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PREDICTORS OF TIME TO HOSPITAL AMONG PEOPLE WITH COLORECTAL CANCER

Miss Saimai Tumwijit

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

A Dissertation Submitted in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy in Nursing Science
Field of Study of Nursing Science
FACULTY OF NURSING
Chulalongkorn University
Academic Year 2021
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ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก

น.ส.สายใหม ตุ้มวิจิตร

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาพยาบาลศาสตรดุษฎีบัณฑิต
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สายใหม ตุ้มวิจิตร : ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก. (PREDICTORS OF TIME TO HOSPITAL AMONG PEOPLE WITH COLORECTAL CANCER) อ.ที่ปรึกษาหลัก : รศ. ดร.ชนกพร จิตปัญญา, อ.ที่ปรึกษาร่วม : รศ. ดร.สุรีพร ธนศิลป์

การศึกษาภาคตัดขวางเชิงพรรณย้อนหลังในครั้งนี้มีวัตถุประสงค์เพื่อศึกษาระยะเวลาในการมาโรงพยาบาล ปัจจัยที่เกี่ยวข้อง และปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก กลุ่มตัวอย่างคือผู้ป่วยมะเร็งลำไส้ใหญ่และทวารหนักที่มาตรวจหรือมารับการรักษาที่แผนกผู้ป่วยนอกอายุรกรรมและศัลยกรรม หน่วยเคมีบำบัด รังสีรักษา หน่วยส่องกล้องทางเดินอาหารและหอผู้ป่วยในจำนวน 240 ราย สุ่มกลุ่มตัวอย่างแบบหลายขั้นตอน เครื่องมือวิจัยประกอบด้วย แบบสอบถามข้อมูลส่วนบุคคล แบบสอบถามระยะเวลาในการมาตรวจและวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนัก แบบสอบถามความรู้เกี่ยวกับมะเร็งลำไส้ใหญ่และทวารหนัก (KR-20 = .786) แบบสอบถามการรับรู้ความเจ็บป่วย (a = .674 - .836) แบบสอบถามพฤติกรรมแสวงหาบริการทางสุขภาพ (a = .706) และแบบสอบถามการรับรู้ความรุนแรงของอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก (a =.803) วิเคราะห์ข้อมูลโดยสถิติพรรณนา และการวิเคราะห์ความถดถอยเชิงพหุ

ผลการวิจัยพบว่าระยะเวลาในการมาโรงพยาบาลของกลุ่มตัวอย่างอยู่ระหว่าง 1 วัน ถึง 632 วัน ค่ามัธยฐานเท่ากับ 32 วัน (พิสัยควอไทล์= 77 วัน) นอกจากนี้ยังพบว่าความรู้เกี่ยวกับมะเร็งลำไส้ใหญ่และทวารหนักด้านวิธีการตรวจคัดกรองมะเร็งลำไส้ใหญ่และทวารหนัก (B= -0.243) การรับรู้การเจ็บป่วยด้านการรับรู้ผลกระทบของอาการ (B= -0.163) และการรับรู้วงจรการเปลี่ยนแปลงของอาการ (B = 0.176) และพฤติกรรมแสวงหาบริการทางสุขภาพด้านการซื้อยากินเอง (B= 0.149) สามารถร่วมกันทำนายความแปรปรวนของระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก ได้ร้อยละ 48.70%

การพยาบาลเพื่อลดระยะเวลาการมาโรงพยาบาลควรคำนึงถึงการรณรงค์ส่งเสริมการรับรู้ความเจ็บป่วยด้านบวก ให้ความรู้เกี่ยวกับอาการและวิธีการตรวจคัดกรองมะเร็งลำไส้ใหญ่และทวารหนัก ส่งเสริมพฤติกรรมแสวงหาบริการทางสุขภาพที่เหมาะสมโดยรีบมาพบแพทย์ตั้งแต่เริ่มมีอาการ

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สาขาวิชา	พยาบาลศาสตร์	ลายมือชื่อนิสิต .....
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Saimai Tumwijit : PREDICTORS OF TIME TO HOSPITAL AMONG PEOPLE WITH COLORECTAL CANCER. Advisor: Assoc. Prof. CHANOKPORN JITPANYA, Ph.D., RN. Co-advisor: Assoc. Prof. SUREEPORN THANASILP, D.N.S., RN.

This retrospective, cross-sectional study aims to describe time to hospital, relating factors, and determine predictors of time to hospital among people with colorectal cancer. Multistage random sampling was used to yield a probability of 240 people with colorectal cancer visiting medical and surgical outpatient departments, oncology units, radiology units, endoscopic units, and inpatient departments. Research instruments consisted of personal information sheet, time to colorectal cancer diagnosis questionnaire, knowledge about colorectal cancer questionnaire (KR-20 = .786), The modified illness perception questionnaire-revised (a = .674 - .836), health care seeking behavior questionnaire (a = .706), and perceived seriousness of warning signs and symptoms questionnaire (a =.803). Data were analyzed by descriptive statistics, and Stepwise multiple regression analysis.

The results revealed that time to hospital, starting from symptoms perceived to the date of first presentation to a physician in the hospital, ranged from 1 to 632 days, with the median of 32 days (IQR=77). Moreover, knowleadge of colorectal cancer in sub-scale of colorectal cancer screening method (B = -0.243), some sub-scales of cognitive illness perception, including consequence (sub-scale) (B = -0.163), timeline cyclical (sub-scale) (B = 0.176), and healthcare seeking behavior in dimension of self-medicating (B= 0.149) could collectively predict time to hospital among people with colorectal cancer with 48.70 % of the variance.

A further nursing intervention to reduce time to hospital should improve knowledge about the symptoms and screening method, enhance positive illness perceptions, and enhance appropriate healthcare seeking behaviors by early visiting a physician.

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Chapter I
Introduction

Background and significance of the study

Colorectal cancer (CRC) was a significant health problem in Thailand, and it was one of the most common cancers reported in Thai people. It was the first most common cancer in males and the third most common cancer among females (National Cancer Institute, 2019). The death rates increased from 4,104 cases in 2015 to 5,476 cases per 100,000 population in 2019 (Bureau of Strategy and Planning Division: Ministry of Public Health, 2019). In addition, hospital-based cancer registries reported that Thai people mainly were diagnosed at advanced stages, accounting for 25.90 % - 37.78 % for stage 3, and 23.04 % - 41.60% for stage 4. Only 0.32% - 10.50 % of them were diagnosed at stage 1, and 8.60% - 29.84% for stage 2 (Chonburi cancer hospital; NCI, 2019; Lam Pang cancer hospital, 2020; Songklanagarind hospital, 20120). Concerning the prevalence, incidence, and mortality rate of CRC, Thailand was one of the countries in Asia impacted by CRC (Wong et al., 2019).

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Based on the literature review, there were several factors related to CRC that may raise a person's risk of developing CRC, such as age, family history of CRC, some inherited conditions, inflammatory bowel disease, personal history of certain types of polyps, race, unhealthy diet, obesity, alcohol use, and smoking (American Cancer Society, 2020; Araghi et al., 2019; Bray et al., 2018; Gandomani et al., 2017; Niederreiter et al., 2018; Zhivotovskiy et al., 2012). A person with some risk factors of CRC has about a 5% chance of developing CRC overall, while those with high risk have more chance (American Cancer Society, 2020; American Society of Clinical

Oncology, 2021). Another issue related to CRC was that delay time to hospital and delay diagnosis, the more diagnosed with CRC, leading to poor outcomes (Tørring et al., 2017).

Time to CRC diagnosis was defined as "interval of time starts from symptoms a person perceives that physical health was abnormal to time of being diagnosed with CRC" (Langenbach et al., 2010; Leiva et al., 2017; Mounce et al., 2017; Pozsgai et al., 2019; Rittitit et al., 2020b; Tørring et al., 2011; Walter et al., 2016). Time to CRC diagnosis included two phases: time to hospital or pre-hospital phase and in-hospital phase. Time to hospital was the time interval starting from symptoms onset, or a patient perceives that physical health was abnormal to first presentation to a physician. In-hospital phase referred to the time at first presentation to a physician to time of being diagnosed of CRC (pathologically confirmed of the diagnosis) (Mitchell et al., 2009; Pozsgai et al., 2019; Ramos et al., 2010; Vega et al., 2015; Walter et al., 2016).

Notably, time to CRC diagnosis remains a problem, especially, time to hospital of people with CRC. A qualitative design found that people with CRC first visited a physician at the hospital after they experienced stomach pain for six weeks. Some of them had rectal bleeding and change in bowel habits longer more than 6 months before deciding to first visit a physician at hospital (Dobson et al., 2018). The other findings of quantitative study found that median time to hospital in people with CRC experiencing CRC-related symptoms was at 30 days (Jensen et al., 2016). Courtney et al. (2012) also reported that 18% of persons experiencing rectal bleeding and 37% of them having change in bowel habits had a longer time to hospital more than 1 month. Moreover, people with CRC wait at least four months until CRC diagnosis (Esteva et al., 2013), and Pruitt et al. (2013) also found that people with CRC had a long diagnosis

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more than eight months. Finally, compared with other cancers such as lung cancer, breast cancer, and ovarian cancer, persons with advanced stage of CRC's time to hospital was longer (Emery et al., 2013; Keeble et al., 2014).

In Thailand, secondary data analysis from a master thesis was conducted. Based on data of 80 people with a confirmed diagnosis with CRC, the median time to hospital was long at 60 days, and total time to until getting treatments was 124 days (Kimpee, et al., 2013). Another study in Thailand reported that time to CRC diagnosis of 191 Thai people with CRC was approximately 246 days. Of this, median time to hospital was longer at 61 days (Rittitit et al., 2020b). Though there was no universal time interval of time to hospital (Pruitt et al., 2013), early presentation to physicians and early diagnosis of CRC was recommended (Hansen et al., 2011; McLachlan et al., 2015; Vega et al., 2015).

Time to hospital was related to cancer's progression. Increased time to hospital leads to poor cancer prognosis and advanced cancer stages (Fisher et al., 2010; Gigliotti et al., 2019; Hafström et al., 2012; Ramos et al., 2016; Walter et al., 2016). Finally, it can increase re-admission, re-hospitalization, cost of treatment, low survival rate, and high mortality rate (Gani et al., 2017; Maringe et al., 2013; Pucciarelli et al., 2017; Tørring et al., 2013). For example, the 5-year survival rate in those diagnosed at stage 3 and stage 4 was less than those with stage 1 or stage (ACS, 2019b, 2020; Maringe et al., 2013; NCI, 2018b; Neal et al., 2015b; Strous et al., 2019).

Nurses should play an integral role in caring for CRC persons, significantly enhance recognizing warning symptoms of CRC, and early to visit a physician. However, nursing care in Thailand mostly focuses on some issues, such as undergoing treatments and complications. For prevention roles, there was only routine care such

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as screening in asymptomatic cases. There was no specific nursing care to enhance persons with CRC or persons at risk of CRC to recognize the significance of CRC-related symptoms and early presentation a physician.

CRC diagnosis was a complex process that begins when the patient detected the first symptoms until a diagnostic procedure performed, undergoing a consultation with a general practitioner; a referral to the specialist; and the waiting period for diagnostic procedures, such as colonoscopy. All this contributes to the idea that time to CRC diagnosis and time to hospital may be longer (Vega et al., 2015).

Existing literature showed that many factors were associated with time to hospital. Some cognitive factors, such as perception, knowledge, etc., may be related to time to hosptal. For example, there were often no specific symptoms for people with CRC. CRC was based on the evaluation of lower abdominal symptoms such as a change in bowel habits, diarrhea, constipation, right red or very dark blood in the stool, discomfort in the abdomen, pains, gas, bloating, fullness, and cramps (American Cancer Society, 2020; Labianca et al., 2013; Vega et al., 2015). These abdominal symptoms were very common and mostly related to non-neoplastic diseases, not CRC. Lower abdominal symptoms were a frequent cause of visits to the general practitioner. The issue was that symptoms were usually very vague and non-specific, which led to increase time to present symptoms to a physician in the hospital.

In most cases, these symptoms start by benign, self-limiting illness, contributing to the patient not visiting a physician or delay to present symptom to a physician in hospital. Thus, patients' knowledge about CRC may be related to time to hospital. Moreover, diagnosis of CRC bases on colonoscopy. This was an invasive procedure

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and usually scarce. Attitude about colonoscopy may influencing patient's follow-up and time to hospital (Vega et al., 2015).

Behavioral factors might be associated with time to hospital. Some people with CRC eliminated symptoms by self-treatment, discussing with family members, waiting for it disappeared, might not visit a physician, and mostly presented to a physician when symptoms were severe (Dracup et al., 1995; Hall et al., 2015; Hashim et al., 2010). However, some patients early presented their symptoms to a physician (Courtney et al., 2012b).

However, previous studies mostly emphasized on socio-demographic factors, such as age, gender, marital status, and education, and clinical factors such as a family history of CRC and cancer (Hansen et al., 2015; Korsgaard et al., 2008; Rasmussen et al., 2015; Tørring et al., 2013; Tørring et al., 2017; van der Geest et al., 2014; Walter et al., 2016; Young et al., 2000). Of those, findings were controversies. Few cognitive factors such as symptom perception or illness perception were examined (Esteva et al., 2013; Leiva et al., 2017, Jensen et al., 2016). Psychological factors, such as fear, embarrassment, worry, anxiety, and depression, were rarely selected (Cockburn et al., 2003; Courtney et al., 2012b; Walter et al., 2016). Concerning some variables such as knowledge, research findings were conflicting or inconsistent (Alatise et al., 2017; Cockburn et al., 2003). Also, few studies on behavioral factors, such as healthcare-seeking behavior, were examined (Hashim et al., 2010).

In Thailand, few studies examined factors related to time to hospital were found, with a small sample size and collected data from only one hospital setting (Kimpee et al., 2013; Rittitit et al., 2020a). Therefore, the study of time to hospital and predicting factors was needed.

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Using a theoretical approach was a significant step to explain phenomena of time to hospital, starting from symptom onset to first visiting a physician at hospitals. It was useful to enhance understanding about varieties of factors related to time to hospital phase among Thai people with CRC. It could be guidance for nurses and health professionals to develop interventions to reduce factors that can contribute to time to hospital and improving early CRC diagnosis in Thai people with CRC.

Regarding the theoretical application and aims of using. In this study, factors associated with time to hospital were derived based on Dracup's framework. Selected factors were knowledge about CRC, cognitive illness perception, emotional illness perception, healthcare-seeking behavior, and perceived seriousness warning signs and symptoms. These selected factors were modifiable, and nurses can play a vital role in modifying these factors. Finally, these factors were supported by research articles.

Research questions

1) What were characteristics of time to hospital among Thai people with CRC?

2) What were characteristics of relating factors of time to hospital among Thai people with CRC?

3) Which factors could predict time to hospital among Thai people with CRC?

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Objectives of the study

1. To describe time to hospital among Thai people with CRC
2. To describe characteristics of relating factors of time to hospital among Thai people with CRC
3. To examine the predicting values of factors of time to hospital among Thai people with CRC.

Theoretical framework

The theoretical framework of this study was guided by the framework of Dracup et al. (2006) and literature reviews, to explain and predict the factors on the time to hospital among people with CRC. This framework was established in 1995 based on three theories: the self-regulation model of illness behavior, the health belief model, and the interactionist role theory or symbolic interactionism. In 2003 and 2006, Dracup et al. (2006) revised the framework based on Leventhal's self-regulatory model of illness behavior (the CSM) to explain the factors related to a patient's behaviors to seek treatments involving a time interval of pre-hospital delay (Dracup et al., 2006).

According to Dracup's framework (1995), total delay time was usually defined as "the amount of time the onset of symptoms to the initiation of definitive therapy" (Dracup et al., 1995). It was divided into two main phases: pre-hospital delay and in-hospital delay. Pre-hospital delay time was commonly defined as "the time from onset of symptoms to the time that patients arrive at the hospital, and the transportation to the hospital was usually a component of this phase. Whereas in-hospital delay time was

time interval from the patients' arrival at the hospital to receiving definitive treatments, the investigation disease or diagnosis was included in this phase (Dracup et al., 2006).

The central concepts consisted of internal and environmental stimuli, cognitive and emotional representations, action plans for coping with problems and emotions, appraisal, and outcomes. The main outcome of this framework was pre-hospital delay time. Factors from central concepts can contribute to the decision-making to visit a physician and were related to decreasing or increasing pre-hospital delay. While the secondary outcomes such as resource utilization, emergency medical service use, and medication use (Dracup et al., 2006).

The framework of Dracup (2006) proposed that several factors contributed to patients in the decision to visit a physician, which was related to decreased or increased pre-hospital delay time. These factors were classified as internal and environmental stimuli factors, cognitive and emotional representation, and action plans for coping with problems and emotions. Internal stimuli were formed within oneself and affect how one response to a health threat, such as physical symptoms, personal factors (e.g., socio-demographic, older age, female, education, clinical characteristics, symptom experience, cultural roles, and expectations) (Dracup et al., 2003; Dracup et al., 2006). Environmental stimuli were factors from the environment that affect response to a health threat and affect care and treatment-seeking behavior. It included the media, the messages from significant others, or witnessing such as family members, friends, coworkers, a healthcare provider, and a stranger (Dracup et al., 2003; Dracup et al., 2006). The process occurs in three stages, with each stage having a cognitive level and emotional level.

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The first stage, cognitive representation. According to Dracup et al. (2006), a cognitive representation was the control process for the objectively represented health threat such as symptoms. Cognitive representation was strongly influenced by knowledge, attitude, or belief about the nature of the heath treat. When individuals perceived symptoms as a health threat, they used sematic memories both in abstract and concrete to label symptoms (identify), perceived causes and timeline of symptoms, belief in the ability to control, and the consequence of symptoms. They would early present symptoms to a physician. Emotional representation can importantly influence patients' response to their symptoms and decision-making to seek care and treatment that can occur parallel to, but partially independent of the cognitive process of coping with health threats (Dracup et al., 2006). When individuals identify the symptoms as a health threat, it might extract the feeling of fear the consequence of seeking help, concerning about troubling others/worry and being embarrassed embossment, worry, or upset. These emotions were factors that increased pre-hospital time.

The second stage was action plan for coping with problems and emotions or coping stage, in which a plan of action was formulated and was self-generated in response to the individual’s representation of the health threat such as symptoms (Dracup et al., 2006). In 1995 and 2006, Dracup and colleagues explained that when patients perceived symptoms or illness as health threats, different coping strategies might be employed to respond to their symptoms or illness. For instance, if individuals identify the symptoms as serious, they may decide to visit a physician or arrive at a hospital early. While those believed that the symptoms to be common gastrointestinal diseases, not related to cancer; they may react to symptoms in self-treatment, take an antacid, wait for relief, reduce in activities, or consult family members, friends. Thus,

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it increased patients delay in pre-hospital phase (Dracup et al., 1995; Dracup et al., 2006; Leventhal & Cameron, 1987).

The third stage was appraisal, in which the individual uses criteria to appraise the success of their coping actions. If individuals perceived that there was not enough process or unsuccessful solutions, the representation of the problems (objective and subjective) and /or the plan to cope with them were reassessed and changed. According to Dracup et al. (2006), appraisal included appraisal of symptoms. For example, appraisal of symptoms not being seriousness, or they were told that denial of suppression of the serious nature of symptom was common, it contributed to treatment delay or seeking care, as well as reassessed and change coping strategy Therefore, it influenced increased pre-hospital delay time.

Although the original version had been developed for reducing pre-hospital delay in acute coronary syndrome, colorectal cancer was a chronic disease, and there were similar and different symptoms between both chronic diseases, such as pain. Moreover, this framework has been as a theoretical framework in previous master studies to explain seeking treatment behavior in patients with CRC, and time to definite diagnosis staring from symptoms onset to first time to visit a specialist physician in patients with bladder cancer (Boonsung K, 2010; Phromdeang et al., 2013)

In this study, time to hospital was a dependent variable that was derived from pre-hospital delay, which was the main outcomes of the Dracup's framework (2006), and it was affected from a post -appraisal stage, action plan for coping with problem and emotion or an individual's perspective control over their symptoms of seeking treatment behavior, cognitive and emotional representation and internal and environmental stimuli factors. Selected factors related to time to hospital among Thai

people with CRC were derived from all constructs of the Dracup's framework (2006), (see Figure 1.1) .

The linkage between those selected factors predicted time to hospital among people with CRC were explained as follows.

Knowledge about CRC was derived from internal stimuli factors. It was associated with time to hospital because knowledge was believed to be a prerequisite for a change in health behavior as it increases understanding of their illness (Chen, 2015), and it would influence the interpretation of symptoms correctly (De Nooijer et al., 2001; Hall et al., 2015). Sufficient knowledge about the disease contributes to people with CRC interpreting their symptoms correctly. They might respond to the symptom by early presentation to a physician. Therefore, those with high knowledge about CRC may have a shorter time to hospital (De Nooijer et al., 2001; Dracup et al., 1995; Dracup et al., 2006).

Cognitive illness perception was derived from the cognitive representation concept of Dracup's framework. Cognitive representation of the health threat included identifying the symptoms as a sign of illness, identifying potential causes and consequences, which were strongly influenced by an individual's knowledge, attitude, or belief about the nature of health threats such as symptoms. Individuals, who believed in symptoms or perceived control over the symptom themselves, were more likely to increase time to present a healthcare provider, leading to increased time to hospital (Dracup et al., 2006).

Emotional illness perception was derived from the emotional representation concept of Dracup's framework. It can significantly influence patients' response to their symptoms and decision-making to seek care and treatment. The emotional reactions

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that can increase time interval to seek treatment by visiting a physician were fearing the consequence of seeking help, concerning about troubling others/worry, and being embarrassed about seeking help, etc. For example, individuals may delay presenting symptoms to a physician when they fear that the symptom will likely suspect being cancer. Therefore, the time to hospital would increase (Dracup et al., 2006).

Healthcare-seeking behavior was action driven by an individual in response to stimulus, such as the perception of a symptom, that he or she decided to indicate a condition needing evaluation by a health professional for treatments (Gillian et al., 1999). This variable was derived from seeking treatment behavior concept in action plans for coping with problems and emotions of the Dracup's framework (2006). For instance, if individuals identify the symptoms as serious, they may decide to visit a physician or arrive at a hospital early. Therefore, they were diagnosed and got treatment promptly. While those believed that the symptoms to be common gastrointestinal diseases, not related to cancer; they may react to symptoms in self-treatment, take an antacid, wait for relief, reduce in activities, or consult family members, friends (Dracup et al., 1995; Dracup et al., 2006; Leventhal & Cameron, 1987). These healthcare-seeking behaviors significantly increased time intervals to present a physician to diagnose and get treatments (Dracup et al., 1995).

Perceived seriousness of warning signs and symptoms was derived from the appraisal stage of Dracup's framework. If an individual appraises that symptom were not being serious, they would be delay treatment, and seek care using the coping strategy that was ineffective. After they perceived that there was not enough process or unsuccessful in solutions, they were reassessed, changed, or may try other coping. Finally, time to hospital phase among people with CRC increased.

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These selected factors related to time to hospital were derived from substruction of concept based on Dracup's framework as mentioned above, such as cognitive factors (perceived seriousness of warning signs and symptoms, knowledge about CRC, cognitive illness perception, emotional illness perception), and behavior factors (healthcare-seeking behavior). A nurse can modify these selected factors, and it might increase the quality of life and increase survival rates among patients with CRC. The relationship among those variables depicted in figure 1.1

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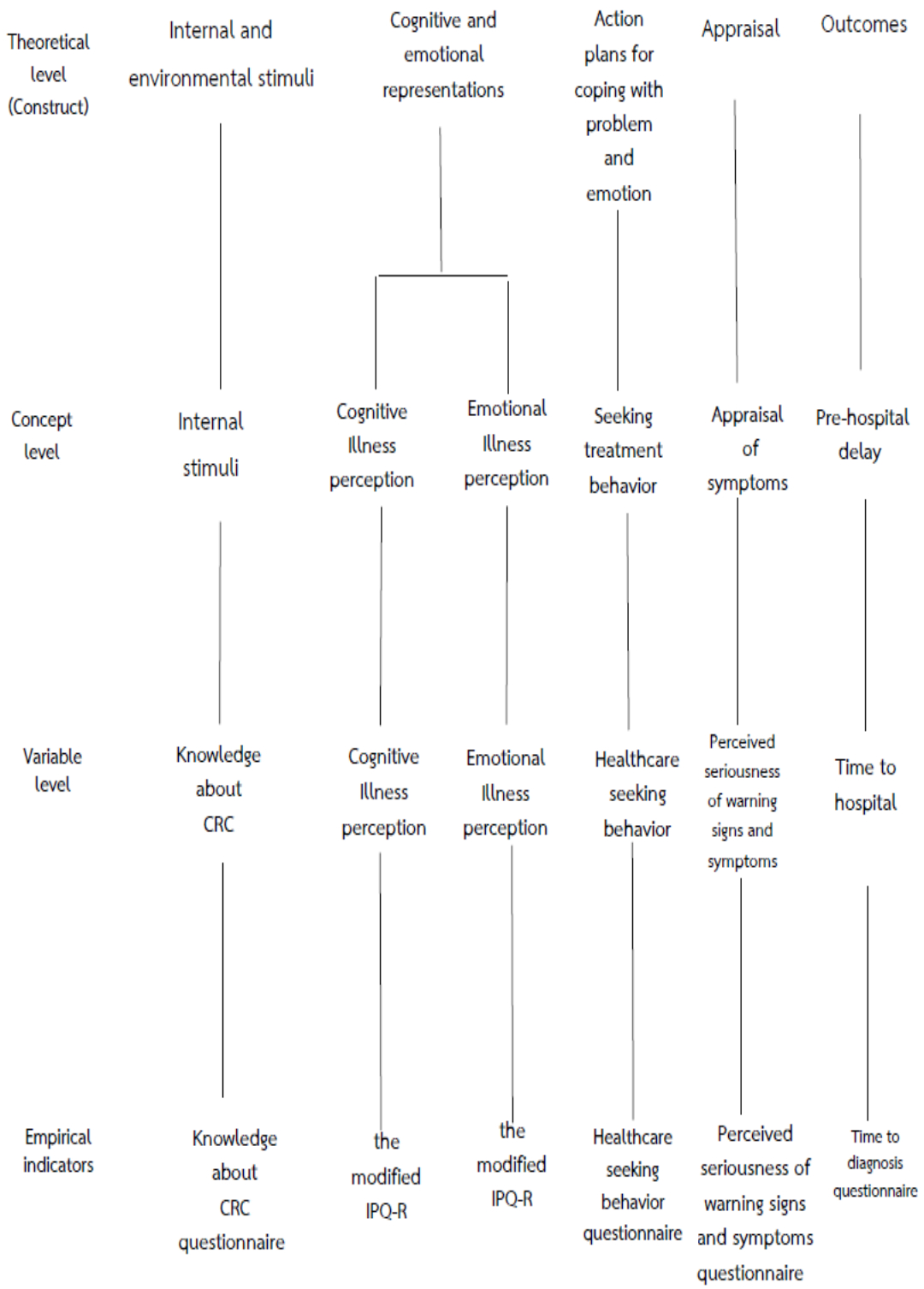

Figure 1.1 Theoretical substruction diagram: time to hospital among people with CRC

Hypothesizes with rationales

1. Knowledge about CRC had a negative association with time to hospital among Thai people with CRC

Rationale. Knowledge about CRC derived from internal stimuli factors of internal and environmental stimuli concept of Dracup's framework. The knowledge can affect a patient's decision to visit a physician at hospitals. Sufficient knowledge about the disease can contribute to interpreting the symptoms correctly. Thus, Thai people with CRC might respond to the symptoms by seeking treatment by early presentation to a physician, which could reduce the time to hospital (De Nooijer et al., 2001; Dracup et al., 1995; Hall et al., 2015). Similarly, findings of Alatise et al. (2017) found that patients with CRC-related symptoms such as rectal bleeding, having higher knowledge of CRC were more likely to early present their symptoms to a physician almost four times than those with lower knowledge of CRC (OR=3.83, 95%CI, 1.55-10.20). Thus, if people with CRC had high knowledge about CRC, time to hospital of those participants would be decreased.

2. Cognitive illness perception had a negative association with time to hospital among Thai people with CRC

Rational. Cognitive illness perception was derived from the cognitive representation concept of Dracup's framework (2006). According to Dracup et al. (2006), patients were less likely to visit a physician if they believe about the nature cyclical of symptoms, believed or perceived control over the symptom by themselves, or control the symptoms independently, thinking or believing that the symptoms were not related to cancer, maybe short, would disappear, as well as a perception that symptoms do not bother the daily living or working. Therefore, people with CRC with

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negative cognitive illness perception, they might not visit a physician; thus, time to hospital increased (Dracup et al., 2006; Jensen et al., 2016). It was similar to findings by Jensen et al. (2016) found that people with CRC who believe in the treatability control were significantly associated with a shorter time to hospital (PR=0.52, 95%, CI: 0.31-0.89). Meanwhile, those with a strong belief about the cyclical nature of their symptoms were more likely to have a longer time to hospital around two times (PR=2.14, 95% CI, 1.29-3.57), and time to hospital of people with CRC decreased if they perceived the potential negative consequence of symptoms that it the most important symptoms.

