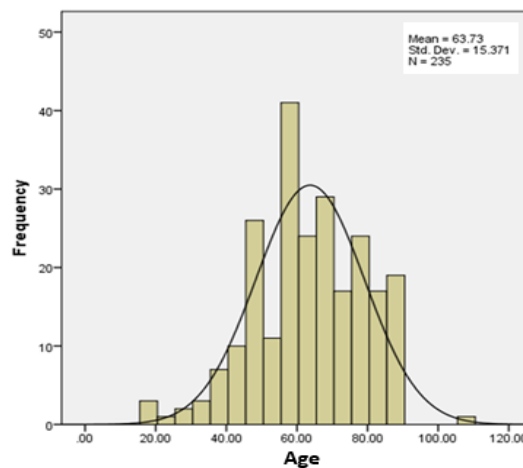| Fam. members diagnosed with CRC	Number of cases	Group Average age (yrs)	Median age (yrs)	Std. Dev. (yrs)	Age Range (yrs)
One member of the family	171	61.63	61.00	14.02	18 - 86
Two members of the family	51	68.47	71.00	16.25	18 - 90
Three members of the family	11	75.64	81.00	20.18	40 - 107
Four members of the family	2	84.05	84.50	4.95	81 - 88

Figure 2. The Distribution of Ages of Family Members Diagnosed with CRC

A chi-square test of independence was performed to examine the relation between "Heard of CRC Screening" and "Do you believe CRC risks can be reduced?" The relation between these variables was statistically significant, $\chi2$ (1, N = 656) = 4.26, p = 0.039 (< α=5%). This indicates that the proportion of respondents who have heard of CRC screening does believe that CRC risks can be reduced (56.0%), while those who are unaware of CRC screening tend to have a lesser belief in that CRC risks can be reduced (47.4%), as shown in Table 14.

Table 14. Cross-tabulation "Heard of CRC Screening" and "Do You Believe CRC Risks Can Be Reduced"

| | | Do You Believe CRC Risks Can Be Reduced? | | |
		I believe I can reduce CRC risk	I don't believe in reducing CRC risk	Total
Heard of Screening	**Yes** Count	247	194	441
	% within, I believe I can reduce CRC risk	56.0%	44.0%	67.2%
	No Count	102	113	215
	% within, I believe I can reduce CRC risk	47.4%	52.6%	32.8%
Total	Count	349	307	656
	% within, I believe I can reduce CRC risk	53.2%	46.8%	100.0%

Table 15 presents the responses of those respondents who were aware of CRC and had heard of CRC screening when asked if they plan to carry out CRC screening. Out of 443 respondents who claimed to have heard of CRC screening, only 40 (9.0%) agreed that they plan to undertake both the FIT test and colonoscopy; 13.1% (58) will do only colonoscopy; 23.5% (104) will do the FIT test, and the majority, 54.4% had no CRC screening plans. Likewise, Table 15 shows the distribution of responses provided by those respondents who had not heard of CRC screening (216) distributed as 49.5% (107) that have no screening plans, 19.4% (146) that will do FIT, 20.8% (103) that will do colonoscopy, and 10.2% (62) that will do both FIT and colonoscopy.

Table 15. Cross-tabulation "Heard of CRC Screening" and "Do You Plan to Screen"

| | | Do you plan to screen? | | | | |
		No Screening plans	Will do FIT	Will do Colonoscopy	Will do both a FIT & Colonoscopy	Total
Heard of Screening	**Yes** Count	241	104	58	40	443
	% within the Heard of Screening	54.4%	23.5%	13.1%	9.0%	100.0%
	No Count	107	42	45	22	216
	% within the Heard of Screening	49.5%	19.4%	20.8%	10.2%	100.0%
Total	Count	348	146	103	62	659

