

## RESEARCH ARTICLE

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# Awareness of Colorectal Cancer and associated Factors among Adults in Bahir Dar City, Northwest, Ethiopia

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## Abstract

**Background:** Colorectal cancer (CRC) is characterized by abnormal cancerous division of cells in the colon or rectum. Colorectal cancer (CRC) is the second most prevalent cause of cancer-related deaths worldwide. Therefore, this study aimed to assess awareness of colorectal cancer and its associated factors among adults in Bahir Dar City, Northwest Ethiopia, in 2023. **Methods:** A community-based, cross-sectional study was conducted in Bahir Dar City from April 17 to May 23, 2023. A total of 845 participants were selected using stratified multi-stage sampling. Interviewer administered questionnaire and validated cancer awareness Questionnaire were used to measure awareness of colorectal cancer in adults. **Results:** In this study, a total of 845 individuals were approached, and 839 participated, with a response rate of 99.2%. Out of 839 respondents, 314 (37.4%) of them had a high awareness of colorectal cancer. Being female (AOR (4.6) 95% CI (3.19-6.63), living in urban areas [AOR = 4.74; 95% CI (3.14-7.15)], educational level secondary school [AOR = 2.1 times; 95% CI (1.02-4.32)] and college and above [AOR = 22.9; 95% CI (1.13-6.47)], and heard about colorectal cancer [AOR = 4.29; 95% CI (2.96-6.22)] had high awareness of colorectal cancer. **Conclusion and recommendation:** The current study revealed that awareness of colorectal cancer was low. Sex, residency, level of education, and hearing about CRC, were associated factors of the awareness of CRC. Therefore, community-based education should be promoted about awareness of colorectal cancer.

**Keywords:** Awareness- colorectal cancer- Bahir Dar City- Ethiopia

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## Introduction

Colorectal cancer (CRC) is one of the most common cancers that occur in the mucosal layer of the lower digestive system. The second most prevalent cause of cancer-related deaths worldwide and the third most frequently diagnosed malignancy is CRC, which has been linked to several lifestyle-related variables [1–4]. According to predictions from the global burden of disease, by 2030, colorectal cancer (CRC) will be responsible for 10% of all new cases of cancer and 9.4% of all cancer-related deaths. These statistics are expected to rise by 60% to more than 2.2 million new cases and 1.1 million deaths [5,6]. Early identification of colorectal cancer (CRC) improves survival rates and reduces psychological suffering for patients and their families. A better knowledge of CRC may lead to increased screening participation from the general public as a result of increased public awareness of the disease [7,8].

The prevalence of colorectal cancer is rapidly increasing due to the increased prevalence of modifiable risk factors like smoking, alcohol, unhealthy diet, and sedentary lifestyle. Nevertheless, increasing the

awareness of people about lifestyle modification, predictor identification, and recognizing warning signs and symptoms may be important to reduce CRC morbidity and mortality. Research indicates that several variables, such as age, sex, education level, place of residence, information source, family history, having chronic disease follow-up, are related to awareness of colorectal cancer [9–11].

In Ethiopia, CRC is the third most prevalent cancer among the entire adult population, and patients often present with advanced stages of cancer [12]. A previous study in Ethiopia shows that CRC is the second most commonly diagnosed cancer (19%) among men and the fourth diagnosed cancer (5%) among women, and a fast-rising burden of colorectal cancer due to the increased prevalence of modifiable risk factors such as smoking, alcohol, unhealthy diet, sedentary lifestyle [13,14].

