

RESEARCH ARTICLE

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Knowledge of Colorectal Cancer Warning Symptoms, Attitudes Toward Early Presentation, and Associated Factors Among Outpatient Attendants at Tikur Anbessa Specialized Hospital, Ethiopia

Bethlehem Abera¹, Zeki Abdurahman Abubeker^{2*}

¹Department of Surgery, Yikatif 12 Hospital Medical College, Addis Ababa

²Hepatobiliary and Pancreatic Surgery Unit, Division of General surgery, College of Health Sciences, Addis Ababa University

*Correspondence: Zeki Abdurahman, zaksurgery@gmail.com

ABSTRACT

Background: Colorectal cancer (CRC) is a major cause of cancer-related morbidity and mortality worldwide. Early diagnosis largely depends on public awareness of warning symptoms and prompt healthcare-seeking behaviors. However, evidence on CRC awareness and attitudes towards early presentation remains limited in low- and middle-income countries, including Ethiopia.

Objective: To assess knowledge of CRC warning symptoms, attitudes toward early presentation, and factors associated with knowledge and attitude among outpatient attendants at Tikur Anbessa Specialized Hospital.

Methods: An institution-based cross-sectional study was conducted among patients visiting the outpatient departments at Tikur Anbessa Specialized Hospital. Data were collected using the validated Cancer Awareness Measure (CAM) questionnaire. Good knowledge was defined as correctly identifying $\geq 70\%$ of the five key CRC warning symptoms. A positive attitude toward early presentation was defined as intending to seek healthcare within three months of noticing a warning symptom. Binary and multivariate logistic regression analyses were performed to identify factors associated with good knowledge and positive attitudes. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were reported, and statistical significance was set at $p < 0.05$.

Result: A total of 394 participants were included. Most participants were younger than 40 years (64.7%), male (65.0%), married (64.5%), and had an educational level below grade 12 (49.2%). Approximately half (51.5%) of participants were residents of Addis Ababa. Overall, 23.1% of the participants demonstrated good knowledge of CRC warning symptoms. Change in bowel habit was the least recognized warning symptom (29.7%). Participants who had previously heard of CRC were more likely to have good knowledge (AOR = 1.79; 95% CI: 1.03–3.13), as were those with a family member or close friend diagnosed with CRC (AOR = 2.44; 95% CI: 1.22–4.88). Educational status showed a positive but borderline significant association with participants' knowledge. Educational level, having a family member or close friend with CRC, and good knowledge of CRC warning symptoms were independently associated with positive attitude toward early presentation. Good knowledge was the strongest predictor of positive attitude.

Conclusion: Knowledge of CRC warning symptoms was low among outpatients at Tikur Anbessa Specialized Hospital, and more than half of the participants had an unfavorable attitude toward early presentation. Prior awareness of CRC, personal exposure to the disease, and better knowledge of warning symptoms were associated with more favorable attitudes. Strengthening public awareness and health education initiatives may improve timely healthcare-seeking behavior and support the early diagnosis of CRC.

Keywords: Colorectal cancer, awareness, warning symptoms, early presentation, bowel habit change, Ethiopia.

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INTRODUCTION

Colorectal cancer (CRC) is a major global public health concern and one of the leading causes of cancer-related morbidity and mortality. According to the Global Cancer Observatory (GLOBOCAN) 2020 estimates, CRC is the third most commonly diagnosed cancer and the second leading cause of cancer-related deaths worldwide (1). Although the highest burden has traditionally been reported in high-income countries, the incidence of CRC is rising rapidly in low- and middle-income countries (LMICs), including those in sub-Saharan Africa, largely due to population aging, urbanization, dietary transitions, physical inactivity, obesity, and other life-style-related risk factors (2).