% within the Heard of Screening	52.8%	22.2%	15.6%	9.4%	100.0%

Another chi-square test of independence was performed between "Heard of CRC" and the place where the respondent lives for the 1222 respondents who answered the question. The relation between these variables was statistically significant, χ^2 (7, N = 1222) = 76.764, p = 0.000 (< α=1%). This indicates that the proportion of respondents who have heard of CRC screening is not the same across the different geographical regions of Lebanon. Table 16 shows that respondents who live in urban areas had more awareness about CRC, for example in urban areas awareness was: Beirut 66.5%, Mount Lebanon 52.2%, and central Bekka near the city of Zahle 68.8%; while in rural areas the awareness percentages were lower: Akkar 32.0%, South Lebanon 39.1%, and North Lebanon 32.5%. These results should form a strong motivation for both governmental health agencies and NGOs to increase their awareness campaigns in rural areas.

Table 16. Cross-tabulation "Heard of CRC Screening" and "Place of Living in Lebanon"

		Where do You Live?								
		Akkar	Mount Lebanon	Bekka	North Lebanon	Dahie	Beirut	South Lebanon	Shouf	Total
Heard of CRC	Yes Count	8	82	11	13	34	335	134	41	658
	% within Where You Live	32.0%	52.2%	68.8%	32.5%	51.5%	66.5%	39.1%	57.7%	53.8%
	No Count	17	75	5	27	32	169	209	30	564
	% within Where You Live	68.0%	47.8%	31.2%	67.5%	48.5%	33.5%	60.9%	42.3%	46.2%
Total	Count	25	157	16	40	66	504	343	71	1222

The respondents who claimed they had heard of CRC across both urban and rural areas were asked if they were ready to undertake CRC screening. Table 17 presents a summary of their responses, where it is clear that the geographical region where respondents live has little influence on readiness for CRC screening. Chi-square test of independence (χ^2 (7, N = 657) = 10.933, p = 0.142 (> α=5%) was statistically insignificant.

Table 17. Cross-tabulation "Readiness for CRC Screening" and "Place of Living in Lebanon"

		Akkar	Mount Lebanon	Bekka	North Lebanon	Dahie	Beirut	South Lebanon	Shouf	Total
Ready For Screening	**Yes** Count	6	52	5	10	26	241	86	33	459
	% within Where You Live	75.0%	63.4%	45.5%	76.9%	76.5%	72.2%	64.2%	80.5%	69.9%
	No Count	2	30	6	3	8	93	48	8	198
	% within Where You Live	25.0%	36.6%	54.5%	23.1%	23.5%	27.8%	35.8%	19.5%	30.1%
Total	Count	8	82	11	13	34	334	134	41	657

CRC-aware participants across both urban and rural areas were asked if they had any relatives who suffer or have suffered from CRC. Table 18 presents the answers provided by 651 CRC-aware respondents who affirmed they had family relatives with CRC.

Table 18. Cross-tabulation "Relatives who have CRC" and "Place of Living in Lebanon"

		Akkar	Mount Lebanon	Bekka	North Lebanon	Dahie	Beirut	South Lebanon	Shouf	Total
Do you have CRC Relatives	**Yes** Count	4	29	1	6	5	77	39	18	179
	% within Where Do You Live	50.0%	36.2%	9.1%	46.2%	14.7%	23.3%	29.1%	43.9%	27.5%
	No Count	4	51	10	7	29	253	95	23	472
	% within Where Do You Live	50.0%	63.8%	90.9%	53.8%	85.3%	76.7%	70.9%	56.1%	72.5%
Total	Count	8	80	11	13	34	330	134	41	651

Table 19 presents the cross-tabulation of the different geographical regions for the answers collected in response to "Did you have any CRC screening in the past?" It is evident that even though the respondents were aware of CRC, the percentages of no screening were relatively high, being 82.4% in Beirut suburbs (Dahie), 65.9% in Shouf, and 47.7% across all of Lebanon. If we try to compare these

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numbers with some others reported in the literature, 49.3% of global respondents never had a CRC screening test, with Saudi Arabia (62.0%) and Poland (61.0%) having the highest proportions (BGI Genomics, 2024). Once more, the NGOs and health agencies should work harder on encouraging CRC screening. CRC screening patterns have a large influence on CRC incidence and mortality trends. Observational studies suggest that colonoscopy reduces CRC incidence by about 40% and mortality by about 60% (Nishihara, Wu, Lochhead, et al., 2013; Doubeni, Corley, Quinn, et al., 2018; Zauber, Winawer, O'Brien, et al., 2012).