3. Emotional illness perception had a positive association with time to hospital among Thai people with CRC

Rational. Emotional illness perception was derived from emotional representation factors of Dracup's framework. According to Dracup's framework (2006), emotional factors can influence patients' decision-making to seek care and treatment or how to respond to CRC-related symptoms. Emotional reactions frequently were parallel to, but partially independent of, the cognitive processes of coping with health threats such as CRC-related symptoms. Emotional responses associated with the increased time to hospital including fear, worry about the finding of diagnosis, embarrassment about their symptoms, anxiety, or depression. These emotions may interact with and temporarily interfere with health-protective behavior, strategies to respond to symptoms, and eventual decision to visit a physician. Therefore, it may increase time to hospital in people with CRC.

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4. Healthcare seeking behavior had positive association with time to hospital among Thai people with CRC

Rational. According to the framework of Dracup, healthcare seeking behavior was a variable derived from seeking treatment behavior concept. Healthcare-seeking behavior was actions or behaviors of patients to respond to their symptoms (Gillian et al., 1999). Healthcare seeking behavior, including culturally prescribed and nostrums, the caring of family remedies, and medically prescribed (Dracup et al., 1995; Dracup et al., 2003; Leventhal, et al., 2010). Therefore, people with CRC who successfully eliminate the symptoms by self-treatment might not visit a physician leading to an increase in the time to hospital. Hashim et al. (2010) confirmed that patients experiencing CRC-related symptoms, such as rectal bleeding, who self-treated were more likely to have a longer time to hospital, compared to those who did not take any self-treatment (OR =5.0; 95% CI, 1.0-24.1).

5. Perceived the seriousness of warning signs and symptoms had a negative association with time to hospital among Thai people with CRC

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Rational. Perceived seriousness of signs and symptoms derived from the appraisal stage of Dracup's framework. People with CRC who appraises symptoms or perceive that symptom were serious, they would promptly seek appropriate medical attention by visiting a physician for diagnosis and treatment. Thereby, time to hospital would be decrease. Meanwhile, if an individual appraises that symptom were not being serious, they would be delay treatment, and seek care using the coping strategy that was ineffective. After they perceived that there was not enough process or unsuccessful in solutions, they were reassessed, changed, or may try other coping. Finally, time to hospital phase among people with CRC increased. Courtney et al. (2012a) found that

patients experiencing rectal bleeding and thought that it was serious were more likely to consult a physician early less than two weeks almost six times, compared to those who thought that the symptom was not serious (OR=5.88, 95% CI, 1.48-23.30). Meanwhile, those experiencing a change in bowel habit and thought that symptoms might not go away, or persisted, were significantly higher in early consult a physician around five time (OR=5.75, 95%, CI, 1.42-23.24).

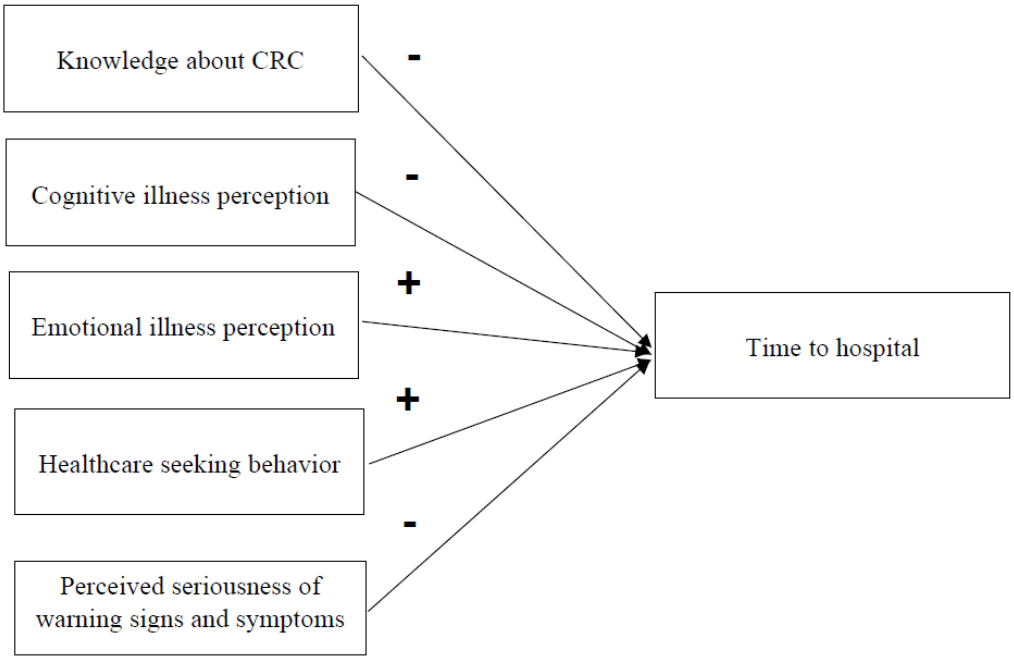

Figure 1.2 Hypothesize framework for factors associated with time to hospital among people with CRC

Scope of the study

The target population of the current study were Thai adult patients aged 18 years and over who were diagnosed with CRC. The setting was medical and surgical outpatient departments (OPD), oncology unit, radiology unit, endoscopic unit, and in-patient department (IPD) at tertiary hospitals and super-tertiary hospitals in Thailand. The dependent variable was time to hospital. The independent variables were knowledge about CRC, cognitive illness perception, emotional illness perception, healthcare seeking behavior, and perceived seriousness of warning signs and symptoms.

Operational definitions

1. Time to hospital referred to time intervals (in days) from the date that Thai people with CRC first perceived or noticed warning signs and symptoms of CRC to the date that his/her first presentation to a specialist physician who requests to take a colonoscopy. It was measured by time to CRC diagnosis questionnaire developed by the researcher. A higher number of days indicated a longer time to hospital.

2. Knowledge about CRC referred to the knowledge of Thai people with CRC about symptoms related to CRC, risk factors of CRC, age at risk for CRC, and CRC screening methods. It was measured by the knowledge about CRC questionnaire that the researcher developed from the knowledge of CRC questionnaire by Hashim et al. (2011). It has been translated into Thai language using the forward- back translation method and adapted to Thai people with CRC by the researcher, under the authors' permission. A higher score represented a higher level of knowledge about CRC.

3. Cognitive illness perception referred to the perception or thinking of Thai people with CRC regarding warning signs and symptoms of CRC that they had experienced, consisting of identity, timeline (acute vs. chronic), consequences, personal control, treatment control, illness coherence, timeline cyclical, and cause sub-scales.

(1) Identity sub-scale referred to the perception or thinking of Thai people with CRC to give a disease label or a patient's ideas about symptoms related to CRC

(2) Timeline (acute vs. chronic) sub-scale referred to the perception or thinking of Thai people with CRC about the temporary or chronicity of the symptoms, such as symptoms would last a short time, or would last for a long time, permanent rather than temporary, or it would be improved in time, etc.

(3) Timeline cyclical sub-scale referred to the perception or thinking of Thai people with CRC about the stability or changeability of their symptoms

(4) Consequences sub-scale referred to the perception or thinking of Thai people with CRC about anticipated, perceived, and experienced that illness and symptoms produced or affected physical, psychological, social, and economic

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(5) Personal control sub-scale referred to the perception or thinking of Thai people with CRC about their own ability to control illness and its symptoms

(6) Treatment control sub-scale referred to the perception or thinking of Thai people with CRC about the ability of experts or treatment for controlling their illness and its symptoms

(7) Coherence sub-scale referred to the perception or thinking of Thai people with CRC regarding the understanding of their illness and its symptoms

(8) Cause sub-scale referred to the perception or thinking of Thai people with CRC regarding causes of their illness and symptoms

It was measured by the Modified Illness Perception Questionnaire-Revised (the modified IPQ-R), which was modified by Hvidberg et al. (2014) used for patients with CRC experiencing symptoms. It was originally developed by Moss-Morris et al. (2002). The modified IPQ-R was translated into Thai language by forward-back translation method by the researcher. The scores were separately calculated by the sum of each sub-scale. A higher score represented a higher cognitive illness perception.

4. Emotional illness perception referred to the external expression of emotional reactions affected by illness and its symptoms, including depression, upset, angry, anxiety, and fear/afraid, reflected by Thai people with CRC. It was measured by the Modified Illness Perception Questionnaire-Revised (the modified IPQ-R) that the researcher adopted from the Modified Illness Perception Questionnaire-Revised by Hvidberg et al. (2014), which was originally developed by Moss-Morris et al. (2002). The researcher translated the modified IPQ-R into Thai language using forward- back translation method. A higher score represented a higher emotional response of illness perception associated with illness and CRC- related symptoms.

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5. Healthcare-seeking behavior referred to actions, behaviors, responses taken by Thai people with CRC when his/her perceived symptoms. The actions, behaviors, responses in healthcare-seeking behavior consisted of five dimensions: self-medicating, complementary and alternative medicine (CAM), counselling, emotional-focused coping, and problem-focused coping. It was measured by the healthcare-seeking behavior questionnaire for Thai people with CRC, developed by the researcher and colleagues using a hybrid measure method and literature review. A higher score indicated the frequency of healthcare-seeking behavior used when experiencing CRC-related symptoms.

6. Perceived the seriousness of warning signs and symptoms referred to the degree in the estimation seriousness of warning signs and symptoms related to CRC reported by Thai people with CRC. It was measured by the perceived seriousness of warning signs and symptoms questionnaire, which was modified from the item asked about the perception of the seriousness of CRC symptoms proposed by Leiva et al. (2017). It has been translated into Thai language using forward - back translation method and adapted for Thai people with CRC by the researcher permitted by the authors. A higher score indicated a higher perceived seriousness of warning signs and symptoms of CRC**.**

Expected benefits

1. The findings of this study added to the literature by providing information on factors that affect time to hospital among Thai people with CRC. Study findings may improve the understanding of specific barriers to and facilitators of time to hospital, which was critical to developing nursing interventions to reduce delay time to hospital among people with CRC.

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2. Nurses were significant parts of the health care systems, especially in a clinical setting. They play an integral role in emphasizing the importance of early symptom recognition and prompt care-seeking by visiting a physician before the disease progresses. Therefore, nurses in clinical settings, nurses in the community, and other healthcare providers can use the findings to organize campaigns, disseminate, advise, or promote proactive activities in patients experiencing CRC-related symptoms and people with risk group of CRC, to early visiting a physician since noticing

symptoms. Moreover, they can develop interventions to modify healthcare-seeking behaviors by early visiting a physician instead of self-medicating.

3. Policymakers can use the findings to message or proactive campaigns for Thai people to recognize the significance of warning signs and symptoms of CRC and early presentation symptoms to a physician, particularly people with average risk and high risk of CRC. Also, they can use the findings to minimize specific barriers to access healthcare facilitators for Thai people.

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CHAPTER II
LITERATURE REVIEW

A critical review of the existing literature describes the phenomena of time to hospital and factors predicting factors of time to hospital among people with CRC. The review consisted of

1. Basic knowledge of colorectal cancer
   1.1 Colorectal cancer occurrence
   1.2 Colorectal cancer diagnosis
   1.3 Stage of colorectal cancer
   1.4 Symptoms of colorectal cancer
   1.5 Treatments for colorectal cancer
   1.6 Risk factors related to colorectal cancer
2. Time to diagnosis
   2.1 Definition of time to diagnosis and time to hospital
   2.2 Phases of time to diagnosis
   2.3 The criteria for considering standardized time to diagnostic pathways
   2.4 Theoretical underpinning time to hospital
   2.5 Factors related to time to hospital in people with colorectal cancer
   2.6 Outcomes related to time to hospital in people with colorectal cancer
   2.7 Literature review about time to hospital in people with colorectal cancer
3. Nursing role related to time to hospital and preventive risk of colorectal cancer

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1. Basic knowledge of colorectal cancer

1.1 Colorectal cancer occurrence

Colorectal cancer (CRC), also called bowel cancer, was one of the leading causes of morbidity and mortality worldwide (Du & Tudyka, 2017). The incidence rates increased with over 1.8 million globally (Bray et al., 2018). It was estimated that CRC will rise by 60%, or more than 2.2 million for newly diagnosed cases by 2030 worldwide (Arnold et al., 2017). American Cancer Society [ACS], (2020) also reported that in 2020, new CRC cases were diagnosed in the US, accounting for 147,950 cases (104,610 cases of colon cancer and 43,340 of rectal cancer), and approximately 53,200 people died from CRC. Although most CRC in American people was in adults ages 50 years and older, the incidence rates in younger people than age 50 were diagnosed at 17,930 cases (12%). In Asia regions, it was predicted that the incidence rates will increase from 283,596 cases in 2008 to 524,520 cases for newly diagnosed cases in 2030 (Sankaranarayanan et al., 2014).

In Thailand, CRC was the first common cancer in males and the third most common cancer among females (NCI, 2019). New CRC cases were detected, accounting for 17,534 cases in 2018 (Lohsiriwat et al., 2020). Moreover, the number of death rates has been steadily increasing every year in both sexes, from 4,104 cases, 4,558 cases, 4,781 cases, 5,068 cases, 5,476 cases per 100,000 population in 2015 to 2019, respectively (Bureau of Strategy and planning division: Ministry of Public Health, 2019).

Moreover, the incidence rates of CRC in Thailand were rising, significantly higher in adults aged 50 years and older. The statistic from the hospital-based cancer registry by NCI (2019) reported that the number of new CRC patients aged 50 – 64

years found at 39.27%, and those aged over 65 were reported at 41.88%. Meanwhile, newly diagnosed cases in younger adults than age 50 years were found at 18.85 %. In addition, the highest rates of CRC in Thai people were diagnosed at advanced or metastatic stages, especially stage IV with 41.6%, followed by stage III with 25.9%. Meanwhile, early stages were found only 1.1% for stage I, 13.9% for stage II, and 17.5% for unknown stage, respectively. Based on these statistics, CRC would be a significant global cancer burden in the coming decade in every region of the world, including Thailand.

1.2 Colorectal cancer diagnosis

CRC can be diagnosed with the following tests (ACS., 2019a; ASCO, 2019; Du et al., 2017; Plumb & Halligan, 2018).

1.2.1 Colonoscopy. The diagnosis of CRC was mainly based on colonoscopy, especially those with bowel symptoms due to the suspicion of CRC (Plumb & Halligan, 2018; Vega et al., 2015). This procedure can be done in a hospital outpatient or the endoscopic unit. It was a procedure that needed a colonoscopist or physician specializing in using special instruments because the procedure inserted inside the entire colon and rectum to look for tumors and suspicious areas such as polyps. The size and its exact location can be determined. Moreover, if any suspicious areas were found, the physician can remove or biopsy the suspicious- looking through colonoscopy.

1.2.2 Proctoscopy was the procedure for the test of diagnosis, particularly the rectal cancer was suspected. It was a procedure that can help a physician look closely at the inside lining of the rectum through the scope. However, a limitation was it can look for the abnormal or suspicious area only the rectum.

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1.2.3 Biopsy was a procedure used to remove a small piece of suspected tissue for CRC examination under a microscope. A biopsy can be performed during a colonoscopy, or it can be done on any tissue removed after surgery treatments, such as local excision or polypectomy. A biopsy can make a definite diagnosis of CRC. Specimens from a biopsy were sent to a pathologist to interpret laboratory tests, evaluate and confirmed cells, tissue, and organs to CRC diagnosis. Similarly, NCI (2019) reported that a histological finding by biopsy confirmed 76.7% of CRC diagnosis, and adenocarcinomas cells can be found in approximately 96% of all CRC by biopsy's findings (Plumb & Halligan, 2018).

1.2.4 Blood test. Laboratory tests can indicate symptoms related to CRC, such as complete blood count (CBC) and tumor marker. Complete blood count (CBC) was useful to indicate bleeding symptoms that maybe occur in CRC patients leading to anemia. Another important blood test was tumor markers. It was protein levels that CRC cells sometimes make substance and release in the blood, called carcinoembryonic antigen (CEA) and CA 19-9. High levels of CEA may indicate that cancer may spread into other organs of bodies. Nevertheless, not all people with high CEA levels were be indicated that cancer has spread to other organs because there were other medical conditions that can increase CEA levels. The Tumor marker may be helpful to monitor patients after treatments or provide an early warning that cancer may be a recurrence.

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1.2.5 Imaging test. CRC diagnosis can be investigated with imaging tests, such as Computed tomography or Magnetic resonance.

1.2.5.1 Computed tomography (CT or CAT) scan was an imaging test that uses x-rays, magnetic fields, sound waves, or radioactive substances to create pictures of the inside of the body. It was a combined picture of 3-dimensional images

to show abnormalities or tumors by measuring the size. This procedure sometimes requests a medium-contrast injection before the scan to provide high-quality detail on the image. In addition, a CT scan can use to check for the spread of cancer to lungs and other organs for CRC patients.

1.2.5.2 Magnetic resonance imaging (MRI) was the best image test to find the growth of CRC. MRI was a procedure that uses radio waves and strong magnets instead of x-rays (magnetic fields). This procedure provided high-quality images, such as tumor size and tumor location, with a clearer picture. MRI sometimes needs a medium-contrast injection before the scan to provide quality detail on the image of pictures.

1.2.5.3 Positron emission tomography (PET) scan was a procedure to create a picture of organs and tissue inside the body. It was generally used with a CT called a PET-CT scan. The procedure usually uses a small amount of a radioactive sugar substance injected into the body, and then a PET scan detected this substance to produce the image. Cancer cells that grew quickly were more likely to take up larger amounts of sugar than normal cells. The PET scan was helpful for a physician to know cancer spreading to lymph nodes or other organs after diagnosis.

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1.2.5.4 Ultrasound was a sound wave to create a picture to find abnormalities or tumors of intestinal organs that cancer has spread. Abdominal ultrasound can be used to look for tumors in the liver, gallbladder, pancreas, or other organs in the abdomen, but it can't look for tumors of the colon. For endorectal ultrasound was a procedure that uses a special procedure inserted into the rectum. It used to look for abnormalities of the rectal wall cancer that has grown and cancer that

reached nearby organs or tissues, such as lymph nodes. However, ultrasound cannot accurately detect cancer that spreads to nearby lymph nodes or beyond the pelvis.

1.3 Stage of colorectal cancer

Staging of CRC was essential for determining the treatment choices, predict prognosis, referring process, and survival rates of CRC patients. The 5- year survival rates were higher at 90% if patients were detected at the early stage. In contrast, the survival rates dropped to 70.4 % for patients diagnosed with regional lymph node involvement and 12.5 % for metastasis to distant organs (Favoriti et al.,2016).

According to the ACS (2017, 2019a), staging systems of CRC popularly used in clinical settings can divide into two systems. Firstly, the TNM staging systems, which have been derived from the Duke's classification. The TNM staging system was the most used to describe the stage of CRC base on invasion depth of the Primary Tumor (T), the presence of Regional Lymph Nodes(N), and the presence of Distant Metastases (M). Currently, the 7th edition of the TNM staging system by the American Joint Committee (AJCC) /Union for International Cancer Control (UICC) was the most popular used to describe the staging of CRC in a clinical setting. The seventh edition of the TNM classified CRC into stage 0 to stage IV as the table 2.1

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Table 2.1 the TNM staging system, AJCC/UICC 7th edition (Labianca et al., 2013)

Primary tumor (T)	
TX =	Primary tumor cannot be assessed
T0 =	No evidence of primary tumor
Tis =	Carcinoma in situ: intraepithelial or invasion of lamina propria
T1 =	Tumor invades submucosa
T2 =	Tumor invades muscularis propria
T3 =	Tumor invades through the muscularis propria into the peri colorectal tissues
T4a =	Tumor penetrates into the surface of the visceral peritoneum
T4b =	Tumor directly invades or is adherent to other organs or structures
Reginal lymph node (N)	
Nx =	Regional lymph nodes cannot be assessed
N0 =	No regional lymph node metastasis
N1 =	Metastasis in one to three regional lymph nodes
N1a =	Metastasis in one regional lymph node
N1b =	Metastasis in two to three regional lymph nodes
N1c =	Tumor satellite deposits in subsierose or in non peritonealised tissues
N2 =	Metastases in ≥ 4 regional lymph nodes (a: 4-6, b: ≥ 7)
Distant metastases (M)	
M0 =	No distant metastases
M1 =	Distant metastases
M1a =	Metastases confined to one organ or site (for example liver, lung, ovary, nonregional node)
M1b =	Metastases in more than one organ/site or the peritoneum

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Table 2.1. The TNM staging system by AJCC/UICC 7th edition and the Duke's stage

Stage	T	N	M	The Duke's stage
0	Tis	N0	M0	-
I	T1 T2	N0 N0	M0 M0	A A
IIA	T3	N0	M0	B
IIB	T4a	N0	M0	B
IIC	T4b	N0	M0	B
IIIA	T1-T2 T1	N1/N1c N2a	M0 M0	C C
IIIB	T3-T4 T2-T3 T1-T2	N1/N1c N2a N2b	M0 M0 M0	C C C
IIIC	T4a T3-T4a T4b	N2a N2b N1-N2	M0 M0 M0	C C C
IVA	Any T	Any N	M1a	D
IVB	Any T	Any N	M1b	D

Source: Adapted from the TNM staging system by AJCC/UICC (2010) (7th ed)

(Labianca et al., 2013)

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Secondly, the Surveillance Epidemiology and End Results (SEER) was a CRC staging system that depends on the results from histological type. The SEER classifies CRC into four stages: the in-situ stages, the local stage, the regional stage, and the distant stage. The details were explained as bellows (ACS, 2019a, 2020).

In situ stages were known as carcinoma in situ (Tis). It was cancer that has not started to invade the wall of the colon or rectum. In situ stage was stage 0 in the TNM staging system.

Localized stage was tumor grew into the colon or rectal wall, but it was not extended through the wall to invade nearby tissues or other organs. It has not spread to nearby lymph nodes. This stage includes stage I, stage Ila, and stage IIb in the TNM staging system.

Regional stage was called for the CRC that has spread through the colon or rectum wall and invades nearby tissue or lymph node. This stage includes stage IIc and stages III in the TNM stage of AJCC systems.

The last stage was called *the distant stage*, which referred to cancer has grown through the wall of colon or rectum and spread to distant lymph node or distant organs of the body, especially the liver, brain, lung, peritoneum. This stage included stage IV of the TNM staging of AJCC system.

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1.4 Symptoms of colorectal cancer

CRC symptoms were usually very vague and non-specific symptoms. An array of symptoms depended on the stage, location of cancer, or metastatic of the tumor (Pedersen et al., 2013; Vega et al., 2015). In general, the common symptoms were general or localized abdominal pain, rectal bleeding, change in bowel habits, which were broadly termed as diarrhea or constipation, change in frequency of defecation, the

shape of stool (e.g., more narrow than usual, mucous bloody stool, difficulty in evacuation or tenesmus) (ACS, 2020; Courtney et al., 2012b; John et al., 2011; Labianca et al., 2013). Including weight loss without specific causes, bloating, iron deficiency and anemia, weakness, fatigue, fever, night sweats, and sometimes short breath (ACS, 2017, 2020; John, et al.,2011; Khan & Hyman, 2010; Labianca et al., 2013). Also, CRC- related symptoms were associated with a chronic functional condition such as irritable bowel syndrome, chronic constipation, benign anorectal lesions, severe abdominal pain, and abdominal mass (Vega et al., 2015). However, ACS (2017, 2020) have noted that warning signs and symptoms of CRC and the most common CRC symptoms were following these symptoms.

(1) rectal bleeding, (2) blood in the stool or the toilet after having a bowel movement that people can notice after defecation, (3) dark or back stools, (4) a change in bowel habits or the shape of the stool change (e.g., the stool more narrow than usual), (5) cramping, pain, or discomfort in the lower abdomen, (6) an urge to have a bowel movement when the bowel is empty, (7) constipation or diarrhea that lasts for more than a few days, (8) decreased appetite, (9) unintentional weight loss. Other CRC common symptoms that should also be concerned were (10) mucous bloody stool, and (11) tenesmus.

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1.5 Treatments for colorectal cancer

Generally, the main treatments of CRC consist of surgery, chemotherapy, radiation, and targeted therapy. These treatments can be administered alone or given a combination treatment, depending on the stage of CRC (ACS, 2019a; Du, 2017).

1.5.1 Surgery was recommended as a treatment to use in general for CRC patients. It was the most effective treatment for the localized disease to remove the

tumor or growth of abnormal cells, principally with the carcinoma in situ and localized stage (Labianca et al., 2013). An example of CRC surgery was polypectomy, which was a local excision through the colonoscopy. It was local excision for the early stage of CRC. Meanwhile, resection of a segment of the colon may be needed for a large tumor that local excision cannot remove. Moreover, survivals at 1, 5, and 10 years were strongly correlated with the stage of disease at the time of surgical reception (ACS, 2019a; Du, 2017).

1.5.2 Chemotherapy was an adjuvant treatment that was mostly recommended for CRC patients with stage III. However, it was suggested along with the surgery for patients with stage IIc because cancer can spread to nearby lymph nodes in this stage, and only surgery is not sufficient. Chemotherapy can also administer to minimize tumor size before a pre-operative period and reduce the hazard of recurrence of cancer and palliative treatments in CRC (Cersosimo, 2013; Du, 2017). According to Labianca et al. (2013), adjuvant therapy reduces the risk of death by 3 % to 5% in stage II with single-agents 5-FU (Fluorouracil), and by 10%-15% in stage III with fluoropyrimidines alone plus a further 4%-5% with oxapliplatin - containing combination. Although chemotherapy can improve survival in CRC, patients may encounter problems caused by the side effects of chemotherapy.

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1.5.3 Radiation was adjuvant treatment aiming to downsize locally advanced tumors before surgery or after surgery to prevent local recurrence, including palliative treatment in case of locally advanced disease and recurrent (Du, 2017). It has played a vital role in the treatment of patients with rectal tumors. Radiation can be administered alone or combined with surgery or chemotherapy, depending on the tumor

size and location. However, radiotherapy has limited value for colon cancer because of the possibility of damage to adjacent organs and the small intestine.

1.5.4 Targeted therapy was an anti-angiogenic agent used in the first-line setting combined with chemotherapy such as 5-FU (Fluorouracil)/ capecitabine and oxaliplatin (Du, 2017). However, there were common side effects with the drug by target therapy, such as hypertension and proteinuria. Moreover, serious side effects that could be found because of using bevacizumab were arterial thromboembolic, hemorrhage, perforation, and fistula formation (Du, 2017).

1.6 Risk factors related to colorectal cancer

16.1.1 Modifiable factors were significant risk factors that increased the CRC. For instance, red meat intake and high meat consumption were probable risk factors of CRC due to stimulation of insulin secretion, increased fat intake, and increased iron absorption (heme). It has been hypothesized that heme can enhance the N endogenous formation of carcinogenic -nitroso compounds leading to cancerization (Hughes et al., 2017). A meta-analysis study of CRC risk factors by Johnson et al. (2013) has highlighted that red meat consumption was a significant factor of CRC (RR=1.13, 95% CI 1.09-1.16). Moreover, people, who ate red meat more than five times a week, were more likely to develop CRC than others around three times (Gandomani et al., 2017). In addition, the longer cooking time of meats can increase heterocyclic amine production, contributed to the increasing of CRC (Anderson, 2011; Gandomani et al., 2017).

Physical inactivity and obesity were enormously significant risk factors to increase CRC. Physical activity lowered the risk of CRC by reducing BMI, reducing the colonic transit time, and lowering insulin levels (Gribovskaja-Rupp et al., 2011).

Meanwhile, physical inactivity led to obesity, increasing serum leptin levels. Leptin level enhance the growth and proliferation of colon cancer cells leading to CRC finally. Similarly, the ACS (2017) has been highlighted that excess body weight in males has a stronger association with increasing CRC than women, and obese males have about a 50% higher risk of colon cancer and 20% higher risk of rectal cancer respectively. On the one hand, a 20% higher risk of colon cancer and a 10% increased risk of rectal cancer in obese females. Also, the findings of Hidayat et al. (2018) revealed that excess body fatness through (increased 5kg/m^2 of BMI) was significantly associated with the risk of CRC in younger adults aged less than 30 years overall with 13% (RR, 1.13, 96%CI, 1.08-1.19), and 17% increase in men, while only 8% in women. Moreover, meta-analysis summarized that BMI (per 8kg/m2) increased CRC risk to overall population (RR=1.10, 95%CI, 1.08-1.12) (Johnson et al., 2013).

Alcohol consumption was regarded as a risk factor for gastrointestinal cancer, including CRC. Alcohol metabolism involved ethanol conversion to its metabolites that could exert carcinogenic effects in the colon (Bay et al., 2018; Gandomani et al., 2017; Haggar et al., 2009). Therefore, a significant positive relationship between alcohol consumption and CRC was found, especially in men. A previous study conducted by Cho et al. (2015) have reported that a higher amount of alcohol consumption was associated with an elevated risk of CRC (HR 1.93, 1.17-3.18), and longer duration was equal to or greater than 30 years were associated with increasing of CRC compared to non-drinker around two times (HR 2.24, 1.31-3.84).

Moreover, Rossi et al. (2018) found that alcohol drinking significantly correlated with CRC risk in men. Also, Zhivotovskiy et al. (2012) found that alcohol drinking was one significant factor affecting an increase of CRC almost nine times (OR=8.73,

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95%CI=5.49-13.87, P<0.0001). Furthermore, beer-drinking increased the risk of CRC almost ten times compared to those with non-drinking (OR=9.24, 95%CI=5.14-16.61, P<0.0001), and consumption of hard drinking increased CRC almost ten times (OR=9.37, 95%CI=5.92-14.82, P<0.0001).

