Quest Journals
Journal of Medical and Dental Science Research
Volume 8~ Issue 5 (2021) pp: 57-63
ISSN(Online) : 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Factors Associated With Acceptance of Colorectal Cancer Screening Among Persons Aged 50 Years and Above In Asokoro District Hospital Abuja, Nigeria

Ndagi Alhassan[1], Ezekiel Ajao[1], Sumi Yahaya Nehemiah[1], Christian Chinedu Asonye[1], Tabitha Leslie[1], Chidinma Abaribe[1]
[1]*Babcock University School of Nursing*
Ilisan Remo, Ogun State, Nigeria.
Corresponding Author: ASONYE, Christian Chinedu

ABSTRACT:
Background and Aim: *The African continent, where colorectal cancer was once considered rare, has witnessed an unprecedented surge in its incidence, contributing to increasing mortality cases. Screening for colorectal cancer has proven effective in reducing disease mortality and is also cost-effective. Therefore, this study assessed colorectal cancer screening behaviour and its associated factors among persons aged 50 years and above in Abuja, Nigeria.*
Methods: *The study adopted a quantitative design, a cross-sectional survey method, to retrieve data from the respondents in the general outpatient department of Asokoro District Hospital Abuja. A self-designed pre-tested questionnaire with a reliability coefficient of 0.751 was distributed to 317 respondents. The statistical package for social sciences (SPSS) version 21 was used as a tool for data analysis. The researcher used descriptive statistics, Pearson Product Moment Correlation, and chi-square statistical analysis fixed at the 0.05 level of significance.*
Results: *The level of acceptance of colorectal cancer screening was found to be below average. There was a significant association between age, awareness of colorectal cancer and screening, family history, and the acceptance of colorectal cancer screening among the respondents with a p-value <0.05. However, gender and prior colorectal cancer screening were not significantly associated with acceptance (p >0.05).*
Conclusion: *The study concluded that the increase in early-onset colorectal cancer incidence and mortality demonstrates an obligation to take action. Earlier screening would save lives, and starting at the age of 45 years may be a robust screening option. Therefore, the researcher recommended that it is imperative to design a community-based intervention program to eliminate the situation which did not give way for colorectal cancer screening among persons aged 50 years and above.*
KEYWORDS: *Colorectal Cancer, Screening, Acceptance, Hospital*

Received 09 May, 2021; Revised: 22 May, 2021; Accepted 24 May, 2021
Published with open access at www.questjournals.org

I. INTRODUCTION

Colorectal cancer is considered one of the most common cancers globally, with above 1.8 million new colorectal cancer cases and 881,000 mortality estimated in 2018 (1). The global prevalence of colorectal cancer is alarmingly on the increase. Colorectal cancer ranks third among the most common cancers worldwide (2) and is one of the top five cancers prevalent in Nigeria. According to Bray et al., lung cancer is the most common cancer and the main cause of cancer death among men, followed by prostate and colorectal cancer (for incidence) and liver and stomach cancer (for mortality). Among women, breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death, followed by colorectal and lung cancer (for incidence) and vice versa (for mortality) (1).

Historically colorectal cancer rates were far lower in low- and middle-income countries (LMICs) than high-income countries; however, globalization has changed the game entirely in recent times (3). The African continent, where colorectal cancer was once considered rare, has witnessed an unprecedented surge in its

incidence, contributing to increasing mortality cases. Although the incidence of colorectal cancer in Sub-Saharan Africa is generally considered to be among the lowest worldwide, there is currently a rising trend in its incidence in Africa (4).

According to Graham, Adeloye, Grant, Theodoratou, & Campbell, the crude incidence of colorectal cancer in Africa for both sexes was 4.04 per 100 000 population (4.38 for men and 3.69 for women) (5). The incidence rate of colorectal cancer in Nigeria is estimated at 3.4 per 100,000 populations (6). The incidence of colorectal cancer is gradually increasing at alarming rates in Africa, although the exact burden of disease in Nigeria remains poorly understood. Studies conducted decades ago showed marginal increases in the incidence of colorectal cancer in most African countries. Over 40 to 50 years ago, the incidence rate of colorectal cancer in West Africa was less than 3 per 100,000 population (Irabor, 2017). Nigeria in the 1960s had about 3.2 per 100,000 population (7). Later on, studies from Nigeria showed significant increases from 21 patients per year between 1954 and 1967 to 70 patients per year between 2000 and 2006 (8).