Table 19. Cross-tabulation "Performed CRC Screening" and "Place of Living in Lebanon"

			Where Do You Live								Total
			Akkar	Mount Lebanon	Bekka	North Lebanon	Dahie	Beirut	South Lebanon	Shouf	
Did you screen in the past	No Screening	Count	3	31	6	5	28	156	57	27	313
		% Where Do You Live	37.5%	37.8%	54.5%	38.5%	82.4%	46.8%	42.5%	65.9%	47.7%
	FIT	Count	2	11	0	1	3	48	20	1	86
		% Where Do You Live	25.0%	13.4%	0.0%	7.7%	8.8%	14.4%	14.9%	2.4%	13.1%
	Colonoscopy	Count	0	20	3	5	0	49	32	5	114
		% Where Do You Live	0.0%	24.4%	27.3%	38.5%	0.0%	14.7%	23.9%	12.2%	17.4%
	Both FIT & Colonoscopy	Count	3	20	2	2	3	80	25	8	143
		% Where Do You Live	37.5%	24.4%	18.2%	15.4%	8.8%	24.0%	18.7%	19.5%	21.8%
Total		Count	8	82	11	13	34	333	134	41	656

The CRC literature indicates that although overall CRC mortality continues to decline, the CRC burden is shifting to younger individuals, where one in five new cases now occur in individuals in their early

50s or younger (American Cancer Society, 2025). Moreover, there is an overall shift to later-stage disease, with more individuals now diagnosed at an advanced stage than in the mid-1990s before widespread screening (Siegel et al., 2023). These facts should encourage people to undergo CRC screening. The main reason holding people back from CRC screening is a fear of colonoscopy and a fear of the results (BGI Genomics, 2023). On this basis, our CRC-aware respondents were asked if they were planning to get screened for colorectal cancer. Table 20 presents the corresponding responses across the different geographical regions of Lebanon. Unfortunately, 52.5% of all CRC-aware respondents claimed that they have no plans for CRC screening, 22.1% will do the FIT exam, 15.7% will do a colonoscopy, and 9.7% will do both the FIT and colonoscopy.

Table 20. Cross-tabulation "Plan for CRC Screening" and "Place of Living in Lebanon"

			Where Do You Live								Total
			Akkar	Mount Lebanon	Bekka	North Lebanon	Dahie	Beirut	South Lebanon	Shouf	
Plan to Screen	No Screening plans	Count	4	52	6	7	17	173	70	16	345
		% Where Do You Live	50.0%	63.4%	54.5%	53.8%	50.0%	51.8%	52.2%	39.0%	52.5%
	Will do FIT	Count	2	14	3	1	14	82	20	9	145
		% Where Do You Live	25.0%	17.1%	27.3%	7.7%	41.2%	24.6%	14.9%	22.0%	22.1%
	Will do a Colonoscopy	Count	2	12	0	3	3	48	24	11	103
		% Where Do You Live	25.0%	14.6%	0.0%	23.1%	8.8%	14.4%	17.9%	26.8%	15.7%
	Will do both FIT & Colonoscopy	Count	0	4	2	2	0	31	20	5	64
		% Where Do You Live	0.0%	4.9%	18.2%	15.4%	0.0%	9.3%	14.9%	12.2%	9.7%
Total		Count	8	82	11	13	34	334	134	41	657

To investigate if the level of education has any effect on the respondents' plans for undergoing CRC screening, a cross-tabulation between educational level and screening plans is presented in Table 21. This table shows that no matter what the respondents' educational level is, their attitudes towards CRC screening are relatively similar; the chi-square test of independence (χ^2 (9, N = 662) = 8.388, p = 0.496

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> $\alpha=0.05$) was statistically insignificant. Hence, the result reveals a life-threatening gap in public awareness of colorectal cancer among the educated community.

