

# Uptake of Colorectal Cancer Screening amongst Residents of Mt. Elgon Sub County, Kenya

Chrispin O Ngwawe\*, Doreen Othero, Guya Benard

Maseno University

Corresponding Author

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## ABSTRACT

**Methodology:** A cross-sectional study using both quantitative and qualitative approaches to data management. A total of 440 participated and were recruited randomly. Quantitative data was collected using semi-structured questionnaires while qualitative data collected through KIIs and FGDs. Quantitative data was analyzed using SPSS version 19 at 95% confidence level while qualitative data analyzed using the NVivo application and presented as narratives. Chi-square test was conducted to establish the association between dependent and independent variables. Approval to carry out this study was sought and obtained from the National Commission for Science, Technology and Innovation (NACOSTI). Voluntary and informed consent of the respondents was sought

**Results.** The level of CRC screening reported was at 9(2.2%). Chi-square test did not establish any significant association between socio-demographic factors and the socioeconomic factors and the uptake of CRC screening observed.

**Discussion:** This CRC uptake is close to approximately 1% previously reported in Kenyan. This corroborates the findings of another study in the United States of America which reported that 38% of adults aged 50 years and older have never had sigmoidoscopy or colonoscopy and 79% have never had a FOBT.

**Recommendations:** The study recommends a review the existing sensitization models of CRC screening

**Key words:** Colorectal cancer, Colorectal cancer screening Uptake, Factors Associated with Screening uptake

## INTRODUCTION

Globally, colorectal cancer (CRC) accounted for 6.5 % of all new cancers' cases in both sexes having 8.3% incidences in males and 5.4% in females and also resulted 8.2% of all cancer deaths [1]. In age-standardized incidence rates, CRC accounted for 11.9% and 9.7% in males and females respectively and 10.5% incidence and 7.5% mortality rates [2]. The global burden of CRC is expected to increase by 60% to more than 2.2 million new cases and 1.1 million deaths by 2030 [3]. It is also worth noting that the prevalence rates of CRC are increasing in many other parts of the world with evidence that programmatic screening programs are achieving positive impacts of reducing the CRC burden. Several screening mechanisms are available but the optimal screening strategy still remains a debatable subject [4]. The United States is the only country in the world where incidence and mortality rates from colorectal cancer are reported to be decreasing significantly but health disparities in CRC screening, treatment, and survival persist [3].

In a study on factors influencing uptake of CRC screening services, it was revealed that awareness of CRC symptoms was associated with having ever used a CRC screening procedure (OR 6.46, CI 95% (4.28–9.74)) or up-to-date screening (OR 7.23, CI 95% (4.36–11.98) [5]. Another study reported that lack of awareness about CRC and negative attitudes is closely associated with unwillingness to participate in CRC screening [6]. In other studies, increasing the patient's awareness using advanced visual media through local campaigns was found to be associated with higher acceptance rates for screening colonoscopies [7]. In addition, a community-focused education program was evaluated and found to be a potential prevention activity for reducing the poor adherence and was capable of making the patient an active participant in their CRC care programs [8]. Another study on African American women reported that women identifying themselves as moderately susceptible were more likely to adhere to screening than women in the high susceptibility group or those who did not know their susceptibility [9]. CRC is increasingly being diagnosed in rural health facilities in Kenya, and this is consistent with the limited reports from around SSA [10]. Findings from another study in Kenya also corroborates the position that CRC is on the rise and during the recent years it has reported a 2.7-fold increase between 1993 and 2005 in Nairobi, Kenya [11]. The increasing burden of CRC can be attributed to late presentation for screening and diagnosis as a result of low awareness of the CRC screening services [12].

Kenya lacks locally generated population-based epidemiological data on the uptake of CRC screening services and this has contributed to the over-reliance on research findings from other jurisdictions in the world to inform local decisions. Information in Nairobi (Kenya) Registry data showed that CRC accounts for 6% of all cancer incident malignancies [10]. It is evident that CRC screening services in Bungoma County are not fully optimized. However, no studies have been done to determine the awareness of screening services in Mt Elgon sub county. Therefore, this cross-sectional study adopting both quantitative and qualitative approaches to data collection, analysis and presentation [13] was conducted to assess the uptake of CRC screening in Mt Elgon Sub County, Bungoma County, Kenya.

