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LEGON



PATIENT ATTRIBUTION OF COLORECTAL CANCER SYMPTOMS AT KORLE BU TEACHING HOSPITAL

BY

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THIS DISSERTATTION IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE.

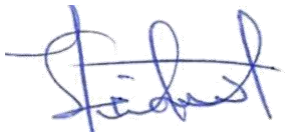
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DECLARATION

I, **JOSEPH SIAW - YEBOAH**, do hereby declare that this dissertation is the result of my efforts under able supervision and it has never been presented for another degree in this University or elsewhere either in whole or in part.



9th July, 2025

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9th July, 2025

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(Academic Supervisor)

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DEDICATION

I dedicate my dissertation to my mentor, Dr. Richard Osei Amponsah who advised and helped me make this successful.



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ABSTRACT

Background: Delayed treatment of colorectal cancer (CRC) leads to poor outcomes, primarily due to patient misinterpretation of symptoms, late healthcare-seeking behaviour, and physician response. Records from Korle Bu Teaching Hospital (KBTH) indicate rising CRC cases since 2018, with patients' symptom misattribution being a major contributor to late-stage diagnoses, resulting in higher mortality and poor prognosis. Limited public awareness of CRC symptoms exacerbates this issue, necessitating further research into patients' symptom perceptions.

Objective: This study examined patient attribution of CRC symptoms, associated factors, and the relationship between symptom attribution and patient interval (time from symptom recognition to medical consultation).

Methods: A cross-sectional study analysed 218 CRC patients treated at KBTH (2018–2020) using interviewer-administered questionnaires (Kobo Collect). Data were analysed in STATA 16, with logistic regression assessing associations ($p < 0.05$ significance).

Results: The mean age was 48.2 years (69% male). Key symptoms prompting medical visits were blood in stool (56.4%), change in bowel habits (64.7%), and abdominal pain (67.9%). Blood in stool was strongly linked to cancer attribution (cOR=13.1, p=0.014) and benign somatic causes (cOR=2.38, p=0.002). Older age predicted psychological (cOR=0.96, p=0.005) and lifestyle-related attributions (cOR=0.97, p=0.005). Patients attributing symptoms to lifestyle factors sought care faster in less than 20 days (aOR=1.96, p=0.046).

Conclusion: Blood in stool, bowel changes, and abdominal pain were the most common symptoms driving healthcare visits. Misattribution delays care, particularly among older adults. Public education on CRC symptoms is critical to improve early detection. KBTH should prioritize community outreach to enhance symptom awareness and reduce late-stage diagnoses.

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LIST OF ABBREVIATION

aOR_____Adjusted Odds Ratio

CCCRC_____ Colorectal cancer

KBTH_____ Korle Bu Teaching Hospital

IPRQ_____ Revised Illness Perception Questionnaire

COVID-19 _____Coronavirus disease

cOR_____Crude Odds Ratio

PI _____Principal Investigator



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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background to the Study

The colon and the rectum are parts of the human digestive system that forms part of the large intestines. Anatomically, the colon is divided into four major sections: the ascending, transverse, descending, and sigmoid colon, leading into the rectum and terminating at the anal canal (Standring et al., 2016; Moore, Dalley, & Agur, 2018). The colon functions primarily in the reabsorption of water and electrolytes from indigestible food residues, while the rectum acts as a reservoir for faecal matter prior to elimination (Marieb & Hohn, 2019).

The large intestines like any part of the human body suffer from various disease conditions such as anal stenosis, colorectal cancer (CRC), colonic inertia, colitis and many more. Among these, CRC remains one of the most commonly diagnosed cancers globally and is a leading cause of cancer-related mortality (World Health Organization (WHO), 2021). It typically originates in the mucosal lining of the colon or rectum and may progress through adenomatous polyps before becoming invasive cancer (Siegel et al., 2020).

Colorectal cancer (CRC) is a global public health disease that is estimated to be killing about 700,000 people annually all over the world (Torres et al., 2015). CRC is said to be the third most commonly diagnosed cancer worldwide and second in Europe and the America (Siegel et al., 2020; Medical University of South Carolina, n.d). Early studies suggested high prevalence rates of CRC in the developed countries but recent studies are suggesting a decline in these rates, an opposite of what is happening in developing countries. The disease, which used to be rare, is fast creeping upon the African continent (Irabor, 2017; Agyeman – Yeboah et al., 2017) especially in the urban centres of Africa.

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Low risk countries such as Ghana in recent times has seen an increase in CRC cases across the country (Missaoui et al., 2017). Data suggest an 8-fold increase in incidence from a mean of 4.1 cases per annum in the 1960s to 32.6 cases per annum in recent years (Agyeman – Yebaoh et al., 2018). Notably, the pattern of CRC in West Africa exhibits distinct characteristics compared to global trends. A majority of cases occur in the rectum and are detectable through digital rectal examination, and patients often present at younger ages between 40 to 45 years compared to the typical onset above 50 years seen in high-income settings (Irabor, 2017; Agyeman-Yeboah et al., 2018).

One of the most concerning aspects of CRC in Ghana and similar settings is the late presentation of patients to health facilities. This delay is often attributed to the misinterpretation of early symptoms, a phenomenon referred to as symptom attribution. While rectal bleeding, changes in bowel habits, and abdominal discomfort are common early signs of CRC, patients frequently misattribute these symptoms to benign conditions such as haemorrhoids or dietary issues, leading to significant delays in diagnosis (Skalitzky et al., 2023).

Comparative studies in other cancers have demonstrated that symptom attribution strongly influences health-seeking behaviour. In breast cancer, for example, a palpable lump is more likely to be recognized as a serious symptom, prompting earlier clinical consultation (Ng et al., 2020; Malherbe et al., 2022). Similarly, astrocytomas in the brain, though complex, often present with neurologically alarming signs such as seizures, leading patients to seek medical attention promptly (Hirtz et al., 2020). However, evidence suggests that symptom ambiguity and misattribution are more pronounced in CRC, particularly in low-awareness settings (Elshami et al., 2022; (Nguyen et al., 2023).

Despite growing concern over CRC in Ghana, there remains a paucity of research specifically exploring how patients interpret their early symptoms and how this affects their decisions to

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seek medical care. Existing studies primarily focus on incidence and pathology but lack in-depth analysis of the factors driving late presentation. This study, therefore, aims to investigate a patient's attribution of colorectal cancer symptoms and the factors associated with the attribution and the association between symptoms attribution and patient's interval.

1.2 Statement of the Problem

Colorectal cancer (CRC) outcomes are significantly affected by patients' misattribution of symptoms, delays in seeking formal healthcare, and, in some cases, inadequate early clinical responses (Siminoff et al., 2014). In Ghana, this problem is particularly pronounced. Many patients interpret cardinal symptoms of CRC such as rectal bleeding and changes in bowel habits as signs of less serious or familiar conditions, particularly "kooko," a local term for haemorrhoids (Boadu & Asase, 2017).

This misattribution often leads patients to seek care from traditional healers, prayer camps, or over-the-counter remedies before consulting biomedical professionals (Turkson et al., 2020). Such health-seeking patterns contribute to diagnostic delays, often resulting in patients presenting with advanced-stage disease when the opportunity for curative treatment is greatly diminished. Records from Korle Bu Teaching Hospital, Ghana's leading referral centre, show an upward trend in new CRC cases rising from 58 in 2018 to 97 in 2020 (Ministry of Health, 2021). Studies suggest poor prognosis, quality of life and survival rates among these CRC patients (Yorke et al., 2019) caused by late presentation of cases as well as ignorance of the importance of early presentation to the health facilities for timely diagnosis and treatment.

Globally, symptom misattribution is a well-recognized barrier to early cancer detection. In high-income settings such as the United Kingdom, Whitaker et al. (2014) found that although symptoms like rectal bleeding are often recognized as potentially serious, they are frequently dismissed or attributed to benign causes such as haemorrhoids, leading to delays in

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presentation. Symptom attribution is largely influenced by patients' level of knowledge about the disease and its early warning signs. Therefore, it is essential to gain deeper insight into how patients interpret or misinterpret the symptoms they present with especially those that later turn out to be indicative of colorectal cancer (CRC). This study aims to investigate patients' symptom attributions and examine the factors associated with these symptoms. While existing literature has addressed symptom attribution in various cancer types, there is a notable paucity of research focusing specifically on CRC patients. Consequently, this study seeks to fill this gap by investigating by investigating patient's attribution of colorectal cancer symptoms, the factors associated with the attribution and the association between symptoms attribution and patient interval (the time from first symptom recognition to first medical consultation).