In addition, smoking was a risk factor for CRC incidence, survival, and mortality (Liang et al., 2009; Walter et al., 2014). Although the precise carcinogenic mechanism of cigarette smoking in CRC was unclear, it seemed that smoking was an association with somatic genetic and epigenetic aberrations of molecular patterns (e.g., CpG island, methylator phenotype (CIMP)-high, microsatellite instability (MSI)-high, and BRAF mutation. Moreover, smoking can directly drive the epigenomic instability associated with these molecular alterations through the induction of hypermethylation at CpG islands and induced carcinogenesis eventually (Drew et al., 2017).

Notably, evidence has reported that a smoker for a long time tended to develop and die from CRC more than a non-smoker (ACS, 2017; Haggar et al., 2009; Zhivotovskiy et al., 2012). The findings of the meta-analysis study concurred that smoking was a significant factor associated with a moderately increased risk of CRC (RR=1.06, 95%, CI 1.03-1.08) (Johnson et al., 2013). Also, the study by Zhivotovskiy et al. (2012) among 180 CRC patients confirmed that smoking was a significant factor affecting CRC diagnosis around two times compared to non-smokers (OR=2.13, 95%CI=1.4- 3.24, P=0.0004). Meanwhile, Walter et al. (2015) have reported that smoking over 20 years was associated with decreased overall survival in CRC patients with stage I - stage III (HR=1.40, 95%, CI=1.01- 1.95), especially in men (HR: 1.51; 95%-CI: 1.09–2.10), and colon cancer (HR, 1.51; 95%-CI: 1.05–2.17).

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16.1.2 None - modifiable factors can increase chance of developing CRC. CRC risk increased after the age of 40 years and rose sharply after aged 50 years and over (ACS, 2020; Haggar et al., 2009), and almost 70% of CRC was observed in patients aged over 65 years (Labianca et al., 2013). Around 26% of CRCs were diagnosed at a distant stage among patients younger than age 50, compared to 23% in ages 50-64 years and 19% among those ages 65 and old. Moreover, the incidence rates in younger adults aged less than 50 increased by 6% for 30 years, especially in a high-risk group (ACS, 2020).

A family history of CRC was significantly related to an increase in CRC diagnosis (Haggar et al., 2009; Labianca et al., 2013). The ACS (2020) has noted that over 30 % of CRC patients have a family history of CRC; in particular, first-degree relative, have two or four times the risk of CRC compared to those without a family history. CRC risk was also significantly increased for individuals with more than one relative diagnosed with the CRC or the relative diagnosed with CRC before age 45 (ACS, 2017). Moreover, the findings of the meta-analysis study emphasized that CRC history in first-degree relatives was an important factor that much higher risk of CRC (RR=1.80, 95%CI, 1.61-2.02) (Johnson et al., 2013).

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Inherited genetic or hereditary syndromes, such as Hereditary Non-Polyposis Colorectal Cancer (HNPCC), known as Lynch syndrome, and Familial Adenomatous Polyposis (FAP), were related to CRC risk. The most common hereditary risk factor for CRC was Lynch syndrome, accounting for about 3 - 5 % of all CRCs. These inherited conditions have a specific mutation dene that hinders the cell's ability to correct errors introduced during DNA replication. These mistakes resulted in additional mutations that can ultimately lead to cancer. The likelihood of which was dependent on

which gene was affected. According to ACS (2020), among the 80% of Lynch syndrome patients with high-risk gene mutations, 19% to 25% will develop CRC by age 50, and the chance to develop CRC will increase to 40 % by age 70 years.

An individual with a personal medical history such as a history of adenomatous polyps, especially multiple or large polyps, inflammatory bowel disease (IBD), cholecystectomy, and a history of abdominal or pelvic radiation for previous cancer, might increase the chance of being CRC (ACS, 2020; Araghi et al., 2019; Gandomani et al., 2017). Individuals with chronic inflammatory bowel disease (IBD) have a much higher CRC risk, almost double than those without IBD, and the most common forms of inflammatory bowel disease (IBD) were ulcerative colitis and Crohn's disease (ACS, 2017, 2019b; Andersen et al., 2012). The meta-analysis findings by Johnson et al. (2013) reported that the overall random effects, inverse-variance weighted average of the relative risk of CRC due to IBD was 2.93 (95% CI, 1.79-4.81). It can summary that IBD was a significant risk factor of CRC overall.

People with diabetes mellitus type II have a slightly increased risk of CRC diagnosis since diabetes type II and CRC share some of the same risk factors such as obesity and physical inactivity. It was stronger appear in male than female (ACS, 2017, 2020). Moreover, chronic infection with gastric Helicobacter pylori (H. Pylori), a bacterial infection in gastrointestinal tract, strongly associated with excess strongly associated with stomach cancer, and it may also be related to a moderately increased risk of CRC diagnosis, and individuals with a history of infection with particular H. pylori strains, was significantly more prevalent in the patients with colon cancer (P= 0.003) (Teimoorian et al., 2018),especially this association was strongest among black Americans (ACS, 2020).

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Other risk of CRC diagnosis was previous treatments for certain cancers such as those who received radiation therapy to treat prior cancer at pelvic of abdominal areas. Men treated with radiotherapy for prostate cancer because of the carcinogenic effects of the treatments as radiotherapy might have an increased developing colorectal cancer (ACS, 2017, 2020; Gandomani et al., 2017).

Additionally, several studies reported that time to diagnosis was associated with CRC occurrence and the stage, especially a longer time (Langenbach et al., 2003; Pozsgai et al., 2019; Strous et al., 2019). A prospective cohort study by Walter et al. (2016) found that patients suspected of CRC, having a longer time to diagnosis at 124 days, were diagnosed with CRC, accounted for 6.1%. The majority of those with CRC had advanced stages with 55.9%. While early-stages were found at 42.8%, and 1.3% were unknown stages.

2. Time to diagnosis

Regarding terms of time to diagnosis, several existing terms have emerged as interchangeably used vary across populations. Those terms such as total diagnostic interval (Helsper et al., 2017), diagnostic intervals (Mounce et al., 2017; Tørring et al., 2013; Tørring et al., 2017), diagnosis interval (Esteva et al., 2013), time interval (Unger-Saldaña & Infante-Castañeda, 2011; van der Geest et al., 2014), time interval for diagnosis (Rittitit et al., 2020b), total time to diagnosis (Hall et al., 2015), the time before treatment (Kimpee et al., 2013), total delay time (Dracup et al., 1995; Dracup et al., 2006; Gigliotti et al., 2019; Xie et al., 2015), and time delay in diagnosis (Sreeramareddy et al., 2009). These terms contained the same meaning, including the length of time of the diagnostic pathway in each phase, starting from the onset of

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symptoms until confirmed diagnosis or getting treatment. However, in this study, all terms above were called “time to diagnosis”

For terms of time to hospital, several existing terms have emerged as interchangeably used vary across populations. Those terms such as pre-hospital delay (Dracup et al., 2006; Mitchell et al., 2008; Xie et al., 2015), patients action phase (Dracup et al., 1995), the primary care interval (IPC) (Helsper et al., 2017; Tørring et al., 2017), patient delays (Gigliotti et al., 2019; Langenbach et al., 2010; Rittitit et al., 2020b; Sreeramareddy et al., 2009; Unger-Saldaña & Infante-Castañeda, 2011), prehospital (van der Geest et al., 2014), patient interval (Esteva et al., 2013; Walter et al., 2016), the time before treatment (Kimpee et al., 2013), and the date of initial consultation (Pruitt et al., 2013). These terms contained the same meaning that referred to time interval starting from the onset of symptoms until first presentation to a physician or arrival of individual at the hospital. However, in this study, all terms above were called “time to hospital”.

2.1 Definition of time to diagnosis and time to hospital

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According to a literature review, the definition of time to diagnosis including definition of time to hospital, and in-hospital phase has been defined vary across populations, such as CRC patients, persons at risk of CRC, myocardial infraction patients, breast cancer patients, oral cavity cancer patients, cancer, including pulmonary tuberculosis patients.

For CRC patients, a systematic review by Mitchell et al. (2008) proposed that time to hospital for CRC was “time interval from people with CRC first noticing symptoms to first presenting to primary care, and time interval from the first consultation at primary care until referral to a specialist.”

Langenbach et al. (2010) defined time to diagnosis in people with CRC as " times starting from patients first noticed any signs or symptoms until the first diagnosis of CRC. Also, the definition of time to hospital, which was one part of time to diagnosis, was defined as “The time between the first symptoms and the first visit to the general practitioner or the first consultation of a specialist and the hospital admission.”

The qualitative study of Ramos et al. (2010) has mentioned time to diagnosis as “the time divided into two intervals starting from the time from the onset of symptoms to initial consultation, and the time initial consultation to physicians or, more generally, the health system”. For time to hospital was defined as the time from the onset of symptoms to initial consultation to physician”

van der Geest et al., 2014 defended time to hospital among people with CRC as “number of days between date of enrolment and date of first hospital visit”

Esteva et al. (2013) defined time to diagnosis in people with CRC as “ the date between onset of first CRC -related symptoms to date of diagnosis”, and time to hospital was defined as “ the date starting from onset of first CRC -related symptoms to date of first consultation with a physician (a general practitioner or a specialist physician in hospital).

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Moreover, in 2017, Tørring and colleagues conducted a cohort study to analyze the relationship between people with CRC and the primary and specialist care component of time to CRC diagnosis among 11,720 people with newly diagnosed CRC in five countries. The definition of time to CRC diagnosis defined as “the time from the first presentation of symptoms in primary care until the date of diagnosis.” Meanwhile, they defined time to hospital as “time from first presentation to referral to a cancer specialist center”

The secondary analysis study by Kimpee et al. (2013) has studied time to hospital, which referred to “interval from the first symptom noticed to the first time to meet a physician”.

In Thailand, the cross-sectional study by Rittitit et al. (2020b) proposed the definition of time to diagnosis in people with CRC as “the time interval from the first symptom presentation until confirmed diagnosis by histological report”. Moreover, n this study, time to hospital was defined as “time from the first symptom presentation until first visit the general practitioner”.

Pruitt et al. (2013) indicated that time to diagnosis of people with CRC was “the period in days between initial consultation for CRC related clinical manifestation or symptom and pathologically-confirmed date of diagnosis”, and time to hospital was “ the initial date on which a patient had a medical appointment for at least one clinical manifestation of CRC-related symptom”

The prospective cohort study by Walter et al. (2016) have mentioned the definition of time to CRC diagnosis as "the time from onset of the first symptoms (s) to the date of being diagnosis by colonoscopy” . While they proposed definition of time to hospital as “the date from first symptom onset to first visiting healthcare consultation”

According to Dobson et al. (2018), time to hospital in people experiencing CRC symptoms referred to “interval from symptom onset, decision making and consultation a physician”

Moreover, definitions of time to hospital have defined in other chronic populations as follows.

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In cancer systematic literature, the definition of time to diagnose by Macleod et al. (2009) was “the interval between the first noticing a symptom, referral, and diagnosis.”, and defined time to hospital as “the interval from the patient first noticing a symptom to interval of first consulting a physician”

Time to hospital in oral cancer cavity proposed in literature review of Gigliotti et al. (2019) referred to “the time from the patient first notices a symptom and the first consultation with a physician or healthcare professionals”. Meanwhile, the period from the participant’s first awareness of symptoms to the initiation of therapy was defined as time to diagnosis.

Literature in patients with myocardial infarction by Dracup et al. (1995, 2006) has defined total delay time, which was the interval from the onset of symptoms to the initiation of definitive therapy”. Meanwhile, time to hospital was usually defined as the amount of time between the first awareness of symptoms and the arrival of the individual at the hospital”

From literature review in patients with acute myocardial infarction of Xie et al. (2015), the definition of time to diagnosis as “the time from onset of symptoms before the initiation of reperfusion therapy for AMI, which can be divided into two distinct periods: pre-hospital periods and in-hospital periods.”, and mentioned that time to hospital or pre-hospital phase was “time from onset of symptoms to arrival to the hospital”

Time to diagnosis in pulmonary tuberculosis patients proposed in the study of Sreeramareddy et al. (2009). It referred to “the period from onset of the first symptom possibly related to pulmonary tuberculosis to the date of diagnosis, which was by the sum of patients interval and health system interval.”. They also defined definition of

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time to hospital as “the period from symptom onset that was possibly related to disease to the date when the patient first visits health care provider both in formal or informal.

For a prospective hospital-based study in people with CRC conducted by Tørring et al. (2011), time to CRC diagnosis defined as “the time from the first presentation of symptoms to a physician until patients were diagnosed with CRC.”

The cross-sectional study conducted by Leiva et al. (2017) defined time to diagnosis in people with CRC as “ the date from patients recall that they have first experienced symptoms to the date of diagnosis”

Moreover, Pozsgai et al. (2019) conducted the retrospective study among people with CRC, and defined time to diagnosis as “the number of days from symptom onset to the first consultation to a physician with symptoms until the pathologically confirmed date of diagnosis”

In the study among people with CRC of Mounce et al. (2017) proposed the definition of time to diagnosis as “time from first symptomatic presentation of CRC to diagnosis” or “the length of time (in days) between the first presentation of a symptom coded in their medical record and the date of diagnosis.”

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Dobson et al. (2014) also explained time to diagnosis in cancer patients in their literature review as the diagnostic pathway, and it meant “the stage to describe the time from symptom onset to commencement of diagnosis and treatment, with these stages often being referred to as stages of delay.”,

For cancer patients, Chan et al. (2020) have proposed the definition of time to diagnosis as “the time from the first presentation of patients with symptoms until the diagnosis.”

In summary, the definition of time to hospital and time to CRC diagnosis has been defined across chronic illness populations. The definitions among those populations were quite similar. Generally, time to hospital referred to the interval of time starting from symptoms onset that patients perceived that physical health was abnormal to the time of first presentation to a physician. Meanwhile, time to diagnosis (total) included the interval of time started from the onset of symptoms that patients perceive that physical health was abnormal to the time of being CRC diagnosed or initiation treatment.

2.2 Phases of time to diagnosis

Based on the literature review, time to diagnosis can be divided into two main phases as follows.

2.2.1) The time to hospital or pre-hospital phase. Time to hospital have been used as interchangeably terms vary across populations such as pre-hospital phase, patient's interval, and patients delay, as mentioned in the beginning. However, the current study used term of time to hospital. Time to hospital have been defined as time intervals starting from first symptoms onset to first presentation their symptoms to a physician in the hospital, or referral to secondary care, or the first consultation with a specialist or the hospital admission (in days, weeks, or months) (Courtney et al., 2012a; Gigliotti et al., 2019; Hashim et al., 2011; Langenbach et al., 2003; Macleod et al., 2009; Pedersen et al., 2013; Walter et al., 2016). Furthermore, several studies encompassed time's transportation to the hospital into time to hospital. Since it was a small component-time from a patient's decision to arrival hospital or presentation to a healthcare provider at the hospital (De Gruyter et al., 2019; Dracup et al., 1995; Dracup et al., 2006; Xie et al., 2015).

Additionally, time to hospital was related to a patient's behaviors. People with CRC maybe response their symptoms in different approaches before presentation their symptoms to a physician or come to a hospital. These behaviors or actions could lead to a delayed or longer time to diagnosis; finally, the disease was more progress, resulting in increased poor prognosis of CRC such as diagnosis at advanced stags (Barnett et al., 2017; Hall et al., 2015).

2.2.2) In-hospital phase or health system interval was time interval that started from the date of first presentation to a physician in the hospital to the date to being confirmed the diagnosis by pathological findings (Leiva et al., 2017; Mitchell et al., 2008; Walter et al., 2016). Several studies included time interval from the first diagnosis to the first initial treatment in this phase (Langenbach et al., 2003; Langenbach et al., 2010; Strous et al., 2019). In addition, time interval of the in-hospital phase was related to a physician and healthcare system, which was also important for improving disease prognosis and survival rates in people with CRC s, and persons with risk of CRC (Ramos et al., 2010).

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However, in this study, the researcher focused on time to hospital or pre-hospital phase and its factors related to time to hospital because understanding the factors that contribute people with CRC decide to come to hospital, it can guild to develop an intervention directed toward reducing the amount of time that those people with CRC take to make the decision to seek care early, and it would improve early diagnosis among people with CRC.

2.3 The criteria for considering standardized time to diagnostic pathways

The criteria for considering time to CRC diagnostic pathways, including time to hospital and in – hospital phase varied across studies as presented bellowed.

Vega et al. (2015) have proposed the pathway of time to diagnosis in CRC patients, adapted from the findings of Esteva et al. (2013)'s study time to CRC diagnosis among 795 CRC patients. This diagnostic pathway proposed the median time to CRC diagnosis at 128 days, the median time to hospital was 19 days, and in-hospital phase was 66 days. At the same time, the median time after diagnosis to initial treatment was 22 days. The detail of this CRC diagnostic pathway described in figure 2.1

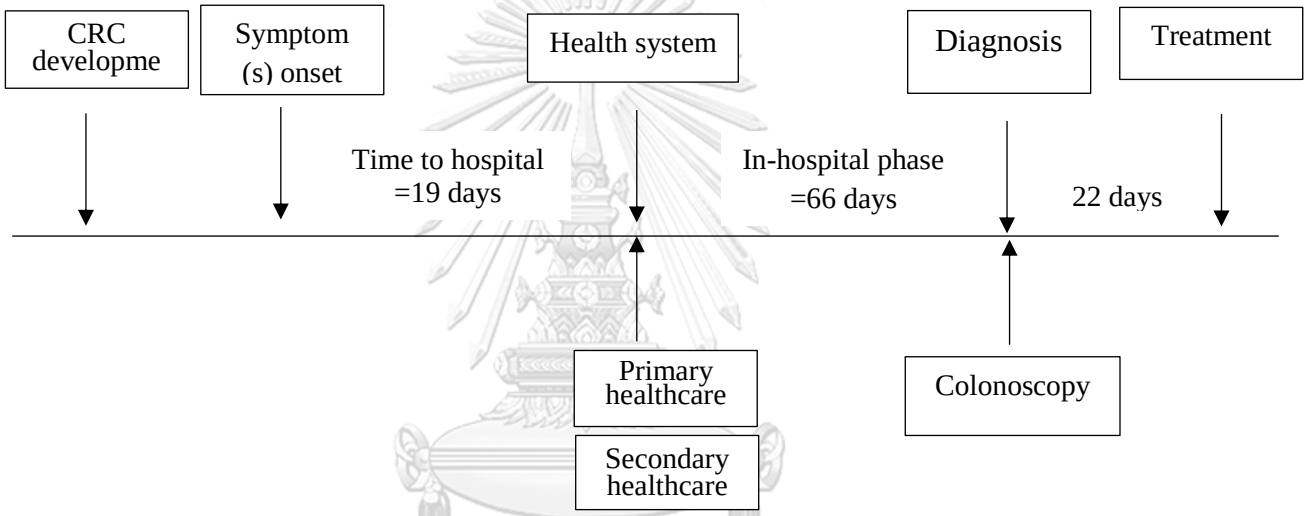

Figure 2.1 Distribution of time to CRC diagnosis pathway (in days) by Vega et al. (2015)

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Cockburn et al. (2003) has investigated the time to hospital of people experiencing potentially bowel cancer. The researchers divided the time interval from the onset of the symptom to the first presentation to a physician into 1 week, 4 weeks, 3 months, and more than 3 months. Three months were the cut-off point to consider a longer time to hospital.

Moreover, the pathway of time to CRC diagnostic pathways has been investigated in a prospective cohort study among 2677 people with CRC and those suspected of CRC by Walter et al. (2016). For people confirmed diagnosed with CRC, the total median time of diagnosis was 124 days. The median of time to hospital reported at 41 days, while the median time of in-hospital phase was 49 days.

Hashim et al. (2011) investigated the time to hospital among people experiencing rectal bleeding, starting from the first rectal bleeding noticed until the first presentation to a physician at the hospital. Two weeks have been used as the cut-off point to consider as longer (delay) or shorter (not delay) of time to hospital in this population.

In the secondary analysis study by Courtney et al. (2012a), time to hospital, starting from time interval from the first symptoms perceived to the first presentation of a physician, was divided into less than 1 week, from 1 week to less than 1 month, and over 1 month. A cut–off point at over 1 month was considered as a longer time to hospital for people experiencing rectal bleeding and change in bowel habit.

National Health Service England [NHS England], (2018) recommended that standard time interval of in -hospital phase for an urgent referral people with CRC and those who suspected CRC was equal to 28 days. It meant that Interval times that starting from the first date that patients presented to primary care with their symptoms until the last date for communication to patients on the diagnosis outcome was 28 days.

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Moreover, the Dutch Cancer Society (2006) guideline has been mentioned in the study of van der Geest et al. (2014). The guidelines-based diagnostic pathway of CRC verified that longer time to hospital or number of days between date of enrolment and date of first hospital visit to hospital that over 1 week, and the in-hospital phase more than 5 weeks were verified as longer time to diagnosis.

Also, the UK guideline of the CRC diagnosis and the management have been used to consider CRC diagnostic pathways in people with CRC by Raje, et al. (2006). The guidelines proposed that every people with CRC should have initial treatment after diagnosis within 2 weeks.

Meanwhile, the Danish fast tract guideline has been employed in the study conducted by Korsgaard et al. (2008). The guideline recommended that for people with CRC, the longer time of in -hospital phase (interval between referral from a healthcare provider and diagnosis of CRC) should be diagnosed within 14 days. Initial treatment should commence within another 14 days after CRC diagnosis.

The study of Strous et al. (2019) used the cut-off point following the Netherlands Comprehensive Cancer Registry (NCR) to consider a longer time to CRC diagnosis. The time interval between the first diagnosis until received the first treatments, such as chemotherapy or surgery less than 35 days was verified as a shorter time to CRC diagnosis. While those receiving treatment after diagnosis over 35 days were verified as a delay time to treatment.

In Thailand, the cancer service plan in the year 2018-2022 by the National Cancer Institute, Department of Medical Services, Ministry of public health (NCI, 2018a) proposed that every patient with cancer should have initial treatments after pathologically confirmed diagnosis within 4 weeks (28 days) for surgery, and 6 weeks

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(42 days) for chemotherapy, or 6 weeks (42 days) for radiation. However, there was no standard time to hospital, starting from symptoms onset to first visiting hospital for people with CRC.

It was noteworthy that criteria used to consider time to hospital and time to CRC diagnostic pathways were varied, such as using a cut-off point of time based on a previous study and using the guideline or fast-track diagnosis program proposed by cancer organizations across countries. However, most guidelines indicated only standardized time for the in-hospital phases. In contrast, standardized time to hospital and total time to CRC diagnosis have not been standardized officially established yet (Courtney et al., 2012b). Hence, the time to hospital for people with CRC remained a multifactorial problem.

In summary, no universal standardized time of diagnostic pathways in people with CRC or people suspected CRC (Pozsgai et al., 2019; Young et al., 2000), and no consistency established in the literature regarding the standardized time to hospital, starting between the onset of symptom and a patient's presentation to the health care system (Young & Solomon, 2018). The longer time to hospital and diagnosis resulted in the worse prognosis of the disease. Therefore, reduction of time to hospital and early diagnosis of CRC was recommended (Hansen et al., 2011; Vega et al., 2015).

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2.4 Theoretical underpinning time to hospital

1) The framework of Dracup and colleagues, the earliest version established in 1995 (Dracup et al., 1995) aimed to explain factors related to a patient's behaviors to seek treatments involving a time interval (delay time) among acute myocardial infarction patients. This framework was developed based on three theories: the self-regulation model of illness behavior, the health belief model, and the interactionist role theory or symbolic interactionism. Later, in 2003, Dracup and colleagues developed the framework based on Leventhal's self-regulatory model of illness behavior. They addressed the seeking care involving time to hospital. In 2006, Dracup and colleagues revised the framework to understand treatment-seeking behavior in response to symptoms in patient with acute coronary syndrome, and the main outcome of this version was pre-hospital delay (Dracup et al., 2006). It therefore offers a useful way of conceptualizing the factors related to patients' delay to presentation symptoms to a physician. However, Dracup's framework has been used as a theoretical framework to explain factors related to time to hospital in several chronic illnesses such as heart disease (Dracup et al., 1997; Dracup et al., 2003), Moreover, this framework has been as a theoretical framework in previous master studies in Thailand, to explain seeking treatment behavior in patients with CRC (Boonsung K, 2010), and time to definite diagnosis staring from symptoms onset to first time to visit a specialist physician in patients with bladder cancer (Phromdeang et al., 2013)

Additionally, Dracup's framework addressed consideration of total delay time interval to diagnosis and the administration treatment, which the shorter interval time was the better outcomes (Dracup et al., 1995). According to Dracup's framework, delay time or total delay time was usually defined as "the amount of time between the first

awareness of symptoms and the arrival of the individual at the hospital and the initiation of definitive therapy" (Dracup et al., 1995). However, Dracup et al. (2006) divided the total delay time into two main phases: pre-hospital delay and in-hospital delay. Pre-hospital delay was the time from onset of symptoms to the time that patients arrive at the hospital. The transportation to the hospital was usually a component of this phase. Whereas in-hospital delay was defined as time interval from the patients' arrival at the hospital to receiving definitive treatments, and the diagnosis was included in this phase.

The major concepts of Dracup's framework were like the original version by Leventhal & Cameron (1987), namely internal and environmental stimuli, cognitive and emotional representations, action plans for coping with problem and emotions, appraisal, and outcomes (Dracup et al., 2006). A diagram of Dracup's framework (2006) was described in figure 2.2.

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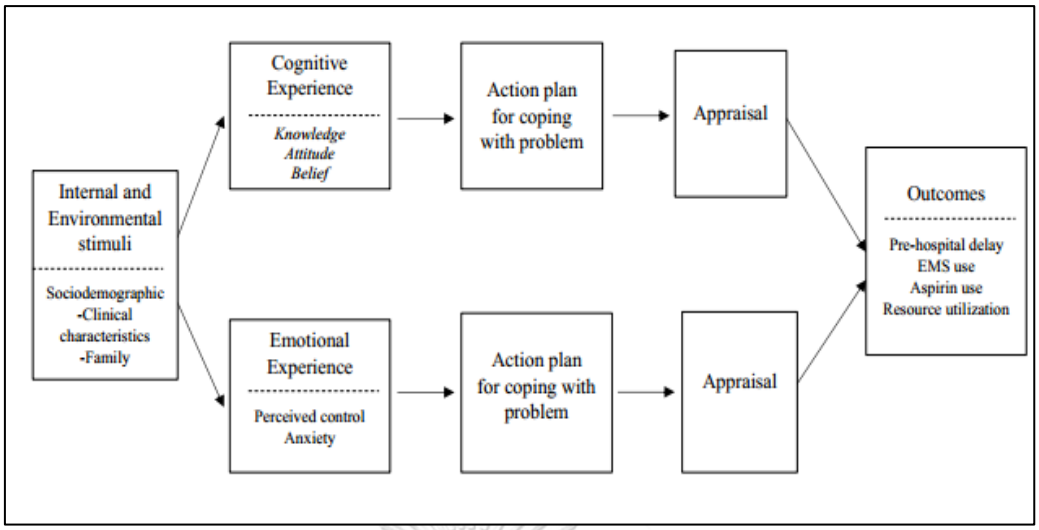

Figure 2.2 The framework of Dracup et al. (2006) adapted from Leventhal's self-regulatory model of illness behavior (Leventhal & Cameron, 1987)

Internal and environmental stimuli. According to Dracup et al. (2003,2006), Internal and environmental factors such as personal characteristic, sociodemographic, clinical characteristics, cultural roles and expectations affect how one responds to a health threat. **Internal stimuli** were formed within oneself and affect how one response to a health threat, such as physical symptoms. It involved with an individual's personal characteristics, socioeconomic status, clinical characteristics, cultural roles, and expectations (Dracup et al., 2003; Dracup et al., 2006). Personal characteristics or sociodemographic factor including age, gender, education, socioeconomic status, ethnicity, personality type (Dracup et al., 1995; Dracup et al., 2006). Meanwhile, clinical characteristics such as a history of illness (Dracup et al., 2006). These variables were the internal stimuli factors that can significantly affect increasing or decreasing pre-hospital delay time (Dracup et al., 2003). For example, Dracup et al. (1995) mentioned that patients with slowly progressing symptoms experience or less specific symptoms significantly increasing of delay time. Meanwhile, those with rapidly

developing symptoms may quickly seek appropriate medical attention, and pre-hospital delay time would be decreased.

Environmental stimuli were stimuli from the environment affected response to a health threat and care/treatment-seeking behavior and involve to pre-hospital delay time. Environmental stimuli involved the media, messages from family member, healthcare provider, significant others or witnessing (Dracup et al., 2003; Dracup et al., 2006). Witnessing was people who can assist a patient decide to seek medical care for their symptom through providing information, such as family members and coworkers, friends, strangers, healthcare providers. Dracup et al. (1995) have mentioned that the spouse or other family members were usually the first to be informed by the patient's symptoms and can assist a patient in deciding to seek medical care or treatment for the symptoms. However, it turned out to be a choice that resulted in a considerable increase in the time interval. On the other hand, if the individual consulted an unrelated individual, such as friends, coworkers, or strangers, the delay or longer time interval was significantly decreased.