Therefore, this suggests that a study describing general awareness of CRC risk factors and warning signals is necessary. It is imperative to increase awareness of the disease to promote healthy lifestyle choices, better CRC management practices, and the implementation of global screening programs all of which are critical to lowering

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morbidity and death in the future [6]

Early detection of CRC does increase survival rates and lessen psychological distress for patients and their families [7]. Increasing public awareness of CRC may encourage more participation in screening among the general public as a result of a better understanding of the condition [8]. Although Ethiopia's National Cancer Control Plan for the years 2016–2020 lists service delivery as the primary strategy for preventing cancer through public awareness of colorectal cancer about 60% of the interventions will be delivered through primary care (which includes community-based interventions, health posts, health centers, and primary hospitals), about 20% at the secondary level of care, and about 20% at the tertiary level of disease intervention [15, 16]. Therefore there are limited studies in Ethiopia on awareness of colorectal cancer and associated factors. However, as far as my search goes, there is no study on the study area's awareness of CRC and associated factors among adults living in Bahir Dar City. This study was to determine the awareness of colorectal cancer and identify factors associated with awareness of colorectal cancer among adults living in Bahir Dar city, Northwest Ethiopia. This study will support health experts to design a way to provide information to the community and the finding can be useful for researchers, educators, and clinicians who prefer to study related subjects in addition to the baseline information.

## Materials and Methods

### *Study design and setting*

A community-based cross-sectional study was conducted from April 17 to May 23, 2023. The study was conducted in Bahir Dar city, the capital city of Amhara National Regional State of Ethiopia. The town is situated 578km Northwest of Addis Ababa the capital city of Ethiopia.

### *Sample and population*

All adults who were living in Bahir Dar City were the source population. All adults living in the selected kebele of Bahir Dar city at the time of the data collection period were the study participants. A total of 845 study subjects was estimated using a single population proportion formula taking the prevalence 50% with a 95% confidence interval; ( $\alpha = 0.05$ ), 5% margin of error, 10% non-response rate, and 2 design effect. Individuals who had a history of colorectal cancer treatment and who resided in the study area less than six months before the study period were excluded from participating in the study.

A multistage sampling technique was used to recruit the study participants. First, out of the six sub-cities in Bahir Dar city, four were chosen by lottery. Then ten kebele were randomly chosen from each sub-cities. A list of all kebele was identified from Bahir Dar city municipality. Then the list of households residing in each kebele was obtained from urban and rural health extension workers at each kebele. Then the required sample size from each kebele was allocated proportionally to the size of participants in each kebele. Systematic random sampling was used to

select households and the first households were selected by lottery method. When the eligible participants in one selected household were more than one, only one respondent was selected by simple random sampling using the lottery method. Trained nurses collected the data through face-to-face interviews using a pretest and structured Amharic language version questionnaire. The data collection process was supervised by two MSC nurses and the principal investigator.

### *Data collection procedure and measurement*

The dependent variable for this study was awareness of colorectal cancer (high/low). It was defined as awareness of colorectal cancer when high awareness: participants who scored 15 (>75%) and above from the provided 20-item questions about the awareness of CRC were considered to have high awareness [11].

Low awareness: those who scored below 15 [<75%] on awareness 20-item questionnaires were considered to have low awareness [11]. The independent variables were Socio-demographic variables including age, religion, sex, marital status, and level of Education, and residency, occupation). Information-related factors (having heard about CRC and knowing the source of information about CRC). Individual-related factors (having a family history of CRC, having a chronic disease follow-up).

Data were collected using an interviewer-administered structured questionnaire. The survey was designed by the principal author and to develop the questionnaires' a thorough searching of the previously validated published studies that were conducted on public and health care awareness of CRC. From the findings, questions were adapted to fit the objectives of our study. Cancer Awareness Measure (CAM) questionnaires were utilized to assess awareness about colorectal cancer symptoms and risk factors. The CAM is a validated standard questionnaire developed by Cancer Research UK, University College London [17] and previously validated published studies that were conducted on public and health care awareness of CRC [11,18,19]. The data was further assured through careful planning and translation of the questionnaire; the English version was translated into the local language, Amharic. The following measures were taken to improve data quality. A pre-test was conducted on 42 (5%) adults in Gondar town one week before the actual data collection. After this, the internal consistency (Cronbach's alpha) in this study was 0.82 which can be considered adequate. To maintain the validity of the tool, its content was reviewed by a senior clinician oncologist expert researcher, and instructors. The instrument asked to say "Yes or No" answers where "Yes" indicated an exact response which scored 1 mark and those who answered "No" scored 0. From the 20-item questionnaire, a total mark of 15 or more ( $\geq 75\%$ ) was referred to as the respondents attaining high awareness, whereas respondents who scored less than 15 (<75%) were attaining low awareness [11,18,19]. The two-day training was given to data collectors before the data collection process. Then the questions were checked for clarity, understandability, and simplicity. The completeness of the data was checked onsite daily during data collection and received prompt feedback from the

supervisor and principal investigator. All completed data collection forms were examined for completeness and consistency during data management, storage, cleaning, and analysis. Five trained diploma nurses were employed as data collectors and two MSC nurses as supervisors.