Early diagnosis is one of the most effective strategies for reducing CRC-related mortality. Individuals who recognize warning symptoms, including persistent changes in bowel habits, rectal bleeding, unexplained weight loss, persistent abdominal pain, and unexplained anemia, are more likely to seek timely medical care, facilitating earlier diagnosis and improving treatment outcomes (3),(4). Early-stage CRC is associated with substantially higher survival rates and a greater likelihood of curative treatment than advanced-stage disease. Conversely, poor public awareness of CRC warning symptoms contributes to delayed healthcare seeking and late-stage diagnosis. Studies have consistently shown that inadequate symptom recognition is a major determinant of prolonged patient delay before seeking medical attention, resulting in many patients presenting with advanced or metastatic disease (5, 6). At advanced stages (Stage III or IV), treatment options become more complex, costly, and are often palliative rather than curative (7). Consequently, delayed diagnosis is associated with increased mortality, lower five-year survival rates, and greater healthcare expenditures, particularly in resource-constrained settings such as Ethiopia (8, 9). Consequently, late-stage presentation is strongly associated with higher mortality rates and poorer five-year survival outcomes (10, 11).

Despite the growing burden of CRC, public awareness of its warning symptoms remains low in many LMICs. Studies conducted across African countries have reported limited knowledge of CRC symptoms, poor awareness of screening services, and delayed healthcare-seeking behavior, all of which contribute to advanced-stage diagnosis (12, 13). These

challenges are further compounded by limited public education campaigns, inadequate screening infrastructure, low health literacy, and competing healthcare priorities.

Evidence from Ethiopia also indicates inadequate awareness of colorectal cancer. A cross-sectional study conducted in Jimma among 422 adult patients reported that 57.6% of participants had poor awareness of CRC. Higher awareness was associated with female sex, urban residence, higher monthly income, previous exposure to information about CRC, and a family history of the disease, whereas inability to read and write and lower educational attainment were associated with poorer awareness (14). However, evidence remains limited and is largely confined to a few geographical areas, limiting the generalizability of existing findings.

Assessment of CRC awareness is commonly conducted using the validated Cancer Awareness Measure (CAM), developed by Cancer Research UK and the University of Oxford in 2007–2008 (15). The CAM has subsequently demonstrated good validity and reliability in population-based surveys and has become one of the most widely used instruments for evaluating public awareness of cancer warning symptoms (16).

Patient delay in presentation is commonly defined as waiting more than three months after the onset of cancer-related symptoms before seeking medical care (4, 6). Insufficient awareness of CRC warning symptoms is considered one of the principal contributors to this delay. However, awareness alone may not necessarily translate into timely healthcare-seeking behavior. Understanding the relationship between knowledge of CRC warning symptoms and attitudes toward early presentation is therefore essential for designing effective public health interventions that promote earlier diagnosis.

In Ethiopia, organized public awareness initiatives and population-based screening programs for colorectal cancer remain limited, and many patients continue to present with advanced disease. Furthermore, little is known about public knowledge of CRC warning symptoms or the factors influencing awareness and attitudes toward early presentation. In particular, evidence on the relationship between knowledge of CRC warning symptoms and attitudes toward seeking timely healthcare is scarce. Therefore, this study aimed to assess knowledge of colorectal cancer warning symptoms,

evaluate attitudes toward early presentation, identify factors associated with both knowledge and attitudes, and examine the relationship between knowledge and attitudes among outpatient attendants at Tikur Anbessa Specialized Hospital, Ethiopia.

METHODS

Study design, setting, and participants

An institution-based cross-sectional study was conducted at Tikur Anbessa Specialized Hospital (TASH), Addis Ababa, Ethiopia. TASH is the country's largest tertiary referral and teaching hospital, providing specialized healthcare services to patients from across Ethiopia.

The study population comprised adult attendants accompanying patients attending outpatient departments during the study period. Individuals aged 19 years or older who were willing to participate were eligible for inclusion. Attendants who were seriously ill or unable to communicate effectively were excluded from the study.

The required sample size was calculated using the single population proportion formula, assuming a 95% confidence level, a 5% margin of error, and a 50% proportion, yielding a final sample size of 394 participants.

Participants were recruited using a consecutive convenience sampling technique. All eligible attendants encountered in outpatient departments, inpatient wards, referral clinics, cafeterias, and other hospital service areas during the data collection period were invited to participate consecutively until the required sample size was achieved.