Table 21. Cross-tabulation "Plans to Perform CRC Screening" and "Education"

			Education				Total
			High Studies	University	High School	Less than High School	
Do You Plan to Screen	No Screening plans	Count	47	249	44	8	348
		% Within Education	47.5%	52.3%	60.3%	57.1%	52.6%
	Will do FIT	Count	25	107	11	3	146
		% Within Education	25.3%	22.5%	15.1%	21.4%	22.1%
	Will do a Colonoscopy	Count	13	80	10	1	104
		% Within Education	13.1%	16.8%	13.7%	7.1%	15.7%
	Will do both FIT & Colonoscopy	Count	14	40	8	2	64
		% Within Education	14.1%	8.4%	11.0%	14.3%	9.7%
Total		Count	99	476	73	14	662

One may ask: If the educated community has undergone CRC screening in the past, then their answers concerning their future screening plans can be justified (see Table 22). To fulfill the aforementioned purpose, CRC-aware participants were asked if they had had any CRC screening in the past. Table 22 summarizes the collected answers, which show that 48.1% of the CRC-aware respondents never did any CRC screening, and only 13.0% did the basic FIT exam. Additionally, among the respondents with university education, 50.6% have never had any screening. The percentages illustrated in Table 22 are well below worldwide percentages for colonoscopies, 38.4%, and for fecal testing, 27.0% (BGI Genomics, 2024). Moreover, the chi-square test of independence (χ^2 (9, N = 661) = 21.777, p = 0.010 < $\alpha=0.05$) was statistically significant, emphasizing that university respondents possess the highest levels of no screening.

Table 22. Cross-tabulation "Past CRC Screening" and "Education"

			Education				Total
			High Studies	University	High School	Less than High School	
Did you screen in the past	No Screening	Count	40	241	33	4	318
		% Within Education	40.8%	50.6%	45.2%	28.6%	48.1%
	FIT	Count	13	65	6	2	86
		% Within Education	13.3%	13.7%	8.2%	14.3%	13.0%
	Colonoscopy	Count	12	78	18	6	114
		% Within Education	12.2%	16.4%	24.7%	42.9%	17.2%
	Both FIT & Colonoscopy	Count	33	92	16	2	143
		% Within Education	33.7%	19.3%	21.9%	14.3%	21.6%
Total		Count	98	476	73	14	661

As final questions, CRC-aware respondents were asked about their beliefs with respect to reducing CRC risks. Table 23 summarizes their answers under the different educational backgrounds. Unfortunately, 46.7% of them believe that CRC risks cannot be reduced. What is worse is that among the highly educated individuals, 45.7% of those with university education have the same negative attitude, thus emphasizing once more the necessity of putting more awareness effort into raising awareness in the educated community. A chi-square test of independence was performed, and it was found that the relation between these variables was statistically significant, χ^2 (3, N = 659) = 23.783, p = 0.000 < α=0.01.

Table 23. Cross-tabulation "I Believe CRC Risks can be Reduced" and "Education"

			Education				Total
			High Studies	University	High School	Less than High School	
Do You Believe CRC Risks Can Be Reduced	I believe I can reduce CRC risk	Count	65	258	21	7	351
		% Within Education	66.3%	54.3%	29.2%	50.0%	53.3%
	I don't believe in reducing CRC risk	Count	33	217	51	7	308
		% Within Education	33.7%	45.7%	70.8%	50.0%	46.7%
Total		Count	98	475	72	14	659