Previous studies had reported colorectal cancer to be rare among Africans (9). African fibre-rich diet and rarity of familial/hereditary colitis were thought to be protective (4). However, updated reports indicate a rising global incidence, and a study conducted in 1996 showed an 81% increase in incidence over two decades in Ibadan southwest Nigeria (10). Other reports suggest that it is the most typical gastrointestinal cancer in Lagos, Nigeria, with late presentations and poor outcome (11; 12). Screening for colorectal cancer has proven effective in reducing disease mortality and is also cost-effective (9).

Early colorectal cancer often times has no symptoms, so secondary preventive measures such as early detection are necessary. Colorectal cancer may be easily prevented through colorectal cancer screening, which can detect the disease during its early stages when the survival rates are highest.

There are numerous colorectal cancer screening tools, and they are divided into two main categories, viz biological sample‐ based tests and colonic sample-based tests. Biological sample-based tests include faecal, blood, and urine tests. Colonic structure‐ based tests include flexible sigmoidoscopy (FS), colonoscopy, computed tomography (CT) colonography, magnetic resonance imaging (MRI) colonography, and double‐ contrast barium enema. Each screening tool has differing characteristics concerning the accuracy, invasiveness, interval, costs, and quality of evidence supporting its use. Stool based biological tests are guaiac‐ based faecal occult blood test (gFOBT), faecal immunochemical test (FIT) and the newer stool DNA test. Traditionally, stool‐ based testing has been used to identify patients that will need colonoscopy procedure (13; 14; 15; 16; 17; 18; 19).

Unfortunately, colorectal cancer screening acceptance is lower than that of other screening-amenable cancers worldwide (20). In Nigeria, despite the availability of resources for the diagnosis of colorectal cancer, there is a lack of consistent acceptance of colorectal cancer screening due to individual belief and specific factors.

Unfortunately, multiple factors are associated with colorectal cancer screening behaviours among person 50 years and above. Some of these factors are culturally related. However, it is essential to note that screening methods for colorectal cancers are relatively expensive, propelling people to use alternative means to treat their symptoms. In addition, low levels of knowledge about colorectal cancer screening is a potent inhibitor, as Odukoya and Fayemi report gross lack of knowledge about colorectal cancer in Nigeria, which was significantly poorer among rural-dwellers in Nigeria.

This study adopted Andersen's behavioral model, which is widely known for verifying the accessibility to health services. The Andersen model consisted of predisposing, enabling, and need factors (21). Predisposing factors refer to basic characteristics of the population; in this study, they included age and gender. Enabling factors refers to conditions that an individual and social effort may change, and in this study, it included educational level. Need factors were the most directly related with health services use, from functional and health problems that stipulate healthcare services need (21). According to Andersen, perceived needs are "how people view their own general health and functional state, as well as how they experience symptoms of illness, pain, and worries about their health and whether or not they judge their problems to be of sufficient importance and magnitude to seek professional help" (21). In this study, they included being aware of colorectal cancer and colorectal cancer screening, haven been screened of colorectal cancer screening before, and having a family history of colorectal cancer: chronic disease and disability status. Based on the ANBM and the literature reviewed, the researcher adapted the four major construct: environment, personal characteristics, health behaviour, and outcome, for use. The researcher suggests environmental (i.e., health system – Asokoro District Hospital, Abuja) and person characteristics (i.e., predisposition of people to use services (age, gender), factors that enable or impede this use (educational level), and a person's perception of need for care (family history of colorectal cancer, prior screening, and awareness of colorectal cancer and screening)) combine to influence health behavior (i.e., health service use – acceptance of colorectal cancer screening) (Figure 1.1).