Data collection instrument

Data were collected using a structured interviewer-administered questionnaire adapted from the Cancer Awareness Measure (CAM) developed by Cancer Research UK and University College London (15) and subsequently validated for assessing public awareness of cancer symptoms subsequently validated (16). The questionnaire consisted of four sections covering sociodemographic characteristics; knowledge of colorectal cancer warning symptoms; attitudes toward early presentation; and previous exposure to colorectal cancer information and related experiences. The questionnaire was translated into Amharic and back-translated into English to ensure consistency. Data collectors received training before

the commencement of data collection.

Measurement of variables

Knowledge of Colorectal Cancer warning symptoms

Knowledge of colorectal cancer warning symptoms was assessed using five symptom-specific questions adapted from the validated CAM questionnaire. The warning symptoms included change in bowel habits; blood mixed with stool; unexplained weight loss; persistent abdominal pain; and unexplained fatigue.

Each correct response received one point, whereas incorrect or "I don't know" responses received zero points, resulting in a total score ranging from 0 to 5. Participants who correctly identified at least four of the five warning symptoms ($\geq 70\%$) were classified as having good knowledge, while those scoring below this threshold were considered to have poor knowledge (17).

Attitude toward Early presentation

Attitude toward early presentation was assessed using seven questionnaire items. Total attitude scores ranged from 0 to 7. Participants scoring five or more points ($\geq 70\%$) were classified as having a positive attitude toward early presentation, whereas those scoring below five were considered to have a negative attitude (4, 6). In addition, participants who indicated that they would seek medical attention within three months of recognizing a colorectal cancer warning symptom were considered to have an intention toward early presentation.

Data analysis

Data were entered, cleaned, and analyzed using SPSS version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize participant characteristics and study variables.

Binary logistic regression analysis was initially performed to examine the association between each independent variable and the study outcomes (knowledge of colorectal cancer warning symptoms and attitude toward early presentation). Variables with a p-value < 0.25 in the binary analysis were included in the multivariable logistic regression model. Adjusted odds ratios (AORs) with 95% confidence intervals (CIs) were calculated to identify independent predictors. Statistical significance was declared at $p < 0.05$.

Ethical considerations

Ethical approval was obtained from the Institutional Review Board of Addis Ababa University (Reference No. Dos/REC/90/2022). Written informed consent was obtained from all participants before data collection. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without consequence. Confidentiality was maintained by assigning unique identification codes instead of personal identifiers, and all study data were securely stored. Results are presented in aggregate to ensure participant anonymity.

RESULTS

Sociodemographic characteristics

A total of 394 participants were included in the study. The largest proportion of participants were aged 20–29 years (34.8%), while only 5.3% were aged 60 years or older. Most participants were male (65.0%), married (64.5%), and had an educational level below Grade 12 (49.2%). Approximately half (51.5%) were residents of Addis Ababa (Table 1).

Table 1: Sociodemographic Characteristics of Study Participants at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia (N = 394)

Variables	Number (n)	Percent (%)
Age (years)		
20-29	137	34.8
30-39	118	29.9
40-49	70	17.8
50-59	48	12.2
>60	21	5.3
Gender		
Male	256	65
Female	138	35
Marital status		
Married	254	64.5
Single	116	29.4
Divorced	17	4.3
Widow	7	1.8
Address		
Addis Ababa	201	51.1
Amhara	72	18.3
Oromia	73	18.5
Others	203	11.7
Highest level of education		
No formal education	73	18.5
Less than 12 th grade	194	49.2
Diploma/degree	116	29.4
Masters/Doctorate	11	2.8
Monthly income (ETB)		
Less than 1000	90	22.8
1000-5000	190	48.2
5000-10000	70	17.8
>10000	30	7.6
Family/close friend with CRC		
Yes	43	10.1
No/I don't know	351	89

Recognition of Colorectal Cancer Warning Symptoms

Overall, 91 participants (23.1%) demonstrated good knowledge of CRC warning symptoms, whereas 303 (76.9%) had poor knowledge.

Among the individual warning symptoms assessed, rectal bleeding and unexplained weight loss were the most frequently recognized, identified by 36.8% of participants each. This was followed by unexplained fatigue and pain during defecation (34.2% each), persistent abdominal pain (31.9%), lump in the anus (29.9%), and change in bowel habits (29.7%), which was the least recognized warning symptom (Table 2).

