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Perceived Barriers to Colorectal Cancer Screening among Physicians Who Routinely Recommend Screening in Tertiary Hospitals in Jos, Plateau State, Nigeria

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Abstract

Background: Colorectal cancer (CRC) is a leading cause of cancer related mortality worldwide. Increased incidence and mortality are projected in low-and-middle-income countries (LMICs) in the near future. Screening is suboptimal in LMICs and hindered by a multifactorial combination of barriers. This study assessed physicians perceived barriers to CRC screening on the provider, patient and system levels.

Methods: This cross-sectional study was conducted among physicians who routinely screen patients for CRC in two tertiary hospitals in Plateau state, Nigeria. The study assessed provider, patient and system-related barriers to CRC screening from providers' perspectives. Seventy-three physicians were selected using a multi-stage sampling technique. Data was collected using a semi-structured self-administered questionnaire.

Results: A lack of knowledge of screening (63%) and lack of training to carry out screening tests (61.6%) were considered major physician-related barriers. Surveyed physicians identified a high number of patient-related factors such as financial constraints (86.3%), lack of insurance cover (75.3), low literacy (75.3%) and limited access to screening (71.2%) as major barriers. Most of the system-related barriers in the questionnaire were considered major barriers to screening including high screening costs (71.2%), lack of resources for screening (71.2%), long waits for GI endoscopy (68.5%), a shortage of trained doctors (60%) and lack of hospital screening policy (68.5%).

Conclusions: Systemic barriers were the most identified barriers in this study, a pattern commonly seen in LMICs. Patient related barriers which are commonly associated with lower socioeconomic groups were also perceived to play a more prominent role than provider related barriers.

Keywords: barriers, colorectal cancer screening, Nigeria, patient, perceived, physician, system

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Introduction

Colorectal cancer is the third most commonly diagnosed cancer worldwide after lung and breast cancer.[1-4] An estimated 1.9 million incident cases and 904,000 colorectal cancer related deaths were recorded worldwide in 2022.[1] The incidence and mortality rates vary significantly in different regions of the globe, higher rates have been observed in developed regions such as North America, Europe, New Zealand, Australia and Eastern Asia.[1,5] Colorectal cancer is however also becoming increasingly prevalent in LMICs with a projected disproportionate rise in incidence in LMICs in the near future.[1-5] Nigeria, Ghana and Tunisia are examples of LMICs that have reported a significant rise in incidence of colorectal cancer over the years.[6-8] Available data shows a 5-fold increased incidence of CRC in Nigeria between 1979 to 2008[9] and an 8-fold increased incidence in Ghana between 1960 and 2017.[6] Nigeria, being the most populous country in Africa, potentially faces a significant burden of this disease.[9]

The rising incidence of CRC in developing countries is attributed to changes associated with economic transition such as an aging population, living a sedentary lifestyle, obesity, heavy alcohol consumption and a diet high in fat and low in fiber.[4,5,10,11] An important cause of a disproportionately high mortality of CRC in LMICs is a lack of screening which doesn't allow detection of premalignant lesions leading to presentation at late stages of the disease with poor outcomes.[7,12] Colorectal cancer screening is suboptimal in Nigeria and other LMICs despite its proven effectiveness.[13] This underutilisation of colorectal cancer screening stems from barriers that cut across physician (provider), patient and systemic (institutional) factors.[14-16] While institutional barriers to screening predominate in low income settings they do not play a major role in developed nations.[17] Patient factors also play an outsized role in reducing screening rates in LMICs like Nigeria.[18] Suboptimal levels of recommendation for screening by physicians is commonly observed in LMICs of Africa.[15,19] A limited awareness of screening guidelines and lack of awareness of the benefits of screening among physicians are commonly recognized barriers to screening in LMICs.[18,20,21] Some physicians find discussing colorectal cancer screening uncomfortable, some have limited time to discuss screening with patients while some may prioritize other health concerns over CRC screening.[22-27]