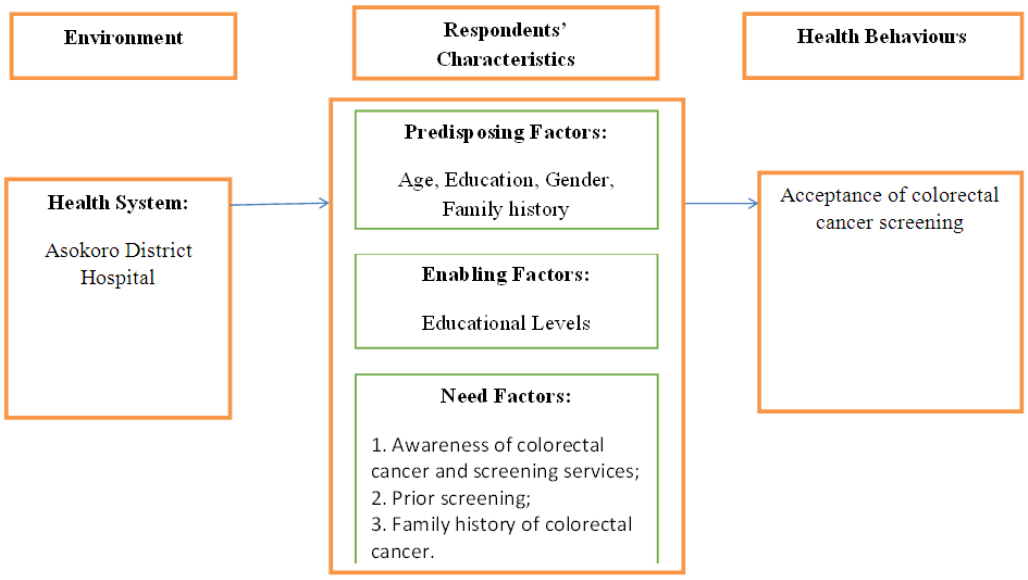

Figure 1.1: Acceptance of colorectal cancer screening conceptual framework, adapted from the Andersen and Newman Behavioural Model (ANBM).

II. METHODOLOGY

This study is a quantitative design, which adopted a descriptive cross-sectional survey method to explore colorectal cancer screening behavior and its associated factors among persons aged 50 years and above in Abuja, Nigeria. The study was carried out in Asokoro District Hospital, Abuja. The population for the study included all adults, both men and women, attending GOPD of Asokoro district hospital, Abuja. The target populations are men and women who are over 50 years old, residing in the Federal capital territory, and attending GOPD of Asokoro district hospital, Abuja. About 60 patients/clients attend the GOPD daily, resulting in an estimated value of 1800 patients/clients per month.

The inclusion criteria were all adult men and women who attend the Asokoro District Hospital, Abuja outpatient clinic for conditions other than colorectal cancer. Respondents who are 50 years and above residing in Abuja and women and men aged 50 and above who were available and gave their consent for this study was included as part of the inclusion criteria. The exclusion criteria were patients who have been previously diagnosed with colorectal cancer and patients who are not interested or do not want comprehensive data collected on them.

The Cochran formula was used in deriving at a sample size 349 (10% attrition included). A non-probability convenient sampling technique was used to select participants in the general out-patient department of Asokoro District Hospital Abuja. Data for this study was collected using a 15-item structured questionnaire adapted from Jacobs (2002). The questionnaire comprised of two sections, namely: Section A: This part consists the socio-demographic section will be used to elicit participants' information on the Age, gender, marital status, educational level, awareness of colorectal cancer and screening, prior colorectal screening, and family history of colorectal cancer. Section B**:** This consists of nine (9) questions on acceptance derived from the various literatures reviewed during the course of this study. The researcher made use of 5 Likert response scale, that is, strongly agree (SA), Agree (A), Neutral (N), Disagree (D), and Strongly Disagree (SD). However, respondents were measured on 36-point reference scale; with 0 as the lowest score and 4 the highest score. The maximum score attainable was "36" and the minimum was "0". The respondents' responses were further dichotomized and assigned a numerical score (mean) depicting their levels of acceptance for colorectal cancer screening, as follows: Poor – 0 to 9; Below Average – 10 to 17; Average – 18; Above Average – 19 to 27; and Good – 28 to 36.