## MATERIALS AND METHODS

This was a cross-sectional study that adopted both quantitative and qualitative approaches to data collection and analysis and presentation. This study was carried out on residents of Mt Elgon sub county over a duration of eight months beginning December 2021 to August 2022. A total 422 adult respondents were enrolled

**Study Design;** A cross-sectional study in which both primary and secondary data were collected.

**Study Location** Mt Elgon Sub County, Bungoma County, Kenya

**Sample Size Calculation** A representative sample of 440 respondents was obtained from the target population of the 15,337 persons from aged 45-59 years in Mt Elgon Sub County [14] using Yamane's Equation (1967).

**Subject Selection Method** multi-stage sampling was adopted for selection of participants from the data collection units. Probability proportionate to sample procedures was used for the study.

### Inclusion Criteria

- i. Mt Elgon sub county residents who are within 45-75 years age bracket
- ii. Respondents were limited to those who gave informed consent

### Exclusion criteria

- i) The study excluded residents who were sick and unable to participate
- ii) Visitors and residents who had stayed for less than six months in Mt Elgon Sub County at the time of the study

### Procedure and Methods

After obtaining the research consent, primary and secondary data were collected using both qualitative and quantitative data methods. The data collection process was undertaken in two weeks

**Ethical Approval**-Approval to carry out this study was sought and obtained from School of Graduate Studies, Maseno University and clearance from Maseno University Ethics and Research Committee and also from the National Commission for Science, Technology and Innovation (NACOSTI). Voluntary and informed consent of the respondents was sought after explaining the aim of the study.

**Statistical Analyses** Quantitative data was analyzed SPSS Statistics 19.0. The descriptive statistics was depicted as percentages. For inferential statistics, cross tabulation with chi-square test was used to establish the existence of statistically significant difference between the independent variables; socio-demographic, socio-economic, and health systems factors with the dependent variables namely the CRC uptake at  $\alpha \leq 0.05$  (95% confidence interval). Binary logistic regression; Odds Ratio (OR) has been used to determine the strength of any statistically significant associations noted from chi-square test. Qualitative data were organized into categories and subjected to manual content thematic analysis and the themes developed presented as verbatim with the respective quantitative data. Results have been presented in tables.

## RESULTS

### Demographic Characteristics of the Study Population

Demographic features of the study population are presented in Table 4.1. The participants' age ranged from 45 to 59 years whereby a majority; 142 (35.3%) were aged between 56 to 59 years with a majority; 218 (54.2%) being females. In regards to ethnicity, most of the participants were Sabaots at 176 (43.8%) with most of them; 342 (85.1%) being married. In terms of religion, a high number; 225 (56.0%) of the participants were Adventists.

Table 4. 1 Demographic characteristics of the Participants

N=402		
Characteristic	n	%
<b>Highest Education Level</b>		
Primary	130	32.3
Secondary	136	33.8*
Diploma	76	18.9
Degree	60	14.9
<b>Source of Income</b>		
Farming	218	54.2

Self-employment	157	39.1
Formal Employment	27	6.7
<b>Length of income activity</b>		
<10 years	80	19.9
11 to 20 years	192	47.8
21 to 30 years	122	30.3
31 to 40 years	8	2
<b>Household Income</b>		
10,000 to 20,000	72	17.9
21,000 to 30,000	120	29.9
>30,000	210	52.2

### Socio-economic Characteristics of the Participants

The socio-economic characteristics of the participants are presented in Table 4.2. A majority of the participants; 136 (33.8%) reported secondary level education as the highest level of education they had attained. Farming was the main source of income for most; 218 (54.2%) of the participants, whereby a majority; 192 (47.8%) reporting to have engaged in their respective income activity for a period of 11 to 20 years. A majority; 210 (52.2%) of the participants reported having a household income of more than 30,000 Kenyan Shillings (KES).

Table 4. 2 Socioeconomic Features of the Participants

<b>N=402</b>		
<b>Characteristic</b>	<b>n</b>	<b>%</b>
<b>Highest Education Level</b>		
Primary	130	32.3
Secondary	136	33.8
Diploma	76	18.9
Degree	60	14.9
<b>Source of Income</b>		
Farming	218	54.2
Self-employment	157	39.1
Formal Employment	27	6.7
<b>Length of income activity</b>		
<10 years	80	19.9
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21 to 30 years	122	30.3
31 to 40 years	8	2
<b>Household Income</b>		
10,000 to 20,000	72	17.9

21,000 to 30,000	120	29.9
>30,000	210	52.2

### Uptake of CRC Screening Services by Participants

Table 4.3 reports the findings on uptake of CRC screening services by the participants. A paltry; 5 (1.2%) of the participants reported to have ever taken a stool test with FOBT kit, whereas only 4 (1.0%) reported to have ever done any other CRC test.