A patients lack of awareness of the need for colorectal cancer screening or the available screening options constitute barriers to screening in Nigeria and other LMICs of Africa.[15,18,19] Fear of discomfort during screening, a fear of potential diagnosis of cancer and cultural beliefs in relation to cancer are some of the other reported patient related barriers.[21,27,28] A patients lack of access to health insurance cover or financial resources also significantly hinder access to screening in low income settings.[21,29]

Even when physicians and patients fulfill all the requirements and obligations for screening, institutional barriers may hinder screening. Inadequate availability of well-equipped healthcare centers and limited availability of endoscopic screening resources are commonly reported barriers to screening for CRC in Africa.[15,18,26,30] Most health care centers that carry out screening in low income settings are located in cities with rural areas commonly neglected.[14,18,21] Long waiting times for screening appointments is common in LMIC and influences patient compliance negatively.[15] Competing demands, such as screening of more prevalent diseases like breast, cervical and prostate cancer limit screening so also does limited availability of trained health care professionals such as Pathologists and Laboratory scientists.[15,18]

Physicians play a pivotal role in patient care, clinical administrative decisions and health policy creation and therefore have a good understanding of provider, patient and institutional dynamics. This study aims to assess physicians perceived barriers to colorectal cancer screening at the provider, patient and institutional levels.

Methodology

Study area

This study was conducted in Jos, Plateau state, Nigeria. Jos is one of the 17 local government areas of Plateau state. Plateau State is situated in the North-Central Nigeria with a projected population of 4.7 million inhabitants as at 2022.[31,32]

Study design

This study utilised a cross-sectional design to assess perceived barriers to colorectal cancer screening among physicians who routinely conduct CRC screenings. The analysis focused specifically on self-identified barriers at the provider, patient and system levels, using data drawn

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from a broader survey on CRC screening knowledge, attitude, practices and perceived barriers to screening.

Study population

The target population included licensed, practicing physicians of all specialties that offer services to adult patients (internal medicine, surgeons, family medicine, clinical laboratory physicians, psychiatrists, gynecologists and medical officers) at the Jos University Teaching Hospital and Plateau State Specialist Hospital located in Jos, Plateau state, Nigeria. Only those physicians who reported routinely recommending or performing CRC screening were included in this analysis. Inclusion criteria consisted of licensed physicians who actively attended to adult patients, physicians who reported routinely screening patients for CRC and those who consented to participate in the research. Exclusion criteria comprised physicians who do not offer clinical services to adults, those who don't screen patients for colorectal cancer and those physicians who did not give consent to be part of the study.

Sample size determination

The original sample size was determined using Cochran's formula for proportions with adjustments for a finite population and expected response. Applying the Cochran's Formula ($n = Z^2 P q/d^2$), a Z-score of 1.96 corresponding to a confidence level of 95%, a Proportion (expected prevalence rate of screening) of 40% from a previous Nigerian study was adopted[14] hence a complementary probability(q) of $(1 – 0.4)$. The degree of precision set at 5% (0.05). An initial sample size of approximately 369 physicians was calculated. Considering that the population of physicians in these tertiary hospitals is less than 10,000, a finite population correction (FPC) was applied using the finite population correction formula ($nf = n \times N-n/N-1$). Whereby, nf = adjusted sample size with finite population correction, n = sample size calculated without finite population correction and N = total population size. A corrected sample size of 163 (physicians) was arrived at. A minimum sample size (after 10% non-response adjustment) of 179 physicians was obtained. A total of 183 (out of 272) correctly filled questionnaires were returned by responding physicians. From this sample, only 39.9% (73 physicians) indicated that they routinely screen for CRC. These 73 responses formed the analytical sample for the present study. This reduced

ultimate sample size reduces generalizability but reflects actual practice behaviors and provides focused insights into the barriers faced by physicians with direct screening experience.

