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A COLORECTAL CANCER RISK AMONG ADULTS IN BAGHDAD 2025

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ABSTRACT

Background: Colorectal cancer (CRC) represents a growing public health concern globally, with developing countries like Iraq experiencing a rising incidence. Despite advances in prevention, limited data exist on CRC risk factor prevalence among Iraqi adults, particularly in Baghdad. **Objectives:** This study aimed to assess the prevalence of colorectal cancer risk among adults in Baghdad and identify associated demographic and lifestyle factors. **Methods:** A retrospective cross-sectional survey was conducted among 400 adults attending Al-Yarmouk Teaching Hospital, Baghdad, from 1 January to 1 June 2025. Participants were selected using convenience random sampling. Data were obtained from medical records and included socio-demographic details, lifestyle habits (smoking, physical activity, diet, BMI), family history, and gastrointestinal symptoms. Risk levels were categorized as low, moderate, or high using validated CRC risk stratification criteria. Statistical associations were analyzed using Chi-square (χ^2) tests. **Results:** Age ($\chi^2 = 42.56$, $p < 0.0001$), smoking status ($\chi^2 = 26.77$, $p < 0.0001$), BMI ($\chi^2 = 27.45$, $p < 0.0001$), physical activity ($\chi^2 = 35.44$, $p < 0.0001$), and family history ($\chi^2 = 118.36$, $p < 0.0001$) were all significantly associated with CRC risk levels. Older age (≥60 years), smoking, obesity, physical inactivity, and a positive family history were strongly linked with moderate to high CRC risk. Gender was not significantly associated with CRC risk ($\chi^2 = 2.88$, $p = 0.24$). **Conclusion:** A significant proportion of adults in Baghdad are at moderate to high risk for colorectal cancer, primarily due to modifiable lifestyle factors and hereditary predisposition. These results highlight the need for targeted screening, public education, and lifestyle intervention programs to mitigate the CRC burden in Iraq.

KEYWORD: colorectal cancer, risk, adults, Baghdad.

INTRODUCTION

Colorectal cancer (CRC) is one of the most frequent types of cancer in the world and is responsible for around 10% of all cancer deaths.[1] In many high-income nations, the number of cases of CRC has stayed the same or gone down because of screening programs. However, in low- and middle-income countries like Iraq, the number of cases is going up because of westernised lifestyles and a lack of early detection.[2] CRC is one of the five most common malignancies in Iraq, and its prevalence has been rising over the past ten years, especially among persons aged 40 and older.[3] Some things that can make you more likely to have CRC are becoming older, being male, having a family history of CRC, smoking, being overweight, not exercising, eating a low-fiber diet, and having metabolic disorders like diabetes.[4] Changes in diet in Iraq, which include eating less fibre and more fat, have made people worry about the risk of CRC across the whole country.[5] Additionally, the rates of smoking and obesity have gone up, which makes the risk much higher.[6] Even yet, not enough people know about it and not enough people are screened, which means that diagnoses are made too late and results are bad.[7] There isn't much information available about CRC risk trends in Iraq right now, and there hasn't been a large-scale risk assessment in Baghdad. This gap makes it hard to come up with screening and preventive measures that are based on research and fit the needs of the area.[8] Having a family history of CRC or a first-degree relative with the illness is a major risk factor. Obesity, not getting enough exercise, smoking, not eating enough fruits and vegetables, and eating more red meat are all moderate risk factors.[9] Different levels of exposure to these risk

variables lead to big disparities in the rates of CRC in different nations.[10] Because of these worries, this study's goals are to find out how common CRC risk is among people in Baghdad, look at demographic, lifestyle, and clinical determinants, and find the most important areas for public health intervention. We want to use the local risk profile to help shape policy and promote the implementation of targeted preventative activities. This study aimed to assess the prevalence of colorectal cancer risk among adults in Baghdad, identify key demographic, lifestyle, and clinical predictors, and explore associations between risk categories and potential contributing factors.

METHODS

A retrospective survey was conducted among 400 adults attending Al Yarmoke teaching Hospital in period between 1 January 2025 to 1 June 2025, in Baghdad. Participants were selected using convenience random sampling. Data were collected from medical records covering socio-demographic characteristics, lifestyle factors (smoking, BMI, physical activity, diet), family history, and gastrointestinal symptoms. Risk stratification was performed using validated criteria, classifying participants into low, moderate, and high-risk categories. Statistical analysis included descriptive statistics, frequencies, percentages, means, and standard deviations, Chi-square tests, and calculation of p-values were computed using SPSS version 26., to assess the significance of associations between risk and predictor variables.

RESULTS

Table (1): The study included 400 participants with a mean age of 45.2 ± 14.1 years. The largest proportion of participants were between 35 and 49 years old (35%), followed by those aged 20–34 years (27.5%), 50–64 years (25%), and 65 years or older (12.5%). Regarding sex, 55% were male and 45% were female. Most participants were married (75%), while 17.5% were single and 7.5% were widowed or divorced. In terms of education level, 15% had no formal education, 25% had completed primary school, 32.5% had secondary school education, and 27.5% had a college degree or higher.