The instrument was validated for both face and content by the supervisor and other expert in the field recommended by the supervisor and all necessary input and corrections will be made. The reliability was determined using Cronbach's alpha reliability coefficient after pre-testing the instrument on 32 respondents in CardioCare Specialty Hospital, Garki, Abuja. The filled questionnaire was retrieved and analyzed. The internal consistency reliability using Cronbach's Alpha (α) (section B) yielded 0.75. Information retrieved at the end of the study was coded and statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 23. Descriptive statistics was applied to examine the participant's baseline characteristics and the significant differences between demographic-characteristics. Correlation and logistic regressions analysis was further conducted to examine the factors associated with colorectal cancer screening as well as the future

intention to undergo colorectal cancer screening.

Ethical clearance for the study was obtained from the Babcock University Health Research Ethical Committee (BUHREC). An introduction letter was obtained from the Babcock University School of Nursing to Asokoro District Hospital Health Research and Ethics Committee for approval to conduct the study. Throughout the period of data collection, participants were assured of strict confidentiality. Moreover, the participants were informed of their liberty to withdraw from the study at any time without any fear of repercussion. Informed consent form was administered to and signed by each participant.

III. RESULTS

Three hundred and seventeen (317) of the 349 eligible respondents participated in this study, thus representing about 91% response rate.

Table 3.1: Respondents Demographical Characteristics

N = 317

	Variables	**Frequency**	**Percentages (%)**
Age	50-60	229	72.2
	61-70	41	12.9
	71 years above	47	14.8
Gender	Male	137	43.3
	Female	180	56.7
Educational qual.	No formal educ	15	4.8
	Primary	35	11.0
	Secondary	116	36.7
	Tertiary	151	47.6
I have heard of Cervical Cancer and Cervical Cancer Screening	Yes	190	60.0
	No	127	40.0
Prior Colorectal Cancer Screening	Yes	20	6
	No	297	94
Family History Colorectal Cancer	Yes	32	10.0
	No	285	90.0

Source: Field study, 2021

The result of the analysis of the demographic variables of the study based on age showed that 72.2% were within age 50 and 60 years, 180 (56.7%) were female, 151 (47.6%) had tertiary education, 190 (60.0%) have heard of Colorectal cancer and Colorectal cancer screening, and 285 (90.0%) were without family history on Colorectal cancer.

Research Question One: What are the factors associated with acceptance of colorectal cancer screening among the respondents.

Table 3.2: Factors Associated with Acceptance of Colorectal Cancer Screening among the Respondents.

Items/Factors	**X^2**	**P-value**
Age	21.098	.009*
Gender	3.543	.106
Educational level	11.341	.000*
Family History of Colorectal Cancer	6.667	.042*
I have heard of Colorectal Cancer and Colorectal Cancer Screening	14.179	.001*
Prior Colorectal Cancer Screening	2.650	.266

Source: Field study, 2021

From table 3.2, age, educational level, family history of colorectal cancer, and awareness of colorectal cancer and colorectal cancer screening were identified as factors associated with acceptance of colorectal cancer screening among the respondents.

Table 3.3: Level of Acceptance of Colorectal Cancer Screening among Persons Aged 50 Years and Above

Levels of acceptance of colorectal cancer screening measured on 36-point reference scale	**Category of Scores**	**Mean** ±SD
Good	28 - 36	**12.89(36%)±4.33**
Above average	19 - 27	
Average	18	
Below average	10 - 17	
Poor	0 - 9	

Source: Field study, 2021

Research Question Two: What is the level of acceptance of colorectal cancer screening among persons aged 50 years and above in Asokoro District Hospital Abuja?

Table 4.3 reveal the level of acceptance of colorectal cancer screening among persons aged 50 years and above in Asokoro District Hospital Abuja measured on 36-point reference scale. The result shows that majority of the respondents' disposition towards the acceptance of colorectal cancer screening were below average with a total mean score of 12.89 (36%).