Sampling technique

A multi-stage sampling technique was used for this study. In stage one purposive sampling was used to select the tertiary institutions which have a broad spectrum of specialties. In stage two, using purposive sampling technique the areas of specialization that are appropriate for the study were selected. In stage three a complete enumeration sampling technique was used to select as many physicians as possible within the chosen specialties to meet up the sample size and to ensure high precision. In stage four a purposive sampling technique was used to select those physicians who routinely screen for colorectal cancer out of the entire population of responding physicians.

Data collection

Data was obtained using a semi-structured self-administered questionnaire between the 25th of January 2024 and 29th of February 2024. The Questionnaire was an adaptation from a validated nationally used United States Survey of Colorectal Cancer Screening Practices created by the United States of America National Cancer Institute.[31] The questionnaire included multiple sections, with the present analysis focusing exclusively on the section assessing physicians perceived barriers to screening. The barriers were grouped into provider, patient and system level barriers. Pre-testing of the questionnaire was conducted at a private tertiary health center in Jos, Plateau state, Nigeria to ensure clarity, reliability, and validity in our setting. The researchers and trained assistants handed over questionnaires to consenting participants at their duty posts and at clinical meetings. Participants were informed about the research and its aims; they were assured of information confidentiality and anonymity. They were also informed that participation is voluntary.

Data analysis

The questionnaires were manually entered into Microsoft Excel (Microsoft corp. USA version 2019) after sorting out for completeness, the data was cleaned and exported to Statistical Product and Service Solutions (SPSS version 23) for analysis. Quantitative data analysis was used in this study. Demographic characteristics of

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the study participants was summarized and described using descriptive statistics. The physicians perceived barriers to screening were categorized into physician, patient and system/institutional barriers. The severity of barriers was categorized based on whether physicians considered them major barriers, minor barriers and non-barriers to colorectal cancer screening. The responses analysed were presented as frequencies and percentages in tables.

Ethical considerations

Ethical clearance was obtained from the Jos University Teaching Hospital and Plateau State Specialist Hospital health research ethics committees with reference numbers NHREC/JUTH/05/10/22 and PSSH/ADM/ETH.CO/2015/C-NHREC/09/23/2010b respectively. **Informed**

consent was obtained in written form from participants prior to data collection. Information concerning study objectives, voluntary participation, and confidentiality was provided to participants. Confidentiality and anonymity of data collected was ensured.

Results

A total of 183 questionnaires were returned by physicians who consented to be part of the study. Seventy-three (39.9%) out of the 183 respondents who returned questionnaires routinely screened for colorectal carcinoma, hence constituted the sample population for the study. Internal medicine physicians (24.7%) had the highest number of physicians who routinely screen. A vast majority of those who screened were males (83.6%) with a male to female ratio of 5.08:1. (table 1)

Table 1: Demographic characteristics of physicians

Physician demographic data	Total respondents (n=183, %)	Physicians Who screen (n=73, %)	Physicians who don't screen (n=110, %)
Specialty			
Family medicine	44(24.0)	18(24.7)	26(23.6)
Internal medicine	22(12.0)	12(16.4)	10 (9.1)
Lab medicine	21(11.5)	9(12.3)	12(10.9)
Surgery	29(15.8)	17(23.3)	12(10.9)
Others	67(36.6)	17(23.3)	50(45.5)
Designation			
Consultant	48(26.2)	19(26.0)	29(26.4)
Non-consultant	135(73.8)	54(74.0)	81(73.8)
Gender			
Male	129(70.5)	61(83.6)	68(61.8)
Female	54(29.5)	12(16.4)	42(38.2)
Marital status			
Married	144(78.3)	52(71.2)	92(83.6)
Single	39(21.3)	21(28.8)	18(16.4)
Participants age			
<30	23(12.6)	13(17.8)	10 (9.1)
30-50	144(78.7)	53(72.6)	91(82.7)
51-70	16 (8.7)	7 (9.6)	9 (8.2)
Number of years of practice			
≤ 5	29(15.8)	14(19.2)	15(13.6)
6-10	57(31.1)	20(27.4)	37(33.6)
11-15	58(31.7)	23(31.5)	35(31.8)
16-20	16(8.7)	7 (9.8)	9 (8.2)