Table 4. 3 Uptake of CRC Screening Services by Participants

N=402		
Uptake of CRC Screening Service	n	%
<b>Stool Test with FOBT Kit</b>		
Yes	5	1.2
No	397	98.8*
<b>Ever done any other CRC Test</b>		
Yes	4	1
No	398	99.0*

### Socio-Demographic Factors and Uptake of CRC Screening Services (FOBT)

Chi-square test was performed to establish association between socio-demographic factors and uptake of CRC screening services (stool test for FOBT) at  $\alpha \leq 0.05$ . As shown in Table 4.4, age, gender, ethnic background, marital status, and religious affiliation showed no significant association to uptake of stool test for FOBT (Chi-square:  $p=0.249$ ,  $p=0.244$ ,  $p=0.421$ ,  $p=0.604$ , and  $p=0.755$  respectively). However, the qualitative findings reported that socio-demographic factors such as being married or not were likely to influence the uptake of CRC screening among the in Mt Elgon Sub County. An elderly participant reported that pressure from a spouse may invoke positive health behaviors and retorted that “most of us follow directions from our partners to comply with medical advice.” This reflects that the participants may be positively influenced if the health information is well packaged and appropriately delivered. Reports from the FGDs suggest that the low uptake of CRC screening uptake was largely attributed to little knowledge of CRC screening and uptake, low education levels and low-income levels. These factors were associated with poor participation in CRC screening exercise amongst the communities. The lack of health problems was also reported as a possible barrier to some respondents from seeking CRC screening. A respondent from Chebuyuk who had not undergone a CRC test expressed, “And I feel that I am absolutely normal with no symptoms of having any problems with my digestive system” The FGDs also acknowledged that undergoing CRC screening may lower mortality by initiating appropriate treatment upon early detection of the disease and therefore contribute in reducing deaths that may be caused by CRC.

Table 4. 4 Uptake of CRC Screening Services (by FOBT) and the Participants Socio-Demographic Factors

N=402					
	Uptake of CRC screening (stool for FOBT)			chi-square	p-value
	Total n (%)	Yes n (%)	No n (%)		
<b>Age</b>					
45-50	132 (32.8)	3 (0.7)	129 (32.1)	2.781	0.249

51-55	128 (31.8)	0 (0.0)	128 (31.8)		
56-59	142 (35.3)	2 (0.5)	140 (34.8)		
<b>Gender</b>					
Male	184 (45.8)	1 (0.3)	183 (45.5)	1.355	0.244
Female	218 (54.2)	4 (1.0)	214 (53.2)		
<b>Ethnic Background</b>					
Bukusu	86 (21.4)	0 (0.0)	86 (21.4)	3.889	0.421
Tachoni	56 (13.9)	0 (0.0)	56 (13.9)		
Sabaot	176 (43.8)	3 (0.7)	173 (43.1)		
Teso	68 (16.9)	2 (0.5)	66 (16.4)		
Others	16 (4.0)	0 (0.0)	16 (4.0)		
<b>Marital Status</b>					
Married	342 (85.1)	4 (1.0)	338 (84.1)	1.007	0.604
Single	36 (9.0)	1 (0.3)	35 (8.7)		
Divorced	24 (5.9)	0 (0.0)	24 (5.9)		
<b>Religion</b>					
Protestants	37 (9.2)	1 (0.3)	36 (8.9)	1.192	0.755
Catholic	102 (25.4)	1 (0.3)	101 (25.1)		
Adventist	225 (56.0)	3 (0.7)	222 (55.3)		
Muslim	38 (9.4)	0 (0.0)	38 (9.4)		

**Socio-Economic Factors and Uptake of CRC Screening Services (FOBT)**

Chi-square test was performed to establish association between socio-economic factors and uptake of CRC screening services (stool test with FOBT) at  $\alpha \leq 0.05$ . As shown in Table 4.5, education level, source of income, and household income showed no significant association uptake of stool test for FOBT (Chi-square:  $p=0.943$ ,  $p=0.489$ , and  $p=0.229$  respectively)

Table 4.5: Socio-Economic Factors and Uptake of CRC Screening Services (FOBT)