Table 4.4: Association between Socio-Demographic Variables (Age, Gender, Educational Level, family history, awareness and prior screening) and Acceptance of Colorectal Cancer Screening.

Items/Factors	**X^2**	**P-value**
Age	21.098	.009*
Gender	3.543	.106
Educational level	11.341	.000*
Family History Colorectal Cancer	6.667	.042*
I have heard of Colorectal Cancer and Colorectal Cancer Screening	14.179	.001*
Prior Colorectal Cancer screening	2.650	.266

Source: Field study, 2021

Testing of Hypotheses

H_O1: There is no significant association between socio-demographic variables (age, gender, educational level, awareness, prior screening and family history) and acceptance of colorectal cancer screening

Table 4.4 shows factors associated with acceptance of colorectal cancer screening among the respondents. The chi-square value obtained for age was $X^2 = 21.098$, p-value = .009; educational qualification was $X^2 = 11.341$, p-value = .000; gender was $X^2 = 3.543$, p-value = .106; awareness was $X^2 = 14.179$, p-value = .001, prior screening was $X^2 = 2.650$, .266, and family history was $X^2 = 6.667$, p-value = .042 at the significant levels of less than 0.05 respectively. Therefore, age, educational status, awareness, and family history were significantly related to acceptance of colorectal cancer screening among the participants, as their p-values were less than 0.05. However, gender ($x^2 = 3.543$, p-value = .106), and prior Colorectal Cancer screening ($X^2 = 14.179$, p-value = .266) were not found to be significant associated with acceptance of colorectal cancer screening among the respondents.

IV. DISCUSSION OF FINDINGS

The study result showed that the respondents' dispositions towards the acceptance of colorectal cancer screening were below average. Evidences in literatures shows that low acceptance of colorectal cancer screening may be due to inadequate finance, ignorance, gullibility or fear of the examination and results (22; 6; 23; 24).

Age and acceptance of colorectal cancer screening: the respondents' age was identified as one of the predictors of participation in colorectal cancer screening. This is supported by several studies that identified a significant association between age and colorectal screening behavior (25; 26; 27).

Gender and acceptance of colorectal cancer screening: The result of this present study shows no association between gender and acceptance of colorectal cancer screening. This result is inconsistent with Huang, Choi, Chen, Wang, Ding, Jin, et al. study that shows an association between gender and acceptance, as

female individuals were associated with reduced participation (28). Similarly, in a cross-sectional survey on a survey study on factors associated with participating in the Danish screening program for colorectal cancer by Nielsen, Berg-Beckhoff & Leppin, the study result revealed that female sex was positively associated with screening participation (29).

Educational level and acceptance of colorectal cancer screening: a significant association between the respondents' educational level and acceptance of colorectal cancer screening was elicited in this study. Previous studies have shown a positive relationship between educational level and participation in colorectal cancer screening. Rim et al., reported low participation in colorectal cancer screening among those with low educational status in their study (30). Chouhdari et al. also submitted that a high educational level, diploma, or university degree was a predictor to participate in colonoscopy (31). This result is also in line with Ait Quakrim et al., who reported that participation in colorectal cancer screening among first-degree relatives increased significantly with the educational level (32).

Awareness of colorectal cancer and screening, and acceptance of colorectal cancer screening: present study revealed a significant association between respondents' awareness of colorectal cancer and screening services and acceptance to of colorectal cancer screening. This is supported by previous studies that being well-informed has a positive effect on participation in CRC screening (33; 34; 35).

Prior screening and acceptance of colorectal cancer screening: The present study shows no association between prior cervical cancer screening and acceptance of colorectal cancer screening among persons aged 50 years and above in Abuja, Nigeria. This result is in contrast to a study by Luu, Lee, Lee, Suh, Kim, and Choi on the acceptance of colorectal cancer screening upper age limit in South Korea, which revealed that those who had never been screened for CRC had the highest acceptance rate (36). Overall, screening history for CRC (screened by both the fecal occult blood test and colonoscopy, and other cancers was negatively associated with acceptance of an upper age limit for CRC screening. Plumb Ghanouni, Rainbow, Djedovic, Marshall, Stein et al., retrospectively reviewed medical records of patients who had not completed colonoscopy, despite a positive screening FOBt result (37). They grouped reasons for non-attendance into broad categories, the largest of which were unwillingness to have a colonoscopy, other commitments, the belief that the FOBt test result was a false positive, or other health issues taking priority. Shields et al., as cited in Plumb et al., found that among patients in a US municipal opportunistic screening program, those with a more strongly positive FOBt result were more likely to undergo colonoscopy (37).