#### Data processing and analysis

Data were entered into Epidata version 4.6.0 and uploaded to Stata version 14 for analysis. Calculations were made in the descriptive analysis for percentages, frequencies, and central tendencies. Adjusted odds Ratio (AOR) with a 95% confidence interval was used to report the association of variables. Independent variables significant at 0.25 in the bivariate analysis were entered and analysis was declared at p-values of 0.05. The goodness of the model was assessed Hosmer and Lemeshow test.

#### Ethical approval and consent to participate

This study was reviewed and approved by an Institutional Review Board of the College of Medicine and Health Sciences, University of Gondar, Ethiopia (Protocol No. S/N /190/2015). All participants provided written informed consent. The study was conducted following the Declaration of Helsinki.

## Results

#### Socio-demographic characteristics of the respondents

A total of 845 were approached and 839 participated in this study making a response rate of 99.2%. Almost half 428 (51%) of the respondents were female, More than a third 616 (73.42%) of the respondents were married and 642 (76.52%) were followers of the Orthodox religion. Most 437 (52.09%) of the participants live in the Urban area. As for the educational level, 290 (34.56) of respondents attended elementary (1 - 8) school while 305 (36.35%) attended college and above, as for occupational status 294 (35.04%) of respondents were employees (Table 1, Figure 1).

Table 1. Socio- Demographic Characteristics of Respondents

Variable	Category	Frequency	Percent
Age in year	20-29 year	59	7.03
	30-39 year	211	25.15
	40-49 year	293	34.92
	>50 year	276	32.9
Sex	Male	411	48.99
	Female	428	51.01
Marital status	Single	127	15.14
	Married	616	73.42
	Widowed	55	6.56
	Divorced	41	4.89
Religion	Muslim	178	21.22
	Orthodox	642	76.52
	Protestant	19	2.26
Residence	urban	437	52.09
	rural	402	47.91
Occupation	Employee	294	35.04
	Merchant	188	22.41
	Retire	19	2.26
	Farmer	246	29.32
	Housewife	92	10.97

#### Information-related factors of respondents

One hundred forty-five (33.88%) of the respondents had received information concerning CRC from health care providers followed by social media 104(24.3%)

#### Awareness of respondents of colorectal cancer

Among the study participants, 536 (63.9%) of them aware that, family history was the most commonly significant non-modifiable risk factor that plays a role in colorectal cancer, followed by aging 440 (52.4%) and type 2 diabetes mellitus 472 (56.3%). The findings of this study showed that the majority 659 (78.55%) of the participants