1.3 Research Questions

1. What are CRC patient's attributions of their key symptoms before presentation to the medical facility?
2. Are there associations between symptom attribution and the type of symptom, socio-demographic characteristics?
3. What symptoms attribution of CRC patients are associated with patient interval?

1.4 Objectives of the study

1.4.1 General Objectives

The aim of this study is to investigate a patient's attribution of colorectal cancer symptoms and the factors associated with these symptoms.

1.4.2 Specific Objectives

The specific objectives of this study are to:

1. To determine CRC patient's attributions of their key symptoms before presentation to the medical facility.

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2. To identify associations between symptom attribution and the socio-demographic characteristics.
3. To assess the association between patient interval and symptoms attribution among CRC patients.

1.5 Justification

The aim of this study is to investigate a patient's attribution of colorectal cancer symptoms and the factors associated these symptoms. Mainly, this study when done will be filling a research gap thus a paucity in studies on patient attribution of symptoms in CRC patients. This information will be valuable in promotion of public health and also impact early reporting and diagnosis of the condition. This information will be relevant in significantly improving the continuum of care given to CRC patients by enabling earlier identification of care gaps, informing targeted interventions across diagnostic, treatment, and follow up stages. This allows healthcare providers to tailor care plans based on patient specific needs, leading to more timely referrals, improved patient adherence, and ultimately better health outcomes. Findings will contribute to expanding knowledge in this area and serve as a precursor to initiating other CRC studies concerning patient symptom attribution. It will also shape public health policy concerning the merchandise of herbal medicines for certain conditions in Ghana.

1.6 Narrative of Conceptual Framework

Patients with CRC, depending on variation in their socio-demographic characteristics such as age, may experience different symptoms at the onset of the disease. The symptoms experienced by individuals inform the choices they make to remedy the symptoms they are experiencing. Also, the symptoms may be attributed to cancer, benign somatic causes, psychological, or lifestyle related causes. These symptoms attributions can be influenced by one's level of education, gender, age or marital status. The symptom attribution ultimately determines

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whether or not a patient will report early to the hospital for early diagnosis and treatment or report late (patient interval) which could affect the overall prognosis of CRC.



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1.6.1 Conceptual Framework

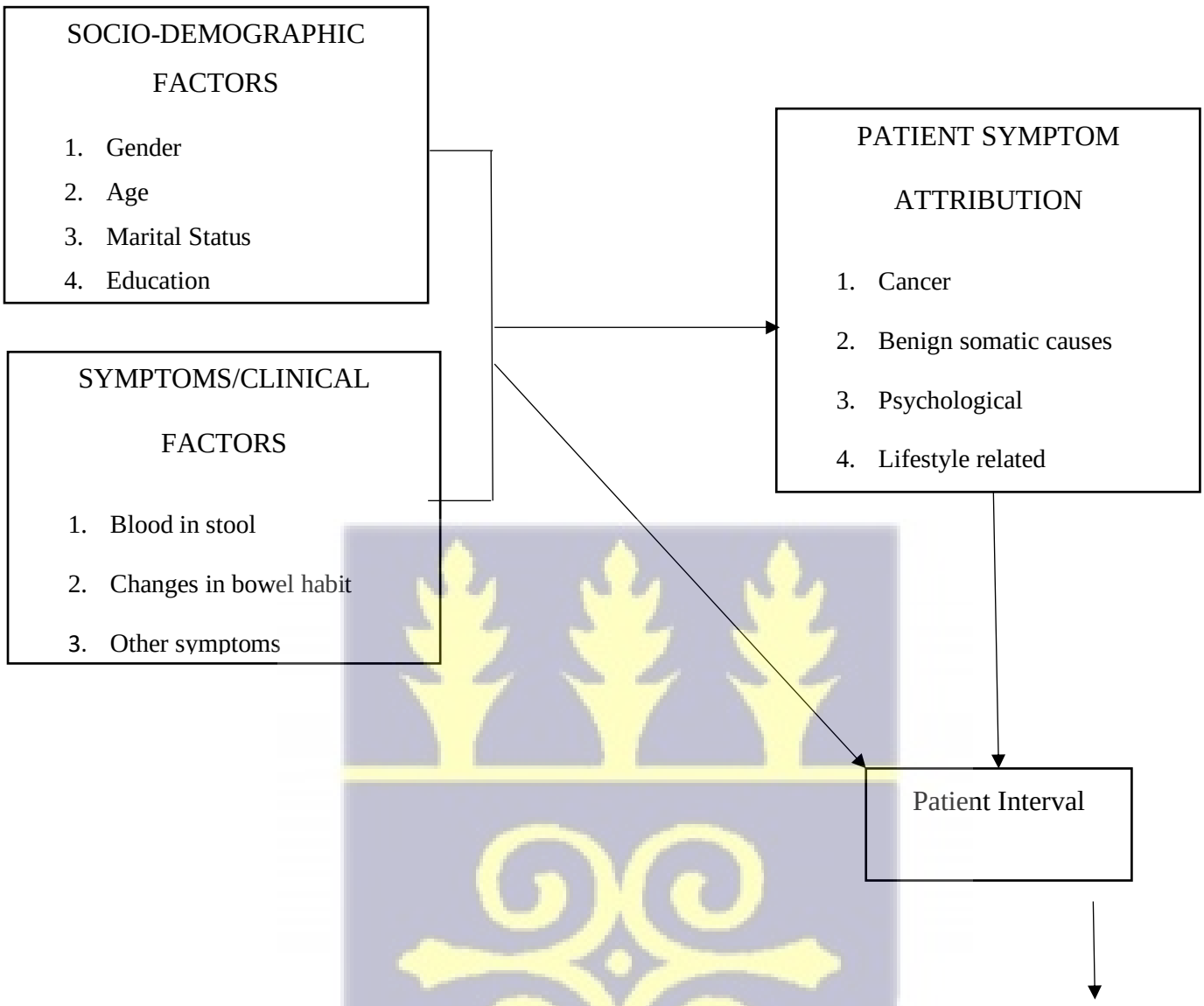


Figure 1. Conceptual Framework of the Study (Author's Construct)

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CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 Introduction

This chapter entails a comprehensive review of existing literature relevant to the subject of study. This review discusses findings of recent studies taken from Ghana and across the world concerning colorectal cancer and patient's symptom attribution touching on statistics or epidemiology as well as associated factors. To conduct this review, electronic searches were carried out using databases such as PubMed, Scopus, Science Direct, Google Scholar, and African Journals Online (AJOL). Search terms included combinations of: "colorectal cancer", "symptom attribution", "illness perception", "diagnostic delay", "patient interval", "Ghana", "Africa", "health-seeking behaviour", and "traditional medicine". The review prioritised peer-reviewed articles published in English from 2013 to 2023, with a focus on studies involving adult populations. However, a limited number of fact-based or foundational sources published prior to 2003 were also included where they provided critical insights. Articles that did not address these core themes or lacked relevance to the study context were excluded. This methodical approach ensured the review is both relevant and grounded in credible evidence. The chapter concludes with a synthesis of key findings and how they relate to the study objectives.

2.2 Epidemiology of Colorectal Cancer and Symptom Attribution

According to the Centre for Disease Control and Prevention (2021), colorectal cancer is a type of cancer that develops in the colon or rectum, affecting both men and women. Cancers develop from abnormal or uncontrolled growths that form in the walls of the colon or rectum (American Cancer Society, 2021). This abnormal growth when detected early through screening can be removed before they become cancerous. Colorectal cancer can be termed a silent killer because

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it lacks symptoms until in its advanced stage (Cleveland Clinic, 2021). Hence the need for regular or periodic screening among risk groups in order to enhance treatment and reduce mortality and morbidity (Hadjipetrou et al., 2017). Colorectal cancers can also be called colon cancer or rectal cancer, depending on where the abnormal growths begin (American Cancer Society, 2021). Usually, colon and rectal cancer are termed as the same because of the many features they have in common. Studies shows that colorectal cancer is common among persons aged 45 years and older, implying that as one ages, the risk for colorectal cancer increases (Cleveland Clinic, 2021). Apart from age, family history, genetics, underlying diseases and lifestyle factors play a role in the development of colorectal cancers (National Health Service, 2019).