Family history and acceptance of colorectal cancer screening: association between the respondents' family history of colorectal cancer and acceptance of colorectal cancer screening was elicited in the study. This result is supported by Courtney et al., who reported that having a patient with colorectal cancer in the family is a predictor for participation in colorectal cancer screening (38). This result is consistent with previous studies, showing that having more than one relative with colorectal cancer was associated with screening participation (39; 40). However, Bia et al., reported no correlation between family history for colorectal cancer and screening participation (41).

V. CONCLUSION

Colorectal cancer (CRC) is a major health problem worldwide. Although population-based CRC screening is strongly recommended in average-risk population, compliance rates are still far from the desirable rates. High levels of screening uptake are necessary for the success of any screening program. The increase in early-onset colorectal cancer incidence and mortality demonstrates an obligation to take actions. Earlier screening would save lives, and starting at the age of 45 years may be a robust screening option.

REFERENCE

[1]. Bray, F., Ferlay, J., Soerjomataran, I., Siegel, R., Torre, L.A., & Jamal, A. (2018). Global cancer statistics 2018: GLOBACAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries, Cancer Journals for Clinicians, 21(13), 18-22

[2]. Tas, F., Kocas, S., & Cirpan, R. (2019). The effect of knowledge and health belief about colorectal cancer screening behavior. *Journal of Clinical Nursing*, 28: 23-24

[3]. May, F.P., & Anandasabapathy, S. (2019). Colon Cancer in Africa: Primetime for screening? *Gastrointestinal Endoscopy.* 89(6), 1238-1240

[4]. Irabor, D.O. (2017). Emergence of colorectal cancer in West Africa: Accepting the inevitable, *Nigerian Medical Journal*, 58(3): 87-91

[5]. Graham, A, Adeloye, D , Grant, L , Theodoratou, E and Campbell,H. (2012). "The incidence of colorectal cancer in sub-Saharan Africa: a systematic analysis*," Journal of Global Health,* 2(2), doi10.7189/jogh.02,020204.

[6]. Irabor, D.O., Afuwape, O.O & Ayandipo, O (2014). The present status of the management of colon and rectal cancer in Nigeria, *Journal of Cancer Research,* 2014: 1-7

[7]. Irabor, D.O., Arowolo, A., Afolabi, A.A (2010). Colon and rectal cancer in Ibadan Nigeria. Colorectal Disease. 12: e43-e49

[8]. Irabor, D., & Adedeji, O.A. (2009). Colorectal cancer in Nigria: 40 years on. A review, *European Journal of Cancer Care,* 18(2): 110-115

[9]. Onyekwere, C., Ogbera,A.O., Abdulkareem, F.B., & Ashindoitiang, J. (2009). Colorectal carcinoma screening in Lagos, Nigeria, are we doing it right. *Gastroenterology Research,2(1), 38-42*

[10]. Iliyasu Y., Ladipo, J.K., Akang, E.E, Adebamowo, C.A., Ajao, O.G., & Aghadiuno, P.U., (1996). A twenty-year review of Malignant colorectal neoplasms at University College Hospital, Ibadan, Nigeria, *Disorders of Colon and Rectum*, 39: 536-540

[11]. Abdulkareem, F.B., Faduyile, A.O., Daramole, O. (2009). Pattern of Malignant Gastrointestinal tumors in Lagos and Shagamu. *West African Journal of Medicine*

[12]. Tade, A.O. (2006). Right sided colon cancer at Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria. A ten year review, *Nigeria Medical Practitioners*, 49: 82-84