Likewise, CRC-aware respondents were asked about their beliefs concerning reducing CRC risks. Table 24 presents a cross-tabulation summarizing their answers under the question "if they were ready for CRC screening". Table 24 shows that 67.5% of those who are ready for screening believe that CRC risks can be reduced, while only 20.5% of those who were not ready for CRC screening believe that they can reduce CRC risk. In general, only 53.2% of the CRC-aware respondents agree that they can reduce CRC risk. This result supports the purpose of our study, where more concentrated and efficient CRC awareness campaigns should be included in the educational curricula. A chi-square test of independence was performed between "Ready for CRC screening" and "the belief in reducing CRC risk" for the 658 CRC-aware respondents. The relation between these variables was statistically significant, χ^2 (1, N = 658) = 123.337, p = 0.000 < α=0.01. This indicates a relatively strong association between readiness for screening and the belief that CRC risk can be reduced.

Table 24. Cross-tabulation "I Believe CRC Risks can be Reduced" and "Readiness for Screening"

		Ready for Screening		Total
		Yes	No	
Do You	I believe I can	**309**	**41**	**350**
Believe CRC	reduce CRC risk % within Ready for Screening	67.5%	20.5%	53.2%
Risks Can Be	I don't believe in	**149**	**159**	**308**
Reduced	reducing CRC risk % within Ready for Screening	32.5%	79.5%	46.8%
Total	Count	**458**	**200**	**658**

Another issue related to the belief of reducing CRC risk is depicted in Table 25, which shows the cross-tabulation between the belief in reducing CRC risk and whether the respondent had relatives with CRC. A chi-square test of independence was performed between "Do you have relatives that have CRC?" and "the belief in reducing CRC risk" for the 655 CRC-aware respondents. The relation between these variables was significant, χ^2 (1, N = 655) = 10.217, p = 0.001. This indicates a relatively strong association between having relatives with CRC and the belief that CRC risk can be reduced.

Table 25. Cross-tabulation "I Believe CRC Risks can be Reduced" and "Having Relatives with CRC"

		Do you have CRC Relatives		Total
		Yes	No	
Do You	Count	**113**	**236**	**349**
Believe CRC	I believe I can			
	reduce CRC risk % within Do you	63.5%	49.5%	53.3%
Risks Can	have CRC Relatives			
Be Reduced	I don't believe in Count	**65**	**241**	**306**

reducing CRC risk	% within Do you have CRC Relatives	36.5%	50.5%	46.7%
Total	Count	178	477	655

Conclusion

This paper aims to assess the awareness of CRC among a sample of 1,229 young, highly educated Lebanese participants. The respondents are predominantly highly educated, with over 80% holding university or higher degrees. Therefore, the sample consists of a young, well-educated group that aligns with the study's objectives. Among them, 53.95% (660 respondents) have heard of this type of cancer, but only 67.27% (444 respondents) are aware of screening tests for colon cancer. The results show with 95% certainty that education level significantly influences CRC awareness scores. Consequently, CRC education initiatives should focus more on educated individuals to motivate them to help raise community awareness about screening. Most respondents' information about CRC comes from the Internet, while very few (6.97%) cited awareness campaigns as their source. Of the seven CRC symptoms listed, the most recognized were 'Blood in stool' (74.85%), 'Flatulence' (50.45%), and 'No sports' (32.27%). When asked if they were willing to undergo CRC screening without symptoms, only 460 respondents (69.6%) agreed. Also, 56.0% believe that CRC risks may be reduced, and among CRC-aware participants, 53.3% (351 out of 659) think they can lower their risk. In addition, among those aware of CRC and screening, only 40 respondents (9.0%) plan to do both the FIT test and colonoscopy; 58 (13.1%) intend to have a colonoscopy; 104 (23.5%) plan to do the FIT test, and the majority, 54.4%, have no screening plans.