N=402					
	Uptake of CRC screening (stool for FOBT)			chi-square	p-value
	Total n (%)	Yes n (%)	No n (%)		
<b>Highest Level of Education</b>					
Primary	130 (32.3)	1 (0.3)	129 (32.0)	0.386	0.943
Secondary	136 (33.8)	2 (0.5)	134 (33.3)		
Diploma	76 (18.9)	1 (0.3)	75 (18.6)		
Degree	60 (14.9)	1 (0.3)	59 (14.6)		
<b>Income Source</b>					
Farming	218 (54.2)	4 (1.0)	214 (53.2)	1.431	0.489
Self-Employed	157 (39.1)	1 (0.3)	156 (38.8)		



Formal Employment	27 (6.7)	0 (0.0)	27 (6.7)		
<b>Household Income</b>					
10000-20000	72 (17.9)	2 (0.3)	70 (17.6)	2.949	0.229
21000-30000	120 (29.9)	0 (0.0)	120 (29.9)		
>30000	210 (52.2)	3 (0.7)	207 (51.5)		

## DISCUSSION

Little is known about the uptake of screening services among populations in Sub-Saharan Africa despite the fact that the CRC is increasing around the world. CRC is the third most common cancer and the second cause of deaths among cancers in the LMICs. [1]. However, the rates of CRC screening uptake are unknown among in Kenya generally and specifically among the populations in Mt Elgon sub county, Bungoma county. Therefore, this study investigated the levels CRC screening services uptake rates among adults ages 45-59 years in Mt Elgon sub county of Bungoma county, Kenya.

The uptake of CRC screening reported by respondents enrolled in this study was only 2.1%. Of these, 5 (1.2%) had done FOBT while another 4 (1.0%) had done alternative CRC tests. This study's findings of the low CRC screening uptake levels corroborate the trends depicted by the findings of another study in the United States of America which reported that 38% of adults aged 50 years and older have never had sigmoidoscopy or colonoscopy and 79% have never had a FOBT (Arnold *et al*,2017). This figure is close to the levels of close to CRC screening uptake rates of approximately 1% previously reported Kenyan population [12].This has also been confirmed by the findings of this study since it has been reported by a higher number of participants at 1.2% of the respondents. Further KII interviews indicated that the Government has not rolled out mechanisms for accelerating the CRC screening services uptake in Bungoma County and specifically for Mt Elgon hence corroborating the observed very low CRC screening services uptake. In the qualitative findings, a participant in FGD 6 also reported that *"the multiple requirements associated with CRC screening protocols such as FOBT entails the patients avoiding the consumption foods such as vegetables and meat before stool collection hence instigating negative attitudes"* amongst the Mt Elgon communities.

In revealing that FOBT is the preferred method of screening by the respondents, the results of this study contradict the findings of a study conducted by [16] in which the authors reported that flexible sigmoidoscopy and colonoscopy were the preferred methods over stool-based approaches. In the FGD 2, a participant stated that lack of adequate information about the disease and its risk factors could lead to non-participation in the screening program. The lack of health problems was also reported as a possible barrier to some respondents from seeking CRC screening. A respondent who had not undergone a CRC test expressed, *"And I feel that I am absolutely normal with no symptoms of having any problems with my digestive system."* These outcomes agree with [11] that there are numerous possible reasons for such a delay in receiving therapy in low resource settings such as Mt Elgon sub county particularly regarding access to care, patient education, expense and difficulty of travel and the referral to distant surgical centers.

The current study posits that the perceptions of susceptibility of having CRC and the benefits of screening might play only a minor role in influencing CRC screening among the participants contrary to HBM. This might be explained in part by health-related cultural values of the residents of Mt Elgon sub county that regards conversations around cancers and terminal illnesses as taboos. Findings from the FGDs 1 that cultural health beliefs and language barriers negatively influenced the CRC screening uptake. One of the participants aged 59 years said, *"It is a taboo to discuss sicknesses especially those that are hinged on fatalities of life"*. These findings reaffirmed the outcomes of an earlier research which also reported that some of the barriers towards the CRC screening services uptake are related to the fact that discussions on

malignancies related to the colon is a taboo subject for many people in the SSA [17].