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Additionally, a person who experiences a health problem, such as physical symptoms, goes through three stages (Dracup et al., 2003; Dracup et al., 2006): (1) Illness representation of the health threat (cognitive and emotional representation). (2) Development of an action plan for coping with the perceived threat. (3) An appraisal and outcomes that included assessing how well the plan addresses the threat. The process occurred in three stages, with each stage having a cognitive level and an emotional level were involved.

The first stage consisted of cognitive representation and emotional representations of the health threat as follows.

Cognitive representation of the health threat included the identification of the symptoms as a sign of illness. The individual gave a label to the threat, which included the identification of potential causes and consequences. Cognitive representation of the symptoms as a sign of illness which occurred in this stage was strongly influenced by personal knowledge, attitude, or belief about the nature of health threats such as symptoms (Dracup et al., 2006). Moreover, at the cognitive level, individual used semantic memories such as general, abstract, or conceptual knowledge to the label for illness or a health threat such as symptoms. Hence, there was a cognitive control process for the objectively represented health threat such as symptoms. However, cognitive representation included the five sets of domains that individual gave a label to the threat (Dracup et al., 2006; Leventhal & Cameron, 1987; Leventhal et al., 2011), namely: identity included individuals given a disease label, an individual's ideas about related somatic representations, i.e., what the threat called, functional changes that observed in oneself, as well as other persons were a concrete feature of the threat. An individual who belief about the nature of the health threat or perceived control over the health threat by themselves was more likely to increase time to presentation a healthcare provider (Dracup et al., 2006).

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Emotional representation can be an important influence on patient decision-making about how to respond to their symptoms. Emotional responses to such labeling may affect how patients selected the action plans for coping in the next phase and were influenced by the individual's perceived control over the health threat and level of anxiety experienced. Since the individual relied on episodic memories at the emotional level, such as the memories of the experience of prior illnesses. Hence, there was an emotional control process for the subjectively represented response to the health threats.

The emotional reactions that delayed presentation for diagnosis and treatment, including fearing the consequence of seeking help, concerning about troubling others/worry, and being embarrassed about seeking help, etc.

These emotional reactions can occur parallel to or partially independent of the cognitive process of coping with the health threat (Dracup et al., 2006; Leventhal & Cameron, 1987). Furthermore, emotional reactions may temporarily interfere with seeking treatment, such as increased the time to visit a doctor (delay). For example, individuals may delay decision-making to meet a doctor when they had strong fear that the symptom is likely to suspect cancer. However, coping with fear or emotional reactions with the health problem may proceed independently. These emotions would be disappeared, and they may not delay to seeing a physician in order to deal more effectively with the probabilities of cancer, and will deal with the fear by talking about it with friends (Dracup et al., 1995; Dracup et al., 2003; Leventhal & Cameron, 1987)

The second stage was **the action plan for coping with problems and emotions**, in which a plan of action was formulated and initiated. The coping action at the cognitive level was primarily conscious. Meanwhile, at the emotional level, the coping action was primarily automatic, and both processes may interact in a way that was mutually facilitating or mutually interfering. The action plans for coping with problems and emotions were highly valued when individuals perceived and believed that it can attack the disease at its location, addressed its mode of action, affected a perceptible target, and they can do so quickly.

However, different coping strategies might be employed in response to the representation of the symptom. For example, the different individuals had different representations of the same illness threat, and they may react to the threat in different

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actions. Meanwhile, the same individuals may perceive the same type of illness differently at different times. Thus, individuals may engage in various coping strategies that might represent the symptom that can increase or decrease the time to hospital (Dracup et al., 1995; Dracup et al., 2006). If patients believed their symptoms to be common gastrointestinal diseases, they may decide to wait for symptoms to go away and periodically evaluated themselves, self-treated by taking antacid and wait for relief (Dracup et al.,1995). They may also seek consultation from friends, relatives, or medical personal (lay and medical consultation period). Moreover, over-the-counter (OTC), prescription medication, reduction in activities may be used (Dracup et al.,1995). All behaviors resulted in significantly increased time to hospital. Simultaneously, they may decide to travel to the hospital without seeking advice from someone else: thus, it can reduce the delay (Dracup et al., 1995; Dracup et al., 2009).

The third stage was **the appraisal stage**. It was the stage that individuals used criteria to appraise the success of their coping actions (Dracup et al., 2006). On the one hand, the appraisal stage was an assessment of how well the plan addressed the threat. At the appraisal stage, there was a cognitive control process for the objectively represented health threat and an emotional control process for the subjective represented response to a health threat. It includes patient's appraisal of symptom as not being serious (e.g., not labeling symptoms or viewing them as not serious) (Dracup et al., 2006). If patients not labeling symptoms or perceived them as not serious and assess that the coping action plan was unsuccessful in solutions the symptoms, the representation of the problems (objective and subjective) and /or the plan to cope with them were reassessed and changed. They may try other coping strategies before visiting a physician in the hospital. Finally, it influenced increased pre-hospital delay.

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Meanwhile, individuals who label the symptoms and appraise symptoms as seriousness may respond to the representation of symptoms by calling the emergency medical system (EMS) earlier, taking medicine, or deciding to travel to the hospital without seeking any advice from someone.

According to Dracup et al. (2006), outcomes can be identified as efficiency of the appraisal stage, and outcomes have resulted from a post-appraisal stage of actions or an individual's perceived control over the threat. Main Outcomes in Dracup's framework (2006) was pre-hospital delay time, which was time interval starting from symptom onset to arrival at the hospital. While the secondary outcomes such as resource utilization, emergency medical service use, and medication use. These outcomes were affected by internal and external stimuli, cognitive and emotional representation, action plan for coping with problem and appraisal. Therefore, it influenced increase or decrease pre-hospital delay.

It can be summarized based on the framework of Dracup (2006) that when an individual's cognitive level identifies the symptom as a health threat or sign of illness, perceived potential causes and consequences. Those cognitive representations were influenced by stimuli factors such as knowledge or attitude, or belief. It might extract the negative emotions feeling parallel. They may use seeking treatment behavior in different coping strategies to reduce or eliminate the symptoms. If individuals appraise symptoms not labelling symptoms as serious, and the coping action plan was unsuccessful in solutions. They may be reassessed and change alternative actions to reduce the symptoms. Therefore, it influenced increased pre-hospital delay time.

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2.5 Factors related to time to hospital in people with colorectal cancer

According to literature review, factors related to time to hospital among people with colorectal cancer were reported as follows.

Age. The findings of age and time to hospital were no conclusive. The study by Rasmussen et al. (2015) found that older age group both in male and female of people with CRC had longer time to hospital or they had long time for presenting their symptom to a physician than younger age group. However, the findings were no conclusive because the findings by Esteva et al. (2013) found that no statistically significant difference of age and time to hospital in people with CRC. Also, Walter et al. (2016) has demonstrated that people with CRC with older age at diagnosis (every10years) was more likely to be associated with a shorter time to hospital compared to younger age (HR=1.08, 95%CI, 1.04-1.12) ($p<0.001$).

Gender. The findings of gender - related to time to hospital were not consistent. Most previous studies have reported that female was more likely to experience longer time to hospital. Rittitit et al. (2020b) reported that Thai female with CRC had longer time interval of CRC diagnosis. The findings by Korsgaard et al. (2008) have reported that female with colon cancer had longer time to hospital than male. Hansen et al. (2015) found that female patients had longer time to hospital or time interval to consult a physician during 24 months after symptoms onset. Esteva et al. (2013) concurred that female with CRC presented a higher time to hospital than male ($p<0.01$).

On the other hand, Courtney et al. (2012b) found that being males were at significantly higher odds of time to hospital or ever presentation for their CRC-related symptoms to a physician, especially rectal bleeding compared to female. It similar to findings by Young et al. (2000) reported that males with CRC were significant more

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likely to have longer time to hospital than females by more than 3 months. Similarly, Strous et al. (2019) found that male was associated with a time from the date of diagnosis until starting treatment that was long over 35 days compared to female gender around 1.39 times (OR=1.39, 95%CI, 1.042-1.853).

A family history of CRC or cancer. The evidence regarding a family history of CRC or cancer on time to hospital was still conflicting. A previous study by Courtney et al. (2012b) found that persons who had discussed their family history of CRC were more likely to early visit a physician after rectal bleeding onset less than four weeks, around six times compared to those without a family history of CRC (OR=6.37, 95%CI, 1.04-38.92). Other findings have found that a family history of cancer was associated with a longer time to diagnosis (HR=0.91, 95%CI, 0.83-0.99) (p,0.031), and in-hospital phase (HR=0.90, 95%CI, 0.82-0.99) (p, 0.033), but there was no significant association with time to hospital (Walter et al., 2016).

Symptom characteristics. Non-specific symptoms increased a longer time to hospital, such as such as change in bowel habit and weight loss (Vega et al., 2015). The findings by Walter et al. (2016) highlighted people with CRC and suspected CRC having less specific CRC- related symptoms, such as indigestion, general abdominal pain, weakness, and change in bowel habit were associated with a longer time to hospital. Because they thought that those symptoms were not serious. Particularly, change in bowel habit was reported as symptoms that related to the most prolonged time to hospital compared to other symptoms (at 42 days). Leiva et al. (2017) found that time to hospital was significantly longer if the people with CRC did not perceive the symptoms as serious or warning CRC symptoms. Moreover, change in bowel habit were the longest time to hospital by a patient interview, with a median time of 167.5

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days. On the other hand, abdominal pain, vomiting, intestinal obstruction, and rectal bleeding were associated with a shorter time to hospital. Likewise, the findings of qualitative studies conducted by Dobson et al. (2018) revealed that people with CRC experienced abdominal pain or rectal bleeding were less length of time intervals to present their symptoms or consult a healthcare provider.

Cognitive illness representation. The retrospective study in people with CRC by Jensen et al. (2016) reported that cognitive representation was associated with time hospital, especially dimensions of treatment control, timeline cyclical, and consequence. People with CRC who a strong belief about the cyclical nature of symptoms were more likely to have a longer time to hospital than those with less belief, approximately two-folds (PR=2.14, 95% CI, 1.29-3.57). Moreover, those who believed in the treatability control had significantly association with a shorter time to hospital, which starting from the onset of symptom to present their CRC-related symptoms to a physician (PR=0.52, 95%, CI: 0.31-0.89). Besides, those with Also, time to hospital of people with CRC decreased if they perceived the potential negative consequences of symptoms that it the most important symptoms.

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Depression and anxiety were emotional responses related to time to CRC diagnosis. The findings of Walter et al. (2016) showed that depression and anxiety were associated with a longer time to CRC diagnosis among people with CRC patients, almost one-fold compared to those without these emotions (HR=0.86, 95% CI, 0.77-0.89), and they were associated with the in-hospital phase around one-fold (HR=0.78, 95% CI, 0.69-0.88), it was related to time to hospital but not significance (HR= 1.05, 95% CI, 0.93–1.18).

Embarrassment has been reported as one emotional response related to a longer time to hospital (Cockburn et al., 2003; Courtney et al., 2012a). Several studies reported that CRC symptomatic patients who thought that CRC tests such as colonoscopy would be embarrassing procedure, were not likely to present symptoms to a healthcare provider, accounting for 1.7- 16.47 % (Cockburn et al., 2003; Courtney et al., 2012a; Norton et al., 2013).

Fear has also been reported as a factor related to time to hospital such as Fear of unpleasant or embarrassing investigations, fear of cancer, or fear of symptoms (Vega et al., 2015). Because the diagnostic CRC process was mainly based on colonoscopy, which was invasive procedure, and the resources for diagnosis was usually scared patients (Leiva et al., 2015). However, the findings still have controversies. According to Diefenbach et al. (1996), patients who feared that the symptoms may be related to cancer, were more likely to delay presenting the symptom to a physician. This situation increased the time to hospital eventually. It was controversial with the findings of Kimpee et al. (2013) demonstrated that fear was associated with decreased time to hosptial among Thai people with CRC (OR=0.4, 95%CI, 0.18-1.91). Likewise, Alatise et al. (2017) found that fear was the main reason that led patients suspected CRC with rectal bleeding to early present the symptom to physicians for taking colonoscopy, accounting for 59.4%.

Worries. According to the findings of Courtney et al. (2012a), patients experiencing CRC symptoms reported that worry and scared about symptoms that they might be serious, were reasons for increasing or time interval to present the symptoms to a physician around 2.4% for rectal bleeding, and 2.4 % for change in bow habit.

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Perceive the seriousness of symptoms. According to Vega et al. (2015), people with CRC who perceived persistent or more seriousness of symptoms affecting daily life, were less likely to delayed seeking treatment. On the other hand, those who perceived more common symptoms or nonspecific symptoms were related to longer time to hospital. Because non-recognition of the seriousness of symptoms also lead people with CRC to self-diagnosis, self – treatment, wait and see, and so on, leading to a longer time to hospital. The findings of Leiva et al. (2017) revealed that the time to hospital reported by people with CRC was significantly longer if they did not perceive the symptoms as serious or warning symptoms of CRC ($p < 0.001$). Esteva et al. (2013) found that perception of CRC symptom seriousness was statistically significant with a shorter time to diagnosis among 795 people with CRC, especially that perceived seriousness of abdominal pain, vomiting, and present of obstruction ($P < 0.01$). Moreover, Courtney et al. (2012b) reported that persons at risk of CRC, who thought their symptoms were serious were more likely to have shorter time to hospital because they early present their symptoms to a physician in less than two weeks after symptom onset, compared to those without thinking that symptom was not serious (OR=5.75, 95% CI, 1.42-23.24).

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Knowledge about CRC. Previous studies showed that lack of knowledge and concern about risk associated with the symptoms since patients first notice symptoms increase time to hospital (Mitchell et al., 2008; Vega et al., 2015). However, the findings were a controversy. Hashim et al. (2011) have reported that knowledge about CRC was not significantly associated with the longer time to hospital, starting from the onset of symptoms to the first presentation to a physician. In contrast, Alatise et al. (2017) found that patients experiencing rectal bleeding with high knowledge of cause,

symptoms, and treatment of CRC were more likely to early present their symptoms to a physician approximately four times than those with low knowledge (OR= 3.83, 95% CI, 1.55-10.20).

Healthcare-seeking behavior was the significant contributor associated with time to hospital. Previous study found that self-medicating affects increased time to hospital of people with colorectal (Hall et al., 2015; Vega et al., 2015). For example, Hashim et al. (2010) demonstrated that persons experiencing CRC- related symptom such as rectal bleeding, who self-treated themselves using self-medicating without medical prescription, traditional healers, healing water, or homeopathy. They were significantly more likely to increase time to present their symptom to a physician (time to hospital). The qualitative study conducted by Hall et al. (2015) revealed that people with CRC seeking healthcare behaviors by self-medicating, seeking advice/ reassurance from family members, or friends, were more likely to have a longer time to present their symptoms to a healthcare provider (time to hospital). Similarly, people with CRC, who performed healthcare seeking behavior by visiting a physician and do not wait for symptom clear up were associated with shorter time to diagnosis ($p < 0.01$) (Esteva et al., 2013).

However, previous studies in Thailand by Poum et al. (2014) reported that self-medicating was associated with an increased time in-hospital phase among breast cancer patients. Similarly, the findings Chotipanich et al. (2019) revealed that cancer patients using complementary and alternative medicine (CMA) was significantly associated with an increased time in-hospital phase, especially using herbal products, and the CAM in this study included of self-medicating, such as a product composed of rice hulls, fish oil, lingzhi mushroom, crocodile blood capsule, and so on.

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2.6 Outcomes related to time to hospital in people with colorectal cancer

A longer time to hospital has a crucial impact on CRC people' outcomes. For example, a longer time interval could be a barrier to early CRC diagnosis and reduce the likelihood of receiving appropriate treatment promptly (Hansen et al., 2011). For that, most of them were diagnosed at advanced or metastatic stages of CRC. Overall prognosis was getting worse (Pita-Fernández et al., 2013). Meanwhile, the shortened time to hospital was related to providing the proportion of early cancer stages and increasing the survival rates (Neal et al., 2015).

Besides, once cancer begins to spread, the opportunity for successful treatments using a primary treatment as surgical might not be sufficient. Thus, aggressive treatments were required, especially chemotherapy and radiation (Mitchell et al., 2008). In addition, Singh et al. (2012) mentioned that longer time interval was one of the most common contributors leading to other poor patien's outcomes such as physical suffering, worse health-related quality of life, psychological distress such anxiety and depression (van der Geest et al., 2014; Walter et al., 2016). In terms of public healthcare, a longer time to hospital leading to comorbidity and increase emergency visited, readmission, and hospitalization (Courtney et al., 2012a). Additionally, Gani et al. (2017) found that the high cost of treatment was found in those diagnosed with CRC, approximately $ 26,408 for surgery and $ 70,090 for patients receiving chemotherapy. These high costs of treatments cause financial problems and an economic burden in the healthcare system.

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2.7 Literature review about time to hospital in people with colorectal cancer

The prospective cohort study among 2677 people with CRC and those suspected of CRC by Walter et al. (2016) also reported that people diagnosed with CRC have median time to hospital accounting for 41 days, and median time in hospital phase was equal to 49 days. However, the median time to CRC diagnosis among the confirmed CRC group was shorter than the non-cancer group (124 and 138 days, respectively).

Other previous CRC studies have demonstrated that people with CRC reported median time to hospital at 19 days, and 66 days for in-hospital time. Median time to CRC diagnosis was found at 128 days (Esteva et al., 2013). Hansen et al. (2015) also showed that median time to diagnosis in people with CRC was 109 days, and median of time to hospital and in-hospital phase were reported at 28 days and 56 days, respectively. Findings by Leiva et al. (2017) among 795 people with CRC revealed that median of total time to diagnosis was equal 131 days, and median of time to hospital was equal 91 days, and median of time in -hospital phase was equal 111 days. Langenbach et al. (2010) reported that 123 people with CRC had mean of total time to diagnosis around 148 days. Of these, mean of time to hospital was longer to 106 days. Moreover, the findings by van der Geest et al. (2014) highlighted that the median of time to hospital were 2 days for patients with colon cancer and 7 days for patients with rectal cancer. Meanwhile, median of in-hospital time intervals for patients with colon cancer was 32 and for patients with rectal cancer reported at 43 days. Moreover, Helsper et al. (2017) studied duration of different interval of diagnostic pathway in day among five cancer patients in Netherlands, including 309 people with CRC. The findings found that median of time to hospital among people with CRC was reported at 8 days, while

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median of time in -hospital phase was reported at 26 days, and total time to CRC diagnosis was equal to 54 days.

The other findings of quantitative study found that median time to hospital in people with CRC experiencing CRC-related symptoms was at 30 days (Jensen et al., 2016). Courtney et al. (2012) also reported that 18% of persons experiencing rectal bleeding and 37% of them having change in bowel habits had a longer time to hospital more than 1 month. Moreover, people with CRC wait at least four months until CRC diagnosis (Esteva et al., 2013), and Pruitt et al. (2013) also found that people with CRC had a long diagnosis more than eight months. Moreover, Dobson et al., (2018) conducted a qualitative study and found that people with CRC visited a physician at the hospital after they experienced stomach pain for six weeks. Some of them had rectal bleeding and change in bowel habits longer more than 6 months before deciding to first visit a physician at hospital.

For Thai literature, previous studies among 191 Thai people with CRC conducted by Rittitit et al. (2020a) found that median time to CRC diagnosis was longer at 246 days. Of these, median time to hospital and in-hospital phase was reported at 61 days and 89 days, respectively. The secondary analysis study of Kimpee et al. (2013) also concurred that that 77% of CRC patients had a longer time to hospital was around 60 days, meanwhile median time of in -hospital phase until first initial treatment was equal 48 days, and total time to diagnoses and treatment was longer at 124 days.

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However, there were no explicit interventions to reduce time to hospital in people with CRC. Although some studies have identified that the “two weeks” program of the UK National Health Service can help to reduce time interval by minimizing complication of CRC such as bowel obstruction, no evidence confirmed that those patients were diagnosed more quickly than those with an alternative diagnosis because of following this program (Walter et al., 2016). Apart from that, population -based screening program have been demonstrated to reduce incidence, mortality rate of CRC, but it is normally for asymptomatic persons. However, there were 80 % of symptomatic people with CRC presented and were diagnosed with CRC, especially rectal bleeding and abdominal pain (Courtney et al., 2012b; Leiva et al., 2017; Vega et al., 2015).

3. Nursing role related to time to diagnosis and preventive risk of colorectal cancer

As mentioned initially, the longer time to hospital and diagnosis have an adverse effect on clinical outcomes, such as stage at diagnosis, or survival after CRC diagnosis. Preventing the disease before it progressed and developed into a severe stage was vital in nursing roles. Because CRC was preventable and treatable when diagnosed at an early stage. Understanding factors related to time to hospital could help to improve the opportunity of early CRC diagnosis through using a nursing role as follows.

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For the time to hospital, nurses working in a clinical setting such as the outpatient department and community can develop an intervention to modify factors related to time to hospital, which was mostly because of patients' behavior before deciding to visit a physician. For example, intervention to emphasized warning signs and symptoms of CRC by educating CRC knowledge and improve their healthcare-seeking behavior by recognize the significance of early presentation of the symptom to a physician, did not self-treatment or ignore the symptoms. Moreover, nursing role to enhance adherence to an investigation of patients suspected CRC or persons at risk was needed. Patients who have undergone an investigation of CRC, e.g., colonoscopy or other radiotherapy investigations, may fear, be embarrassed about the examination, worried about the cost of treatment. They may be absent from the colonoscopy appointment. Therefore, the nursing role in developing interventions or educated the patients to reduce fear, worry, or embracement about taking colonoscopy was crucial, and it could be reduced time to hospital among this population.

For nurses in gastrointestinal and endoscopy units should work in coordination with other multidiscipline teams, such as a nurse in OPD, a specialist physician, or technicians, to reduce the long waiting time of investigation CRC's process. However, a histopathological finding might not find cancerous cells after colonoscopy, but they were still a high-risk person. For that, nurses in the endoscopic unit can emphasize the patients to recognize the significance of CRC-related symptoms and advise them to follow up based on the doctor's recommendation. It could reduce CRC time to hospital and improve early diagnosis eventually.

Regarding cancer nurses in a clinical setting, encourage a person who has a first-relative family member to recognize that they are risk persons of CRC was needed.

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Nurses can develop programs to improve health literacy about CRC to increasingly recognize the symptoms, and early presentation of the symptoms to a physician, and early screening. It could reduce time to hospital and total time to CRC diagnosis, and the opportunity to be diagnosed with advanced or metastatic stage would be less. Moreover, administrator nurses can set the nursing policy cooperated with other health providers to improve the diagnostic process of CRC and reduce waiting time for making an appointment with a specialist physician. It would improve early diagnosis among this population.

In summary, nurses were significant parts of the health care systems, especially in a clinical setting. They play an integral role in providing advice and encouraging people with CRC and person at risk of CRC to recognize symptoms and receive treatments appropriately before the disease progression. Therefore, reducing time intervals especially time to hospital was a challenge for a nursing role because it could decrease the mortality rate of CRC and increase the chance of diagnosing CRC at early stages, the survival rates would be increased eventually.

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According to a literature review, no one knows when a noncancerous cell in colon or rectum walls grows up and develops into a cancerous cell. Limited intervention fails of interventions, or referral guidelines for suspected colorectal cancer patients might be because there are no exactly understanding factors predicting time to hospital in this population. Limited evidence leading to inconclusive results among this population. Therefore, examine the correlation between time to hospital and predicting factors was needed.

The findings of this study were be addressed to the literature by providing information on time to hospital among people with CRC. Also, study findings may improve the understanding of specific barriers to and facilitators of time to hospital, which was critical to developing interventions that may decrease the mortality rate of CRC. CRC was preventable and treatable when diagnosed at an early stage. Early diagnosis of CRC may lead to an overall decreased cost of treating the disease, with the cost increasing as the stage of diagnosis advances.

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CHAPTER III
METHODOLOGY

This chapter described the research methodology consisting of research design, population, sampling technique, sample selection, research instruments, protection of human subjects, data collection, and data analysis.

Research Design

This study was a retrospective, cross-sectional design aiming to study time to hospital, relating factors, and determine predictors of time to hospital among Thai people with CRC.

Population and sample

Population

The target population in this study was all adults and older with colorectal cancer (CRC) in Thailand. Since it was impossible to recruit all people with CRC across Thailand, thus, a study population was considered. The study population was a subset of the target population from whom an accessible sample was taken over the period of data collection based on specific inclusion criteria. Therefore, the study population in this study was Thai people with CRC aged 18 years old and older. Evidence showed that the youngest case of CRC has been reported at 18 years old (NCI, 2018b). These persons were visiting at medical and surgical outpatient departments (OPD), oncology units, radiology units, and endoscopic units. Also, people with CRC admitted at inpatient departments (IPD) were recruited.

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Sample size determination

Sample size was determined using power table of Cohen (1988). The power of test was 80%, the alpha value of 0.05, the effect size was 0.24, based on a previous similar study of factors predicting time before treatment of people with CRC by Kimpee et al. (2013). The result provided 200 study participants, approximately 20 % of 200 study participants was added to prevent an attrition rate of the sample (Catalogue of Bias Collaboration, 2021). Thus, the total sample size in the current study was 240 participants.

Sampling technique

Based on the statistical assumption of the multiple regression analysis which was a normal distribution of the sample (Kline, 2013), a multistage random sampling was used to yield a probability sample of Thai people with CRC.

The researcher used the following procedures.

1. The researcher searched a comprehensive list of hospitals in Thailand.

2. Then, the researcher re-checked the lists (from step 1) with the lists from the official web page of Thai cancer provided by the Thai Society of Clinical Oncology (TSCO). TSCO showed the lists of the hospitals providing care for cancer patients. There were 70 public hospitals and 37 private hospitals providing service for cancer patients.

3. Next, all 37 private hospitals were excluded from the current study.

4. Seventy public hospitals (70) were affiliated with different organizations including Ministry of Public Health, University Hospitals, Military and Police, Bangkok Metropolitan Administration, and Thai Red Cross Society.

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5. Moreover, 70 hospitals can be categorized into super-tertiary (17 hospitals) and tertiary level (53 hospitals). Of those, tertiary hospitals can be divided into 37 regional hospitals (or Advanced level, A-level) and 16 general hospitals (or 15 Standard level, S-level & 1 Middle 1 level hospital, M1-level)

According to TSCO webpages, the hospitals providing care for cancer patients in Thailand were in Bangkok and 5 regions (northern, central, eastern, northeastern, and southern regions). In Bangkok there were 8 super-tertiary hospitals, 2 advanced level hospitals (A), and 6 standard level hospitals (S). In the northern region, there were 2 super-tertiary hospitals, 5 advanced level hospitals (A), and 1 middle 1 level hospital (M1). In the central region, there were 3 super-tertiary hospitals, 10 advanced level hospitals (A), and 2 standard level hospitals (S). In the northeastern region, there were 2 super-tertiary hospitals, 11 advanced level hospitals (A), and 3 standard level hospitals (S). In the southern region there were 2 super-tertiary hospitals, 5 advanced level hospitals (A), and 2 standard level hospitals (S). Lastly, in the eastern region, there were 4 advanced level hospitals (A), and 2 standard hospitals (S) (See Table 3.1). However, the M1 level hospital was excluded from sampling process because there was one hospital and few CRC patients. Finally, 69 public hospitals were recruited to a random sampling to select the hospital setting in next step.

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Table 3.1 The number of public hospitals categorized based on level of hospitals and regions of Thailand follow by TSCO* webpage

Level / Regions	Super-tertiary (Total=17)	A level (Total=37)	S level (Total=15)	M1 level (Total=1)
Bangkok (total=16)	8	2	6	-
Northern (Total=8)	2	5	-	1
Central (Total=15)	3	10	2	-
Northeastern (Total=16)	2	11	3	-
Southern (Total=9)	2	5	2	-
Eastern (Total=6)	-	4	2	-

*TSCO = Thai Society of Clinical Oncology

6. Next, the multi-stage sampling technique (probability sampling) was used.

6.1 Step 1 - A simple random sampling. The researcher utilized a simple random sampling using a lottery (without replacement) to figure out which geographical region would be representative of each level of public hospitals. However, the number of hospitals at each level was varied. Thus, the researcher arranged the proportion of representativeness of the geographic region in each hospital level as follows: Super-tertiary level hospital (17 hospitals): Advance-level hospital (37 hospitals): Standard-level hospital (15 hospitals) was 1: 2: 1 region.

The result was: 1) Bangkok represented super-tertiary level hospital, 2) Eastern region and Southern region represented advance-level hospital, and 3) Northeastern region represented standard - level hospital.

7. Step 2 - A simple random sampling. The researcher utilized a simple random sampling using lottery (without replacement) to figure out; which super-tertiary hospital would be a representative of Bangkok; which advanced level hospital (A-level) would be a representative of the Eastern region and Southern region; and which standard hospital (S-level) would be a representative of the Northeastern region.

The results were Siriraj hospital, Chonburi cancer hospital, Maharaj Nakorn Si Thammarat hospital, and Mukdahan hospital, respectively. However, after getting IRB approval, Maharaj Nakorn Si Thammarat hospital were excluded from random sampling due to the COVID-19 outbreak and a high number of infections in the province. Finally, three hospitals, namely, Siriraj hospital, Chonburi cancer hospital, and Mukdahan hospital, were the current study's settings.