[13]. Centers for Disease Control and Prevention (CDC). (2013). Vital signs: Colorectal cancer screening test use-United States. *Morbidity and Mortality Weekly Report, 62, 881-888.*

[14]. Wong, C.K., Lam, C.L., Wan, Y.F., & Fong, D.Y. (2015). Cost-effectiveness simulation and analysis of colorectal cancer screening in Hong Kong Chinese population: Comparison amongst colonoscopy, guaiac and immunologic fecal occult blood testing. *BMC Cancer*, 15, 705

[15]. Schreuders, E.H., Grobbee, E.J., Spaander, M.C., & Kuipers, E.J. (2016). Advances in fecal tests for colorectal cancer screening. *Current Treatment Optionsin Gastroenterology 14,152-162.*

[16]. Niedermaier, T., Weigl, K., Hoffmeister, M., & Brenner, H. (2017). Diagnostic performance of flexible sigmoidoscopy combined with fecal immunochemical test in colorectal cancer screening: Meta-analysis and modeling. *European Journal of Epidemiology, 32, 481-493*

[17]. Inadomi, J.M. (2017). Screening for Colorectal Neoplasia, *New England Journal of Medicine, 376, 149-56.*

[18]. Bevan, R., Rutter, M.D. (2018). Colorectal cancer Screening-who, how, and When? *Clinical Endoscopy, 51, 37-49*

[19]. Moreno, C., Kim, D.H., Bartel, T.B., Cash, B.D., Chang, K. J., Feig, B.W., . . . Carucci, L.R., (2018). ACR Appropriateness Criteria® colorectal cancer screening. *Journal of American College of Radiology, 15, 56-68.*

[20]. Odukoya, O & Fayemi, M. (2019). A Rural-Urban Comparison of Knowledge, Risk- Factors and Preventive Practices for Colorectal Cancer among Adults in Lagos State. *Asian Pac J Cancer Prev*. 2019 Apr 29;20(4):1063-1071. doi: 10.31557/APJCP.2019.20.4.1063. PMID: 31030475; PMCID: PMC6948893.

[21]. Andersen, R. M., (1995). Revisiting the behavioural model and access to medical care: does it matter? *J Health Soc Behav*; 36(March): 1-10

[22]. Nwozichi, C.U., Ojewole, F.O., Oluwatosin, A.O. (2017): Understanding the challenges of providing holistic oncology Nursing care in Nigeria. *Asia Pacific Journal of Oncology Nursing, 4(1), 18-20*

[23]. Nwozichi, C.U. (2019). Toward a germinal theory of knowing-Revealing-Humanizing as expressions of caring in cancer palliative care. *Asia-Pacific Journal of Oncology Nursing*, 6(3), 269-272

[24]. Emeka Ray-Offor., et al. (2020). Colorectal Cancer in Niger Delta, Nigeria: Multi-centre lower Gastrointestinal Endoscopy Study, *Journal of Medical Research and Case Reports* 2(1).

[25]. Klabunde C, Blom J, Bulliard JL, Garcia M, Hagoel L, Mai V, Patnick J, Rozjabek H, Senore C, & Törnberg S. (2015). Participation rates for organized colorectal cancer screening programmes: an international comparison. J Med Screen. 2015 Sep;22(3):119-26. doi: 10.1177/0969141315584694. Epub 2015 May 12. PMID: 25967088.

[26]. Yang, S.E, Han, N.K., Lee, S.M., Kim, T.H., & Chung, W. (2015). The factors related to the non-practice of cancer screening in cancer survivors: based on the 2007-2012 Korean National Health and Nutrition Examination Survey. Health Policy Management, 25, 162-173

[27]. Choi, B., Um, T., & Lee, K. (2018). Factors related to cancer screening behaviours. *Epidemiology and Health, 40, 1-9.*

[28]. Wong, M. C, Ding, H., Wang, J., Chan, P. S, & Huang, J. (2019). Prevalence and risk factors of colorectal cancer in Asia. *Intest Res.* 2019 Jul;17(3):317-329. doi: 10.5217/ir.2019.00021. Epub 2019 May 20. PMID: 31085968; PMCID: PMC6667372.