#### Information-related factors of respondents

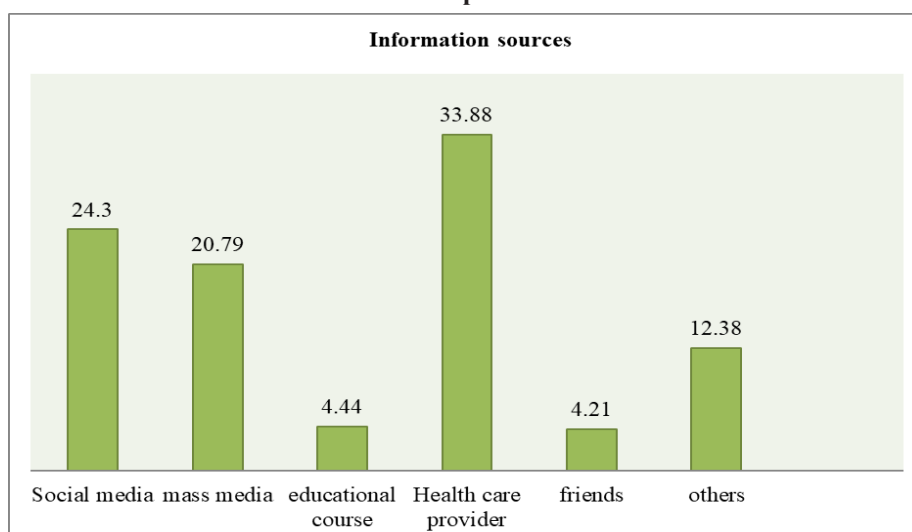


Figure 1. Total Distribution of Respondents' Sources of Information about Colorectal Cancer among Adults in Bahir Dar City, Northwest, Ethiopia, 2023 (n= 428)

Table 2. Awareness Regarding Colorectal Cancer Risk Factors and Symptoms among Respondents

Awareness Question	Yes		No	
	Freq.	%	Freq.	%
Alcohol consumption is a risk factor for CRC	653	77.83	186	22.17
Smoking cigarettes is a risk factor for CRC	659	78.55	180	21.45
Lack of vegetables and fruits is a risk factor for CRC	426	50.77	413	49.23
Eating highly red meat is a risk factor for CRC	368	43.9	471	56.1
Eating a low-fiber diet is a risk factor for CRC	328	39.1	511	60.9
Overweight/obesity is a risk factor for CRC	414	49.34	425	50.66
Aging is a risk factor for CRC	440	52.44	399	47.56
Family history influences the incidence of CRC	536	63.9	303	36.1
Lack of physical exercise is a risk factor for CRC	439	52.32	400	47.68
Type 2 diabetes is a risk factor for CRC	472	56.3	367	43.7
Prior colon diseases are a risk factor for CRC	611	72.8	228	27.2
Rectal bleeding is a symptom of CRC	508	60.55	331	39.45
Weight loss is a symptom of CRC	515	61.38	324	38.62
Change in bowel habits is a symptom of CRC	406	48.39	433	51.61
The sensation of a non-full dump of waste	419	49.9	420	50.1
Chronic abdominal pain is a symptom of CRC	526	62.7	313	37.3
Anemia is a symptom of CRC	439	52.32	400	47.68
Blood in stool is a symptom of CRC	497	59.2	342	40.8
Loss of appetite is a symptom of CRC	426	50.77	413	49.23
A lump lower abdomen is a symptom of CRC	261	31.1	578	68.9

Table 3. Factors associated with the awareness of Colorectal Cancer

Variable	Categories	Awareness		COR (95%CI)	AOR (95%CI)	p-value
		High n. (%)	Low n. (%)			
Sex	Female	229 (72.93)	199 (37.9)	4.41 (3.25,5.99)	4.6 (3.19,6.63)	0
	Male	85 (27.07)	326 (62.1)	Ref.	Ref.	
Marital status	Single	45 (14.33)	82 (15.62)	Ref.	Ref.	
	Married	242 (77.04)	374 (71.24)	1.17 (0.79,1.76)	0.81 (0.50,1.32)	0.41
	Widowed	17(5.41)	38 (7.24)	0.82 (0.41,1.61)	0.71 (0.30,1.69)	0.44
	Divorced	10 (3.18)	31 (5.9)	0.59 (0.26,1.31)	0.57 (0.20,1.59)	0.28
Religion	Muslim	54 (17.2)	124 (23.62)	Ref.	Ref.	
	Orthodox	253 (80.57)	389 (74.1)	1.49 (1.05,2.13)	0.94 (0.59,1.48)	0.799
	Protestant	7 (2.23)	12 (2.29)	1.34 (0.5,3.59)	0.54 (0.17,1.75)	0.3
Occupation	Employee	155 (49.36)	139 (26.48)	Ref.	Ref.	
	Merchant	59 (18.79)	129 (24.57)	0.41 (0.27,0.60)	1.00 (0.53,1.87)	0.98
	Retire	6 (1.91)	13 (2.48)	0.41 (0.15,1.12)	0.69 (0.21,2.26)	0.54
	Farmer	64 (20.38)	182 (34.67)	0.31 (0.22,0.45)	1.37 (0.71,2.65)	0.34
	Others	30 (9.55)	62 (11.81)	0.43 (0.26,0.71)	1.14 (0.55,2.35)	0.71
Residence	Urban	229 (72.93)	208 (39.62)	4.11 (3.03,5.56)	4.74 (3.14,7.15)	0
	Rural	85 (27.07)	317 (60.38)	Ref.	Ref.	
Level of Education	Unable to read and write	18 (5.73)	71 (13.52)	Ref.	Ref.	
	primary school	71 (22.61)	219 (41.71)	1.27 (0.71,2.29)	1.13 (0.96,2.85)	0.36
	secondary school	58 (18.47)	97 (18.48)	2.35 (1.28,4.34)	2.1 (1.02,4.32)	0.04
	Collage and above	167 (53.18)	138 (26.29)	4.77 (2.71,8.38)	2.9 (1.3,6.47)	0.009
Heard about CRC	Yes	239 (76.11)	189 (36)	5.67 (4.14,7.76)	4.29 (2.96,6.22)	0
	No	75 (23.89)	336 (64)	Ref.	Ref.	