Among participants with good knowledge, 61.0% were male, 70.5% were aged 20–40 years, 70.5% reported a monthly income below ETB 5,000, 65.2% were married, and 52.6% resided in Addis Ababa.

Table 2: Recognition of Colorectal Cancer Warning Symptoms Among Study Participants at Tikur Anbessa Specialized Hospital, Ethiopia (N = 394)

Colorectal cancer warning symptom	Recognized, n(%)
Rectal bleeding	145 (36.8)
Unexpected weight loss	145 (36.8)
Unexpected fatigue	135 (34.2)
Pain during defecation	135 (34.2)
Persistent abdominal pain	126 (31.9)
Lump in the anus	118 (29.9)
Change in bowel habit	117 (29.7)

Factors associated with good Knowledge of Colorectal Cancer Warning Symptoms

Multivariable logistic regression analysis showed that sex, age, and educational level were not independently associated with good knowledge of CRC warning symptoms (Table 3). Although participants with secondary education had higher odds of good knowledge than those with no formal education, the association was of borderline statistical significance (AOR = 2.35, 95% CI: 0.97–5.69; $p = 0.059$).

Participants who had previously heard of colorectal cancer were significantly more likely to have good knowledge than those who had not (AOR = 1.79, 95% CI: 1.03–3.13; $p = 0.038$). Similarly, participants who reported having a family member or close friend with colorectal cancer had significantly higher odds of good knowledge compared with those without such experience (AOR = 2.44, 95% CI: 1.22–4.88; $p = 0.011$) (Table 3).

Table 3: Factors Associated with Good Knowledge of Colorectal Cancer Warning Symptoms Among Study Participants: Multivariable Logistic Regression Analysis (N = 394)

Variable	Adjusted OR (95% CI)	P-value
Sex		
Female	1.01 (0.59-1.74)	0.960
Male	1	
Age (years)	0.89 (0.71-1.13)	0.357
Education		
Primary	1.19 (0.51-2.77)	0.694
Secondary education	2.35 (0.97- 5.69)	0.059
College or above	1.35 (0.27 – 6.71)	0.717
No formal education	1	
Heard of CRC		
Yes	1.79 (1.03-3.13)	0.038
No	1	
Close family		
Yes	2.44 (1.22-4.88)	0.011
No	1	

Attitudes toward Early Presentation

Overall, 302 (76.6%) participants had a positive attitude toward early presentation, whereas 92 (23.4%) had a negative attitude. However, 229 (58.1%) participants reported that they would delay seeking medical care for more than three months after noticing symptoms suggestive of colorectal cancer.

There was a statistically significant association between knowledge of colorectal cancer warning symptoms and attitudes toward early presentation ($\chi^2 = 110.53$, $p < 0.001$). Among participants with good knowledge, 90.1% had a positive attitude compared with 72.6% of those with poor knowledge (Table 4).

Factors Associated with Positive Attitudes Toward Early Presentation

Variables with a p -value < 0.25 in the bivariable analysis were included in the multivariable logistic regression model. After adjustment for potential confounders, educational level, having a family member or close friend with colorectal cancer, and knowledge of CRC warning symptoms remained significantly associated with a positive attitude toward early presentation (Table 5).

Compared with participants with no formal education, those with education below Grade 12 (AOR = 5.37, 95%

CI: 2.06–13.99; $p = 0.001$) and those with a diploma or degree (AOR = 5.20, 95% CI: 1.89–14.43; $p = 0.002$) were significantly more likely to have a positive attitude toward early presentation.

Participants who had a family member or close friend diagnosed with colorectal cancer were also more likely to report a positive attitude than those without such experience (AOR = 4.69, 95% CI: 1.84–11.91; $p = 0.001$).

Knowledge of colorectal cancer warning symptoms was strongly associated with a positive attitude toward early presentation. Participants with good knowledge had substantially higher odds of reporting a positive attitude than those with poor knowledge (AOR = 38.58, 95% CI: 15.87–93.79; $p < 0.001$). In contrast, age, marital status, and previous awareness of colorectal cancer were not independently associated with attitudes toward early presentation (all $p > 0.05$) (Table 5).