The outcomes also revealed that there is a higher likelihood of CRC screening uptake in the more urban areas Mt Elgon than in the rural areas. This finding corroborates an earlier finding that urban area of residence was associated with higher rates of screening uptake in US studies [18] although contradictory results have been reported Swedish study which found higher CRC screening uptake in rural areas [19]. It is further reported that the willingness to participate in the screening process has a relationship with the participants' cultural beliefs and education status. These results are agreement with the findings of an earlier study which reported that cultural beliefs may define health-seeking behaviors amongst communities [20]

Chi-square test was performed to establish association between socio-demographic factors and uptake of CRC screening services (stool test for FOBT) at  $\alpha \leq 0.05$  and revealed that age, gender, ethnic background, marital status, and religious affiliation showed no significant association to uptake of stool test for FOBT (Chi-square:  $p=0.249$ ,  $p=0.244$ ,  $p=0.421$ ,  $p=0.604$ , and  $p=0.755$  respectively). This observation contradicts the findings from another study in the Europe, where the authors found that controlling by age and educational level, married couples were more willing to take part in screening programs and presented higher attendance screening rates than those non-married and that invitations of both partners increased screening participation rates [21]. However, these findings agree with a European study carried out in 953 average-risk participants where uptake of CRC screening was more than four times higher among participants with high education level [22].

Of great significance are the findings showing that 91.4% of the respondents were unwilling to take-up CRC screening. The higher unwillingness levels to screen for the disease in Mt Elgon sub county may be attributed to the low awareness of the disease amongst the population [23]. Taken together these findings suggest that there was a low level of willingness for screening for CRC among the population. This resonated with earlier results by [24] which reported that a general knowledge deficit about CRC prevented patients from making an informed decision whether to receive CRC screening. The low CRC screening uptake levels are in tandem with reports by [11] from the Tenwek Hospital, a regional cancer referral facility that asymptomatic patients are rarely screened for CRC in Kenya. The reports by [11] also noted that most CRC patients present at the facility at advanced stages a further confirmation of poor CRC screening services uptake amongst the populations in the facility's catchment area. These findings also resonate with the fact that there are numerous possible reasons for such a delay in receiving screening in low-resource settings especially the SSA particularly regarding access to care, patient education, expense and difficulty of travel, and the frequent need for referral to distant surgical centers.

This study posted results that the education level, source of income, and household income showed no significant association uptake of stool test for FOBT (Chi-square:  $p=0.419$ ,  $p=0.250$ , and  $p=0.539$  respectively). This outcome differs with the results of a study conducted on the socio-demographic variables likely to influence the undergoing CRC screening in Hong Kong and China studies which revealed a positive relationship for education and household income with the uptake of screening services [25]. This observation could be explained by the availability of the CRC screening programs and their target age groups across the two countries.

## CONCLUSIONS FROM THE STUDY

i) This study concludes that levels of uptake of CRC screening services by the participants was at 5 (1.2%) of the participants for the stool test with FOBT kit, whereas only 4 (1.0%) reported to have ever done any other CRC test thus at cumulatively at 9 (2.2%) for all the respondents. The study reports that age, gender, ethnic background, marital status, and religious affiliation showed no significant association to uptake of stool test for FOBT (Chi-square:  $p=0.249$ ,  $p=0.244$ ,  $p=0.421$ ,  $p=0.604$ , and  $p=0.755$  respectively). In addition, education level, source of income, and household income showed no significant association uptake of stool test for FOBT (Chi-square:  $p=0.943$ ,  $p=0.489$ , and  $p=0.229$  respectively).



ii) In addition, the study found that also for other screening tests, age, gender, ethnic background, marital status, and religious affiliation showed no significant association to uptake of stool test for any other CRC screening tests (Chi-square:  $p=0.332$ ,  $p=0.865$ ,  $p=0.560$ ,  $p=0.239$ , and  $p=0.371$  respectively).

iii) On the contrary, findings from the FGDs revealed that cultural health beliefs and language barriers negatively influenced the CRC screening uptake. However, from the FGDs, it was noted that marital status revealed a statistically significant relationship with uptake of CRC screening services.

## RECOMMENDATIONS FROM THE STUDY

1. I) Ministry of Health at national and county levels should consider revision of policies on CRC screening so as to upscale the involvement of Peer Education among selected high -risk groups.
2. ii) MOH at national and county levels should consider sensitization programs for the local community to have adequate information regarding the benefits and of CRC screening uptake in order to help in accelerating the CRC screening uptake in Mt Elgon for early detection and treatment to reduce CRC associated morbidity and mortality

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