COR, Crude odds ratio; AOR, adjusted odds ratio; 95%CI, 95%confidence interval; Ref, Reference

were aware that the highest modifiable agent of CRC was smoking followed by alcohol consumption 653 (77.8%) lack of vegetables and fruits intake 426 (50.8%) and Overweight/obesity 414 (49.3%). Regarding participants' awareness of warning signs of CRC, chronic abdominal pain 526 (62.7%) weight loss 515 (61.38) and rectal bleeding 508 (60.6%) were the most common warning symptoms described the change in bowel habits 406 (48.4%), and a lump in the lower abdomen 261(31%) were the stated symptoms of colorectal cancer by participants respectively (Table 2).

#### *Factors associated with the awareness of colorectal cancer*

In multivariable logistic regression analysis factors that were significantly associated with p-value <0.05 awareness of colorectal cancer were after controlling confounders in the final model, sex, residency, level of education, and hearing about CRC.

There was a significant association between awareness of CRC and sex (P= 0.000). The study participants who were female are almost 4.6 times more likely to have a high awareness of colorectal cancer AOR; 4.6, 95%CI: 3.19-6.63 as compared to males. Residency has a significant relationship with awareness of CRC (P= 0.00). Adults who are living in urban areas were 4.74 times more likely to have a high awareness of colorectal cancer AOR; 4.74, 95% CI: 3.14-7.15 than those participants living in urban areas. Similarly, secondary school level (P =0.04) were 2.1 times, college and above (P =0.009) 2.9 times more likely to have a high awareness of colorectal cancer with AOR; 2.1, 95%CI: 1.02-4.32 and AOR; 2.9, 95%CI: 1.1.3-6.47 respectively as compared to those adults educational level of unable to read and write. Participants who heard about CRC have a significant relationship with awareness of CRC (P = 0.000). Additionally, adults who had heard about CRC were 4.29 times more likely to have a high awareness of CRC AOR; 4.29, 95% CI: 2.96-6.22 compared to never heard about CRC (Table 3).

## **Discussion**

This study assessed the awareness of CRC and associated factors among adults in Bahir Dar city, North-West Ethiopia. The overall finding showed that 37.4% with a 95% CI (34.2-40.7). of the study participants had a high awareness of CRC. The result is in line with a study done in Palestine 40% of respondents had an awareness of CRC [20]. The possible reason may be a similar study design.

However, the finding of awareness of CRC in this study 37.4% was lower than the study done in Jimma 42.4 % had awareness of CRC [11], the Kingdom of Bahrain 56% had awareness of CRC [21], and the United Arab Emirates 65% had awareness of CRC [28]. This discrepancy might be due to differences in socio-demographic characteristics, and educational status and might be due to the difference in study settings, health care setup, and health information dissemination.