Table 4: Association Between Knowledge of Colorectal Cancer Warning Symptoms and Attitudes Toward Early Presentation Among Study Participants (N = 394)

Knowledge of CRC warning symptoms	Positive attitude n (%)	Negative attitude n (%)	Total n (%)
Good knowledge	82 (90.1)	9 (9.9)	91 (23.1)
Poor knowledge	220 (72.6)	83 (27.4)	303 (76.9)
Total	302 (76.6)	92 (23.4)	394 (100.0)

$$\chi^2 = 110.53, p < 0.001$$

Table 5: Factors Associated with Positive Attitudes Toward Early Presentation of Colorectal Cancer Warning Symptoms: Multivariable Logistic Regression Analysis (N = 394)

Variable	AOR (95% CI)	P-value
Age (years)		
20-29	1	
30-39	0.86 (0.43-1.69)	0.655
40-49	0.87 (0.36-2.12)	0.764
50-59	0.75 (0.28-1.98)	0.558
>60	0.49 (0.09-2.55)	0.400
Marital status		
Married	1	
Single	1.60 (0.84-3.04)	0.149
Divorced	0.66 (0.14-3.08)	0.603
Widow	0.23 (0.01-8.21)	0.420
Highest level of education		
No formal education	1	
Less than 12 th grade	5.37 (2.06-13.99)	0.001
Diploma/degree	5.20 (1.89-14.43)	0.002
Masters/Doctorate	1.54 (0.21-11.24)	0.670
Heard of CRC		
Yes	1.57 (0.88-2.84)	0.136
No	1	
Close family/friend with CRC		
Yes	4.69 (1.84-11.91)	0.001
No	1	
Knowledge on CRC warning signs		
Good	38.58 (15.87-93.79)	0.000
Poor	1	

DISCUSSION

This study assessed knowledge of CRC warning symptoms, attitudes toward early presentation, and factors associated with both outcomes among adult attendants at Tikur Anbessa Specialized Hospital. Overall, knowledge of CRC warning symptoms was low, with fewer than one-quarter of participants demonstrating good knowledge. More than half of the participants reported that they would delay seeking medical care for more than three months after recognizing CRC warning symptoms. Previous awareness of CRC and having a family member or close friend diagnosed with CRC were independently associated with better knowledge, while educational level, personal exposure to CRC, and knowledge of CRC warning symptoms were independently associated with positive attitudes toward early presentation.

The low level of knowledge observed in this study is consistent with findings from other low- and middle-income countries, where public knowledge of CRC remains inadequate despite the increasing burden of the disease (1, 2). Similar findings have been reported from Nigeria, Kenya, and southwest Ethiopia, where poor recognition of CRC symptoms and limited awareness of screening contribute to delayed diagnosis and advanced-stage disease presentation (12-14). The low level of knowledge in our study may reflect limited public education on colorectal cancer, the absence of organized screening programs, low media coverage of cancer prevention, and restricted access to reliable health information in Ethiopia.

Participants who had previously heard of CRC and those with a family member or close friend diagnosed with the disease were more likely to demonstrate good knowledge of CRC warning symptoms. Similar associations have been reported elsewhere, suggesting that previous exposure to cancer-related information or personal experience increases awareness of symptoms and encourages individuals to seek additional health information (18-20). These findings support the importance of community-based education and patient advocacy in improving public knowledge of colorectal cancer.

Unlike previous studies conducted in the Ethiopia (16), United Kingdom and Australia (14, 21), which reported higher levels of CRC awareness among individuals with higher income, monthly income was not independently associated with

knowledge in the present study. Likewise, although previous studies found women to have better awareness of CRC than men (14, 22), sex was not significantly associated with knowledge in our study. These differences may reflect variations in study populations, socioeconomic contexts, access to health information, or cultural differences in health-seeking behavior. Educational attainment appeared to be a more important determinant of knowledge than income in our setting.