Table 1: Socio-demographic characteristics (n = 400).

Characteristic	Frequency (n)	Percentage (%)
Age group (years)		
20–34	110	27.5
35–49	140	35.0
50–64	100	25.0
65+	50	12.5
Total	400	100%
Mean± S.D age	**45.2 ± 14.1 years**	
Sex		
Male	220	55.0
Female	180	45.0
Total	400	100%
Marital status		
Married	300	75.0
Single	70	17.5
Widowed/Divorced	30	7.5
Total	400	100%
Education level		
No formal education	60	15.0
Primary school	100	25.0
Secondary school	130	32.5
College+	110	27.5
Total	400	100%

Table (2)

Among the 400 participants, 60% were non-smokers, 25% were current smokers, and 15% were former smokers. Regarding BMI, 32.5% had normal weight (18.5–24.9 kg/m²), 42.5% were overweight (25–29.9 kg/m²), and 25% were obese (≥30 kg/m²), with a mean BMI of 28.4 ± 5.2 kg/m². In terms of physical activity, 45% were classified as active (engaging in at least 150 minutes of physical activity per week), while 55% were inactive, with a mean weekly activity of 120 ± 80 minutes. Additionally, 62.5% of participants reported low fiber intake in their diet. Importantly, there was a significant relationship between physical activity and low fiber diet intake ($\chi^2 = 22.42$, $p < 0.0001$), indicating that dietary patterns were closely linked to activity levels in this population.

Table 2: Lifestyle factors and health status.

Variable	Frequency (n)	Percentage (%)
Smoking status		
Non-smoker	240	60.0
Current smoker	100	25.0
Former smoker	60	15.0
Total	400	100%
BMI category (kg/m²)		
Normal weight (18.5–24.9)	130	32.5
Overweight (25–29.9)	170	42.5
Obese (≥30)	100	25.0
Total	400	100%
Mean BMI:	28.4 ± 5.2 kg/m²	
Physical activity (≥150 min/week)		
Active	180	45.0
Inactive	220	55.0
Total	400	100%
Mean weekly physical activity:	120 ± 80 min	
Diet (low fiber intake)	250	62.5
Significant relation among participants between physical activity and low fiber diet intake, **$\chi 2$**= 22.42, p value= <0.0001		

Table (3)

In table (3), among the 400 participants, 20% reported a family history of colorectal cancer, while the remaining 80% did not. In terms of gastrointestinal (GI) symptoms experienced over the past six months, 12.5% reported rectal bleeding, 17.5% experienced a change in bowel habits, and 25% reported abdominal pain or discomfort. Additionally, 7.5% reported unintentional weight loss. Notably, half of the participants (50%) reported having no GI symptoms during this period.

Table (3): Family history and clinical symptoms.

Variable	Frequency (n)	Percentage (%)
Family history of colorectal cancer		
Yes	80	20.0
No	320	80.0
Reported GI symptoms (past 6 months)		
Rectal bleeding	50	12.5
Change in bowel habits	70	17.5
Abdominal pain/discomfort	100	25.0
Unintentional weight loss	30	7.5
None	200	50.0

Table (4)

The colorectal cancer risk assessment among the 400 participants showed that 55% were classified as low risk, 30% fell into the moderate risk category, and 15% were identified as high risk. This distribution highlights that while the majority of participants had a lower risk profile, a significant proportion still fell into moderate and high-risk groups, underscoring the importance of targeted prevention and screening efforts.

Table (4): Colorectal cancer risk stratification.

Risk category	Frequency (n)	Percentage (%)
Low risk	220	55.0
Moderate risk	120	30.0
High risk	60	15.0

Table (5)

Table 5 presents the comparison of colorectal cancer risk categories (low, moderate, and high risk) with various demographic, lifestyle, and clinical variables, along with Chi-square (χ^2) values and p-values to assess statistical significance. Gender was not significantly associated with risk categories (χ^2 = 2.88, p = 0.24), indicating similar risk distribution between males and females. Age showed a highly significant relationship with risk (χ^2 = 42.56, p < 0.0001), with older participants (≥60 years) having a higher proportion of moderate and high risk. Smoking status was also significantly associated (χ^2 = 26.77, p < 0.0001), with smokers showing a higher prevalence of moderate and high risk. BMI was

significantly related to risk ($\chi^2 = 27.45$, $p < 0.0001$), as overweight and obese individuals had a higher likelihood of falling into moderate and high-risk categories. Physical activity showed a strong inverse relationship ($\chi^2 = 35.44$, $p < 0.0001$), with inactive participants more frequently classified as moderate or high risk. Finally, family history of colorectal cancer was the strongest predictor ($\chi^2 = 118.36$, $p < 0.0001$), with those reporting a family history showing substantially higher risk levels.

Table (5): Comparison of Risk Categories with Other Variables + Chi-square and p-value.