According to the American Cancer Society (2021), colorectal cancer is the third leading cause of cancer-related mortalities in both men and in women, and the second most common cause of cancer mortalities for both men and women are combined in the United States of America. A systematic analysis of published papers by Graham et al. (2012) noted that in sub-Saharan Africa, the crude incidence of colorectal cancer is pegged at 4.04/100,000 in a population peaking 4.38 for men and 3.69 for women. In that same year, the World Health Organization (2012) announced that there were approximately 1.4 million new diagnoses of colorectal cancer cases made with about 700,000 deaths occurring worldwide. Studies however shows that there has been a drop in CRC mortality in developed countries due to early diagnosis and improved treatment, death rate among people younger than 55 have increased by 1% per annum from 2008 to 2017. However, in developing countries mortality is either stable or increasing due to late presentation of cases to the health facility for treatment. Some researchers have attributed this to a lack of knowledge on the symptoms of colorectal cancer among the general populace, hence affected patients are likely interpret their symptoms wrongly (Boadu & Asase, 2017; Yorke et al., 2019).

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According to Nijrolder et al. (2011), the way people perceive the symptoms they experience influence prognosis and care seeking behaviour of affected individuals. Causal attributions, thoughts and doubts concerning symptom progression, a perceived lack of control over symptoms, and having completely somatic ascriptions mostly result in a poor prognosis and care seeking behaviour. A study conducted in Denmark by Jensen et al. (2015) noted that how a patient interprets his or her symptoms depends on several factors. Firstly, the specific symptom experienced by the patient may influence the way that it is interpreted by the patient, presented to others and which attributions are given to the symptoms. Another study also reported that a patient's thoughts about a symptom may vary according to the nature of that particular symptom, and patients who experienced blood in stools were more likely to fear that this was a symptom of cancer (Pedersen et al., 2013). Secondly, people of low socio-economic status find it difficult interpreting health messages and may be less aware of which symptoms to attribute to cancer than people with a higher socioeconomic status (Bo et al., 2014). Finally, the social context and the specific situation can influence the way people attribute symptoms to different explanations (Bo et al., 2014). Jensen et al. (2015) also reported that persons with rectal cancer were more likely to believe that their symptom was due to a benign somatic cause, such as haemorrhoids, a scratch or cut. Despite this, the researcher notes that studies assessing and accounting for symptom attribution in CRC patient is lacking, creating an essential research gap, this study seeks to fill.

2.3 Diagnosis (Early/Late) / Patient Interval

In the early stages, CRC tends to be asymptomatic until in its advanced stages hence the need for regular or periodic screenings. Colorectal screenings help in the early identification and removal of these abnormal growths before they become cancerous. Screenings also help in early detection and treatment of the cancer cells before it is too late. This is important because treatment works better at the early stages. The recommended gold standard for colorectal

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cancer screening is a colonoscopy. Colonoscopy is done using a long flexible tube called a colonoscope that has a light and a camera for viewing the large intestines to detect anomalies. The faecal occult blood tests, faecal DNA tests, flexible sigmoidoscopy, barium enema and CT colonography (virtual colonoscopy) are other screening tools used in detecting colorectal cancer (John Hopkins Medicine, 2021). The length of time or the interval between when a patient experiences initial symptoms and when they eventually report to the health facility for treatment varies greatly due to effect of symptom attribution (Nielsen et al., 2010). Long patient intervals have been shown to impact prognosis or health outcomes since diagnosis and subsequent treatment has been delayed (Hansen et al., 2011). Timely presentation of cases to the health facilities has been shown to have saved 1.5 million survivors of colorectal cancer in the United States. Research shows that long patient intervals are fuelled by assumption that symptoms are not serious or are benign, denial of symptoms, fear of serious illness, income and lower levels of education, the female gender and rectal tumour location and this influenced patient time interval to seek care (Jensen et al., 2015; Golding et al., 2020).

2.4 Symptoms

According to the Cambridge dictionary, symptoms are subjective physical or mental change or feeling of illness experienced by the sick. Symptoms of colorectal cancer are normally silent or minimal and may mimic other simple conditions until the advanced stages. Common symptoms are blood in stool and changes in bowel habits. Blood in stool is the most common symptom associated with colorectal cancer. Having blood in stool does not necessarily imply the presence of a cancer since other disease conditions may cause blood in the stool. Hence the need for colorectal screening to detect the presence of cancerous cells. Another noticeable symptom is the change in bowel habits characterised by constipation, diarrhoea, narrowing of stools, incomplete evacuation, and bowel incontinence. Other symptoms that may be experienced by CRC patients include anaemia,

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abdominal or pelvic pain or bloating, unexplained weight loss and vomiting (Alrubaie et al., 2019). In their study, Jensen et al., (2015) found significant associations between the symptoms perceived as the most important and the attributions given to these symptoms. Patients who reported their most important symptom to be blood in stool were more likely to attribute this to cancer or benign somatic causes such as haemorrhoids, a scratch or cut than patients who did not see blood in stool as the most important symptom (Jensen et al., 2015).

2.5 Sociodemographic Factors

A number of studies have documented the influence of age on CRC stating an increase in CRC as one ages. However recent findings in parts of Africa have noted a change in this pattern, reporting that younger persons are being diagnosed with CRC prompting a consideration of lowering the recommended screening age. In relation to symptom attribution, Jensen et al. (2015) in their study reported that persons who are aged 65 years or older were significantly less likely to attribute their symptoms to psychological and lifestyle-related causes compared to persons below the age of 65 years. Various research show that CRC does occur in men and women but reveal that rates for men are a little higher than that of women. The highest incidence rates were observed in Australia and New Zealand, with the estimated age-standardized rates being 44.8 per 100000 population in men and 32.2 in women (Favoriti et al., 2016). In Africa, Western Africa records 3.5 per 100000 in men and 3.0 in women (Bray et al., 2018). Studies from Graham et al. (2012) noted a crude incidence of CRC in Sub-Saharan Africa at an estimated 4.04/100,000 population (4.38 men and 3.69 women). According to Jensen and colleagues (2015) patient who had high educational levels were less likely to attribute their symptom to psychological causes compared to those with lower levels of education.

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2.6 Remedies Adopted for Symptoms of Colorectal Cancer

Overtime, numerous remedies have been employed in treating colorectal cancer based on its symptoms. In Ghana, piles or haemorrhoids or 'Kooko" which have symptoms close to that of colorectal cancer are treated with the use of herbs for topical application at the affected part, oral administration of decoctions of particular herbs and use of enemas (Turkson et al., 2020). Aiello and colleagues (2019) after an extensive literature search for medicinal plants in the prevention and treatment of colon cancer indicated the fruits, seeds, leaves, and plant roots of grapes, soybean, green tea, garlic, olive, and pomegranate as the most effective plants against colon cancer. In a case management study, the effectiveness of a combined therapy for treating colorectal cancer was evaluated. The therapy includes a combination of Fluorouracil, Leucovorin, and Irinotecan (FOLFIRI) chemotherapy along with Korean Herbs - Panax ginseng and Cordyceps sinensis herbal pharmacopuncture treatment. After treatment, the tumour mass sizes in the lung and lymph node metastases decreased, and the side effects caused by chemotherapy were mitigated (Lee et al., 2014). Another study documented findings where long-term Chinese Herbal Medicine therapy based on general traditional Chinese medicine principles, such as nourishing spleen qi, soothing liver qi, removing blood stasis, and detoxification improved survival outcomes in CRC patients with liver-limited metastases (Shao et al., 2019). In a publication by www.fightcolorectalcancer.org (2021), numerous complementary and alternative medicines were recommended for treating and managing colorectal cancer. Notable amongst them was the use of the cannabis plant to ease cancer-related side effects to reduce pain and nausea, and increase appetite. Another CAM is the use of exercise and meditation specifically Yoga to improve sleep, mood and circulation, reduce stress, and physically strengthen the body (www.fightcolorectalcancer.org, 2021).

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2.7 Tools for assessing Symptom Attribution

In 1997, Leventhal and colleagues founded the Common-Sense Model of Self-Regulation otherwise known as the Leventhal's Model which describe five components of illness representations. This model was based on the idea that the beliefs people have concerning an illness forms a normal guide to self - diagnosis or attribution enabling them to make sense of their symptoms and guide any coping actions. These five components of illness representations include:

(1) Identity: the label or name given to the condition and the symptoms that 'appear' to go with it.

(2) Cause: the individualistic ideas about the perceived cause of the condition, which may not be completely accurate.

(3) Time-line: the predictive belief about how long the condition might last.

(4) Consequences: the individual beliefs about the consequences of the condition and how this will impact on them physically and socially. These representations may only develop into more realistic beliefs over time.

(5) Curability/controllability: the beliefs about whether the condition can be cured or kept under control and the degree to which the individual plays a part in achieving this.