Consistent with the findings from Jimma (14), participants with little or no formal education demonstrated lower levels of knowledge. Although participants with secondary education showed higher odds of good knowledge, the association was only of borderline statistical significance, and no significant association was observed among those with college education or above. This may be attributable to the relatively small number of participants in the higher educational categories, resulting in limited statistical power. Nevertheless, these findings suggest that inadequate knowledge of CRC may extend across educational groups in settings where structured public cancer education programs are limited (16). Consequently, awareness interventions should target the general population rather than focusing solely on specific educational groups.

Recognition of individual CRC warning symptoms was also poor. Change in bowel habits, one of the most common early manifestations of colorectal cancer, was the least recognized warning symptom in the present study. In contrast, studies from the United Kingdom reported change in bowel habits as the most frequently recognized CRC warning symptom, followed by persistent abdominal pain, while tiredness and abdominal lumps were among the least recognized symptoms (21, 22). Failure to recognize early bowel symptoms may contribute to delays in seeking medical care and ultimately to late-stage diagnosis. This finding highlights an important gap that should be addressed in future public awareness campaigns.

An important finding of this study was the strong association between knowledge of CRC warning symptoms and positive attitudes toward early presentation. Participants with good knowledge were substantially more likely to report favorable attitudes toward seeking timely medical care than those with poor knowledge. Similar findings have been reported in previous studies, which demonstrated that greater awareness of cancer symptoms is associated with shorter patient delay and

earlier diagnosis (4). Although the cross-sectional nature of this study precludes establishing causality, the observed association suggests that improving public knowledge may promote more favorable attitudes toward timely healthcare seeking.

Educational attainment was also independently associated with positive attitudes toward early presentation. Participants who had completed secondary education or higher were more likely to report positive attitudes than those with no formal education. Similar findings have been reported in Jordan and China, where higher educational attainment was associated with better knowledge, more favorable attitudes toward cancer prevention, and greater willingness to participate in early detection practices (23-25). Higher education may improve health literacy, enabling individuals to recognize warning symptoms, interpret health information, and appreciate the benefits of early diagnosis.

Similarly, participants with a family member or close friend diagnosed with CRC were more likely to report positive attitudes toward early presentation. Personal experience with cancer may increase perceived susceptibility and reinforce the importance of seeking prompt medical attention when symptoms occur. Comparable findings have been reported from Jordan and other settings, where familiarity with colorectal cancer was associated with greater willingness to participate in screening and early detection activities (23, 26).

Strengths and Limitations

This study used the validated Cancer Awareness Measure (CAM) questionnaire, allowing comparison with findings from other countries. In addition, it examined both knowledge of CRC warning symptoms and attitudes toward early presentation, providing a broader understanding of factors that may influence timely healthcare-seeking behavior.

However, several limitations should be considered. First, the cross-sectional design precludes establishing causal relationships between knowledge and attitudes. Second, the study was conducted at a single tertiary hospital using consecutive sampling, which may limit the generalizability of the findings to the wider Ethiopian population. Third, self-reported responses are subject to recall and social desirability bias. Finally, the study assessed intended healthcare-seeking behavior rather than actual healthcare utilization, which may differ from participants' real-world actions.

Conclusion and recommendation

Knowledge of colorectal cancer warning symptoms was low among adult attendants at Tikur Anbessa Specialized Hospital, and many participants reported that they would delay seeking medical care after recognizing potential CRC symptoms. Previous awareness of CRC and personal exposure to the disease were associated with better knowledge, while educational attainment, personal exposure to CRC, and knowledge of warning symptoms were independently associated with more favorable attitudes toward early presentation. These findings underscore the need to strengthen public education and awareness initiatives aimed at improving recognition of colorectal cancer warning symptoms and encouraging timely healthcare seeking. Such interventions may facilitate earlier diagnosis and ultimately improve colorectal cancer outcomes in Ethiopia.

Author Contributions

Zeki Abdurahman conceptualized and designed the study, performed the data analysis, interpreted the findings, and drafted the manuscript. Bethlehem Abera contributed to data collection, data interpretation, and critical revision of the manuscript. All authors reviewed, approved the final version of the manuscript, and agree to be accountable for all aspects of the work.

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Conflict of Interest

The authors declare that they have no competing interests.

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