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Physician demographic data	Total respondents (n=183, %)	Physicians Who screen (n=73, %)	Physicians who don't screen (n=110, %)
>20	23(12.6)	9(12.3)	14(12.7)
Patients seen in a week			
≤25	52(28.4)	19(26.0)	33(30.0)
26-50	89(48.6)	34(46.6)	55(50.0)
51-100	28(15.3)	12(16.4)	16(14.5)
>100	14 (7.7)	8(11.0)	6 (5.5)
Percentage distribution of patients' ≥50 years			
<25	38(20.8)	10(13.7)	28(25.5)
25-49	92(50.3)	39(53.4)	53(48.2)
50-74	49(26.8)	22(30.1)	27(24.5)
75-100	4(2.2)	2(2.7)	2 (1.8)

Sixty-three percent (63%) and 61.6% of physicians who routinely screen their patients considered a lack of knowledge of screening guidelines and lack of training to carry out the screening tests respectively as major provider-barriers to screening.

Table 2: Physician's perceived provider-related barriers to CRC screening (n=73)

Provider (Doctor) related barriers, n (%)	Major barrier	Minor barrier	Not a barrier
Lack of training in carrying out screening test on patients	45(61.6)	20(27.4)	8(11.0)
Lack of knowledge of the guidelines of screening	46(63.0)	17(23.3)	10(13.7)
Lack of time to discuss screening	24(32.9)	36(49.3)	13(17.8)
Lack of time to arrange screening	24(32.9)	26(35.6)	23(31.5)
The test is inconvenient for patients	17(23.3)	33(45.2)	23(31.5)
Reluctance to discuss CRC screening	16(21.9)	26(35.6)	31(42.5)
Difficulty counselling about screening	12(16.4)	32(43.8)	29(39.7)
Questions about efficacy/accuracy of screening test	18(24.7)	28(38.4)	27(37.0)
Complexity of screening options	21(28.8)	23(31.5)	29(39.7)
Inadequate reimbursement	21(28.8)	26(35.6)	26(35.6)

Financial constraints in out-of-pocket payment was considered a major patient related barrier to screening by 86.3% of all doctors who routinely screen. Patients not having insurance cover (75.3), low literacy level (75.3%) and limited access to screening facility (71.2%) were also identified as major barriers.

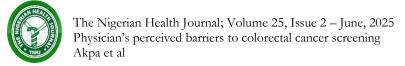**Table 3:** Physician's perceived patient related barriers to CRC screening (n=73)

Patients related barriers, n (%)	Major barrier	Minor barrier	Not a barrier
Patient fear of finding cancer	50(68.5)	17(23.3)	6 (8.2)
Patients being unaware of colorectal screening	48(65.8)	18(24.7)	7 (9.6)
Patients believe screening is not effective or beneficial	18(24.7)	33(45.2)	22(30.1)
Patients' embarrassment or anxiety about screening tests	26(35.6)	41(56.2)	6 (8.2)
Fear of pain from screening procedure	30(41.1)	34(46.6)	9(12.3)
Patient does not have insurance that covers test	55(75.3)	16(21.9)	2 (2.7)
Financial constraints in out-of-pocket payment	63(86.3)	8(11.0)	2 (2.7)

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Patients related barriers, n (%)	Major barrier	Minor barrier	Not a barrier
Limited access to screening facility	52(71.2)	19(26.0)	2 (2.7)
Low literacy level	55(75.3)	10(13.7)	8(11.0)
Poor patient adherence or compliance	46(63.0)	23(31.5)	4 (5.5)
Cultural or religious factors	38(52.1)	28(38.4)	7 (9.6)
Inability to perform preparation for procedure	20(27.4)	36(49.3)	17(23.3)
Language barrier	12(16.4)	36(49.3)	25(34.2)
Previous complications from a screening test	23(31.5)	26(35.6)	24(32.9)
Lack of knowledge about colorectal cancer	42(57.5)	23(31.5)	8(11.0)
Patient does not believe he/she is susceptible to colorectal cancer	33(45.2)	29(39.7)	11(15.1)
Logistical barriers	35(47.9)	31(42.5)	7 (9.6)
Competing demands	37(50.7)	24(32.9)	12(16.4)
Patient does not perceive colorectal cancer as a serious health threat	31(42.5)	28(38.4)	14(19.2)