These cognitive dimensions form the foundation for understanding how patients interpret symptoms and decide whether (and how) to seek help. Over time, the model was operationalized into the Illness Perception Questionnaire (IPQ) developed by Weinman et al. (1996), which measured these five cognitive dimensions. Subsequently, the IPQ was revised into the Revised Illness Perception Questionnaire (IPQ-R) by Moss-Morris et al. (2002), which expanded the model to include emotional representations, acknowledging that illness beliefs

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are not only cognitive but also affective in nature (e.g., fear, anxiety, and emotional responses to symptoms).

In the context of symptom attribution, another relevant tool is the Symptom Interpretation Questionnaire (SIQ) developed by Robbins and Kirmayer (1991). This 39-item instrument assesses how individuals attribute 13 common somatic symptoms to three potential causes: (1) physical illness, (2) psychological or emotional factors, or (3) normalizing/external causes (e.g., environmental conditions or everyday experiences). Each attribution is rated on a Likert scale indicating the perceived strength of that causal belief. The SIQ provides a structured way to examine the attributional processes central to symptom interpretation and aligns conceptually with the CSM by capturing the beliefs individuals hold about symptom origin (Robbins & Kirmayer, 1991).

Together, these models and tools provide a theoretical and methodological basis for exploring how patients cognitively and emotionally interpret CRC symptoms, which is particularly relevant in contexts such as Ghana where cultural beliefs strongly influence symptom attribution and subsequent help-seeking behaviour.

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CHAPTER THREE

3.0 METHODOLOGY

3.1 Study Design

The study was an analytical quantitative cross-sectional study using patients who were receiving treatment for colorectal cancer at the palliative care unit of the Korle-Bu teaching hospital. The study employed a quantitative approach in executing the said design.

3.2 Study Site

This study was conducted at the Korle-Bu Teaching Hospital (KBTH). KBTH is a tertiary hospital receiving referrals from all over Ghana from both private and government facilities. KBTH is located in the Ablekuma South District in the Greater Accra Region. The district has a population of about 213,914 with 47.4% males and 52.6% females. The main economic activities peculiar to this district is fishing (due to its proximity to the Atlantic Ocean) and trading. Patients from neighbouring countries such as Togo, Burkina Faso, etc. also patronize the hospital. It is a 2000 bed capacity facility with 17 clinical and diagnostic departments/units. The hospital on the average sees 1500 patients daily with about 250 daily admissions. The hospital has a National Radiotherapy Oncology and Nuclear Medicine Centre that takes care of Cancer patients. Fridays are clinical days for Gastrointestinal Tract/Sarcoma. The services provided by the Centre to patients include Brachytherapy, Chemotherapy, Consultations and Patient care, Nuclear Medicine, Counselling and Survivorship Programme and External Beam Radiation Therapy.

3.3 Study Population

The target population for the study were all **238** patients registered with the palliative care unit at the National Radiotherapy Oncology and Nuclear Medicine Centre of the KBTH from 2018 to 2020 receiving treatment for colorectal cancer.

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3.3.1 Inclusion criteria

Study participants included both male and female patients with colorectal cancer registered at the palliative care unit of the KBTH from January 2018 to December 2020 who visit regularly on clinic days or had their phone numbers captured accurately in the records.

3.3.2 Exclusion criteria

Participants were excluded if;

1. They recorded no initial symptoms of cancer before seeing a general physician.

3.4 Sample Size

There was no sample size calculation. This was because the total population of CRC from 2018 to 2020 was small (238 patients) hence all patients with colorectal cancer registered at the palliative care unit of the KBTH from 2018 to 2020 were eligible to participate in the study.

3.5 Data Collection Techniques and Tools

The study tool was an interviewer-administered structured questionnaire. The CRC patients were not every day walk-in patients to the facility and some were at home at the time of the study, thus, information regarding names and telephone numbers of patients with colorectal cancer registered at the National Radiotherapy Oncology and Nuclear Medicine Centre of the KBTH from 2018 to 2020 were retrieved from records. Both face-face and telephone interviews were used. The principal investigator or research assistant approached patients who visited the facility on clinic days to deliver questionnaires to study participants or conduct interviews.

Phone interviews were conducted for patients residing outside of Accra who could not attend clinic during the period of the study. The phone interviews were a means to reach participants who were not on admission or at the hospital for clinic at the time of the study. Detailed information about the study were given to participants on phone and in person where

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appropriate. Participants signed an informed consent after which the questionnaire was given to them to answer. Non-responding patients were give reminder follow up one week after failed initial attempt of administering the questionnaire to enable them complete it Data collection was done using Kobo Collect.

The questionnaire was explained in Twi, Ga, or Ewe for respondents who cannot read or write. The translation was done using semantic translation. For such group of participants, Kobo collect designed electronic questionnaires were administered by the interviewer during face to face or phone conversations . All others were self administered. Each questionnaire took approximately 30 minutes to answer. Only 218 out of the 238 CRC patients agreed to participate and completed the questionnaires.

The questionnaire was adapted from Jensen et al. (2015). The questionnaire had 3 main sections, Section one (1) focused on socio demographic/personal characteristics such as age, gender, marital status and educational level. Section two (2) comprised of questions on symptoms, patient interval and remedies while section three (3) was the Revised Illness Perception Questionnaire (IPR-Q) eliciting responses on symptoms attribution to colorectal cancer.

3.6 Training and Pre-Testing of Data Collection tools

The questionnaire was pre-tested through phone interviews among 20 selected Anorectal cancer patients other than colorectal cancer at the KBTH. The purpose of pre-testing was to facilitate clarity of the questions by the study participants. Pre-testing enabled detection of typographical errors in the questions and enabled the researcher to determine the approximate time required to administer the questions. All forms of anomalies in the questionnaire were identified and corrected before actual data collection started.

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3.7 Variables

Table 3.1: Variables in the study

Dependent Variable	**Operational Definition**	**Type of Variable**	**Scale of measurement**
Symptoms attribution to colorectal cancer	Most important symptom patients experienced that made participant them to seek healthcare "What symptoms did you experience before seeking medical attention and realising that you had Colorectal cancer?" **"Which of the symptoms you experienced do you think was most important?**	Categorical 1. Blood stool 2. Changes in bowel movement 3. Abdominal pain 4. Others	Nominal
Symptom			
Blood in stool	whether or not patient had blood in stool as a symptom	binary	Nominal
Abdominal pain	whether or not patient had abdominal pain as a symptom	binary	Nominal
Change in bowels	whether or not patient experienced any	binary	Nominal

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	changes in bowels as a symptom		
other symptoms	Symptoms to be stated by patients	binary	Nominal
Secondary dependent variable			
Patient Interval	**Time (in days) from when the most important symptom was realized by patients to when the patient saw the physician**	Numerical discrete	Ratio
Independent Variable			
Age	Age at last birthday	Numerical Continuous	Ratio
Gender	Male or female	Numerical Continuous	Ratio
Employment status	Recorded employment status of patient	Binary	Nominal Employed Unemployed
Marital Status	Living alone(single/divorced) or living with a partner (married/ cohabiting)	Binary	Nominal

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Type of Cancer	Colon or Rectal	Binary	Nominal
Educational Level	highest education attained	Categorical	Nominal

The stated "most important" symptom was the focal point when answering the remaining part of the questionnaire. If a participant indicates two or more symptoms, the symptom stated first was considered the most important. "The most important symptoms" collated from participants patients were categorised into the following four groups: blood in stool, abdominal pain, change in bowel habits and other symptoms (Jensen et al., 2015) The patients were also asked to state the causes they attributed to their most important symptom. Thus, in contrast to the original IPQ-R, patients identified the perceived causes of their symptom different from the causes of their illness. The questionnaire had 19 possible causes of the symptom each of which the participants rated on a 5-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). The ratings on the Likert scale were dichotomised into nominal scale of "yes" and "no", with "yes" comprising of "strongly agree" and "agree" and "no" by putting together "neither agree nor disagree", "disagree", and "strongly disagree".

3.8 Quality Control

To ensure quality of study outcome, all data collection tools were pre tested. The Research Assistants were trained prior to commencement of study.

3.9 Data Management and Analysis

The Kobo Collect electronic data were received in comma separated values file (.csv) format. Data was opened in excel spreadsheet and cleaned by looking out for multiple entry. Data was imported into Stata 16 for analysis.

Data collected was analysed using Stata version 16 for 218 participants. Percentages, frequencies were reported for categorical variables such as marital status, educational level,

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and gender and caner type. Means and standard deviation were reported for continuous variables such as age. Chi-square was used to test association between variables. A p-value < 0.05 was deemed statistically significant. The chi-square statistic provided a statistical test for ascertaining whether an association exists between two variables. The data was presented using tables.