On the contrary, the awareness of CRC in Bahir Dar city, 37.4% was higher than studies conducted in Jordan

(32.8%), Klang Valley (29.1%) [22], and Lebanon (31.5) [19]. The possible explanation might be for Jordan might be due to the study area, and source of population. Klang Valley might be due to a smaller sample size.

Sex, residency, level of education, and hearing about CRC, were identified as factors that were significantly associated with awareness of colorectal cancer among adults in this study. The study participants who were females were almost 4.6 times more likely to have a high awareness of colorectal cancer as compared to males. The result of the current study is supported by the findings of the study conducted in Jimma [11], Gaza Strip [23], Kingdom of Bahrain [9], Palestine [20], Jordan [24], Qatar [25], Caribbean [26]. This sex gap may be caused by the fact that females are more likely than males to receive cancer-related health education or information in connection with their encounters with reproductive health care providers, and males are roughly two times as likely to exhibit low levels of health-seeking behavior [27]. This finding suggests that males should be informed of the disease risk factors and symptoms.

In this study living in urban areas were 4.74 times more likely to have high awareness of colorectal cancer than those participants living in rural areas. The study conducted in Jimma [11], Malaysia, supports this study. The probable explanation for this might be that adults who live in urban areas frequently obtain information from the mass media (television, radio), and social media, and they have improved their awareness of how to use these informational resources. However, primary care physicians and specialized doctors are less accessible to and used by rural communities [28].

Those with, a level of education learning secondary school, college & above were 2.1 times, and 2.9 times more likely to have a high awareness of colorectal cancer respectively as compared to those adults unable to read and write. This result is supported by the study done in Jimma [11] Bahrain [9], Madinah, Saudi Arabia [10], Qatar [25], and Klang Valley [22]. The possible justification for this might be participants enrolled in college or university the level of education increases, and the chance of individual's exposure to a different source of information.

Moreover, educated people in Ethiopia use social media platforms more than unable to read and write [29]. These findings imply that efforts should be made to increase CRC awareness among those with less formal educational efforts, and discussions with medical professionals can help achieve this. According to the current study, heard about CRC were 4.29 times more likely to have high awareness of CRC compared to never hear about CRC. This finding is supported by the studies conducted in Jimma [11], and Madinah, Saudi Arabia [10]. The possible justification for this might be participants with better access to health-related information like CRC had better awareness about the disease, more familiar with the disease, risk factors, and symptoms. which provides them with more cancer information and raises their awareness of cancer symptoms and risk factors [30]. This finding suggests that there is a large knowledge gap between understanding and awareness of CRC.

In conclusion, awareness of colorectal cancer in the study area was relatively poor. Furthermore, it was found that gender, residency, level of education, hearing about CRC, and family history were significantly associated with awareness of colorectal cancer. Further more, our finding from this study characterize a firm base for healthcare providers in promoting awareness and educators to direct their determinations decisively to ward the setting up of preventive practice and disease early detection strategies.

#### Limitation of the Study

This study was limited to a specific town of Amhara regional state Bahir Dar city and the result may not show the overall awareness of CRC among the adult population living in Ethiopia. So, other national interventional community-based studies focusing on awareness creation and risk reduction are recommended for future researchers.

### Author Contribution Statement

All authors equally contribute to the conceptualization and design, acquisition of data, or analysis and interpretation of data. ZM, DT, AND BA critically revised the manuscript. All authors read and approved the final version of the manuscript.

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#### Declarations of Conflicting interests

There are no conflicts of interest concerning the research.

#### List of Abbreviations and/or Acronyms

AOR: Adjusted Odds Ratio, CAM, Cancer Awareness Measurement, and COD: Crude Odds Ratio, CI: Confidence Interval, CRC: Colorectal Cancer, HH: Household, OR: Odds Ratio

#### Ethical approval and consent to participate

This study was reviewed and approved by an Institutional Review Board of the College of Medicine and Health Sciences, University of Gondar, Ethiopia (Protocol No. S/N /190/2015). All participants provided written informed consent. The study was conducted following the Declaration of Helsinki.

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