High cost of screening and lack of insurance cover was selected as a major barrier to screening by 71.2% of physicians who screen for CRC. The same number of physicians (71.2%) also agreed that a lack of resources for screening and diagnostic procedures was a major barrier to screening.

Table 4: Physician's perceived system (institution) related barriers to CRC screening (n=73)

System related barriers, n (%)	Major barrier	Minor barrier	Not a barrier
Screening costs too much or insurance scheme doesn't cover	52(71.2)	16(21.9)	5 (6.8)
Primary care physicians do not actively recommend screening patients	48(65.8)	21(28.8)	4 (5.5)
Shortage of trained doctors to conduct screening with faecal occult blood test	44(60.3)	24(32.9)	5 (6.8)
Shortage of trained doctors to conduct follow-up with invasive procedures such as flexible sigmoidoscopy or colonoscopy	44(60.2)	22(30.1)	7 (9.6)
Lack of support staff for follow-up of patients	43(58.9)	22(30.1)	8(11.0)
Lack of screening result tracking system	40(54.8)	25(34.2)	8(11.0)
Lack of patient educational materials	42(57.5)	23(31.5)	8(11.0)
Long waits to get GI-endoscopy	50(68.5)	18(24.7)	5 (6.8)
Lack of resources for screening and diagnostic procedures	52(71.2)	18(24.7)	3 (4.1)
Difficulty scheduling GI-endoscopy	27(37.0)	36(49.3)	10(13.7)
Poor feedback on procedural results	26(35.6)	34(46.6)	13(17.8)
No hospital policy for screening	50(68.5)	16(21.9)	7 (9.6)
Lack of screening reminder system	45(61.6)	22(30.1)	6 (8.2)
Fragmented patient care (lack of continuity)	47(64.4)	17(23.3)	9(12.3)

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Discussion

Screening for colorectal cancer is suboptimal in Nigeria due to multiple barriers at the provider, patient and health system levels.[14-16] These barriers are consistent with the complex challenges commonly encountered in LMICs where healthcare systems face limited manpower capacity, resource constraints and gaps in public health awareness and education. In this study, physicians identified a lack of knowledge of screening guidelines (63%) and a lack of training in conducting screening tests (61.6%) as the most significant provider-related barriers to screening. This is consistent with studies in other low-income settings, were inadequate physician training and poor awareness of screening protocols limit CRC screening uptake.[14,15,18,21,33]

Additionally, time constraints such as a lack of time to discuss screening (32.9%) and lack of time to arrange screening (32.9%) were notable, however only about a third of physicians considered them major barriers. High patient loads and limited consultation times is common in Nigeria and other low-income settings alike.[34,35] The reduced time of doctor-patient interaction prevents proper engagement in patient counselling for preventive care such as cancer screening.

Interestingly reluctance to discuss CRC screening, difficulty counselling patients and a perceived inconvenience of screening tests were less likely to be considered major barriers to screening by physicians suggesting that physicians would readily counsel patients for screening if they possessed the requisite knowledge and time in their practice setting.