The questionnaire had 19 possible causes of the symptom each of which the participants rated on a 5-point Likert scale (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). The ratings on the Likert scale were dichotomised into nominal binary scale of "yes" and "no", with "yes" comprising of "strongly agree" and "agree" and "no" by putting together "neither agree nor disagree", "disagree", and "strongly disagree".(Jensen et al., 2015).

Logistic regression was used to examine the associations between symptom attribution and the type of symptom and socio-demographic characteristics. The odds ratios (unadjusted and adjusted) were assessed at a confidence level of 95%.

3.10 Ethical Consideration

Ethical clearance was obtained from the Korle-Bu teaching Hospital Institutional Review Board (Appendix IV)

Approval

An Introductory Letter was obtained from the School of Public Health, University of Ghana and presented to the hospital management for permission before commencement of data collection.

Consenting Procedure

A written consent was obtained from participants before commencement of study. This written consent included an explanation of the purpose and benefits of participating in the study. The

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participants were made to understand that participation is purely voluntary and they were at liberty to discontinue at any given time within the study and nobody will be upset should they decide to do so. The participants were given opportunity to ask questions and a consent was required by way of a signature before administering questionnaire.

Privacy

The participants were at liberty to choose a place of convenience where they feel their privacy is assured or respected to fill out/answer the questionnaire. They were allowed to take the questionnaire away if need be. Those who took the questionnaire away were reminded after a week to return the answered questionnaire.

Confidentiality

Participants were allowed to answer questions in the questionnaire at their own place of convenience to ensure privacy. Questionnaire did not bear the name of participants or any information that could help identify the participants. Data collected was kept under lock and key for use by the principal investigator only. Those entered into excel were kept on a computer with a secure password.

Cost to participants

The research did not come at any monetary cost but the valuable time of participants was required to fill out the questionnaire.

Compensation

Participants were not compensated financially or with any other physical item.

Potential Benefits

Participating in this study educated the participants about the importance for early diagnosis and treatment of cancer and its effect on prognosis as well as early reporting to the facility when experiencing symptoms during treatment of Cancer.

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Potential Risk/Discomfort

There was minimal risk to participants regarding travel to facility/ meeting point except for participants who were served questionnaires or interviewed at the facility. However, given that the world was bedevilled with COVID-19 there existed a general risk of contracting Covid-19. To mitigate this risk, all safety protocols were strictly adhered to such as social distancing, wearing of mask and hand washing.



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CHAPTER FOUR

4.0 RESULTS

4.1 Socio-demographic characteristics of respondents

The distribution of participants' socio-demographic characteristics is shown below in table 4.1. Participants' age ranged from 30 to 80 years with a mean age of respondents was 48.2 years ± 9.5SD. Majority of the participants 69.3% (151/218) were males. Majority of the participants 80.3% (175/218) were married. Most of the participants 88.1% (192/218) had had some form of formal education with 11.9% (26/218) having had no formal education.

Table 4.1 Socio-demographic characteristics of colorectal cancer patients at Korle Bu Teaching Hospital

Variables	Frequency	Percent (%)
Age in years (M ± SD)	48.17 ± 9.46	
Sex		
Male	151	69.3
Female	67	30.7
Marital status		
Single	3	1.4
Married	175	80.3
Divorced	33	15.1
Widowed	7	3.2
Educational level		
No formal	26	11.9
Primary	40	18.4
JHS/SHS	56	25.7
Tertiary	96	44.0

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4.2 Symptom Type

More than half of the respondents 56.4% (123/218) experienced blood in their stool before seeking medical attention. Also, 64.7% (141/218) and 67.9% (148/218) reported noticing a change in bowel movement and abdominal pain respectively before seeking medical attention. However, 43.6% (95/218) indicated abdominal pain as the most important symptom, followed by blood stool 31.7% (69/218) and change in bowel movements 24.7% (54/218).

Table 4.2 **Symptom type**

Variables	Frequency	Percent (%)
Blood in stool		
Yes	123	56.4
No	95	43.6
Change in bowel movement		
Yes	141	64.7
No	77	35.3
Abdominal pain		
Yes	148	67.9
No	70	32.1
Most important symptom		
Blood in stool	69	31.7
Change in bowel movement	54	24.7
Abdominal pain	95	43.6

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4.3 Symptom Attribution

The proportion of colorectal cancer patients who attributed their symptoms to cancer was 7.3%, benign somatic cause (54.1%), psychological causes (61.9%), lifestyle causes (65.1%) and causes beyond an individual's control (34.4%).

Table 4.3 **Symptom Attribution (n = 218)**

Variables	Proportion (%)	95% CI (%)
Cancer	7.3	4.3 – 11.6
Benign somatic causes	54.1	47.3 - 60.9
Psychological causes	61.9	55.1 - 68.4
Lifestyle causes	65.1	58.4 - 71.4
Causes beyond an individual's control	34.4	28.1 - 41.1

4.4 Socio-demographic characteristics and symptom type associated with cancer attribution

The results from a Chi-squared/Fischer's exact test of socio-demographic characteristics and symptom type associated with cancer attribution is shown in the table below. The presence of blood in the stool (p = 0.002) of participants with cancer was more likely to be attributed to having colorectal cancer.

Table 4.4 **Socio-demographic characteristics and symptom type with cancer attribution**

Variables	Cancer Attribution		p-value
	Attributed (n = 16)	Not attributed (n = 202)	
Age	48.00 ± 8.82	48.19 ± 9.53	0.939
Sex			$^{+}$0.361
Male	10(6.6)	141(93.4)	
Female	6(9.0)	61(91.0)	
Marital status			$^{+}$0.239
Single	1(33.3)	2(66.7)	

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Married	12(6.9)	163(93.1)	
Divorced	2(6.1)	31(93.9)	
Widowed	1(14.3)	6(85.7)	
Educational level			+0.376
No formal	1(3.9)	25(96.1)	
Primary	3(7.5)	37(92.5)	
JHS/SHS	7(12.5)	49(87.5)	
Tertiary	5(5.2)	91(94.8)	
Blood in stool			**+0.001***
No	1(1.1)	94(98.9)	
Yes	15(12.2)	108(87.8)	
Change in bowel movement			0.202
No	8(10.4)	69(89.6)	
Yes	8(5.7)	133(94.3)	
Abdominal pain			0.111
No	8(11.4)	62(88.6)	
Yes	8(5.4)	140(94.6)	

+ (fisher's exact) *(statistically significant, p≤0.05)

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4.5 Socio-demographic characteristics and symptom type associated with benign somatic causes

From the table below, blood in stool (p = 0.002) was significantly attributed to benign somatic causes among participants after a Chi-squared/Fischer's exact test.

Table 4.5 **Socio-demographic characteristics and symptom type associated with benign somatic causes**

Variables	**Benign somatic causes** Attribution		p-value
	Attributed (n = 118)	Not attributed (n = 100)	
Age	47.63 ± 8.96	48.82 ± 10.03	0.355
Sex			0.609
Male	80(53.0)	71(47.0)	
Female	38(56.7)	29(43.3)	
Marital status			+0.558
Single	1(33.3)	2(66.7)	
Married	93(53.1)	82(46.9)	
Divorced	21(63.6)	12(36.4)	
Widowed	3(42.9)	4(57.1)	
Educational level			0.550
No formal	14(53.9)	12(46.1)	
Primary	24(60.0)	16(40.0)	
JHS/SHS	33(58.9)	23(41.1)	
Tertiary	47(49.0)	49(51.0)	
Blood in stool			**0.002***
No	40(42.1)	55(57.9)	
Yes	78(63.4)	45(36.6)	
Change in bowel movement			0.058
No	35(45.5)	42(54.5)	
Yes	83(58.9)	58(41.1)	
Abdominal pain			0.796
No	37(52.9)	33(47.1)	
Yes	81(54.7)	67(45.3)	

+ (fisher's exact) *(statistically significant, p≤0.05)

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4.6 Socio-demographic characteristics and symptom type associated with psychological related causes

The age of participants (p = 0.004) was the only socio-demographic characteristic associated with attribution of symptoms to psychological related causes.