8. Step 3 - Eligible participants were chosen based on inclusion and exclusion criteria.

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9. A systematic random sampling was employed to access a study participant. The researcher surveyed the name list of patients diagnosed with CRC from patient’s medical records. Next, the study participant who met inclusion criteria were recruited using a systematic random sampling by a random table with sampling interval at every odd number (e.g., 1, 3, 5,7, 9)

10. The researcher determined the proportion of the study participant's number in each hospital setting according to proportionate stratified sampling based on the size of the hospital. The proportionate stratified sample of 240 study participants in each hospital level as follows: Super-tertiary level hospital: Advance level hospital: Standard level hospital was equal 35%: 50%: 15%. Therefore, the number of study participants from Siriraj hospital, which represented super-tertiary hospital was 84 cases. A total of 120 cases were a study participant of advanced level hospital for Chonburi Cancer hospital. Lastly, a study participant from Mukdahan hospital, which represented standard level hospital was 36 cases.

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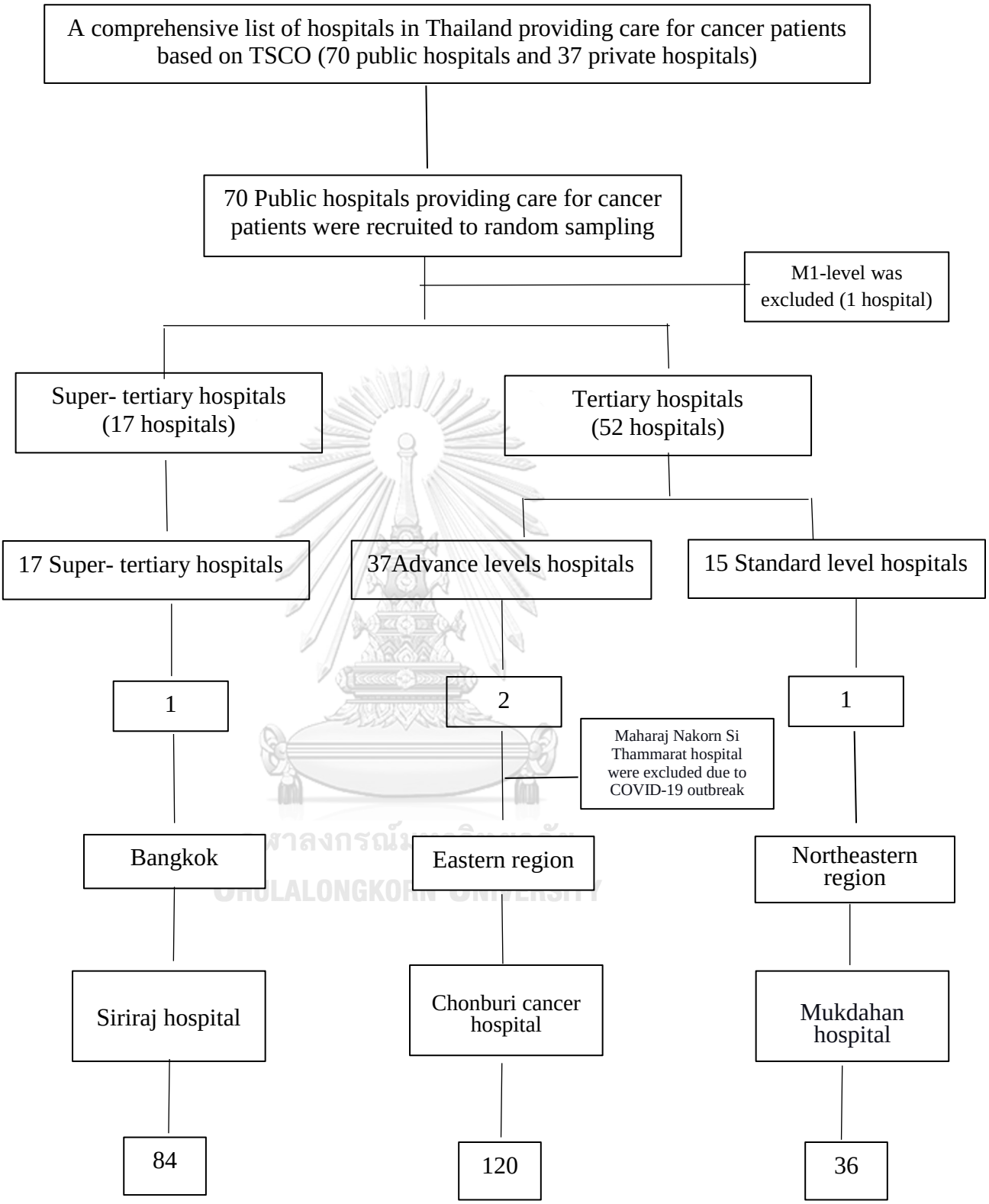

Figure 3.1 The sampling technique of the current study

Sample selection

The study participants were people who diagnosed with CRC from public hospitals, Thailand, visiting medical and surgical outpatient departments, oncology units, radiology units, and endoscopic units. Also, people with CRC admitted in inpatient departments were be recruited, and they meet inclusion criteria as follows.

1. Aged 18 years and over

2. Having at least one warning signs and symptoms of CRC (ACS, 2017, 2020), including rectal bleeding, mucous bloody, blood in the stool, dark or back stools, a change in bowel habits (e.g., the shape of the stool change, the stool more narrow than usual), abdominal pain, cramping, or discomfort in the lower abdomen, tenesmus, boating or gas in stomach, chronic constipation, diarrhea, decreased appetite, and unintentional weight loss

3. Having the pathologically confirmed of CRC diagnosis and participants knew that he/she were medically diagnosed with CRC

4. No history of psychiatric illness, dementia, or Alzheimer, which reviewed from medical record

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5. Ability to cooperate, and willing to participate in this study.

Exclusion criteria. The study participants were excluded from the study if they were diagnosed with CRC by annual screening without any symptoms, or they were diagnosed with CRC recurrent.

Termination criteria. The study participants were excluded from the study if they have crisis symptoms while answering the questionnaire, such as dizziness, hypotension, dyspnea, and other symptoms, or need to admit during collecting data. Also, if they were uncomfortable to respond to the questionnaire.

In current study, 9 potential study participants were excluded due to the following reasons: unable to cooperate during an interview; unable to communicate in Thai language; being contacted with a COVID-19 patient; crying during an interview; and having crisis symptom during receiving chemotherapy.

Instrumentations

The research instruments consisted of 6 questionnaires: 1) personal information sheet, 2) time to diagnosis questionnaire, 3) knowledge about CRC questionnaire, 4) the Modified Illness Perception Questionnaire-Revised, 5) health care seeking behavior questionnaire, and 6) perceived seriousness of warning signs and symptoms questionnaire (Appendix H: Research instruments).

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Table 3.2 Variables and their instruments of the current study

Variables	Instruments	Number of items
Personal, illness-related characteristic data	Personal information sheet developed by the researcher	18 items
Time to hospital	Time to CRC diagnosis questionnaire developed by the researcher	4 items
Knowledge about CRC	The knowledge about CRC questionnaire developed by Hashim et al (2011)	22 items
Cognitive illness perception and emotional illness perception	The modified Illness Perception Questionnaire-Revised developed by Hvidberg et al. (2014)	61 items
Health care seeking behavior	The health care seeking behavior questionnaire developed by the researcher	21 items
Perceived seriousness of warning signs and symptoms,	The perceived seriousness of warning signs and symptoms questionnaire developed by Leiva et al. (2017)	11 items

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Instrument development procedure

In the current study, three instruments were translated from English into Thai including the knowledge about CRC questionnaire, the modified Illness Perception Questionnaire-Revised, the perceived seriousness of warning signs and symptoms questionnaire. Moreover, health care seeking behavior questionnaire was developed by the researcher using a hybrid measure method.

Translation process

The researcher sent an e-mail to the original / authorized authors to ask for a permission to use the instruments. After obtaining the permission or writing consent from the original or authorized authors (Appendix E: Permission letters for research instrument using), three instruments were translated from English into Thai using forward-back translation of Sperber et al. (1994, 2004). The process was as follows.

Step 1 Forward translation

The original versions of the instruments were translated from English to Thai by two bilingual nursing faculty members who had high competence in English and Thai (Appendix D: List of the linguistics). They were also familiar with Thai and English cultures. After that, the researcher compared both versions by checking similarities and differences, discussed with advisors, and drafted the final version of Thai instruments.

Step 2 Back translation

Two bilingual nurses who had high competence to use English and Thai performed a back translation from Thai into English.

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Step 3

The original English version and back-translated English version were compared. The researcher and advisors examined all items of the instruments checking the comparability of language, and similarity of interpretability.

Step 4

The researcher and advisors assessed the accuracy of translated Thai version, checked appropriated wording and refinement until the comprehensive final Thai version was the consensus.

Instrument description and its psychometric properties

1. Personal information sheet

The purpose of this form was to collect information regarding personal, illness-related characteristics, and social background of the study participants. This form comprised two parts. The first part of this form was a self-administered questionnaire which concerned about personal information including gender, age, marital status, education, income, weight and height, medical coverages, alcohol use, smoking status, family history of CRC, family history of other cancers, history of radiation to abdomen or pelvic area to treat prior cancer, and comorbidity.

The second part of this form consisted of 6 items including a personal history of polyps, personal history of inflammatory bowel disease (e.g., ulcerative colitis or Crohn's disease), having a history of hereditary CRC syndromes (e.g., FAP or HNPCC), type of CRC and pathological findings, the stage of CRC, and the TNM classification. In the second part, the researcher reviewed the data from medical records.

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2. Time to CRC diagnosis questionnaire. This questionnaire was developed by the researcher. The questionnaire comprised 4 questions assessing the time interval (in days) starting from the first date of symptoms onset to the first date of pathologically confirmed CRC diagnosis. Time to CRC diagnosis was divided into two phases: time to hospital or pre-hospital phase and in-hospital phase.

Time to hospital or pre-hospital phase was assessed by time interval (in days) from the first date that the study participants perceived or noticed symptoms to the first date that his/her presentation to a specialist physician who requested to take a colonoscopy. It consisted of 3 items, such as the first date of the symptom onset, types

of symptoms, and the first date that his/she present the symptom to a specialist physician who requests to take a colonoscopy.

Moreover, the researcher carefully interviewed the study participants. If the participants remembered an exact date of symptom onset and the first date of presentation to a physician, the pre-hospital phase (time interval) would be recorded.

If they could not remember an exact date, they would be asked an estimated point of time, such as the beginning of the month, the middle of the month, or the end of the month.

Moreover, if the study participants still could not remember an estimated point of time, the researcher used the technique of Rittitit et al. (2020b) by giving some clues about Thai holidays or festivals as the reference date (such as New Year Day, Songkran Day, Buddhist Holidays, Mother or Father Day). This technique can help the study participants recalled an estimated date of symptom onset that might occur.

In-hospital phase started from the first date that the study participants presented to a specialist who ordered a colonoscopy to the date of CRC diagnosis confirmed by pathological finding.

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The total time to CRC diagnosis in this study were summed the time to hospital (pre-hospital phase) and in-hospital phases (see figure 3.2).

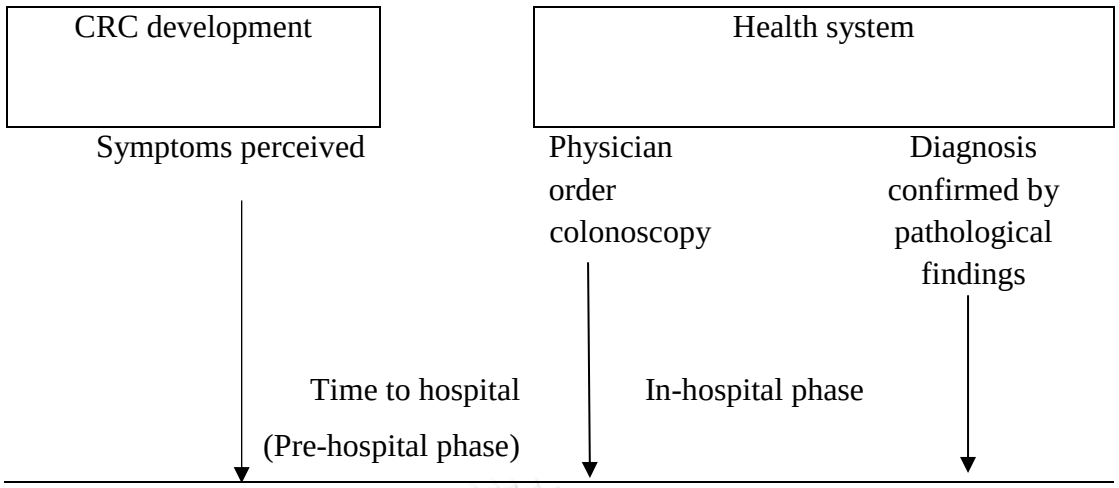

Figure 3.2 The total time to CRC diagnosis in the current study

3. Knowledge about CRC questionnaire was developed by Hashim et al. (2011). Original items of Hashim et al. (2011) were developed based on a literature review and were validated by a panel of experts consisting of a colorectal surgeon and primary care physicians.

Twenty-two items consisted of 4 sub-scale including CRC symptoms (10 items), CRC risk factors (10 items), age at risk for CRC (1 item), and CRC screening methods (1 item). Total score ranged from 0 to 22 (Hashim et al., 2011). Total score would be categorized into low level (0 to 12) and high level (13 to 22).

Item difficulty (p) and discrimination (r) of the questionnaire was tested. The item difficulty index ranges from 0 to 100. The closer the difficulty of an item approaches to zero, the more difficult that item was. Meanwhile, the higher the value, the easier the item. Item difficulty level was classified as “easy” if the index was 85% or above, “moderate” if the index was between 51 and 84%, and “hard” for the index was equal to if 50% or below (Office of educational assessment, University of Washington, 2021). In the current study, item difficulty level showed that the easy

items were equal to 3 items, moderate difficulty items were equal to 16 items, and hard items were equal to 3 items.

Item discrimination was classified as good if the index was above .30, fair if it was between .10 and .30, and poor if it was below .10 (Office of educational assessment, University of Washington, 2021). In the current study, items with a good discrimination were equal to 13 items, fair items were equal to 4 items and poor items were equal to 4 items

Although some items of the current questionnaire had more difficulty or easy items, and the discrimination shown poor items, those items were still be kept as items in this questionnaire. Because these items were important content about symptoms of CRC and risk factors knowledge.

4 The Modified Illness Perception Questionnaire - Revised (the modified IPQ-R). The original Illness Perceptions Questionnaire (IPQ) was established by Weinman et al. (1996) which was based on the self–regulatory model of Leventhal & Nerenz (1984). The original version had 5 sub-scales including identity, timeline, consequences, cure/control, and cause. Then, Moss-Morris et al. (2002) revised items and added 3 new sub-scales to assess cognitive and emotional illness perceptions. Those new subscales were named cyclical timeline, illness coherence, and emotional perception. Hvidberg et al. (2014) modified the IPQ - R questionnaire to assess the cognitive and emotional illness perception among patients with CRC. The internal reliability of the modified IPQ-R using Cronbach alphas for sub-scales ranged from 0.71 to 0.86.

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Cognitive illness perception consisted of 8 subscales including identity, timeline (acute/chronic), consequence, personal control, treatment control, illness coherence, timeline (cyclical), and cause.

Identity sub-scale consisted of 11 items relating to CRC warning signs and symptoms (ID 1-11). The study participants were asked whether they perceived that these warning signs and symptoms were specifically related to their illness. The response was "Yes" (1) or "Not" (0) format. Each score was summed to get total score ranging from 0 to 11. The higher the score, the more a study participant perceived that sign and symptoms were linked to cancer (or the higher the score, the more threat a study participant perceived).

Timeline (acute/chronic) sub-scale consisted of 7 items (IP 1-7) assessing the perception of the chronicity of symptoms. Total score ranged from 0 to 35. The higher the score, the more a study participant perceived that an illness was chronic.

Consequence sub-scale consisted of 4 items (IP 8 - 11) measuring the perception about effects on the study participants' physical, psychological, social, and economic burden. The scores ranged from 4 to 20. The higher the score, the more a study participants perceived the negative consequences of an illness.

Personal control sub-scale consisted of 4 items (IP12 - 15) assessing the perception of the study participants about their ability to control symptoms. Possible scores ranged from 4 to 20. The higher the score, the more a study participant perceived about their ability to control their symptoms.

Treatment control sub-scale comprises 3 items (IP 16-18) measuring the perception of the study participants about an effectiveness of treatment to control their

symptoms. Possible score ranged from 3 to 15. The higher the score, the more a study participant perceived those medical treatments could control their symptoms.

Illness coherence sub-scale consisted of 5 items (IP 19 – 23) measuring the perception of the study participants regarding their understanding of their symptoms. A possible range score ranged from 5 to 25. The higher the score, the more a study participant understood more about their illness.

Timeline cyclical sub-scale contained 4 items (IP 24 – 27) assessing the perception of the study participants about the stability or changeability of their illness. Possible scores ranged from 4 to 20. The higher the score, the more a study participant perceived about the stability or changeability of their illness.

Cause sub-scale included 18 items (CIP 1-18) measuring the perception about cause of symptoms among the study participants. Possible score ranged from 18 to 90. The higher the score, the more a study participant perceived about causes resulting in their symptoms and illness.

Except identity sub-scale, all sub-scales were rated on a 5-point Likert Scale ranging from strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), to strongly agree (5). Identity sub-scale was rated on dichotomous response “Yes” (1) or “Not” (0). There were 8 revising scores, including IP 1,4,7,18,19,20,21,22.

Emotional illness perception consisted of one subscale including 5 items (IP 28 - 32) to measure emotional response affected by the symptoms such as depression, upset, angry, anxiety, and fear/afraid. Possible scores ranged from 5 to 25. The higher the score, the more negative emotional response of a study participant.

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5. Healthcare seeking behavior questionnaire (HCSB questionnaire)

The researcher developed the health care seeking behavior questionnaire using a hybrid measure method (Switzer et al., 1999) and literature review.

According to Switzer et al. (1999), hybrid measures were created by combining items from more than one source or established scales with newly created items to assess a single construct. It was appropriate when existing scales did not adequately cover all the issues of interest or have questionable psychometric properties. Thereby, creating a composite measure from more than one scale or developing new items to supplement a scale may be justified.

However, extensive literature reviews found that an appropriate study measure of health care seeking behavior in patients with CRC was no established measure existed. Although only some measures were nearly appropriate for the current study, no single existing measure assessed the full range of health care seeking behavior important to patients with CRC. Consequently, a hybrid measure of health care seeking behavior was needed.

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The brief steps of a hybrid measure method to develop health care seeking behavior questionnaire in the current study were briefly described as follows.

1. The researcher and colleagues conducted an extensive literature review utilizing database including Science Direct, ProQuest and EBSCO host, Web of Science, Scopus, Google Scholar, PubMed, and CU reference databases. The key searching terms were “healthcare seeking behavior and/or scale, healthcare seeking behavior and/or questionnaire, healthcare seeking behavior and/or instrument”. One hundred and one papers were identified. However, only 16 articles meeting eligible criteria were selected to be critically appraised.

2. After an extensive literature review, two questions guiding the search for an appropriate study measure of the current study were asked.

a) Do appropriate established measures exist?

Answer: No established measures existed.

b) Do measures that are nearly appropriate for the study goals exist? If so, a modified or hybrid measure should be considered. If no appropriate or nearly appropriate measures exist, creation of a new measure may be justified.

Answer: Yes, measures that were nearly appropriate for the current study existed. However, there was no single existing measure assessed the full range of HCSB important to our participants.

Therefore, the researcher and colleagues decided to use a hybrid measure to assess HCSB.

Hybrid measures – created by combining items from more than one established scale, or by combining items from an established scale with newly created items – are one step further removed from their original psycho- metric properties than are measures that have been modified. When existing scales do not adequately cover all the issues of interest, or have questionable psychometric properties, creating a composite measure from more than one scale or developing new items to supplement a scale may be justified. As with the modified measures, the rationale for creating a hybrid measure should be developed with the foreknowledge that previous psychometric work with these items may no longer be valid.

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3. Description of the original measure

Based on an extensive systematic literature review from step 2, thirteen questionnaires were identified.

Table 3.3 A description of the original HCSB measure

Instrument name and authors	Number of items	Response scale
A Comprehensive questionnaire concerning symptom experience and HCSB (Rasmussen et al., 2014)	13	Yes/No
The Awareness and Belief about Cancer measure (the ABC measure) (Hvidberg et al., 2015)	5	Yes/No
HCSB and coping strategy survey questionnaire (Abraham et al., 2017)	9	Yes/No
the Mediar Health seeking survey (Ndarukwa et al., 2020)	20	Yes/ No
A self-administered questionnaire for rectal bleeding and HCSB (Eslick et al., 2009)	1	Yes/No
A self-administered questionnaire of HCSB for abdominal symptoms (Williams et al., 2006))	6	Yes/No
A survey questionnaire for household perception of HCSB (Hertz et al., 2019)	9	Yes/No

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Instrument name and authors	Number of items	Response scale
A pretest structured questionnaire illness and HCSB (Abuzerr et al., 2019)	5	Yes/No
A questionnaire from the world health organization adapted into Bahasa Indonesia (Andarini et al., 2019)	5	Yes/No
A survey of self-management and HCSB (van der Velden et al., 2020)	30	Yes/no
HCSB symptom coping questionnaire (Irwin et al., 2008)	8	Yes/no
A self-administered questionnaire (Fortenberry, 1997)	10	Yes/no
A structure and pre-tested questionnaire for HCSB (Rumman et al., 2008)	30	Yes/no
Total items	151 items	

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4. The researcher and team drew items from several measures to examine specific aspects of healthcare seeking behavior. From 151 items shown in Table 3.3, the researcher drew items and group them into 20 items to examine specific aspects of HCSB (Appendix H. Research instruments).

The questionnaire consisted of 21 items that could reflect health care seeking behaviors in five dimensions: self-medicating, complementary therapy, and alternative medicine (CAM), counselling, emotional-focused coping, and problem-focused coping. The study participants were firstly asked to rate whether they perform health care seeking behavior which was stated in the HCSB questionnaire. If study participants answered “yes," they were continued to ask the frequency of using that HCSB types.

In the current study, health care seeking behavior encompassed five dimensions as follows.

Self-medicating comprised 3 items (item 1, 2, 3) describing actions or behaviors of the study participants regarding self-medicating remedies for their symptoms before visiting a physician. Its frequency of using self-medicating ranged between 0 and 9. A higher score indicated that patients with CRC used self-medicating including bought an over-the-counter medicine (OTC) such as antacid, laxative, or stomach pain reliever , bought a medicine from the chemist without the prescription, or products or supplements to control symptoms before presenting to a physician.

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Complementary therapy and alternative medicine (CAM) contained 3 items (items 4,5,7). The question regarding actions or behaviors of the study participants by using a complementary therapy, such as homeopathic, acupuncture, yoga, massage, foot reflexology, using herbs, traditional medicine, or using alternative medicine, such as a traditional practitioner such as a traditional healer, folk healer, or monk, etc. when they experienced CRC-related symptoms

Counselling consisted of 5 items (items 6,8,9,10,11). The question regarding to actions or behaviors of the study participants by consulting or discussing about

symptoms with laypersons (e.g., family member, friends, co-workers, or acquaintance), consulting professional healthcare providers such as nurses, pharmacists, physicians, or other healthcare providers when they experienced CRC-related symptoms

Emotional-focused coping consisted of 6 items (items 12, 13, 14, 18, 19, 20). The questions regarding actions or behaviors of the study participants when they experienced CRC-related symptoms by using emotional coping such as prayer, wishing symptoms would go away, relying on religious teaching, trying not to attend to the symptom, trying to think that these symptoms were normal for the same age or gender, etc.

Problem -focused coping consisted of 3 items (items 15,16,17). The question involve to actions or behaviors of the study participants when they experienced with CRC- related symptoms by using problem solving such as trying to control symptoms by altering diet, e.g., eating on time, low meat, high vegetable and fruits consumption, , limited moving activity and rest, as well as trying exercise or more moving the body.

Additionally, the researcher added 1 item, which was the open list, for healthcare-seeking behaviors proposed by the study participants and were not proposed in the items list of the questionnaire (item number 21). The study participants may use different healthcare seeking behavior, and more than listed in the query.

Rating scores for HCSB questionnaire divided into two parts. First part, they were asked about whether they perform HCSB based on the list of HCSB statement of the questionnaire that “When you experience warning signs and symptoms of CRC, do you comply with the healthcare- seeking behavior statements?” the answer was rated using “No” (0) and “Yes” (1) response format.

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Second part, if participants answer "Yes," they were asked the second question related to the frequency of using the healthcare-seeking be behavior in each statement by using the question that “How often do you comply with the following statement when symptoms occur?". The “yes” response score of frequency rating was a 3-point rating scale, ranging from 1 = practice rarely, or 1-2 times, 2 = practice sometimes, or 3 – 5 times, and 3 = practice regularly/all times.

In the current study, the healthcare seeking behavior was calculated by average sum scores of each dimension. The high weighed scores of the dimension, the more a study participant often used healthcare seeking behavior when they experienced CRC-related symptom.

6. Perceived seriousness of warning signs and symptoms questionnaire. The questionnaire was adapted from the item asked about the perception of the seriousness of CRC symptoms by Leiva et al. (2017). The questionnaire consisted of 11 items of CRC - related symptoms lists based on the question was that “Do you think how these following warning signs and symptoms were serious?

A 5 - point rating scale ranging from not at all (1), mildly (2), moderately (3), very (4), and extremely (5) was used to assess perceived seriousness of warning signs and symptoms of CRC. The total score of perceived seriousness of warning signs and symptoms was summed ranging from 11 to 55. A higher score indicated that a study participant perceived a higher seriousness of warning signs and symptoms of CRC.

Psychometric Properties of instruments of the current study

Content validity of the instruments. In the current study, the knowledge about CRC questionnaire, the modified IPQ-R questionnaire, the perceived seriousness of warning signs and symptoms questionnaire, and the health care seeking behavior questionnaire were validated by a panel of 7 experts experiencing CRC research, nursing care, and services (Appendix C: Lists of the experts). They were 2 physicians specialized in colorectal cancer, 4 nursing instructors, and 1 advance practitioner nurse (APN). These experts were asked to rate the level of relevance among items, the operational definition, and objective of the measure as they intended to measure by using a 4-point rating scale from 1 (not relevant), 2 (somewhat relevant), 3 (quite relevant), to 4 (highly relevant). Moreover, the experts were also asked to comment if they did not agree with any of the items (Polit & Beck, 2017).

The Item-Content Validity Index (I-CVI) was calculated both item-content validity index and scale-content Validity Index using the averaging approach (S-CVI/Ave). An acceptable value of I-CVI was greater than .80, and an acceptable score of S-CVI/Ave was equal to or greater than .90 (Polit & Beck, 2017). The scores of I-CVI and S-CVI/Ave of all instruments were shown as bellows.

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Table 3.4 Content validity index (CVI) of the instruments

Instruments	I-CVI	S-CVI (Average agreement)
1. Knowledge about CRC	0.85 – 1.00	0.95
2. The Modified IPQ-R	0.71 - 1.00	0.97
3. Health care seeking behavior (HCSB)	0.71 - 1.00	0.92
4. Perceived seriousness of warning sign and symptoms	0.85- 1.00	0.97

Face validity.

After the instruments were reviewed by 7 experts, the researcher refined the items based on recommendations of the experts. Then, all questionnaires were tested by 5 laypersons to check the clarity of the items.

A field test and item selection

After obtaining the approval of Institutional Review Board and the Ethical Review Committee for Research Subject from Chulalongkorn University and each hospital settings. All questionnaires were field-tested among 30 Thai patients with CRC whose characteristics were similar to the study participants. However, they were not recruited into the main study. Item analysis and reliability of instruments were evaluated.

Item analysis and item selection

The item discrimination, corrected item-total correlation, inter-item correlation was used. The corrected items-total correlation should be ≥ .30 (Pedhazur & Schmelkin, 1991). An acceptable range of inter-item correlation should be .20 - .80. The item that had inter-item correlation greater than .80 should be considered

redundant. An inter-item correlation lower than .20 with other items was considered to removed (Nunnally & Bernstein, 1994).

Reliability

Knowledge about CRC questionnaire was tested by internal consistency via Kuder-Richardson 20 (KR – 20), and identity subscale of cognitive illness representation. Cronbach's alpha coefficient was used for evaluating the internal consistency of the modified IPQ-R, healthcare-seeking behavior, and perceived seriousness of warning signs and symptoms. Coefficients of Cronbach's alpha at .65 - .70 was minimally acceptable, between 0.70 and 0.80 was respectable; between .80 and .90 were considered especially desirable; however much .90, one should consider shortening the scale (DeVellis, 2017; Polit & Beck, 2017). For healthcare-seeking behavior was a new research instrument or immature scale, Coefficients of 0.70 or higher were desirable (Nunnally & Bernstein, 1994). The reliability of the instrument in the current study were summarized in Table 3.5.

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Table 3.5 Reliabilities of the instruments

	Reliability		
	Types of reliability test	n=30	n=240
Knowledge about CRC questionnaire	Internal consistency (KR-20)	.786	.753
The modified IPQ-R questionnaire			
-Identity sub-scale	Internal consistency (KR-20)	.714	.715

Table 3.5. Reliabilities of the instruments (Cont.)