[29]. Nielsen, J.B., Berg-Beckhoff, G. & Leppin, A., (2021). To do or not to do – a survey study on factors associated with participating in the Danish screening program for colorectal cancer. *BMC Health Serv Res* **21,** 43 (2021). https://doi.org/10.1186/s12913-020-06023-6

[30]. Rim, S. H., Joseph, D.A., Steele, C.B., Thompson, T.B., & Seeff, L.C. (2011). Colorectal cancer Screening—United States, 2002, 2004, 2006, and 2008," *Morbidity and Mortality Weekly Report*. 60(1), 42–46

[31]. Chouhdari, S.A., Yavari, P., Pourhoseingholi, M.A., & Sohrabi, M.R. (2016). Association between Socioeconomic Status and Participation in Colonoscopy Screening Program in First Degree Relatives of Colorectal Cancer Patients. *Iranian Journal of Cancer Prevention, 9(2), 1-6.*

[32]. Ait Ouakrim, D., Lockett, T., Boussioutas, A., Hopper, J.L., & Jenkins, M.A. (2013). Screening Participation for People at Increased Risk of Colorectal Cancer Due to Family History: A Systematic Review and Meta-Analysis. *Family. Cancer, 12,* 459- -472

[33]. Sanderson, P. R., Weinstein, N., Teufel-Shone, N., Martínez, M. E., (2011). Assessing colorectal cancer screening knowledge at tribal fairs. Prev Chronic Dis. 2011;8(1):16–25.

[34]. Gregory, T. A., Wilson, C., Duncan, A., Turnbull, D., Cole, S. R., Young, G., (2011). Demographic, social cognitive and social ecological predictors of intention and participation in screening for colorectal cancer. BMC Public Health. 2011;14:38–48.

[35]. Gede, N., Reményi Kiss, D., & Kiss, I., (2018). Colorectal cancer and screening awareness and sources of information in the Hungarian population. *BMC Fam Pract* 19**,** 106 (2018). https://doi.org/10.1186/s12875-018-0799-1

[36]. Luu, X. Q., Lee, K., Lee, Y. Y., Suh, M., Kim, Y., & Choi, K. S. (2020). Acceptance on colorectal cancer screening upper age limit in South Korea. *World journal of gastroenterology*, *26*(27), 3963–3974. https://doi.org/10.3748/wjg.v26.i27.3963

[37]. Plumb, A, A., Ghanouni, A., Rainbow, S., Djedovic, N., Marshall, S., Stein J., et al. (2017). Patient factors associated with non-attendace at colonoscopy after a positive screening faecal occult blood test. Journal of medical screening, 24(1): pp. 12 – 19 https://doi.org/10.1177/0969141316645629

[38]. Courtney, J.R., Paul, L.C., Carey, L.M., Sanson-Fisher, R.W., Macrae, F.A., . . . Simmons, J., (2013). A population-based cross-sectional study of colorectal cancer screening practices of first-degree relatives of colorectal cancer patients, *BMC Cancer, 13(13), 1-11*.

[39]. Gimeno-Garcia AZ, Quintero E, Nicolas-Perez D,Hernadez, M., & JimennezSosa, A. (2011). Colorectal cancer screening in the first-degree relatives of colorectal cancer: participation, knowledge, and barriers against screening. *European Journal of Gastroenterology and Hepatology, 23(12), 1165-1171.*

[40]. Kilickap, S., Arslan, C., Rama, D.., & Yalcin, S. (2012). Screening colonoscopy participation in Turkish colorectal cancer patients and their first degree relatives. *Asian Pacific Journal of Cancer Preventon, 13(6), 2829-2832.*

[41]. Bai,Y., Wong, C.L., Peng, X., Winnie, K., & So, W. (2020). Colonoscopy Screening Behaviour and Associated Factors Amongst First-Degree Relatives of People with Colorectal Cancer in China: Testing the Health Belief Model Using a Cross-Sectional Design, *International Journal of Environmental Research and Public Health*, *17*, *4927doi:10.3390/ijerph17144927*