Table 4.6 **Socio-demographic characteristics and symptom type associated with Psychological related causes**

Variables	**Psychological related causes** Attribution		p-value
	Attributed (n = 135)	Not attributed (n = 83)	
Age	46.74 ± 8.79	50.51 ± 10.10	**0.004***
Sex			0.882
Male	94(62.3)	57(37.7)	
Female	41(61.2)	26(38.8)	
Marital status			+0.385
Single	1(33.3)	2(66.7)	
Married	106(60.6)	69(39.4)	
Divorced	22(66.7)	11(33.3)	
Widowed	6(85.7)	1(14.3)	
Educational level			0.669
No formal	17(65.4)	9(34.6)	
Primary	24(60.0)	16(40.0)	
JHS/SHS	38(67.9)	18(32.1)	
Tertiary	56(58.3)	40(41.7)	
Blood in stool			0.962
No	59(62.1)	36(37.9)	
Yes	76(61.8)	47(38.2)	
Change in bowel movement			0.926
No	48(62.3)	29(37.7)	
Yes	887(61.7)	54(38.3)	
Abdominal pain			0.622
No	45(64.3)	25(35.7)	
Yes	90(60.8)	58(39.2)	

+ (fisher's exact) *(statistically significant, p≤0.05)

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4.7 Socio-demographic characteristics and symptom type associated with lifestyle related causes

The age of participants (p = 0.034) was the only socio-demographic characteristic that showed significant association with lifestyle related causes attributed to having colorectal cancer.

Table 4.7 **Socio-demographic characteristics and symptom type associated with lifestyle related causes**

Variables	**Lifestyle related causes Attribution**		p-value
	Attributed (n = 142)	Not attributed (n = 76)	
Age	47.18 ± 8.89	50.03 ± 10.26	**0.034***
Sex			0.153
Male	103(68.2)	48(31.8)	
Female	39(58.2)	28(41.8)	
Marital status			+0.740
Single	1(33.3)	2(66.7)	
Married	114(65.1)	61(34.9)	
Divorced	22(66.7)	11(33.3)	
Widowed	5(71.4)	2(28.6)	
Educational level			0.311
No formal	16(61.5)	10(39.5)	
Primary	28(70.0)	12(30.0)	
JHS/SHS	41(73.2)	15(26.8)	
Tertiary	57(59.4)	39(40.6)	
Blood in stool			0.748
No	63(66.3)	32(33.7)	
Yes	79(64.2)	44(35.8)	
Change in bowel movement			0.067
No	44(57.1)	33(42.9)	
Yes	98(69.5)	43(30.5)	
Abdominal pain			0.902
No	46(65.7)	24(34.3)	
Yes	96(64.9)	52(35.1)	

+ (fisher's exact) *(statistically significant, p≤0.05)

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4.8 Socio-demographic characteristics and symptom type associated with causes beyond individual control

From the table below, none of the socio-demographic characteristics and symptom type were found to be significantly associated with causes beyond an individual's control.

Table 4.8 **Socio-demographic characteristics and symptom type associated with causes beyond individual control**

Variables	Attribution		p-value
	Attributed (n = 75)	Not attributed (n = 143)	
Age	48.17 ± 9.35	48.17 ± 9.56	0.999
Sex			0.526
Male	54(35.8)	97(64.2)	
Female	21(31.3)	46(68.7)	
Marital status			+0.786
Single	1(33.3)	2(66.7)	
Married	62(35.4)	113(64.6)	
Divorced	9(27.3)	24(72.7)	
Widowed	3(42.9)	4(57.1)	
Educational level			0.745
No formal	11(42.3)	15(57.7)	
Primary	13(32.5)	27(67.5)	
JHS/SHS	17(30.4)	39(69.6)	
Tertiary	34(35.4)	62(64.6)	
Blood in stool			0.126
No	38(40.0)	57(60.0)	
Yes	37(30.1)	86(69.9)	
Change in bowel movement			0.879
No	27(35.1)	50(64.9)	
Yes	48(34.0)	93(66.0)	
Abdominal pain			0.980
No	24(34.3)	46(65.7)	
Yes	51(34.5)	97(65.5)	

+ (fisher's exact) *(statistically significant, p≤0.05)

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4.9 Socio-demographic characteristics and causes attributed to the symptom

The odds of attributing symptoms to cancer was significantly 13.1 times as high among participants who experienced blood in stool as compared to those who did not experience in stool (cOR = 13.1; 95% CI = 1.69 – 100.7; p = 0.014).

Participants who saw blood in their stool were significantly 2.38 times more likely than respondents who did not see blood in their stool to attribute their symptoms to benign somatic causes (cOR = 2.38; 95% CI = 1.38 – 4.12; p = 0.002).

A one year increase in the age of participants significantly reduced their odds of attributing their symptoms to psychologically related causes by 4% (cOR = 0.96; 95% CI = 0.93 – 0.99; p = 0.005).

A one year increase in the age of participants significantly reduced their odds of attributing their symptoms to lifestyle related causes by 3% (cOR = 0.97; 95% CI = 0.94 – 0.99; p = 0.005).

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Table 4.9 **Socio-demographic characteristics and causes attributed to the symptoms**

Variables	Cancer cOR(95% CI)	Benign somatic causes cOR(95% CI)	Lifestyle related causes cOR(95% CI)	Psychological related causes cOR(95% CI)	Causes beyond individual control cOR(95% CI)
Age	1.00(0.95 - 1.05)	0.99(0.96 - 1.02)	**0.97(0.94 - 1.00)***	**0.96(0.93 - 0.99)***	1.00(0.97 - 1.03)
Sex					
Male	1.000	1.000	1.000	1.000	1.000
Female	1.39(0.48 - 3.99)	1.16(0.65 - 2.08)	0.65(0.36 - 1.18)	0.96(0.53 - 1.73)	0.82(0.44 - 1.52)
Marital status					
Single	1.000	1.000	1.000	1.000	1.000
Married	0.15(0.01 - 1.74)	2.27(0.20 - 25.48)	3.74(0.33 - 42.06)	3.07(0.27 - 34.54)	1.10(0.10 - 12.35)
Divorced	0.13(0.01 - 2.11)	3.50(0.29 - 42.77)	4.00(0.33 - 49.08)	4.00(0.33 - 49.08)	0.75(0.06 - 9.32)
Widowed	0.33(0.01 - 8.18)	1.50(0.09 - 25.39)	5.00(0.27 - 91.52)	12(0.49 - 294.57)	1.50(0.09 - 25.39)
Educational level					
No formal	1.000	1.000	1.000	1.000	1.000
Primary	2.03(0.20 - 20.61)	1.29(0.47 - 3.49)	1.46(0.52 -4.13)	0.79(0.28 - 2.22)	0.66(0.24 - 1.82)
JHS/SHS	3.57(0.42 - 30.66)	1.23(0.48 - 3.14)	1.71(0.64 - 4.58)	1.12(0.42 - 2.99)	0.59(0.23 - 1.56)
Tertiary	1.37(0.15 - 12.30)	0.82(0.34 - 1.96)	0.91(0.38 - 2.22)	0.74(0.30 - 1.83)	0.75(0.31 - 1.81)
Blood in stool					
No	1.000	1.000	1.000	1.000	1.000
Yes	**13.06(1.69 – 100.71)***	**2.38(1.38 – 4.12)***	0.91(0.52 - 1.60)	0.99(0.57 - 1.71)	0.65(0.37 – 1.13)
Change in bowel movement					
No	1.000	1.000	1.000	1.000	1.000
Yes	0.52(0.19 – 1.44)	1.72(0.98 – 3.01)	1.71(0.96 – 3.04)	0.97(0.55 - 1.73)	0.96(0.53 - 1.71)
Abdominal pain					

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No	1.000	1.000	1.000	1.000	1.000
Yes	0.44(0.16 – 1.23)	1.08(0.61 – 1.91)	0.96(0.53 - 1.75)	0.86(0.48 – 1.55)	1.01(0.55 - 1.83)

(statistically significant)*



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4.10 Symptom attributions and patient interval

The table shows the association between the patient intervals and the five symptom attribution groups. The median patient interval was found to be 20 days. Majority of patients (73.9%) were found to have reported to a health facility in less than 20 days. Participants who attributed their symptoms to lifestyle related causes were more likely to visit a health facility. Participants who attributed their symptoms to lifestyle related causes were significantly 2.06 times more likely to visit a health facility in less than twenty days after the onset of symptoms as compared to those who did not attribute their symptoms to lifestyle related causes (cOR = 2.06; 95% CI = 1.11 – 3.82; p = 0.022). However, after adjusting for other variables, participants who attributed their symptoms to lifestyle related causes were significantly 1.96 times more likely to visit a health facility in less than twenty days after the onset of symptoms as compared to those who did not attribute their symptoms to lifestyle related causes (aOR = 1.96; 95% CI = 1.01 – 3.81; p = 0.046).