	Reliability		
	Types of reliability test	n=30	n=240
-Timeline acute / chronic sub-scale	Internal consistency (Cronbach's alpha)	.707	7.14
-Consequence sub-scale	Internal consistency (Cronbach's alpha)	.788	.800
-Personal control sub-scale	Internal consistency (Cronbach's alpha)	.674	.708
-Treatment control sub-scale	Internal consistency (Cronbach's alpha)	.751	.784
-Illness coherence sub-scale	Internal consistency (Cronbach's alpha)	.718	.737
-Timeline cyclical sub-scale	Internal consistency (Cronbach's alpha)	.814	.821
-Cause sub-scale	Internal consistency (Cronbach's alpha)	.701	.705
-Emotional representation subscale	Internal consistency (Cronbach's alpha)	.836	.844
Health care-seeking behavior questionnaire	Internal consistency (Cronbach's alpha)	.706	.760
Perceived the seriousness of warning signs and symptoms questionnaire	Internal consistency (Cronbach's alpha)	.803	.853

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Right Protection of Human Subject.

The study was submitted to the Institutional Review Board (IRB) of Chulalongkorn University, and three Institutional Review Board (IRB) of each hospital setting for a field study and the data collection: Siriraj hospital, Chonburi Cancer hospital**,** and Mukdahan hospital (Appendix B: Approval of ethical review committee). The potential participants were invited to participate in the study by a nurse who worked in the hospital settings and did not directly influence participants. The medium used in the invitation process was a handbill providing the preliminary detail of the research project, such as the potential inclusion criteria, objective of the study, and the researcher's cell phone's number and e-mail address.

In the informed consent process, the researcher informed the objective of the study, benefits of the study, the procedures, the completed number of questions, the protection of confidentiality, potential risks and preventive measured, and freedom to decline the study participation at any time while collecting data, but they still had right to receive standard care. There was neither cost nor any harm, risks, or side effects of the study to the study participants. However, answering the questions can make the study participants not comfortable or waste their time. Thus, researcher chooses time to interview and collect the data that less bother them, such as waiting for a physician, waiting for the dispensing, or an appointment. In addition, the researcher will quit the interview in case the study participants have crisis symptoms while answering the questionnaire, such as dizziness, hypotension, dyspnea, headache, or other symptoms, and the researcher will cooperate with the nurses in the unit to assist a participant.

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Privacy and confidentiality were protected by using the code number instead of the study participant's name. Only the researcher can assess to these data using password before assessing the data. The findings of the study were reported by overall data without identify individual data. All data were kept one year after finishing the collection data, and they were be deleted after the publication. Informed consents were obtained by getting the study participants' signature before collecting the data.

Table 3.6 Approval number of ethical review committee in this study

Name of hospital setting	**Certificate of approval number / Institutions**	**Date of approval**
Siriraj hospital	COA no. Si 383/2021	May 25, 2021
Chonburi Cancer hospital	COA No. 09/2021	June 15, 2021
Chulalongkorn University	COA No. 144/2021	June 16, 2021
Mukdahan hospital	Permission letter for data collection (MH. 0032.2/2278)	30 July 2021

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Data collection procedure and recruitment process

In the current study, the researcher collected the data after the proposal was approved by the Ethical Review Committee for Research involving Human Research Subject, Health Science Group 1, Chulalongkorn University, and Institutional Review Board (IRB) of each hospital setting. The collecting data and recruitment participant process started from 21 June to 31 August 2021 as follows.

1) The researcher contracted a physician who took care of people with CRC to request permission to collect the data and review the medical record (Appendix F: Physician information sheet). Then, the researcher contracted a head nurse or a nurse in each hospital setting to make relationships before collecting data at medical and surgical out-patient departments (OPD), oncology unit, radiology unit, and the endoscopic unit. Also, in-patient department (IPD) in which people with CRC were admitted.

2) For the recruitment participant process, the researcher preliminary surveyed the name list of people with CRC who met inclusion criteria.

3) After that, a nurse working in the hospital settings invited the study participants who met inclusion criteria and systematic sampling to participate in the study and provided preliminary information. The medium used for the invitation process was a handbill having preliminary details of the research study, such as the title and objective of the study, setting, preliminary inclusion criteria, and researcher's name and contract. If the study participants interested in the project, the researcher started the informed consent process.

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4) The researcher met the study participants to inform the objective of the study, human rights protection, benefits, or risk of participation from the study, the procedures that they have to perform. If they willing to participate in the study, the researcher asked for their signature on the consent forms.

5) The study participants were be asked for answer six questionnaires, consisted of the personal sheet (12 items for the study participants answering), time to diagnosis questionnaire (3 items for participants answering), knowledge about CRC (22 items), The modified IPQ-R (61 items), healthcare-seeking behavior (21 items), and perceived seriousness of signs and symptoms questionnaire (11 items). The total number of items that the study participants needed to fill in was 130 items, and it took time around 15 - 35 minutes. In cases the study participant was not comfortable reading the question by themselves, the researcher read the question for them. For 6 clinical data and 1 item from time to diagnosis questionnaire, the researcher reviewed from the medical record.

6) For the time to diagnosis questionnaire, the study participants were asked to think back since the first symptom onset. If the study participants can remember the exact date of symptom onset, this exact date was recorded. If they could not remember the exact date but could only estimate the month, the estimated date such as the beginning, the middle, or the end of the month was be recorded. However, if the study participants cannot remember the exact date or the estimated date, the researcher dealt with this problem using the technique following Rittitit et al. (2020b). The technique was using the important date or major Thai holidays/festivals as the reference date, such as New Year Day, Songkran Day, Buddhist Holidays, Mother or Father Day. This technique can help the study participants recall the date of symptom onset that might occur during or close to any important holiday or festival.

7) The researcher let the study participants filled in all questionnaires without pressure, and they can ask any questions if they did not understand items. When the researcher received the questionnaire back, the researcher checked the completeness of the questionnaires. In the end, the researcher gave the correct answers of the knowledge about CRC questionnaire to them. Moreover, the researcher gave study participants a chance to ask about their health problems and appropriate advice based on their health problems were given.

8) The researcher thanked the study participants for their cooperation. The researcher carried out this process until the required number of the study participants were obtained.

Due to the Covid-19 outbreak in Thailand and the large number of infections in Nakhon Si Thammarat province, the patients had limited access to the hospital (except in emergency situations). For this reason, the researcher could not collect data from Maharaj Nakhon Si Thammarat Hospital.

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Data analysis

Data were analyzed using the Statistical Package of the Social Science (SPSS for window version 22) (Licensed software from Chulalongkorn university). Data analysis were as follows.

1. Descriptive statistics, such as frequency, percentage, means, standard deviation, min, max, and range were used to describe characteristics of the study variables.

2. Median and Interquartile Range (IQR) were used to describe time to hospital, time in-hospital phase, and total time to diagnosis.

3. Spearman rank coefficients were used to test the associations between personal factors, clinical factors and time to hospital. Pearson product correlation coefficients were used to test the associations between selected factors and time to hospital.

4. The assumptions underlying were determined including scale measurement, normality, the independence of error, multicollinearity, and homoscedasticity and linearity.

5. Testing predicting model of time to pre-hospital phase by using Multiple regression analysis. Stepwise regression method was be used for test statistically significant of all the predictors for the findings the best regression estimates. Model fit were be explained by R^2 (Hair, 2014; Kaiwan, 2015)

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CHAPTER IV
RESULTS

Chapter IV presented the findings of the study. This retrospective, correlational study aimed to (1) describe time to hospital (2) describe characteristic of relating factors of time to hospital, and (3) determine predictors of time to hospital among Thai people with colorectal cancer (CRC).

In this chapter, the results were presented as follows

Descriptive characteristics of the study participants

Descriptive characteristics of the study variables

Statistical assumption testing

Relationships among personal factors, clinical factors, selected factors and time to hospital

Predicting models of time to hospital

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Descriptive characteristics of the study participants

Demographic data of the study participants

The total of 240 people with colorectal cancer (100%) participated in this study. All participants were recruited from 3 public hospitals. One of them was super-tertiary hospital; one was advanced-level hospital; and one was standard-level hospital. The selected hospitals came across three regions of Thailand including Bangkok, Eastern region, and Northeastern region. The selected study participants were visiting at medical and surgical out-patient departments, oncology units, radiology units, and endoscopic units. Also, people with CRC at in-patient department were recruited.

The following section presented characteristics of the study participants including demographic, and illness-related data.

Table 4.1 showed that the study participants' ages ranged from 50 to 64 years old (51.25%). More than half of the study participants were males (57.92%); getting married (70.83%); and using universal health coverage (54.17%). However, about 45.42 % of them had monthly personal income less than or equal 15000 Thai Baht. Regarding education, the study participants completed elementary school (44.17%).

Table 4.1 Demographic characteristics of the study participants (n = 240)

Characteristics	Frequency	%
Gender		
Male	139	57.92
Female	101	42.08
Age (Range = 27 – 81 years, Mean = 58.77 years (SD= 10.44)		
≤ 49 years old	47	19.58
50 - 64 years old	123	51.25
≥ 65 years old	70	29.17
Marital status		
Single	33	13.75
Married	170	70.83
Separate/divorce/windowed	37	15.42

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Characteristics	Frequency	%
Education		
Illiteracy	12	5.00
Complete elementary school	106	44.17
Complete primary school	20	8.33
Complete secondary school	29	12.08
Postsecondary technical degree	22	9.17
Complete Bachelor's degree	40	16.67
Post University degree	11	4.58
Medical coverage		
Out of pocket	14	5.83
Social Security Scheme	38	15.83
Private Insurance	6	2.50
Universal Health Coverage (30-Baht scheme)	130	54.17
Civil Servant Scheme/Reembark	52	21.67
Monthly personal income (Thai baht)		
≤ 15,000	109	45.42
15,001 – 35,000	95	39.58
≥ 35,000	28	11.67
Missing data	8	3.33

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Illness-related data of the study participants

Table 4.2 showed that most participants were non-drinkers (63.33%) and non-smokers (70.83%). Their Body Mass Index (BMI) were described as normal (45.83%). Moreover, half of study participants (52.92 %) had some comorbidities. Regarding CRC-related comorbidities, diabetes mellitus (DM) was mostly reported (18.75%) followed with gastrointestinal disease (2.08 %). Another comorbidity reported by the study participants was hypertension (33.75%). Finally, most of them have no family history of cancer (76.25%).

Table 4.2 Clinical data of study participants (n = 240)

Clinical data	Frequency	%
Alcohol use		
Non-drinker	152	63.33
Social drinker (Occasionally used)	75	31.25
Alcohol abuser (Excessive used, drink everyday)	13	5.42
Tobacco use		
Non-smoker	170	70.83
Ex-smoker	57	23.75
Current smokers	13	5.42
Body Mass Index (BMI) (kg. / m^2)		
Underweight < 18.50	44	18.33
Normal weight 18.50 -22.99	110	45.83
Overweight: 23.00 -24.99	35	14.58
Obese: 25.00 - > 30.00	51	21.25

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Clinical data	Frequency	%
Family history of cancers		
No family history of cancers	183	76.25
Having family history of cancers	57	23.75
Current treatments		
Chemotherapy only	29	12.08
Chemotherapy and radiation	21	8.75
Surgery only	10	4.17
Surgery and radiation	3	1.25
Surgery and chemotherapy	140	58.33
Surgery, chemotherapy, and radiation	37	15.42
Comorbidity		
No comorbidity	113	47.08
With comorbidity*	127	52.92
Comorbidity related to CRC*		
Diabetes mellitus	45	18.75
Gastrointestinal disease	5	2.08
(Peptic ulcer, GERD)		
Other comorbidities*		
Hypertension	81	33.75
Dyslipidemia	34	14.17
Heart disease	15	6.25
Thyroid	7	2.92

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Clinical data	Frequency	%
Gout	3	1.25
Stroke	2	0.83
Hepatitis B	2	0.83
Thalassemia	2	0.83
Asthma / COPD	2	0.83
Benign Prostate Hyperplasia	2	0.83
Chronic Kidney Disease	1	0.42
SLE	1	0.42

Note: * each participant might have ≥ 1 comorbidity at the same time

Risk stratification of colorectal cancer of the study participants

Table 4.3 showed that based on risk stratification of CRC, approximately two third of the study participants (61.66%) were at an average risk of CRC. Only 14.17 % were categorized as no risk of CRC. For those with a high risk of CRC, Table 4.4 showed that 14.58% had a family history of CRC.

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Table 4.3 Study participants' risk stratification of colorectal cancer (n = 240)

Risk of CRC	Frequency	%
No risk	34	14.17
Age < 50 years old and no criteria of CRC risk		
An average risk	148	61.66
Aged ≥ 50 years old and no criteria of CRC risk		
A high-risk	58	24.17
Having 1 criteria of CRC risk	45	18.75
Having 2 criteria of CRC risk	10	4.16
Having 3 criteria of CRC risk	3	1.25

Table 4.4 Study participants' high-risk criteria of CRC*

High-risk criteria	Frequency	%
Family history of CRC	35	14.58
Personal history of polyps	28	11.67
Personal history of IBD	8	3.33
Personal history of radiation to abdomen or pelvic areas to treat prior cancer (Cervix cancer)	2	0.83
Having a history of hereditary CRC syndromes	1	0.42

Note: *each participant can report more than one criterion for high risk

Table 4.5 showed that most of the study participants were diagnosed with colon cancer (61.67%). Pathological findings were mostly reported as adenocarcinoma (95.42%). The study participants were diagnosed at stage III (46.67%). Concerning TNM classification of CRC diagnosis, tumor (T) at first diagnosis was mostly reported with T3 (52.92%). Metastasis to other organs (M) were reported at N2 (30.00%).

Table 4.5 Description of CRC diagnosis in the study participants (n = 240)

Diagnostic variables	Frequency	%
Type of CRC		
Colon cancer	148	61.67
Rectum cancer	92	38.33
Pathology findings		
Adenocarcinoma	229	95.42
Neoplasm, malignant	4	1.67
Mucinous adenocarcinoma	5	2.08
Sig net ring cell carcinoma	2	0.83
Stage of CRC diagnosis		
Stage I	1	0.42
Stage II	39	16.25
Stage III	112	46.67
Stage IV	88	36.66
Level of CRC diagnosis		
Early stages (stage I, II)	40	16.67
Advanced stages (stage III, IV)	200	83.33
TNM Classification		
Tumor (T)		
T1	3	1.25
T2	34	14.17
T3	127	52.92
T4	68	28.33

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Diagnostic variables	Frequency	%
Not identify	8	3.33
Lymph Node (N)		
N0	29	12.08
N1	68	28.33
N2	72	30.00
N3	31	12.93
N1a	5	2.08
N1b	4	1.67
N1c	2	0.83
N2a	11	4.58
N2b	8	3.33
Not identify	10	4.17
Metastasis (M)		
M0	112	46.67
M1/Mx	128	53.33

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Descriptive characteristics of the study variables

Time to hospital of the study participants

Table 4.6 showed that time to hospital of the study participants (starting from symptoms perceived to the date of first presentation a physician) ranged from 1 to 632 days. The median of time to hospital was equal to 32.00 days (IQR= 77). The in-hospital phase ranged from 2 to 315 days; and the median was equal to 28.50 days (IQR=39). Finally, the findings showed that total time to diagnosis of the study participants ranged from 4 to 656 days. The median of time to diagnosis was 87.50 days (IQR= 88).

Table 4.6 Time to hospital, in -hospital, and total time to diagnosis of the study participants (n=240)

Phase	Min	Max	Mean (SD)	Mode	Median (IQR)
Time to hospital	1	632	77.49 (103.55)	31	32.00 (77)
In-hospital phase	2	315	39.10 (38.85)	7	28.50 (39)
Total time to diagnosis	4	656	116.86 (107.92)	22	87.50 (88)

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Warning signs and symptoms of the study participants

Table 4.7 showed that colorectal cancer-related symptoms perceived by the study participants were chronic constipation or diarrhea (24.17%), rectal bleeding (23.33%), and abdominal pain (20.42%).

Table 4.7 Warning signs and symptoms of the study participants (n=240)

Warning sign and symptoms	Frequency	%
No report	26	10.83
Did report	214	89.17
Chronic constipation or diarrhea	58	24.17
Rectal bleeding	56	23.33
Abdominal pain	49	20.42
Tenesmus	13	5.42
Bloating up, and gas in the stomach	13	5.42
Mucous bloody	8	3.33
A change in bowel habits	6	2.50
Unintentional weight loss	3	1.25
Blood in the stool	3	1.25
Dark or back stools	3	1.25
Decreased appetite	2	0.83

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Table 4.8 showed that there were other symptoms reported by the study participants such as gut obstruction (7.50%), a lump at the anus (1.67%) and fatigue (1.67%).

Table 4. 8 Other symptoms reported by the study participants (n=26)

Other symptoms	Frequency	%
Gut obstruction	18	7.50
A lump at the anus	4	1.67
Fatigue	4	1.67

Concerning the total number of colorectal cancer-related symptoms perceived by the study participants, Table 4.9 showed that the number of colorectal cancer-related symptoms had a mean of 1.71 (SD= 0.69). Also, almost half of them reported two symptoms (43.33 %).

Table 4.9 The number of CRC-related symptoms reported by the study participants (n=240)

Symptoms	Frequency	%	Min	Max	Mean	(SD)
One symptom	103	42.92	-	-	-	
Two symptoms	104	43.33	-	-	-	
Three symptoms	33	13.75	-	-	-	
Total	240	100	1	3	1.71	0.69

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Knowledge about colorectal cancer

Table 4.10 showed that the total score of knowledge about colorectal cancer among the study participants ranged from 6 to 21 (mean =14.07, SD=3.24). Many of them had a high level of knowledge about colorectal cancer (71.25%).

Table 4.10 Knowledge about colorectal cancer of the study participants (n = 240)

Knowledge of CRC	Possible range	Actual range	n	(%)	Mean (SD)
A low level	0 - 12	6 - 12	69	28.75	9.88 (1.75)
A high level	13 - 22	13 - 21	171	71.25	15.77 (1.89)
Total	0 - 22	6 – 21	240	100.00	14.07 (3.24)

Table 4.11 Sub-scale scores of knowledges about colorectal cancer (n=240)

Sub-scale scores	Possible range	Actual range	Means	SD
Symptom of CRC	1 - 10	1 - 10	7.16	1.85
Age-related risk of CRC	0 - 1	0 - 1	0.72	0.44
Risk factor of CRC	1 - 10	0 - 9	5.45	1.67
CRC screening method	0 - 1	0 - 1	0.72	0.44

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Illness perception

Illness perception including cognitive domain and emotional domain among the participants were presented in Table 4.12. The mean score of each dimension ranged from 7.73 to 50.94.

Table 4. 12 Illness perception including cognitive and emotional domains of the study participants (n= 240)

Illness perception Domain	Possible range	Actual range	Min	Max	Mean	SD
Cognitive domain						
-Identity	0 – 11	1 -11	1	11	7.73	2.19
-Timeline (acute/ chronic)	7 - 35	9 - 32	9	32	20.13	3.63
-Consequence	4 - 20	4 - 20	4	20	13.17	3.73
-Personal control	4 - 20	6 - 20	6	20	14.29	2.70
-Treatment control	3 - 15	5 -14	5	14	10.57	1.43
-Illness coherence	5 - 25	5 - 24	5	24	12.72	3.74
-Timeline (cyclical)	4 - 20	4 - 19	4	19	10.74	3.66
-Cause	18 - 90	32 - 84	32	84	50.94	8.24
Emotional domain	5 – 25	5 – 25	5	25	13.40	4.18

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Health care seeking behavior (HCSB)

Health care seeking behaviors of the study participants, consisted of self-medicating, complementary therapy & alternative medicine (CAM), counselling, emotional-focus coping, and problem-solving coping dimensions were presented in Table 4.13. The most frequently health care seeking behaviors used was problem-focused coping while the least frequently used was complementary therapy & alternative medicine (CAM).

Table 4.13 Health care seeking behaviors of the study participants including all sub-scale scores **(**n= 240)

Health care seeking behaviors	Possible range	Actual range	Min	Max	Mean (S.D.)	Weighed scores (%)
Self-medicating	0 - 9	0 - 9	0	9	2.75 (2.27)	30.55
CAM	0 - 9	0 - 9	0	9	1.05 (1.48)	11.66
Counselling	0 - 15	0 - 13	0	13	5.69 (3.00)	37.93
Emotional-focused coping	0 - 18	0 - 18	0	18	6.83 (3.90)	37.94
Problem-focused coping	0 – 9	0 – 9	0	9	3.95 (2.60)	43.88

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Perceived seriousness of warning signs and symptoms

Table 4.14 showed that the study participants perceived that rectal bleeding was the most serious symptom (mean score = 3.76, SD=1.17). On the contrary, bloating up, fullness or gas in the stomach was the least serious symptom perceived (mean = 2.76, SD=1.02).

Table 4.14 Perceived seriousness of warning signs and symptoms (n= 240)

Perceived seriousness of warning signs and symptoms	Possible range	Actual range	Min	Max	Mean (SD)
Rectal bleeding	1-5	1-5	1	5	3.76 (1.17)
Mucous bloody	1-5	1-5	1	5	3.65 (1.14)
Blood in the stool	1-5	1-5	1	5	3.35 (1.06)
Dark or back stools	1-5	1-5	1	5	3.05 (1.05)
A change in bowel habits (e.g., shape of the stool smaller or more narrow than usual)	1-5	1-5	1	5	2.98 (1.02)
Tenesmus	1-5	1-5	1	5	3.20 (1.02)
Abdominal pain or discomfort in the lower abdomen	1-5	1-5	1	5	3.45(1.05)
Bloating up, fullness, or gas in the stomach	1-5	1-5	1	5	2.76 (1.02)
Chronic constipation or diarrhea	1-5	1-5	1	5	2.92 (1.04)
Decreased appetite	1-5	1-5	1	5	3.03 (1.08)
Unintentional weight loss	1-5	1-5	1	5	3.25 (1.11)
Total scores	11-55	13-55	13	55	35.45 (7.52)

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Statistical assumption testing

Multiple regression analysis was be used to predict the set of predictor variables and time to hospital among people with colorectal cancer. Therefore, a preliminary analysis was also tested to confirm that there was no assumption violation of multiple regression check underlying the assumptions. Basic assumption of multiple regression was tested in the current study such as scale measure, normality testing, independent of error, linearity, multicollinearity, and homoscedasticity and linearity. These assumptions testing was tested as follows.

1. Scale of measurement

The dependent variable should be interval or ratio. Meanwhile independent variable can be dummy and interval scale. In the current study, time to hospital was interval scales. Independent variables were interval scales, including knowledge about CRC, cognitive illness perception, emotional illness perception, healthcare seeking behavior, and perceived seriousness of warning signs and symptoms.

2. Normality testing

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Skewness and kurtosis values were used to test normal distribution of the data. Regarding to West et al. (1995), the skewness and kurtosis values of 3 and 21, respectively, represent a highly non-normality. It can be concluded that there was efficient evidence about the satisfaction of the univariate normality assumption in the current study. (See appendix I: preliminary analysis and statistics).

However, time to hospital data was right-skewed curve. Therefore, a transformation to Logarithm using natural log (log N) was used before statistical analysis. Also, the researcher tested multivariate outlier using Mahalanobis Distances

(MD) method. The obtained values were taken to D^2 (square) and compared with Chi-square values considering $p < 0.001$. It was found that there were 2 cases outlier at ID number 2 (Chi-square values= .00000), and ID number 22 (Chi-square values = .00055). Therefore, the researcher removed the 2 cases with outlier before running analysis. Finally, 238 cases were used to analysis in regression.

3. The independence of errors

The independence of errors of multiple regression was tested using residual plot and Durbin-Watson test. The Durbin-Watson was equal to 1.603 for time to hospital. Based on Durbin Watson test, the value between 1.5 - 2.5 denotes no autocorrelation (Tabachnick & Fidell, 2013). The residual plot was showed in appendix I: preliminary and statistics. The results showed that no autocorrelation among variables.

4. Multicollinearity

Khine (2013) recommended that multicollinearity occurred when a high correlation of any variables was greater than .90. In additions, the tolerance values were all greater than .10, or Variance Inflation Factor (VIF) values was less than 10 indicating no multicollinearity among the predictors (Hair, 2014)

In this study, Pearson's correlation coefficient (r) of the study variables was between 0.013 and 0.621. Tolerance was between 0.46 - 0.94. VIF was between 1.07 - 2.19. Therefore, no multicollinearity was in the current study.

5. Homoscedasticity and linearity

It was tested by the visual examination of the plot of regression of the standardized predicted dependent variable against the regression standardized residual. Meanwhile, linearity was indicated by the residual scatter plots. In this study, homoscedasticity and linearity was reasonably accepted (Appendix I: Preliminary analysis and statistics)

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Relationships among personal factors, clinical factors, and time to hospital

Table 4.15 showed that there was only a statistically significant association between gender (r_s= -0.160) and time to hospital among the study participants at p-value < 0.05

Table 4.15 Spearman rank correlation coefficient between personal factors, clinical factors and time to hospital (n=238)

Factors	Time to hospital (rs)	p-value
Age	-0.019	0.772
Education	0.062	0.414
Monthly income	-0.059	0.371
Gender	-0.160	0.014
Family history of CRC	0.035	0.571
Personal history of radiation to the abdomen or pelvic area to treat prior cancer	0.088	0.175
Personal history of polyps	0.037	0.551
Personal history of inflammatory bowel disease	-0.076	0.254
Having a hereditary CRC syndrome	0.029	0.658
Family history of other cancers	0.058	0.354

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Relationships among selected factors and time to hospital of the study participants

Table 4.16 showed that there were statistically significant associations between CRC screening method knowledge (r = -0.880), timeline-acute vs chronic sub-scale (r = 0.151), consequence sub-scale (r= -0.630), illness coherence (r=0.149), timeline-cyclical sub-scale (r = 0.780), emotional illness perception (r = 0.141), self-medicating (r=0.580), and time to hospital among the study participants at p-value < 0.05

Table 4.16 Pearson correlation coefficients between selected factors and time to hospital (n=238)

Factors and sub-scales	Time to hospital (r)	P-value
Knowleadge about CRC		
-Symptom of CRC	-0.044	0.435
-Age-related risk of CRC	-0.038	0.618
-Risk factor of CRC	- 0.012	0.824
-CRC screening method	-0.880	0.00
Cognitive illness perception		
-Identity	-0.040	0.566
-Timeline (acute/chronic)	0.151	0.017
-Consequenc	-0.630	0.00
-Personal control	-0.036	0.064
-Treatment control	0.096	0.087
-Illness coherence	0.149	0.020
-Timeline (cyclical)	0.780	0.000
-Cause	0.106	0.104
Emotional illness perception	0.141	0.030

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Factors and sub-scales	Time to hospital (r)	P-value
Healthcare-seeking behavior		
-Self-medicating	0.580	0.00
-Complementary and alternative medicine (CAM)	0.077	0.120
-Counseling	-0.100	0.136
-Emotional-focused coping	-0.034	0.599
-Problem-focused coping	-0.066	0.321
Percieved seriousness of warning sings and symptoms	-0.086	0.186

Predicting model of time to hospital of the study participants

The result from Table 4.17 showed that there were four factors had a significant association with time to hospital among the study participants: 1) knowleadge of colorectal cancer screening method (sub-scale) had a significantly negative association with time to hospital (B = -0.243, p = 0.000), 2) Consequenc (sub-scale) of cognitive illness perception had a significantly negative association with time to hospital (B = -0.163, p = 0.010), 3) timeline cyclical (sub -scale) of cognitive illness perception had a significantly positive association with time to hospital (B= 0.176, p = 0.003), and 4) self-medicating had a significantly positive association with time to hospital (B=0.149,p= 0.017). These factors could collectively predict time to hospital among people with colorectal cancer with 48.70 % of variance (R^2=0.487, p value=0.05). The predicted equation was presented as follows.

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Time to hospital = 0.851 - 0.243 (Knowleadge of CRC screening method sub-scale) - 0.163 (consequenc sub-scale) + 0.176 (Timeline cyclical sub scale) + 0.149 (Self-medicating)

Table 4.17 Predicting factors of time to hospital among the study participants using Stepwise Multiple Regression Analysis (n=238)

Predictors	Coef (B)	SE Coef	Beta	95%CI	t-value	p-value
Constant	0.851	0.136		(0.583,1.118)	6.255	0.000
Knowleadge of CRC screening method (sub-scale)	-0.243	0.063	-0.257	(0.038, 0.287)	-3.889	0.000
Consequenc (sub-scale)	-0.163	0.063	-0.163	(0.016, 0.277)	-2.588	0.010
Timeline cyclical(sub scale)	0.176	0.060	0.193	(0.057, 0.294)	2.941	0.003
Self-medicating	0.149	0.062	0.157	(0.111, 0.371)	2.396	0.017

ANOVA (F= 93.889, p-value= .01)

R Square (R^2) = .487 Adjusted R Square = .482

SE=0.446 R square Change = .007

Durbin-Watson = 1.603

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CHAPTER V
DISCUSSIONS

This chapter discussed the study findings. The topic of discussion includes conclusion, the characteristics of the study variable, hypothesis testing, implications for nursing knowledge and practices, limitations of the study. The latter section in this chapter also provides the recommendations for further study

Conclusion

The retrospective, cross-sectional design was employed for answering the research questions. The purpose of this study was to describe time to hospital, describe characteristic of relating factors of time to hospital, and determine predictors of time to hospital among Thai people with colorectal cancer (CRC). Dracup's framework (2006) and literature review were used as the conceptual framework. Dependent variable was time to hospital. Independent variables consisted of knowledge about colorectal cancer, cognitive illness perception, emotional illness perception, healthcare seeking behavior, and perceived seriousness of warning signs and symptoms. Multistage random sampling was used to select three hospitals from across regions of Thailand.