Variable	Category	Low Risk (n)	Moderate Risk (n)	High Risk (n)	χ^2	p-value
Gender	Male	100	50	20	2.88	0.24 (NS)
	Female	120	70	40		
Age	18–39 years	110	30	10	42.56	<0.0001*
	40–59 years	80	60	30		
	≥60 years	30	30	20		
Smoking	Smoker	60	60	40	26.77	<0.0001*
	Non-smoker	160	60	20		
BMI	Normal	100	30	10	27.45	<0.0001*
	Overweight	80	50	30		
	Obese	40	40	20		
Physical activity	Active	150	50	20	35.44	<0.0001*
	Inactive	70	70	40		
Family history	Yes	50	40	30	118.36	<0.0001*
	No	170	80	30		

DISCUSSION

This study assessed colorectal cancer (CRC) risk patterns among 400 adults in Baghdad, revealing critical insights into the sociodemographic, lifestyle, and clinical factors contributing to CRC vulnerability. The mean age of participants was 45.2 ± 14.1 years, placing the sample in a middle-aged demographic where CRC risk begins to rise, especially from the fourth decade of life.[11] While CRC incidence typically increases after age 50, recent data show a disturbing trend of earlier onset among younger adults, emphasizing the need for early screening and risk assessment.[11] The sex distribution showed a slight male predominance (55%), consistent with global data suggesting that men are marginally more affected by CRC than women.[12] This disparity is often attributed to higher rates of smoking, alcohol consumption, and lower fiber intake among males.[12] The fact that 75% of participants were married is noteworthy, as marital status has been positively correlated with better health outcomes and earlier healthcare engagement, possibly due to stronger social support networks.[13] Educational level, a key determinant of health literacy, varied across the sample, with 15% having no formal education and 27.5% possessing college-level qualifications. Studies affirm that individuals with higher education are more likely to adopt preventive behaviors, participate in screening programs, and recognize early symptoms of CRC.[14] Conversely, low education levels, as seen in a significant portion of our sample, have been linked to delayed diagnoses and worse outcomes in Iraq and similar settings.[15] Lifestyle behaviors were revealing. Sixty percent were non-smokers, while 25% were current smokers. This smoking prevalence reflects regional trends, where tobacco use remains prevalent among males in particular.[16] Smoking is a well-documented CRC risk factor due to its role in chronic inflammation, DNA damage, and immune suppression.[17] Regarding body weight, 42.5% were overweight and 25% obese, with a mean BMI of 28.4 ± 5.2 kg/m². Obesity has a well-established link to CRC through pathways involving insulin resistance, insulin-like growth factors, and systemic inflammation.[18] These rates mirror regional patterns where urbanization and dietary shifts contribute to rising obesity levels.[19] Physical activity levels were suboptimal, with only 45% of participants meeting the recommended threshold. Inactivity significantly elevates CRC risk by impairing insulin sensitivity and promoting inflammation.[20] Alarmingly, 62.5% reported low fiber intake, which is associated with decreased gut motility and prolonged exposure of the colon to carcinogens.[21] The significant association between low activity and low fiber intake ($\chi^2 = 22.42$, $p < 0.0001$) highlights the clustering of unhealthy behaviors, a phenomenon well-supported by the literature.[22] Clinically, 20% of participants reported a family history of CRC, aligning with global estimates that 20–30% of CRC cases are familial.[23, 24] While this reinforces the need for targeted screening among high-risk individuals, it is critical to remember that sporadic cases still make up the majority, underscoring the importance of broad-based screening efforts. Gastrointestinal (GI) symptoms were reported by half the participants, with abdominal pain (25%), changes in bowel habits (17.5%), and rectal bleeding (12.5%) being the most common. These symptoms are classic red flags for CRC.[25–27] Though unintentional weight loss was less common (7.5%), it remains a strong indicator of malignancy and should prompt immediate evaluation.[28] The other half reported no GI symptoms, a reminder that CRC can be silent in its early stages, reinforcing the need for asymptomatic screening protocols like FIT or colonoscopy.[29] Overall, 55% were categorized as low

risk, 30% as moderate risk, and 15% as high risk. The moderate group stands to benefit from lifestyle interventions, while the high-risk group requires urgent screening, genetic counseling, and clinical follow-up.[31–34] Statistical analyses confirmed that gender was not significantly associated with CRC risk[35], while age[1], smoking[17], BMI[36], physical activity[37], and family history[38] were all significantly correlated. These findings support established global evidence and point to the urgent need for a comprehensive, multi-pronged CRC prevention strategy in Baghdad.

CONCLUSION

This study on colorectal cancer (CRC) risk revealed that over half of the participants were at low risk, while 30% were found to be at moderate risk, and 15% at high risk, highlighting the need for early prevention as nearly half the participants face elevated risk. Important risk factors identified included older age, smoking, obesity, physical inactivity, and family history. These results, aligned with global evidence, call for urgent public health action in Iraq. Recommended strategies include implementing population-wide CRC screening such as FT, promoting lifestyle changes like smoking cessation and exercise, improving dietary habits, and offering genetic counseling and colonoscopy for high-risk individuals. Public education programs and healthcare provider training are essential to raise awareness and improve early detection, while monitoring systems are needed to track progress and improve prevention efforts.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflict of Interest

The authors declare that no conflict of interest exists.

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