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Table 4.10 **Symptom attributions and patient interval**

Variables	Patient interval		cOR(95% CI)	p-value	aOR(95% CI)	p-value
	< 20 days 73.9% (n = 161)	≥ 20 days 26.1% (n = 57)				
Cancer						
Not attributed	147(72.8)	55(27.2)	1.000		1.000	
Attributed	14(87.5)	2(12.5)	2.62(0.58 – 11.89)	0.213	3.15(0.65 – 15.30)	0.154
Benign somatic causes						
Not attributed	72(72.0)	28(28.0)	1.000		1.000	
Attributed	89(75.4)	29(24.6)	1.19(0.65 – 2.19)	0.567	1.18(0.62 – 2.22)	0.614
Psychological related causes						
Not attributed	60(72.3)	23(27.7)	1.000		1.000	
Attributed	101(74.8)	34(25.2)	1.14(0.61 – 2.11)	0.680	1.05(0.53 – 2.05)	0.897

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Lifestyle related causes						
Not attributed	49(64.5)	27(35.6)	1.000		1.000	
Attributed	112(78.9)	30(21.1)	**2.06(1.11 – 3.82)**	**0.022***	**1.96(1.01 – 3.81)**	**0.046***
Causes beyond individual control						
Not attributed	103(72.0)	40(28.0)	1.000		1.000	
Attributed	58(77.3)	17(22.7)	1.32(0.69 – 2.54)	0.398	1.33(0.67 – 2.62)	0.413

Adjusted for age, gender, marital status and education *(statistically significant, p≤0.05

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CHAPTER FIVE

5.0 DISCUSSION

This chapter entails a thorough discussion comparing the results of this current study to findings in literature. In this current study, a look was taken at how colorectal cancer patients interpreted their symptoms and how these interpretations affected their health seeking behaviour.

In this study, 56.4% of respondents experienced blood in their stool before seeking medical attention. Also, 64.7% and 67.9% reported noticing a change in bowel movement and abdominal pain respectively before seeking medical attention. Amongst these same respondents, 43.6% indicated abdominal pain as the most important symptom, followed by blood stool (31.7%) and change in bowel movements (24.7%). Again, participants in this study who experience blood in stool were more likely to consider a benign cause rather a cancer. In contrast, Danish researchers, Jensen et al. (2015) noted that blood in stool was the most important symptom (32.8%), followed by bowel habit changes (28.9%), other symptoms (22.0%) and abdominal pain (16.3%). Similarly, blood in stool was the most important symptom according to another group of respondents in Denmark (Pedersen et al., 2013). In both studies, blood in stool was considered more of a cancerous symptom than a benign one (Jensen et al., 2015; Pedersen et al., 2013). Symptoms classified as the most important are the 'alarms' that prompt people to seek medical care and may vary amongst person to person. Differences in the importance of symptoms may be due to geographical variation, age, existing comorbidities, social and cultural influences of beliefs and poor awareness of the symptoms of cancer (Hall et al., 2015; Quaife et al., 2014; McLachlan et al., 2015; Rosendal et al., 2013).

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An increase in the age of participants significantly reduced their odds of attributing their symptoms to psychologically related causes and lifestyle related causes. Likewise, Jensen et al. (2015) also reported that persons who are aged 65 years or older were significantly less likely to attribute their symptoms to psychological and lifestyle related causes compared to persons below the age of 65 years. Perhaps age associated with knowledge of cancer and its expected symptoms (Moya, Chávez-Baray Garcia, and McCreary , 2022) is the reason for the reduced odds of attributing symptoms psychologically related causes and lifestyle related causes. Findings from Moya, Chávez-Baray Garcia, and McCreary (2022) highlight a lack of knowledge and orientation on cancer in youth and young adults suggesting the need for community tailored education and screening interventions. Also, older persons throughout life may have had a personal, familiar or friend history of cancer or having received information about cancer prevention from a physician, that may inform their attribution of symptoms.

In this study, the median patient interval was found to be 20 days. Majority of patients were found to have reported to a health facility in less than 20 days. Participants who attributed their symptoms to lifestyle related causes were significantly 1.96 times more likely to visit a health facility in less than twenty days after the onset of symptoms as compared to those who did not attribute their symptoms to lifestyle related causes. The length of time or the interval between when a patient experiences initial symptoms and when they eventually report to the health facility for treatment varies greatly due to effect of symptom attribution (Nielsen et al., 2010). Long patient intervals have been shown to impact prognosis or health outcomes since diagnosis and subsequent treatment has been delayed (Hansen et al., 2011). Timely presentation of cases to the health facilities has been shown to have saved 1.5 million survivors of colorectal cancer in the United States. The median patient interval of 20 days in this study is lower than 88 days reported by Jensen et al. (2015).

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Research shows that long patient intervals are fuelled by assumption that symptoms are not serious or are benign, denial of symptoms, fear of serious illness, income and lower levels of education, the female gender and rectal tumour location and this influenced patient time interval to seek care (Jensen et al., 2015; Golding et al., 2020). Participants who attributed their symptoms to lifestyle related causes were more likely to visit a health facility in less than twenty days. This finding may be linked to the intense health education on lifestyle factors such as alcohol drinking, smoking, sedentary lifestyle that have been trumpeted to be associated with other chronic diseases such as lung cancer, hypertension and diabetes within the Ghanaian context. There is a need for public awareness of colorectal screenings through colonoscopy to help in the early identification and removal of these abnormal growths before they become cancerous.

5.1 Limitation of the study

The findings of this study cannot be generalised for all CRC patients as it was conducted as a facility-based study. The associations found in the study are not causal due to the nature of the cross-sectional study design employed. That notwithstanding, the analytical methods used in this study are robust and statistically sound to give reasonable estimation of odds ratios within a 95% confidence interval. A lack of local studies bordering on symptoms attribution to colorectal cancer or even other types of cancers made comparison of result difficult as there is scarcity of data in the Ghanaian context.

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CHAPTER SIX

6.0 CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

In this study, blood in stool in 56.4% of respondents, change in bowel movement (64.7%) and abdominal pain (67.9%) were the symptoms that prompted colorectal cancer patients to seek medical attention.

The odds of attributing symptoms to cancer were significantly higher among participants who experienced blood in stool as compared to those who did not experience in stool. Participants who saw blood in their stool were more likely to attribute their symptoms to benign somatic causes

A one year increase in the age of participants significantly reduced their odds of attributing their symptoms to psychologically related causes and lifestyle related causes.

Participants who attributed their symptoms to lifestyle related causes had a better patients' interval and were more likely to visit a health facility in less than 20 days.

6.2 Recommendations

1. Health professionals at the Korle-Bu teaching hospital should embark of community outreach about colorectal cancer and its symptoms to sensitize the communities on symptoms to look out for.
2. Health professionals should encourage early reporting of key symptoms CRC such as blood in stool, change in bowel, and abdominal pains to a health facility to curb the poor prognosis associated with long patient interval.

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3. Recommendation for further studies:

   A qualitative study on the experiences of CRC patients with long patient interval resulting from non-attribution of CRC symptoms to cancer.



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APPENDIX I: PARTICIPANTS INFORMATION SHEET

Description of the Consenting process

This information sheet is to inform the participants about the research for them to make an informed decision of whether to participate in the study or not. It also outlines the nature of the research, what the research involves, risks, benefits and compensation. Participants will be required to sign or thumbprint to give consent to be recruited in the study after they have read or have had someone read this information sheet to them.

Title of Study:

"Patient Attribution of Colorectal Cancer Symptoms at Korle Bu Teaching Hospital"

Introduction:

The principal investigator (PI) is Joseph Siaw - Yeboah**,** a Master of Public Health (MPH) student of the School of Public Health of the College of Health Sciences, University of Ghana. My email address is siaw4real@gmail.com. My telephone number is……..

Background and Purpose of Research:

I am carrying out a research on the topic: "Patient Attribution of Colorectal Cancer Symptoms at Korle Bu Teaching Hospital".

Nature of Research:

The research is a cross-sectional study with a quantitative approach. My interest is in finding out the Patient Attribution of Colorectal Cancer Symptoms at Korle Bu Teaching Hospital. It would be conducted among 218 Colorectal Cancer patients.

PARTICIPANTS INVOLVEMENT

Duration/ what is involved:

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A structured questionnaire would be used to elicit information from the study participants after the aim of the study has been explained to them and they are interested in participating. The questionnaire would be administered in English Language for literate respondents and translated into a local dialect for non-English literate respondents. This would last for 30 minutes.