The study participants were recruited from three hospitals located in Bangkok, Eastern region, and Northeastern region of Thailand. Study participants were Thai adults with colorectal cancer aged 18 years old and older, visiting medical and surgical outpatient departments, oncology units, radiology units, endoscopic units, and people with colorectal cancer admitted in-patient departments. Study participants who met

inclusion criteria were recruited using a systematic random sampling by a random table with sampling interval at every odd number (e.g., 1, 3, 5,7, 9…).

The data were collected using six self-reported questionnaires. There was personal information sheet, time to colorectal cancer diagnosis questionnaire, knowledge about colorectal cancer questionnaire, the modified illness perception – revised questionnaire, healthcare-seeking behavior questionnaire, and perceived seriousness of warning signs and symptoms questionnaire. The instruments had content validated by a panel of 7 experts experiencing colorectal cancer research and services. Cronbach's alpha coefficients were used to test the internal reliability for the modified illness perception -revised questionnaire, healthcare seeking behavior questionnaire, and perceived seriousness of warning sign and symptoms questionnaire. Meanwhile, knowledge about colorectal cancer and identity subscale were tested reliability using Kuder - Richardson -20 (KR-20). The reliability of all questions was acceptable.

Data were analyzed by descriptive statistics consisted of percentage, range, mean, standard deviation, median, interquartile range (IQR). Relationships among selected factors (personal factors, clinical factors) and time to hospital were analyzed by Spearman rank coefficients and Pearson correlation coefficients. Testing predicting model of time to hospital among people with colorectal cancer using Multiple regression analysis (Stepwise regression method). Data were gathered between 21 June 2021 and 31 August 2021.

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Characteristics of the study participants

The results showed that more than half of the study participants were males (57.92%). The study participants' ages ranged from 50 to 64 years old (51.25%), getting married (70.83%), completed elementary school (44.17%), half of them used Universal Health Coverage (30 -Baht scheme) (54.17%), and 45.42% of them had monthly personal income less than or equal 15000 Thai Baht.

Most participants were non-drinkers (63.33%) and non-smokers (70.83%). Half of them (52.92 %) had some comorbidities. Regarding colorectal cancer-related comorbidities, diabetes mellitus (DM) was mainly reported (18.75%). Another comorbidity was hypertension (33.75%), and most of them have no family history of cancer (76.25%). Regarding the risk stratification of colorectal cancer, two-thirds (61.66%) were at average risk of colorectal cancer group. Only 14.17 % were categorized as no risk criteria of colorectal cancer. For those with a high risk of colorectal cancer, 14.58% of them had a family history of colorectal cancer.

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Moreover, the number of study participants with colon cancer was higher, almost 2-folds, than those with rectal cancer (61.67% and 38.33%). Mostly, they were diagnosed at the advanced stages higher than the early stages (83.33% and 16.67%, respectively). The staging of colorectal cancer diagnosis was the highest reporting at stage 3 (46.67%), followed by stage 4 (36.66%). Adenocarcinoma was the most pathological findings (95.42%). Concerning the TNM classification of colorectal cancer diagnosis, tumor (T) at first diagnosis was mainly reported with T3 (52.92%). Metastasis to other organs (M) and lymph node (N) was reported at M1/Mx (53.33%) and N2 (30.00%), respectively. This finding of the current study was similar to other

previous findings also showed that the highest rates of colorectal cancer in Thailand were diagnosed at stage 3 (35.60%), followed by stage 4 (23.04%). Only 10.47 % for stage 1 , 29.84% for stage 2, and 1.05% for unknow stage (Rittitite et al., 2020a).

Characteristics of the study variables

The study variables' characteristics, including time to hospital, knowledge about colorectal cancer, cognitive and emotional illness perception, healthcare seeking behavior, and perceived seriousness of warning signs and symptoms, were described as follows.

The median and IQR of time to hospital among the study participants, starting from the first symptom perceived to the first date of presentation to a physician in hospital, ranged from 1 to 632 days, with the median of time was equal to 32 days (IQR=77). Meanwhile, the time interval of the in-hospital phase ranged from 2 to 315 days, with a median was equal to 28.50 days (IQR=39). Finally, the study participants' total time to colorectal cancer diagnosis ranged from 4 to 656 days, with a median of 87.50 days (IQR= 88).

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Warning signs and symptoms majorly reported by the study participants were chronic constipation or diarrhea (24.17%), rectal bleeding (23.33%), and abdominal pain (20.42%). Other symptoms were reported by the study participants, such as gut obstruction (7.50%), a lump at the anus (1.67%), and fatigue (1.67%). Furthermore, almost half of them reported two symptoms (43.33 %).

Regarding knowledge about colorectal cancer, 71.25% of the study participants had a high level of knowledge about colorectal cancer. The total score of knowledge

about colorectal cancer among the study participants ranged from 6 to 21, with a mean score of 14.07 (SD=3.24). Symptoms of colorectal cancer's knowledge sub-scale had the highest mean scores of 7.16 (SD= 1.85).

Illness perception, including cognitive and emotional domains among the participants, showed a mean score of each subscale ranging from 7.73 to 50.94.

As regards healthcare-seeking behavior, the most frequent health care seeking behaviors used of the study participants was problem-focused coping with weighed scores at 43.88 % (mean = 3.95, SD=2.60), while the least frequently used was complementary therapy & alternative medicine (CAM), with mean scores of 1.05 (SD = 1.48).

Lastly, total scores of perceived seriousness of warning signs and symptoms of the study participants were reported with mean scores of 35.45 (SD= 7.52). Moreover, the study participants perceived that rectal bleeding was the most serious symptom, with mean scores of 3.76 (SD=1.17). Meanwhile, bloating up, fullness, or gas in the stomach was the least serious symptom perceived, with mean scores of 2.76 (SD=1.02).

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Relationship and predicting factors of time to hospital of the study participants

Concerning factors association, there were statistically significant associations between selected factors including CRC screening method knowledge (r = -0.880), timeline-acute vs chronic sub-scale (r = 0.151), consequence sub-scale (r= -0.630), illness coherence (0.149), timeline-cyclical subscale (r = 0.780), emotional illness

perception (r = 0.141), self-medicating (r=0.580), and gender (r_s= -0.160) and time to hospital among people with CRC at p-value < 0.05.

However, predictors, namely knowleadge of colorectal cancer screening method (B = -0.243) , some congitive illness perception, including consequenc sub-scale (B = -0.163) and timeline cyclical sub -scale (B= 0.176), and self-medicating (B=0.149) could collectively predict time to hospital among people with colorectal cancer with 48.70 % of variance (R^2=.487) at p value < 0.05. The predicted equation was presented as follows.

Time to hospital = 0.851 - 0.243 (Knowleadge of CRC screening method sub-scale) - 0.163 (consequenc sub-scale) + 0.176 (Timeline cyclical sub scale) + 0.149 (Self-medicating)

Discussion of the study

1. Time to hospital of the study participants (Pre-hospital phase)

The median of time to hospital of the current study was equal to 32 days (IQR=77). It was shortened than the previous study conducted in Thailand reported at 60 - 61 days (Kimpee et al., 2013; Rittitit et al., 2020b). Comparison with the results of developing countries, time to hospital of the current study was longer than some developed countries such as in Spain and Denmark, which reported that median of time to hospital among people with colorectal cancer was equal to 8, 19 and 28 days, respectively (Esteva et al., 2013; Hansen et al., 2011; Helsper et al., 2017). It was also longer than the time to hospital of people with colon cancer which reported at 2 -18 days (Korsgaard et al., 2008; van der Geest et al., 2014), but shorter than people diagnosed with rectum cancer (44 days) in the study of Korsgaard et al. (2008). Median time to hospital among people with CRC in the current study also was longer than the

findings of van der Geest et al. (2014). However, the median time to hospital of the current study was shorter compared to some developing countries by Leiva et al. (2017) which reported median time to hospital of people with colorectal cancer at 91 days.

Differences in the results between the current study and previous studies in Thailand can be explained as follows. Most of the study participants in the current study were middle-aged adults aged 50 – 64 years (51.25%). They would have a memory and recall the date of the symptom onset and the date of a physician's presentation. Moreover, the hospital settings in the current study would be located in their geographic region and maybe close to the study participants' houses. Thus, they did not travel to secondary hospitals that might long distances from their house. Therefore, accessibility to healthcare facilities and no long-distance could contribute to a shorter time to hospital of the study participants in the current study.

Time of the in-hospital phase of the study participants

The median time of the in-hospital phase in the current study was equal to 28.50 days (IQR=39). It was shortened than the previous studies conducted in Thailand, in which the median time of the in-hospital phase among people with colorectal cancer was equal to 89 days (Rittitit et al., 2020b).

However, it was close to the results of some developing countries that was reported that people with colorectal cancer had a median time of in-hospital phase, starting from the first presentation to a physician to the date of colorectal cancer diagnosis confirmed by pathological findings, was equal to 30 days to 32 days (Langenbach et al., 2010; van der Geest et al., 2014). However, the median time of the in-hospital phase of the current study was shorted than several Western studies. For

example, median time of people with colorectal cancer in Denmark was 56 days (Hansen et al., 2011), and 58 days for study in Britain people with colorectal cancer (Walter et al., 2016), 66 days in Spain country (Vega et al., 2015), as well as longest median time at 111 days, which was reported by people with colorectal cancer in Spain conducted by Leiva et al. (2017)

Total time to diagnosis of the study participants

The current study's median time to diagnosis (total) was 87.50 days (IQR=88). Compared with the previous studies reported 246 days (Rittitit et al., 2020b). Comparison with developing countries, such as people with colorectal cancer in the Netherlands, Denmark, Spain, Canada, and the USA. Pruitt et al. (2013) revealed that the median total time to diagnosis was between 40 days for rectal cancer and 60 days for colon cancer in the US. Meanwhile, European people with colorectal cancer reported that the median total time to diagnosis was between 54 days and 94 days (Helsper et al., 2017; Pita-Fernández et al., 2016) and between 104 days and 180 days (Esteva et al., 2013; Hafström et al., 2012; Hansen et al., 2011; Singh et al., 2012; Walter et al., 2016).

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The results of current study differed from previous study in Thailand. It can be explained that the current study was conducted in three level-hospital across Thailand. These hospitals can provide care for cancer patients: Super-tertiary, A-level, and S-levels. Therefore, it seems that the study participants in the current study had more alternatives to access services in various healthcare services.

Moreover, hospitals setting in the current study have a specialist physician to investigate or diagnose colorectal cancer directly. Thus, the study participants had

more opportunity to access health services and visit a specialist directly without waiting time to referral system from general physicians to a tertiary hospital of the previous study. Also, those hospitals were located in specific region. It may be closer to the study participants' house. They did not have to travel to seek treatments from the big hospitals with located on a longer distance. The accessing health facilities may contribute to a shorter time to hospital among the study participants.

Relationships among personal factors, clinical factors, and time to hospital

This part discussed characteristics of relating factors of time to hospital. Concerning personal and clinical factors associated with time to hospital, the results revealed that only one factor statistically significant association with time to hospital was gender (rs= -0.160, p-value = 0.014). It meant that gender impacted time to hospital among Thai people with colorectal cancer. In the current study, female participants with colorectal cancer had greater time to a hospital than male participants with median of 34 day, meanwhile median of time to hospital among male was 31 days.

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This current finding was congruence to several previous studies supporting that female were more likely to have a longer time to hospital than males. For instance, Rittitit et al. (2020b) revealed that Thai females with colorectal cancer had time to hospital starting from symptom onset to first visit a physician when they experienced colorectal cancer-related symptoms longer than males with colorectal cancer. Other previous findings from Western literature found that females with colon cancer had a substantially longer time to hospital than males with colon cancer (median of 29 days for females and 16 days for males) (Korsgaard et al., 2008). Likewise, Hansen et al. (2015) concurred that females with colorectal cancer had longer time intervals and

frequently consulted a physician than males after the onset of symptoms. It was similar to the findings conducted by Esteva et al. (2013) revealed that females with colorectal cancer in Spain presented a higher time interval starting from symptom onset to diagnosis than males (153 days and 113 days, respectively).

The reasons of the findings can be explained that in the fact females have much more responsibilities, duties, and social roles (e.g., mother, wife, and working woman roles). They have to take responsibility for taking care of family and raising their kids, together with working a full-time job. These responsibilities and being busy might make them feel tired and did not want to wait time to visit a physician. Thereby, time to hospital of females longer than males.

In addition, females usually push males to visit a physician when a man has colorectal cancer-related symptoms. Meanwhile, females themselves wait and observe until symptom disappears. Also, females commonly say nothing to their family members until they have already visited a physician (Esteva et al., 2013). Waiting and observing symptoms increase time to hospital, and not being investigated and getting appropriate treatment promptly.

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3. Hypothesis testing

Hypothesis 1: Knowledge about CRC had a negative association with time to hospital among Thai people with colorectal cancer

The current study found that knowledge about colorectal cancer, especially about the colorectal cancer screening method had negatively affected time to hospital among Thai people with colorectal cancer (B=-0.243, p = 0.000). It meant that the study participants with a high score of knowledge about screening methods had a shorter time to hospital when they experienced colorectal cancer-related symptoms. Therefore, the finding supported the hypothesis of the study.

The result of the study was consistent with the previous studies' findings reported that time to hospital in people with colorectal cancer decreased if they have high knowledge about the disease, but a lack of knowledge about colorectal cancers increased time to hospital (Vega et al., 2015). It was congruent with the findings conducted in people experienced with colorectal-related symptoms. For instance, Alatise et al. (2017) found that people experiencing rectal bleeding who have higher knowledge of CRC of causes, symptoms, colorectal examination, and treatment contributed to shorter time to hospital since they were more likely to present their symptoms early to a physician for taking colonoscopy almost four times than those with lower knowledge of colorectal cancer (OR=3.83, 95%CI, 1.55-10.20).

In the current study, the median time to hospital among people with a high level of knowledge about colorectal cancer was reported at 32 days, shorter than those with a low knowledge of colorectal cancer reported at 39 days. The study participants having knowledge, especially colorectal cancer screening method, reported that they had a shorter time to hospital than those with no knowledge about colorectal cancer

screening method with a median of 31 days and 62 days, respectively. These results would be explained based on Dracup's framework as follows.

According to Dracup's framework, knowledge was derived from the internal stimuli factors that affect individuals' decision-making to respond to a health threat and affect the way to seek treatment. Knowledge was believed to be a prerequisite for a change in health behavior. Thus, it increases understanding of their illness (Chen, 2015). The primary goal of colorectal cancer screening was to prevent mortality rates and improve survival rates. Screening tests can help identify cancers at an early stage. For that, sufficient knowledge about colorectal cancer screening methods can encourage them to realize the importance of the disease and contribute to early a physician. Knowledge would assist a patient decide to seek medical care for their symptom correctly. Consequently, Thai people with colorectal cancer might respond to the symptoms by seeking treatment by early presentation to a physician, which could eventually reduce the time to hospital.

Hypothesis 2. Cognitive illness perception had a negative association with time to hospital among Thai people with colorectal cancer.

The current study found that two cognitive illness perceptions affected on time to hospital. Some sub-scales of cognitive illness perception, including consequence sub-scale, had a negative effect on hospital time (B= -0.163, p=0.010). Also, the timeline cyclical sub-scale positively affected the time to hospital (B= 0.176, p=0.003) in Thai people with colorectal cancer. The Stepwise regression analysis showed that both sub-scales were factor that could collectively predict time to hospital in Thai people with colorectal cancer. It meant that the participants who less perceived a negative consequence of symptoms, and strongly believed the cyclical nature of their

symptoms were more likely to have a longer time to hospital. Therefore, the findings supported this hypothesis of the study.

The current findings were consistent with a previous study conducted to examine time interval to hospital in people with colorectal cancer starting from the symptom onset to the first presentation to a physician. The findings by Jensen et al. (2016) showed that cognitive illness perception such as treatment control, timeline cyclical, and consequence sub-scale was statistically significantly associated with a long time to hospital among people with colorectal cancer at 88 days or more. Those people with colorectal cancer having a strong belief about the cyclical nature of their symptoms, such as cycle in their symptoms came and went, change day by day, or very unpredictable, were associated with a long time to hospital compared to the patients with low scores (PR=2.14, 95% CI, 1.29-3.57). Moreover, those patients with strong beliefs or perceived the potential negative consequence of symptoms such as blood in the stool were the most important symptoms associated with short time to hospital at p-value < 0.05.

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Theoretically, Dracup's framework explained that cognitive representation was strongly influenced by knowledge, attitude, or belief about the nature of the heath treat. When individuals perceived symptoms as a health threat, they used sematic memories both in abstract and concrete to label symptoms (identify), perceived causes and timeline of symptoms, belief in the ability to control, and the consequence of symptoms. The timeline was components of Dracup's framework that also relevant as patients who perceive their symptoms as temporary rather than permanent and experienced cyclical symptoms (e.g., symptoms came and went), leading to patients being more likely to report a long time to hospital. Moreover, patients who did not attribute their symptoms

to cancer or did not perceive their symptoms as serious and consequence of symptoms did not affect their physical, psychological, social, and economical, such as not bothering daily living, working, economic or close up person. They found a long time to a hospital than those who perceive their symptoms as a serious, or specifically negative consequence.

It could be summary based on Dracup et al. (2006) that people with colorectal cancer who perceived or strong believe about the nature cyclical of symptoms, believed that symptoms do not bother the daily living or working. They may remedy by self-medicating remedies instead of early visiting a physician in the hospital. Hence, people with colorectal cancer with negative cognitive illness perception might not visit a physician leading to a long time to hospital (Dracup et al., 2006; Jensen et al., 2016).

Hypothesis 3. Emotional illness perception had a positive association with time to hospital among Thai people with colorectal cancer

This study found that emotional illness perception had a significantly positive association with time to hospital (r= 0.141, p = 0.030), but emotional illness perceptions could not collectively predict time to hospital among Thai people with colorectal cancer. Therefore, the findings supported this hypothesis of the study.

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The relationship between emotional illness perception and time to hospital was similar to previous studies from the literature review indicated that some emotions of emotional illness perceptions were associated with a longer time to hospital. Such as fear, worry about symptoms, embarrassment about their symptoms or colorectal cancer examination, anxiety or depression may interact with decision making to visit a physician, leading to longer time to hospital among people with colorectal cancer (Cockburn et al., 2003; Courtney et al., 2012a; Vega et al., 2015). These emotional

illness perceptions were affected by the perception of colorectal cancer-related symptoms and related to the decision-making of people with colorectal cancer to visit a physician that would increase time to the hospital.

Based on Dracup's framework, it would be explained that emotional illness perception can importantly influence patients' response to their symptoms and decision-making to seek care and treatment. It can occur parallel to, but partially independent of the cognitive process of coping with health threats (Dracup et al., 2006). When individuals identify the symptoms as a health threat, it might extract the feeling of fear, the consequence of seeking help, concerning about troubling others/worry and being embarrassed embossment, worry, or upset. These emotions were factors that increased time to hospital. However, coping with the fear of emotional reactions to the health threat may proceed independently. For that, these emotions would be disappeared in order to deal more effectively with the probability of cancer and will deal with the fear by talking about the health threat or symptoms with friends or family. Thus, they may not delay to seeking treatments by visiting a physician (Dracup et al., 1995; Dracup et al., 2003; Dracup et al., 2006; Leventhal & Cameron, 1987)

However, the emotional representations related to colorectal cancer-related symptoms in the current study could not be collectively predicted with time to hospital among the study participants. It can be explained that the study participants might have had a negative emotional illness perception to response to CRC-related symptoms with a mean score of 13.40 (SD=4.18) or around half from the total score of emotional illness perception (Table 4.12). It meant that those participants perceived emotions such as depression, got upset, angry, anxious, and fear that affected by the CRC-related

symptoms at a moderate level. They may be able to deal with these emotions. and seek medical attention since symptom onset. Similar to Jensen et al. (2016) explained that emotions such as fear, worry, and anxiety can be motivating and hampering factors for healthcare seeking. Therefore, patients with colorectal cancer may have reacted differently to the emotions caused by their symptoms in different coping strategies. For example, it may have led some patients to seek medical attention quickly while others wait and observe symptoms.

Therefore, it could be summary based on Dracup's framework that although the emotional illness perception was not collaborative predict time to the hospital, it was associated with a longer time to hospital among Thai people with colorectal cancer. Emotional illness perception would be motivating people with colorectal cancer of healthcare seeking behavior such as self-mediating, wait and observe, emotional and problem-focused coping and so on that lead to a longer time to hospital eventually.

Hypothesis 4. Healthcare seeking behavior had positive association with time to hospital among Thai people with colorectal cancer

The current study found that healthcare seeking behavior had an effect on time to hospital, especially the self-medicating dimension, which had a positive effect on time to hospital (B= 0.149, p = 0.017), and could collectively with other factors to predict time to hospital among Thai people with colorectal cancer. It meant that Thai people who remedy their symptoms using an over-the-counter medicine (OTC), e.g., antacid, laxative, or stomach pain reliever) bought medicine without the prescription and bought products or supplements to control symptoms. There was association with

a longer time to hospital when the patient experienced symptoms. Therefore, the findings supported the hypothesis of the study.

The current findings were congruent with the previous studies conducted in Asia peoples such as Malaysian people who experience colorectal cancer-related symptoms. The findings demonstrated that those people who self-treated themselves using self-medicating without medical prescription, traditional healers, healing water, or homeopathy. They were significantly more likely to increase time to hospital to present their symptom to a physician around five times (OR =5.0, 95% CI, 1.0-24.1) (Hashim et al., 2010). Likewise, the qualitative study conducted by Hall et al. (2015) revealed that people with colorectal cancer seeking healthcare behaviors by self-medicating, seeking advice/ reassurance from family members, or friends, were more likely to have a long time to hospital to present their symptoms to a healthcare provider. In common with the previous study, qualitative findings by Dobson et al. (2018) revealed that people with colorectal cancer who did not initially perceive symptoms as warning signs and symptoms, or appraisal symptoms as not serious, will be engaged in a variety of responses to symptoms, such as self-medicating, the consumption of other one' medication, dietary change, lifestyle adjustments. These healthcare seeking behaviors contribute to increasing time to colorectal diagnosis. Other findings supported that people with colorectal cancer performed healthcare seeking behavior by visiting a physician and do not waiting for symptom clear up were associated with a shorter time to diagnosis ($p < 0.01$) (Esteva et al., 2013).

As expected, healthcare seeking behavior was a significant contributor associated with time to hospital in Thai people with colorectal cancer. According to Dracup's framework, it could be explained that healthcare-seeking behavior was action-

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driven by an individual in response to a stimulus. It was also actions or behavior to seek treatment for coping with problems and emotions. Based on Dracup's framework, people with colorectal cancer who identify the symptoms as serious may decide to visit a physician or arrive at a hospital early. While those who believed that the symptoms to be common gastrointestinal diseases, not related to cancer. They may react to symptoms in seeking remedies such as self-medicating, taking an antacid, waiting for relief, reducing activities, or consulting family members and friends. These healthcare-seeking behaviors significantly increased time to hospital eventually (Dracup et al., 1995; Dracup et al., 2006; Leventhal & Cameron, 1987).

To date, there was no study reporting such findings of healthcare seeking behavior and time to hospital among people with colorectal cancer in Thailand. The current study can confirm that time to hospital, starting from symptoms onset to first presentation a physician in people with colorectal cancer would depend on healthcare-seeking behavior. Thus, the intervention to reduce healthcare seeking behavior, especially self-medicating among this population was recommended.

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Hypothesis 5. Perceived the seriousness of warning signs and symptoms had a negative association with time to hospital among Thai people with colorectal cancer.

The study found that perceived seriousness of warning signs and symptoms had negative association with time to hospital (r= -0.086, p=0.186), but they could not collectively predict time to hospital among Thai people with colorectal cancer. Therefore, the finding was supported the hypothesis of the study. The current results were similar to the previous findings found that people with colorectal cancer who perceived seriousness of warning signs and symptoms were significantly associated

with increase time to hospital (Courtney et al., 2012b; Esteva et al., 2013; Leiva et al., 2017).

It can be explained based on Dracup et al. (2006) that individuals who perceived their symptoms as serious would promptly seek appropriate medical attention by visiting a physician for diagnosis and treatment. Thereby, time to hospital or visiting a physician would be decrease. Meanwhile, an individual who appraised symptom were not serious, they would be delay treatment, and seek care using the coping strategy that was ineffective. After they perceived that there was not enough process or unsuccessful in solutions, they were reassessed, changed, or may try other coping. Finally, time to first visit a hospital would be increased.

However, the current study's findings showed that perceived seriousness of warning signs and symptoms could not joint to predict time to hospital among Thai people with colorectal cancer. It might because the study participants perceived that most of the warning signs and symptoms were moderately serious, such as dark or back stools, a change in bowel habits, e.g., the shape of the stool smaller or more narrow than usual, bloating up, fullness, or gas in the stomach, decreased appetite, accounting for 30.42% - 33.75%. Importantly, chronic constipation or diarrhea was the most perceived as mild seriousness at 29.58% (see Appendix J). These circumstances lead to increase time to hospital compared to those who perceived the seriousness of their symptoms (Vega et al., 2015). Similarly, Dracup et al. (1995) have mentioned that slowly progressing symptoms or non-specific symptoms contribute increasing of time to hospital. Congruently, Walter et al. (2016) highlighted patients with colorectal cancer having less specific CRC- related symptoms, such as indigestion, general abdominal pain, weakness, and change in bowel habit, were associated with a longer time to

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hospital. Since they thought that those symptoms were not serious. Particularly, change in bowel habit was reported as a symptom related to the most prolonged time to diagnosis compared to other symptoms.

Implications of the current findings

In summary, this study was first time used the theoretical of Dracup's framework to select the concept, explain the phenomenon of time to hospital, and predict factors among people with colorectal cancer. In addition, it was first time used as the theoretical underpinning to gather empirical data to conduct predicting factors for time to hospital using cognitive factors (knowledge about colorectal cancer, cognitive illness perception, emotional illness perception, perceived seriousness of warning signs and symptoms), and behavioral factors (healthcare seeking behavior), and among people with colorectal cancer.

These current findings can contribute knowledge and support that Dracup's framework and empirical evidence of cognitive factors and behavioral factors were associated with time to hospital among people with colorectal cancer. The major factors that could collectively predict time to hospital were knowledge about colorectal cancer, especially colorectal cancer screening method, cognitive illness perception, including consequence sub-scale and timeline cyclical sub-scale, and healthcare seeking behavior including self-medicating dimension.

The findings of this study could be added to the literature by providing information on factors that influence time to hospital derived from the whole construct of Dracup's framework. Moreover, study findings may improve the understanding of specific barriers to and facilitators of time to hospital, which was critical to the

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development of interventions to reduce time to hospital (starting from symptoms onset to first visit a physician in the hospital), that may lead to increase survival of colorectal cancer, and to increase the chance of early diagnosis. Since colorectal cancer was preventable and treatable when diagnosed at an early stage. Early diagnosis of colorectal cancer may lead to an overall decreased cost of treating the disease, with the cost increasing as the stage of diagnosis advances.

1. Implications for nursing and practice

Reducing time to hospital among people with colorectal cancer was a challenge for nursing roles. Since it could decrease the mortality rate and increase the opportunity for early diagnosis, the survival of people with colorectal cancer would increase. Understanding factors predicting time to hospital could be helpful for nurses who work in clinical settings or community nurses to develop and test interventions directed toward reducing the time interval that patients take to decide to seek care and treatment, especially time to hospital.

The current findings highlighted time to hospital among people with colorectal cancer was influenced by the colorectal cancer screening method, consequence sub-scale, timeline cyclical sub-scale, and self-medicating of healthcare-seeking behavior. Concerning findings, several practical implementations for nursing practice can be proposed as follows.

In the current study, knowledge about colorectal cancer, especially colorectal cancer screening methods, was found to reduce time to hospital. The results showed that higher knowledge about colorectal cancer screening could decrease time to hospital among people with colorectal cancer to be shorter. Therefore, intervention or education

program to promote colorectal cancer screening was necessary. Enhancement campaign or productive campaign for Thai people to recognize the significance of warning signs and symptoms of colorectal cancer, promote early colorectal cancer diagnosis by screening method. Raising awareness not only people with average risks of colorectal cancer but also should enhance people with a high risk to be aware of colorectal cancer and early visit a physician since noticed the first symptom and early screening.

In addition, cognitive illness perceptions influence on time to hospital. People with less perception of negative consequences of colorectal cancer-related symptoms and illness and strong belief in natural cyclical of symptoms could increase time to hospital to be longer. Therefore, encouraging those people to have a positive perception of their illness. For instance, promoting understanding of the negative consequence of symptoms such as burden to a family member, worse physical, and financial burden finally. Given an understanding of the cyclical nature of the symptoms that it would not be stable. Thus, they should not wait until the symptoms were severe.