Other results inform that respondents who live in urban areas had more awareness about CRC, for example in urban areas awareness was: Beirut 66.5%, Mount Lebanon 52.2%, and central Bekka (East region of Lebanon) near the city of Zahle 68.8%; while in rural areas the awareness percentages were lower: Akkar (Upper North) 32.0%, South Lebanon 39.1%, and North Lebanon 32.5%. Those results must incite a strong motivation for both governmental health agencies and NGOs to increase their awareness campaigns in rural areas. Also, although the respondents were aware of CRC, the percentages of not undergoing screening were relatively high, being 82.4% in Beirut suburbs (Dahie), 65.9% in Shouf (Mount Lebanon), and 47.7% across all of Lebanon. Adding to the above, responses across the different geographical regions of Lebanon, unfortunately, were low. 52.6% of all CRC-aware respondents claimed that they have no plans for CRC screening, 22.1% will do the FIT exam, 15.7% will do a colonoscopy, and 9.7% will do both the FIT and colonoscopy.

Finally, no matter what the respondents' educational level is, their attitudes towards CRC screening are relatively similar; the chi-square test of independence ($\chi 2$ (9, N = 662) = 8.388, p = 0.496 > α=0.05) was statistically insignificant. Hence, the result reveals a life-threatening gap in public awareness of colorectal cancer among the educated community. Findings reveal that among the respondents with university education, 50.6% have never had any screening, 13.7% did fecal testing, 16.4% had

colonoscopies, and 19.3% did both. These results are well below worldwide percentages for colonoscopies, 38.4%, and for fecal testing, 27.0% (BGI Genomics, 2024). In addition to the above-mentioned, only 53.2% of the CRC-aware respondents believe that CRC risks could be reduced. What is worse, is that among the highly educated individuals, 45.7% of those with university education have the same negative attitude as less educated individuals, thus emphasizing once more the necessity of putting more awareness-effort into raising awareness in the educated community. The aforementioned result supports the purpose of this study. More focused and efficient CRC awareness campaigns have to be considered in the educational curricula, and CRC screening awareness initiatives should be made mandatory in schools.

CRC awareness is a priority for early detection and survival. As global progress has been made, significant gaps continue to exist, especially in low- and middle-income regions like the Arab world. Lebanon, with its rising CRC rates, needs urgent and targeted interventions to boost awareness, promote screening, and ultimately reduce mortality.

Healthcare providers must be encouraged to offer FIT as a first-line screening tool, particularly for asymptomatic individuals over the age of 45 or those with moderate risk. Community health centers, NGOs, and the Ministry of Public Health can play a central role in distributing FIT kits, especially in underserved or rural areas. To improve CRC awareness and screening in Lebanon and the broader Arab world, public health strategies should focus on:

- Promoting FIT as a simple, reliable first step in CRC screening.
- Launching culturally sensitive education campaigns that explain the value and ease of FIT.
- Training primary healthcare providers to offer and explain FIT to eligible patients.
- Ensuring that FIT kits are available and affordable, especially in low-income communities.
- National awareness campaigns using culturally appropriate materials.
- Integration of CRC awareness into teaching curricula.
- Integration of FIT into public health services and primary care.
- Training healthcare providers to initiate discussions about CRC.
- Involving religious leaders and local influencers to break taboos.
- Offering free or low-cost screening in public health facilities.

Incorporating FIT into national screening strategies could be a game-changer for Lebanon and similar countries, helping to overcome both cultural and economic barriers. Raising CRC awareness and providing accessible, non-invasive screening options like FIT will not only improve early detection but also save lives.

Recommendations

It is time for CRC to be part of the teaching curricula both in high school and university education. To realize that, the government authorities, school boards, and NGOs should work hard. Then, the youth will grow aware, and they will spread more awareness as they grow up.

Strengths and Limitations

This study is one of the rare investigations to evaluate colorectal cancer awareness in highly educated people in Lebanon, utilizing a validated questionnaire. The considerable sample size improves our findings and increases their reliability. Moreover, the research offers important perspectives to assist in enhancing public health initiatives. Nevertheless, there are certain constraints, including insufficient representation from the various Lebanese regions, as most respondents were from the capital, Beirut (approximately 50%). Likewise, it is worth mentioning that our study could not detect the issues of social desirability bias, where participants tended to over-report positive behaviors.

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