Potential Risks:

Risks: This research itself only poses minimal risk of having to share seemingly personal information. However, there is potential risks of contracting Covid-19 from answering the questionnaire in this study under the current circumstances of Covid-19. Therefore, the following interventions have been put in place to ensure your safety:

1. Respondents will receive education on the covid-19, mode of transmission and prevention.
2. Respondents shall wash their hands with soap under running water as observed by research assistants before receiving the questionnaire from research assistants.
3. Respondents will sanitize their hands with alcohol hand rubs after filling the questionnaires.
4. Pens used to fill questionnaire will not be passed on from one respondent to another.
5. Social distancing will be maintained between research assistants and respondents.
6. Respondents who are not wearing mask will not be engaged by research assistants.
7. Research assistants will always wear a face mask, wash their hands with soap under running water and or sanitize their hands with alcohol hand rubs before engaging a respondent.

Benefits:

Cost:

There will be no cost incurred by participants for taking part of the study except their time.

Compensation:

There will not be any compensation for participating in the study.

Confidentiality:

In ensuring anonymity, participants would only be identified with codes and numbers. No information regarding participants name or any other information that traces the data collected to

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the participants would be taken. Filled questionnaires would be kept under lock and key, with only the principal investigator having access.

Voluntary participation/ withdrawal:

Participation in the study is voluntary and not compulsory. Participants have the right to decide whether or not they want to be part of the study. You can also withdraw your consent at any time of the study.

Outcome and feedback:

Findings of the study as well as suggestions will be shared with stakeholders which may improve health service delivery at the hospital. The report will be published in a journal.

Funding information:

This study is funded by the Principal Investigator.

Sharing of Participants Information/Data:

Participant information or data will be kept by the PI. Filled questionnaires will be kept under lock and key, with only the principal investigator having access. It will not be shared with anyone else.

Provision of Information and Consent for participants:

A copy of the information sheet and consent form will be given to you to sign or thumb-print before participation in the study

Who to Contact for Further Clarification/Questions:

You can contact my supervisor on 0244271821 or email her habonful@ug.edu.gh

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APPENDIX II: CONSENT FORM FOR STUDY PARTICIPANTS

STUDY TITLE:

Patient Attribution of Colorectal Cancer Symptoms at Korle Bu Teaching Hospital

PARTICIPANTS' STATEMENT

I acknowledge that I have read or have had the purpose and contents of the Participants' Information Sheet read and satisfactorily explained to me in a language I understand. I fully understand the contents and any potential implications as well as my right to change my mind (i.e. withdraw from the research) even after I have signed this form.

I voluntarily agree to be part of this research.

Name or Initials of Participant…….. ID Code ……

Participants' Signature …… OR Thumb Print……

Date:…….

INTERPRETERS' STATEMENT

I interpreted the purpose and contents of the Participants' Information Sheet to the named participant to the best of my ability to his/her proper understanding.

All questions, appropriate clarifications sort by the participant and answers were also duly interpreted to his/her satisfaction.

Name of Interpreter……

Signature of Interpreter…… Date: ……

Contact Details: …….

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STATEMENT OF WITNESS:

I was present when the purpose and contents of the Participant Information Sheet was read and explained satisfactorily to the participant in the language he/she understood

I confirm that he/she was given the opportunity to ask questions/seek clarifications and same were duly answered to his/her satisfaction before voluntarily agreeing to be part of the research.

Name:……

Signature…….. OR Thumb Print …….....

Date:……

INVESTIGATOR STATEMENT AND SIGNATURE:

I certify that the participant has been given ample time to read and learn about the study. All questions and clarifications raised by the participant have been addressed.

Researcher's name…….

Signature …….

Date…….

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APPENDIX III: (QUESTIONNAIRE)

QUESTIONNAIRE ON PATIENT ATTRIBUTION OF COLORECTAL CANCER SYMPTOMS AT KORLE BU TEACHING HOSPITAL

This is a research on Patient Attribution of Colorectal Cancer Symptoms at Korle Bu Teaching Hospital. You are required to share your experiences by responding to the following questions.

	QUESTIONS	CODING CATEGORIES	SKIP TO	CODES
	1. **INDIVIDUAL FACTORS**			
a.	Sex	**Male……..….1** **Female……...……2**		sex
b.	Age (State your last birthday age)	……		age
c.	Marital status	**Single ……..……1** **Married…….……..2** **Divorced …….……....3** **Widowed ……4** **Cohabiting……...5**		mstat
d.	Education level	**No formal education …..……1** **Primary level ……..……2** **JHS** **Secondary…….……....3** **Tertiary……..……..4**		educ

SYMPTOM ATTRIBUTION

What symptoms did you experience before seeking medical attention before realizing that you had Colorectal cancer?

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1 Blood Stool 1.Yes [ ] 2. No [ ]

2 Changes in bowel movement 1.Yes [ ] 2. No [ ]

3 Abdominal Pain 1.Yes [ ] 2. No [ ]

Others……

Out of the symptoms you experienced, which do you think was most important? (Most important symptom experienced that made participant to seek healthcare)

……

Which of the following remedies did you consider in dealing with the symptoms stated before seeking medical attention? (Tick as many as apply)

Topical application at the affected part 1.Yes [ ] 2. No [ ]

Oral administration of decoctions of particular herbs 1.Yes [ ] 2. No [ ]

Oral administration of drugs bought from a nearby pharmacy or drugstore 1.Yes [ ] 2. No [ ]

Use of anal insertions 1.Yes [ ] 2. No [ ]

Use of enemas 1.Yes [ ] 2. No [ ]

Visiting of Prayer Camps/Men of God/Herbalist/Traditional Healers 1.Yes [ ] 2. No [ ]

Please state time (in days) from when the most important symptom was realised to when the patient actually reported to the hospital or saw the physician (Patient Interval)

……

In the next section, there are possible causes that you may have attributed to the symptoms that made you seek medical attention. Select whether you strongly agree, agree, neither agree or disagree, disagree or strongly disagree with the statement

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Causes	Strongly Agree 5	Agree 4	Neither Agree nor Disagree 3	Disagree 2	Strongly Disagree 1
Cancer					
My symptoms were as a result of cancer					
Benign Somatic Causes					
My symptoms were as a result of a germ/bacterial/viral infection					
My symptoms were as a result of an altered immunity					
My symptoms were as a result of an already diagnosed disease					
My symptoms were as a result of a haemorrhoid					
My symptoms were as a result of a scratch or cut					
Psychological Causes					
My symptoms were as a result of worrying					
My symptoms were as a result of stress					

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My symptoms were as a result of my emotional state (feeling down, lonely, anxious, empty, family problems, overwork)					
Lifestyle Causes					
My symptoms were as a result of my diet					
My symptoms were as a result of my own behaviour					
My symptoms were as a result of smoking					
My symptoms were as a result of alcohol consumption					
Causes beyond Individual Control					
My symptoms were as a result of an accident or injury					
My symptoms were as a result of hereditary (it runs in my family)					
My symptoms were as a result of ageing					
My symptoms were as a result of chance or bad luck					

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APPENDIX 1V (ETHICAL CLEARANCE)

In case of reply the number
And the date of this
Letter should be quoted
My Ref. No. KBTH/oms/c3122
Your Ref. No.....

KORLE BU TEACHING HOSPITAL
P. O. BOX KB 77,
KORLE BU, ACCRA.

Tel: +233 302 667759/673034-6
Fax: +233 302 667759
Email: Info@kbth.gov.gh
pr@kbth.gov.gh
Website: www.kbth.gov.gh

29th March, 2022

JOSEPH SIAW-YEBOAH
SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA, LEGON

PATIENT ATTRIBUTION OF COLORECTAL CANCER SYMPTOMS AT KORLE BU TEACHING HOSPITAL

KBTH-IRB /000177/2021

Investigator: Joseph Siaw-Yeboah

The Korle Bu Teaching Hospital Institutional Review Board (KBTH IRB) reviewed and granted approval to the study entitled: "Patient Attribution of Colorectal Cancer Symptoms at Korle Bu Teaching Hospital"

Please note that the Board requires you to submit a final review report on completion of this study to the KBTH-IRB.

Kindly, note that, any modification/amendment to the approved study protocol without approval from KBTH-IRB renders this certificate invalid.

Please report all serious adverse events related to this study to KBTH-IRB within seven days verbally and fourteen days in writing.

This IRB approval is valid till 28th February, 2023. You are to submit annual report for continuing review.

Sincere regards,

DR. DANIEL ANKRAH
VICE CHAIR (KBTH-IRB)
FOR: CHAIR (KBTH-IRB)

Cc: The Chief Executive Officer, KBTH
The Director of Medical Affairs, KBTH

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