The responses of surveyed physicians showed that patient-related barriers were more pronounced than provider barriers. Financial constraints (86.3%), lack of insurance coverage (86.3%) and low literacy level (75.3%) were the most critical patient related obstacles. These findings are consistent with research in Nigeria and other LMICs, where out-of-pocket healthcare expenditures and poor health insurance penetration deter preventive care especially among the lowest income earners.[15,18,21,19,33,36]
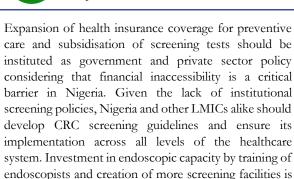
Patients fear of cancer diagnosis was also considered a major barrier to screening by 68.5% of sampled physicians. This common psychological barrier has been observed in other populations.[21,33,26,27] The fear of cancer diagnosis among patients is exemplified by a study in Morocco in which 12.3% of patients who received a positive Faecal CRC screening test didn't obtain follow up colonoscopy.[28] Seventy-one percent (71.2%) of responding physicians considered limited patient access to screening facilities as a major barrier to screening, a reflection of the urban-rural healthcare disparities in Nigeria and other LMICs alike.[14,18,21,30]

Other significant factors that were considered major patient-related barriers include poor adherence to follow up (63%) and cultural/religious factors (52.1%). Patient loss to follow up is common in low-income settings where the factors responsible for patient loss to follow up are significantly more prevalent.[37] Religious and cultural misconceptions about cancer are persistent in many African societies and have been documented to negatively influence cancer screening.[38,39]

Almost all of the system related barriers explored in the questionnaire were considered major barriers to screening by a majority of physicians surveyed. High screening costs (71.2%), lack of resources for screening (71.2%), long waits for GI endoscopy (68.5%), a shortage of trained doctors to carry out screening tests (60%) and a lack of hospital screening policy (68.5%) were considered major impediments. These findings align with studies showing that inadequate infrastructure, poor funding, limited specialist workforce, limited endoscopic capacity and the absence of institutional cancer screening protocols hinder cancer screening in LMICs.[15,18,33]

The findings of this study offer a comprehensive overview of the multifaceted barriers to colorectal cancer screening in LMICs, with significant implications for future research, health policy and the clinical practice of CRC screening.

Physician training and education should be of prime focus considering the lack of knowledge and training as regards CRC screening, integrating CRC screening education into medical training at both undergraduate and continuing medical education level is therefore essential. Because of physician shortages, nurses and community health workers should be trained to carry out basic screening counselling and follow-up in a task shifting and a multidisciplinary approach. Structured counselling tools such as posters, brochures, brief scripts and decision aids should be used to optimize the limited consultation time and high patient load in our setting.

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Expansion of health insurance coverage for preventive care and subsidisation of screening tests should be instituted as government and private sector policy considering that financial inaccessibility is a critical barrier in Nigeria. Given the lack of institutional screening policies, Nigeria and other LMICs alike should develop CRC screening guidelines and ensure its implementation across all levels of the healthcare system. Investment in endoscopic capacity by training of endoscopists and creation of more screening facilities is needed to reduce waiting times and improve screening reach. Community engagement and awareness through mass media should be used to address cultural and religious misconceptions about screening with emphasis on the benefits of early detection.

Further research investigating physician, patient and institutional barriers should be carried out. These include research to investigate physician knowledge and training gaps, research to explore patient sociocultural and financial barriers to screening, in addition to studies aimed at identifying the most effective screening strategies for colorectal cancer.

Limitations of the study

The relatively small sample size (n=73) reduces the statistical power and generalizability of the study. This study used self-reported data hence physicians may provide socially desirable rather than truthful information. Recall bias could also have occurred because physicians may not have accurately remembered the information sought. Non-response bias is also a potential limitation as a high percentage of those who were given questionnaires did not return them.

Conclusion

This study showed that systemic barriers to CRC screening were most frequently identified as major barriers to screening by physicians, a testament to the situation of healthcare delivery in LMICs whereby health infrastructure, material resources and manpower is lacking. Patient related barriers to screening were also considered to be more pronounced than provider related barriers. These patient related barriers such as financial constraints, lack of insurance cover and lack of access to healthcare are predictably more prevalent in the lower socioeconomic groups in our setting. The multifactorial interplay of barriers needs urgent attention by all stakeholders concerned in order to avoid the ominous future predictions concerning CRC in our environment.

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