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Importantly, healthcare seeking behavior, especially self-medicating, influenced the increase of time to hospital among people with colorectal cancer. Therefore, nurses and healthcare providers can use the findings to set proactive campaigns to adjust or modify healthcare seeking behavior into early visit a physician and reducing self-medicating when experiencing colorectal cancer-related symptoms, such as buying medicine without a prescription, using over-the courter-medicine (OTC), using health product and supplements or traditional medicine to relieve

symptoms. Also, nurses in a clinical setting can explain the drawback of using self-medicating before visiting a physician.

2. Implications for nursing education

Colorectal cancer was preventable and treatable when diagnosed at an early stage, and the longer time to hospital, the more disease-poor prognosis eventually. The current findings provided comprehensive information on predictors of time to hospital among people with colorectal cancer. Therefore, nursing education areas can use the findings to emphasize the significance of warning signs and symptoms and risk criteria of persons at risk of colorectal cancer and promote patients did not use self-medicating in adult nursing and community nursing lesson.

3. Implications for nursing research

The current study was the first study to investigate the influencing of cognitive factors (knowledge about colorectal cancer, cognitive illness perception, emotional illness perception), and behavior factors (healthcare seeking behavior) among people with colorectal cancer. The current study's findings can serve as evidence to researchers who would like to develop an intervention to improve knowledge about colorectal cancer, improve illness perception such as given knowledge or reduce negative emotions and enhance positive cognitive illness of colorectal cancer. Moreover, the findings could be useful for developing an intervention to change attitudes of using self-medicating when symptoms occur in people with colorectal cancer.

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4. Implications for healthcare policy

Policymakers have the power to introduce change and have experience of what was feasible and justifiable to implement. The current study's findings may be useful for policymakers to enhance recognition of the characteristic of warning signs and symptoms of colorectal cancer, colorectal cancer screening method, and early detection.

The current findings highlighted that knowledge about colorectal cancer screening, cognitive factors, including consequence and timeline cyclical, and behavior factors, such as self-medicating, influenced time to hospital among Thai people with colorectal cancer. Therefore, mass media campaigns, messages, or proactive campaigns for Thai people to recognize the significance of warning signs and symptoms of colorectal cancer and early presentation symptoms to a physician were needed. Furthermore, increasing sufficient health facilities for colorectal cancer screening, particularly for supporting people with average risk and high risk of colorectal cancer, should be considered by policymakers. Also, they can use the findings to minimize specific barriers to access healthcare facilities for Thai people, improve referral pathways for people suspected of colorectal cancer to a specialist physician, and plan to encourage an adequate number of specialist physicians in primary hospitals.

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Moreover, it should enhance campaigns to support persons with average risk and a high risk of colorectal cancer to early colorectal cancer screening. Reducing using healthcare seeking behavior such as self-medicating, emotional-focused coping, and problem-focused coping, and promote early visiting a physician. Therefore, modifying these factors can reduce time to hospital, and it would eventually improve survival rates among people with colorectal cancer.

Limitation of the study

Overall, the current study involved a rigorous methodology using probability sampling to recruit the study participants (multistage sampling and systematic random sampling) and had adequate power of sample to detect a significant difference of the findings. However, some issues should be considered. The discussion of limitations issues related to these findings emphasized study design and generalization of the findings as follows.

This study is a retrospective, cross-sectional study. Thus, the findings can explain the relationship and predicting factors among the study variable, but it could not infer a causal relationship between the study variable. Moreover, measurement time to the hospital was based on memory recalled ability and symptom interpretation of the study participants. The issue of how valid the authors measured time to hospital was limited. The study participant was asked to think back since the first symptom onset and the first date they presented to a physician. Therefore, it may not be exactly an accurate time.

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Moreover, several questionnaires need to recall answers, which may interfere with the correct answer. However, time to hospital in this study was varied, which could be affected by several factors such as cultures and memory recall ability. Moreover, the symptoms characteristics among colorectal cancer might be different from other adults' cancer patients. Thus, the time to hospital among people with colorectal cancer could differ from other cancer populations.

Recommendation for future research

1. This study was conducted in patients with colorectal cancer using a retrospective, cross-sectional design in three regions of Thailand. Therefore, a larger sample size among people with colorectal cancer in all geographic regions of Thailand should be conducted. Study time to hospital among persons at risk of colorectal cancer should be conducted. Moreover, future studies should examine time to the hospital, starting from symptom onset to the first presentation in other cancers, and comparted time to hospital between different cancer patients across all regions.

2. Further study should develop interventions such as an education program to increase positive cognitive illness perception and reduce emotional illness perception or establish a program to enhance screening for patients with colorectal cancer to reduce time to hospital and improve early diagnosis among people with colorectal cancer.

3. The current study focused on time to hospital among people with colorectal cancer. However, the examination time interval in all colorectal cancer diagnosis pathways should be considered. The information could support health campaigns for early diagnosis among Thai people with colorectal cancer.

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4. In this study, all variables were derived by substruction from Dacrup's framework constructs. Therefore, a repeated correlational study should be tested using other factors or other theories or frameworks, and path analysis to test direction and indirection between selected factors, time to hospital, and colorectal cancer diagnosis should be considered.

5. The study of factors affecting colorectal cancer diagnosis under the time frame to diagnosis, starting first symptoms onset to the first pathology confirmed colorectal cancer diagnosis, using Cox- regression should be conducted.

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CHULALONGKORN UNIVERSITY

REFERENCES

Abraham, O., Pu, J., Schleiden, L. J., & Albert, S. M. (2017). Factors contributing to poor satisfaction with sleep and healthcare seeking behavior in older adults. *Sleep Health*, *3*(1), 43-48. https://doi.org/10.1016/j.sleh.2016.11.004

Abuzerr, S., Nasseri, S., Yunesian, M., Hadi, M., Mahvi, A. H., Nabizadeh, R., & Mustafa, A. A. (2019). Prevalence of diarrheal illness and healthcare-seeking behavior by age-group and sex among the population of Gaza strip: a community-based cross-sectional study. *BMC Public Health*, *19*(1), 704-704. https://doi.org/10.1186/S12889-019-7070-0

Adelstein, B.-A., Macaskill, P., Turner, R. M., & Irwig, L. (2012). Patients who take their symptoms less seriously are more likely to have colorectal cancer. *BMC gastroenterology*, *12*(1), 1-9.

Alatise, O. I., Fischer, S. E., Ayandipo, O. O., Omisore, A. G., Olatoke, S. A., & Kingham, T. P. (2017). Health-seeking behavior and barriers to care in patients with rectal bleeding in Nigeria. *Journal of Global Oncology*, *3*(6), 749-756. https:// doi:10.1200/jgo.2016.006601

American Cancer Society [ACS]. (2017). *Colorectal Cancer Facts & Figure 2017-2019*. https;//www.cancer.org/content/dam/cancer org/research/cancer-facts-and-statistics/colorectal-cancer-facts-and-figures/colorectal-cancer-facts-and-figures-2017-2019 pdf

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

American Cancer Society [ACS]. (2019a). *What is Colorectal Cancer*? https://www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html

American Cancer Society [ACS]. (2019b). *Colorectal Cancer*. https://www.cancer.org/cancer/colon-rectal-cancer.html

American Cancer Society [ACS]. (2020). *Colorectal Cancer: Facts & Figures 2020-2022*. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/colorectal-cancer-facts-and-figures/colorectal-cancer-facts-and-figures-2020-2022.pdf

American Society of Clinical Oncology [ASCO]. (2021). Colorectal Cancer: Risk Factors and Prevention. https://www.cancer.net/cancer-types/colorectal-cancer/risk-factors-and-prevention.

Andarini, S., Arif, A. Z., Al Rasyid, H., Wahono, C. S., Kalim, H., & Handono, K. (2019). Factors associated with health care seeking behavior for musculoskeletal pain in Indonesia: A cross-sectional study. *International Journal of Rheumatic Diseases*. https://doi.org/10.1111/1756-185X.13536

Anderson, J. C. (2011). Risk factors and screening for colorectal cancer. In Anderson, J.C. & Kahi, C. J. (Eds.), *Colorectal Cancer Screening, Clinical Gastroenterology* (pp. 7-23). Springer Science+Business Media. https://www.researchgate.net

Andersen, V., Halfvarson, J., & Vogel, U. (2012). Colorectal cancer in patients with inflammatory bowel disease: Can we predict risk? World Journal of Gastroenterology: WJG, 18(31), 4091. https://doi:10.3748/wjg.v18.i31.4091

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Araghi, M., Soerjomataram, I., Jenkins, M., Brierley, J., Morris, E., Bray, F., & Arnold, M. (2019). Global trends in colorectal cancer mortality: projections to the year 2035. *International Journal of Cancer*, *144*(12), 2992-3000. https://doi:10.1002/ijc.32055

Arnold, M., Sierra, M. S., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2017). Global patterns and trends in colorectal cancer incidence and mortality. *Gut*, *66*(4), 683-691. https://doi:10.1136/gutjnl-2015-310912

Barnett, K. N., Weller, D., Smith, S., Orbell, S., Vedsted, P., Steele, R. J. C., Melia, J. W., Moss, S. M., Patnick, J., & Campbell, C. (2017). Understanding of a negative bowel screening result and potential impact on future symptom appraisal and help-seeking behaviour: A focus group study. *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy*, *20*(4), 584-592. https://doi:10.1111/hex.12484

Boonpipatpong, T. (2014). Overall, of colorectal cancer and caring. In T. Boonpipatpong, Wannawong, S (Ed.), *In State- of- the -art : strand of care for colorectal cancer* (pp. 1-52). Chanmeung Publishing (In Thai).

Boonsung, K., Kimpee, S., Danaidutsadeekul, S., & Boonnuch, W. (2010). Factors predicting treatment seeking behavior of colorectal cancer patients. *Journal of Nurse Science*, *28* (4), 37-45 (In Thai). https://ns.mahidol.ac.th/english/journal_NS/pdf/vol28/suppl1/Kanokwan.pdf

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Bray, F., Ferlay, J., Soerjomataram, I., Siegel, R. L., Torre, L. A., & Jemal, A. (2018). Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians, 68*(6), 394-424. https://doi:10.3322/caac.21492

Bureau of Strategy and Planning Division: Ministry of Public Health. (2019). *Public Health Statistics A.D.2019*. Ministry of Public Health, Thailand. https://bps.moph.go.th/new_bps/sites/default/files/statistic62.pdf.

Center, M. M., Jemal, A., Smith, R. A., & Ward, E. (2009). Worldwide variations in colorectal cancer. *CA: a cancer journal for clinicians, 59*(6), 366-378.

Catalogue of Bias Collaboration, Bankhead C, Aronson JK, Nunan D. (2021). *Attrition bias*. In: Catalogue of Bias 2017. https://catalogofbias.org/biases/attrition-bias/

Cersosimo, R. J. (2013). Management of advanced colorectal cancer, Part 2. *American Journal of Health-System Pharmacy* (6), 491. https://doi:10.2146/ajhp110532.p2

Chan, J., Linden, K., McGrath, C., Renaud, J., Doering, P., MacDonald, S., Gaudet, M., Pantarotto, J., Asmis, T., & Slotman, B. (2020). Time to diagnosis and treatment with palliative radiotherapy among inuit patients with cancer from the arctic territory of Nunavut, Canada. *Clinical Oncology, 32*(1), 60-67. https://doi.org/10.1016/j.clon.2019.07.001

Chen, A. T. (2015). Information use and illness representations: Understanding their connection in illness coping [Article]. *Journal of the Association for Information Science & Technology, 66*(2), 340-353. https://doi.org/10.1002/asi.23173

Cho, S., Shin, A., Park, S. K., Shin, H.-R., Chang, S.-H., & Yoo, K.-Y. (2015). Alcohol drinking, cigarette smoking and risk of colorectal cancer in the Korean multi-center cancer cohort. *Journal of Cancer Prevention, 20*(2), 147-152. https://doi:10.15430/jcp.2015.20.2.147

Chonburi Cancer Hospital. (2019). *Hospital -based cancer registry 2019 (Volume XI - XX).* Digital Medical Division, Chonburi cancer hospital, Thailand.

Chotipanich, A., Sooksrisawat, C., & Jittiworapan, B. (2019). Association between complementary and alternative medicine use and prolonged time to conventional treatment among Thai cancer patients in a tertiary-care hospital. *Peer J, 7*, e7159. https://doi.org/10.7717/peerj.7159

Cockburn, J., Paul, C., Tzelepis, F., McElduff, P., & Byles, J. (2003). Delay in seeking advice for symptoms that potentially indicate bowel cancer. *American Journal of Health Behavior, 27*(4), 401-407. https://doi.org/10.5993/AJHB.27.4.12

Courtney, R. J., Paul, C. L., Sanson-Fisher, R. W., Attia, J., McEvoy, M., & Macrae, F. (2012a). Current state of medical-advice-seeking behavior for symptoms of colorectal cancer: determinants of failure and delay in medical consultation. *Colorectal Disease, 14*(5), e222-e229. https://doi.org/10.1111/j.1463-1318.2012.02881.x

Courtney, R. J., Paul, C. L., Sanson-Fisher, R. W., Macrae, F. A., Attia, J., & McEvoy, M. (2012b). Factors associated with consultation behavior for primary symptoms potentially indicating colorectal cancer: a cross-sectional study on response to symptoms. *BMC gastroenterology, 12*(1), 100-108. https://doi.org/10.1186/1471-230X-12-100

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

De Gruyter, E., Saunders, C., Stavreski, B., & Jennings, G. (2019). Impact of reducing pre-hospital delay in response to heart attack symptoms in Australia. *Heart, Lung and Circulation, 28*(8), 1154-1160. https://doi:10.1016/j.hlc.2018.07.018

De Nooijer, J., Lechner, L., & De Vries, H. (2001). Help-seeking behaviour for cancer symptoms: perceptions of patients and general practitioners. *Psycho-Oncology, 10*(6), 469. https://doi:10.1002/pon.535

DeVellis, R. F. (2017). Scale development (4th ed.). SAGE Publications, Inc.

Diefenbach, M. A., & Leventhal, H. (1996). The common-sense model of illness representation: Theoretical and practical considerations. *Journal of Social Distress the Homeless, 5*(1), 11-38. https://doi.org/10.1007/BF02090456

Dobson, C. M., Russell, A. J., & Rubin, G. P. (2014). Patient delay in cancer diagnosis: what do we really mean and can we be more specific? *BMC Health Services Research, 14*(1), 1-6. https://doi.org/10.1186/1472-6963-14-387

Dobson, C., Russell, A., Brown, S., & Rubin, G. (2018). The role of social context in symptom appraisal and help-seeking among people with lung or colorectal symptoms: A qualitative interview study. *European Journal of Cancer Care, 27*(2), e12815. https://doi.org/10.1111/ecc.12815

Dracup, K., & Moser, D. K. (1997). Beyond sociodemographic: factors influencing the decision to seek treatment for symptoms of acute myocardial infarction. *Heart Lung, 26*(4), 253-262. https://doi.org/10.1016/S0147-9563(97)90082-0

Dracup, K., McKinley, S., Riegel, B., Mieschke, H., Doering, L. V., & Moser, D. K. (2006). A nursing intervention to reduce prehospital delay in acute coronary

syndrome: a randomized clinical trial. *Journal of Cardiovascular Nursing, 21*(3), 186-193. https://doi. 10.1097/00005082-200605000-00006

Dracup, K., McKinley, S., Riegel, B., Moser, D. K., Meischke, H., Doering, L. V., Davidson, P., Paul, S. M., Baker, H., & Pelter, M. (2009). A randomized clinical trial to reduce patient prehospital delay to treatment in acute coronary syndrome. *Circulation: Cardiovascular Quality Outcomes*, *2*(6), 524-532. https://doi: 10.1161/CIRCOUTCOMES.109.852608

Dracup, K., Moser, D. K., Eisenberg, M., Meischke, H., Alonzo, A. A., & Braslow, A. (1995). Causes of delay in seeking treatment for heart attack symptoms. *Social Science & Medicine, 40*(3), 379-392. https://doi.org/10.1016/0277-9536(94)00278-2

Dracup, K., Moser, D. K., McKinley, S., Ball, C., Yamasaki, K., Kim, C.-J., Doering, L. V., & Caldwell, M. A. (2003). An international perspective on the time to treatment for acute myocardial infarction. *Journal of Nursing Scholarship, 35*(4), 317-323. https://doi.org/10.1111/j.1547-5069.2003.00317.x

Drew, D. A., Nishihara, R., Lochhead, P., Kuchiba, A., Qian, Z. R., Mima, K., Nosho, K., Wu, K., Wang, M., & Giovannucci, E. (2017). A prospective study of smoking and risk of synchronous colorectal cancers. *The American Journal of Gastroenterology, 112*(3), 493. https://doi:10.1038/ajg.2016.589.

Du, Y. (2017). PET/CT in Colorectal Cancer. In Y. Du (Ed.), *Clinicians' Guides to Radionuclide Hybrid Imaging* (pp. 49-55). Springer International Publishing. https:// dx.doi.org/10.1007/978-3-319-54837-1

Du, Y., & Tudyka, V. (2017). Introduction of Colorectal Cancer. In Y. Du (Ed.), *Clinicians' Guides to Radionuclide Hybrid Imaging · PET/CT* (pp. 1-7). Springer International Publishing. https:// doi.org/10.1007/978-3-319-54837-1

Office of educational assessment, University of Washington (2021, July 21). *Understanding item analysis.* https://www.washington.edu/assessment/scanning-scoring/scoring/reports/ item-analysis/

Emery, J. D., Walter, F. M., Gray, V., Sinclair, C., Howting, D., Bulsara, M., Bulsara, C., Webster, A., Auret, K., & Saunders, C. (2013). Diagnosing cancer in the bush: a mixed-methods study of symptom appraisal and help-seeking behaviour in people with cancer from rural Western Australia. *Family Practice, 30*(3), 294-301. https://doi.org/10.1093/fampra/cms08

Eslick, G. D., Kalantar, J. S., & Talley, N. J. (2009). Rectal bleeding: Epidemiology, associated risk factors, and health care seeking behaviour: A population-based study. *Colorectal disease, 11*(9), 921-926. https://doi.org/10.1111/j.1463-1318.2008.01721.x

Esteva, M., Leiva, A., Ramos, M., Pita-Fernández, S., González-Luján, L., Casamitjana, M., Sánchez, M. A., Pértega-Díaz, S., Ruiz, A., Gonzalez-Santamaría, P., Martín-Rabadán, M., Costa-Alcaraz, A. M., Espí, A., Macià, F., Segura, J. M., Lafita, S., Arnal-Monreal, F., Amengual, I., Boscá-Watts, M. M., Hospital, A., Manzano, H., & Magallón, R. (2013). Factors related with symptom duration until diagnosis and

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

treatment of symptomatic colorectal cancer. *BMC Cancer, 13*(1), 87. https://doi:10.1186/1471-2407-13-87

Favoriti, P., Carbone, G., Greco, M., Pirozzi, F., Pirozzi, R. E. M., & Corcione, F. (2016). Worldwide burden of colorectal cancer: a review. *Updates in Surgery, 68*(1), 7-11. https:// doi:10.1007/s13304-016-0359-y

Fisher, D. A., Zullig, L. L., Grambow, S. C., Abbott, D. H., Sandler, R. S., Fletcher, R. H., El-Serag, H. B., & Provenzale, D. (2010). Determinants of medical system delay in the diagnosis of colorectal cancer within the Veteran Affairs Health System. *Digestive Diseases and Sciences, 55*(5), 1434-1441. https://doi:10.1007/S10620-010-1174-9

Fortenberry, J. D. (1997). Health care seeking behaviors related to sexually transmitted diseases among adolescents. *American Journal of Public Health, 87*(3), 417-420.

Gandomani, H. S., Aghajani, M., Mohammadian-Hafshejani, A., Tarazoj, A. A., Pouyesh, V., & Salehiniya, H. (2017). Colorectal cancer in the world: incidence, mortality and risk factors. *Biomedical Research and Therapy, 4*(10), 1656-1675. https://doi.org/10.15419/bmrat.v4i10.372

Gani, F., Cerullo, M., Canner, J. K., Conca-Cheng, A., Harzman, A. E., Husain, S. G., Cirocco, W. C., Arnold, M. W., Traugott, A., Johnston, F. M., & Pawlik, T. M. (2017). Defining payments associated with the treatment of colorectal cancer. *Journal of Surgical Research, 220*, 284-292. https://doi.org/10.1016/j.jss.2017.07.021

Gigliotti, J., Madathil, S., & Makhoul, N. (2019). Delays in oral cavity cancer. *International Journal of Oral and Maxillofacial Surgery, 48*(9), 1131-1137. https://doi:10.1016/j.ijom.2019.02.015

Gillian, M. J., Phillips, M. M., Smith, D. E., Cornell, C. E., & Bittner, V. (1999). Health care-seeking behavior. In Raczynski J. M. & DicClemente R. J. (6th Ed.), *Handbook of health promotion and disease prevention* (pp. 95-122). Plenum.

Gribovskaja-Rupp, I., Kosinski, L., & Ludwig, K. A. (2011). Obesity and colorectal cancer. *Clinics in Colon and Rectal Surgery, 24*(04, 229-243.https://doi: 10.1055/s-0031-1295686

Hafström, L., Johansson, H., & Ahlberg, J. (2012). Does diagnostic delay of colorectal cancer result in malpractice claims? A retrospective analysis of the Swedish board of malpractice from 1995-2008. *Patient Safety in Surgery, 6*(1), 13-18. https:// doi:10.1186/1754-9493-6-13

Haggar, F. A., & Boushey, R. P. (2009). Colorectal cancer epidemiology: Incidence, mortality, survival, and risk factors. *Clinics in Colon and Rectal Surgery, 22*(04), 191-197. https://doi: 10.1055/s-0029-1242458

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2014). *Multivariate data analysis* (7th ed.). Pearson.

Hall, N., Birt, L., Banks, J., Emery, J., Mills, K., Johnson, M., Rubin, G. P., Hamilton, W., & Walter, F. M. (2015). Symptom appraisal and healthcare-seeking for symptoms suggestive of colorectal cancer: a qualitative study. *BMJ Open, 5*(10), e008448-e008448. https:// doi:10.1136/bmjopen-2015-008448

Hansen, P. L., Hjertholm, P., & Vedsted, P. (2015). Increased diagnostic activity in general practice during the year preceding colorectal cancer diagnosis. *International Journal of Cancer*, 137(3), 615-624. https://doi:10.1002/ijc.29418

Hansen, R. P., Vedsted, P., Sokolowski, I., Søndergaard, J., & Olesen, F. (2011). Time intervals from first symptom to treatment of cancer: a cohort study of 2,212 newly diagnosed cancer patients. *BMC Health Services Research, 11*(1), 1-8. https:// doi:10.1186/1472-6963-11-284

Hashim, S. M., Fah, T. S., Omar, K., Radzniwan, M., Rashid, A., Shah, S. A., & Sagap, I. (2011). Knowledge of colorectal cancer among patients presenting with rectal bleeding and its association with delay in seeking medical advice. *Asian Pacific Journal of Cancer Prevention, 12*(8), 2007-2011.

Hashim, S. M., Omar, K., Fah, T. S., Rashid, R. A., Daud, T. I., Shah, S. A., & Sagap, I. (2010). Factors influencing late consultation among patients with rectal bleeding in University Kebangsaan Malaysia Medical Centre. *Asian Pacific Journal of Cancer Prevention, 11*(5), 1335-1339. http://journal.waocp.org/article_25374_46281437c2e589aacffb360401ff087d.pdf

Helsper, C. C., van Erp, N. N., Peeters, P. P., & de Wit, N. N. (2017). Time to diagnosis and treatment for cancer patients in the Netherlands: room for improvement? *European Journal of Cancer, 87*, 113-121. https://doi:10.1016/j.ejca.2017.10.003

Hertz, J. T., Madut, D. B., William, G., Maro, V. P., Crump, J. A., & Rubach, M. P. (2019). Perceptions of stroke and associated health-care-seeking behavior in Northern Tanzania: a community-based study. Neuroepidemiology, 1-7. https://doi.org/10.1159/000499069

Hidayat, K., Yang, C. M., & Shi, B. M. (2018). Body fatness at an early age and risk of colorectal cancer. *International Journal of Cancer*, *142*(4), 729-740. https://doi.org/10.1002/ijc.31100

Hughes, L. A., Simons, C. C., van den Brandt, P. A., van Engeland, M., & Weijenberg, M. P. (2017). Lifestyle, diet, and colorectal cancer risk according to (epi) genetic instability: current evidence and future directions of molecular pathological epidemiology. *Current Colorectal Cancer Reports*, *13*(6), 455-469. https://doi.org/10.1007/S11888-017-0395-0

Hvidberg, L., Jensen, L. F., Pedersen, A. F., Aro, A. R., & Vedsted, P. (2014). Measurement properties of the Danish version of the Illness Perception Questionnaire-Revised for patients with colorectal cancer symptoms. *Journal of Health Psychology*, *19*(10), 1279-1290. https://doi.10.1177/1359105313488978

Hvidberg, L., Wulff, C. N., Pedersen, A. F., & Vedsted, P. (2015). Barriers to healthcare seeking, beliefs about cancer and the role of socio-economic position. A Danish population-based study. *Journal of Preventive Medicine*, *71*, 107-113. https://doi.org/10.1016/j.ypmed.2014.12.007

Irwin, D. E., Milsom, I., Kopp, Z., Abrams, P., & Group, E. S. (2008). Symptom bother and health care–seeking behavior among individuals with overactive bladder.

European Urology, 53(5), 1029-1039. https://doi.org/10.1016/j.eururo.2008.01.027

Islami, F., Goding Sauer, A., Miller, K. D., Siegel, R. L., Fedewa, S. A., Jacobs, E. J., McCullough, M. L., Patel, A. V., Ma, J., & Soerjomataram, I. (2018). Proportion and number of cancer cases and deaths attributable to potentially modifiable risk factors in the United States. *CA: A Cancer Journal for Clinicians*, *68*(1), 31-54. https:// doi:10.3322/caac.21440

Jarbøl, D. E., Rasmussen, S., Svendsen, R. P., Balasubramaniam, K., Haastrup, P. F., Petersen, M. S., Fallah, M., & Elnegaard, S. (2018). Barriers to contacting general practice with alarm symptoms of colorectal cancer: a population-based study. *Family Practice*, *35*(4), 399-405. https://doi.org/10.1093/fampra/cmx117

Jensen, L. F., Hvidberg, L., Pedersen, A. F., Aro, A. R., & Vedsted, P. (2016). Time from first symptom experience to help seeking for colorectal cancer patients: Associations with cognitive and emotional symptom representations. *Patient Education and Counseling*, *99*(5), 807-813. https:// doi: 10.1016/j.pec.2015.11.013

John, S., George, S., Primrose, J., & Fozard, J. (2011). Symptoms and signs in patients with colorectal cancer. *Colorectal Disease*, *13*(1), 17-25. https://doi:10.1111/j.1463-1318.2010.02221.x

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Johnson, C. M., Wei, C., Ensor, J. E., Smolenski, D. J., Amos, C. I., Levin, B., & Berry, D. A. (2013). Meta-analyses of colorectal cancer risk factors. *Cancer Causes & Control*, *24*(6), 1207-1222. https://doi: 10.1007/s10552-013-0201-5 https:// doi:10.1002/ijc.28763

Kaiwan, Y. (2015). *Multivariate statistical analysis for research* (2nd ed.). V print. (In Thai).

Keeble, S., Abel, G. A., Saunders, C. L., McPhail, S., Walter, F. M., Neal, R. D., Rubin, G. P., & Lyratzopoulos, G. (2014). Variation in promptness of presentation among 10,297 patients subsequently diagnosed with one of 18 cancers: evidence from a National Audit of Cancer Diagnosis in Primary Care. *International Journal of Cancer*, *135*(5), 1220-1228.

Khan, R., & Hyman, D. (2010). Hematochezia in the young patient: a review of health-seeking behavior, physician attitudes, and controversies in management. *Digestive Diseases and Sciences*, *55*(2), 233-239. https://doi 10.1007/s10620-009-0750-3

Khine, M. S. (2013). *Application of Structural Equation Modeling in Educational Research and Practice*. Rotterdam, The Netherlands: Sense.

Kimpee, S., Danaidutsadeekul, S., Boonsung, K., & Boonnuch, W. (2013). Factors predicting time before treatment of colorectal cancer patients. *Nursing Science Journal of Thailand*, *31*(2), 16-25. (In Thai). https://he02.tci-thaijo.org/index.php/ns/article/view/26470

Korsgaard, M., Pedersen, L., & Laurberg, S. (2008). Delay of diagnosis and treatment of colorectal cancer-A population-based Danish study. *Cancer Detection and Prevention*, *32*(1), 45-51. https://doi:10.1016/j.cdp.2008.01.001

php/ns/article/view/26470/22480 /ac.2020.01.07

Labianca, R., Nordlinger, B., Beretta, G., Mosconi, S., Mandalà, M., Cervantes, A., Arnold, D., & Group, E. G. W. (2013). Early colon cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. *Annals of Oncology*, *24* (suppl_6), vi64-vi72. https://doi.org/10.1093/annonc/mdt354

Lam Pang cancer hospital. (2020). *Hospital - based cancer registry 2019 (Publication No.39).* Cancer registry. Lam Pang cancer hospital, Thailand. https://www2.lpch.go.th/lpch/uploads/20200615093942001097.pdf

Langenbach, M. R., Sauerland, S., Kröbel, K.-W., & Zirngibl, H. (2010). Why so late?!-delay in treatment of colorectal cancer is socially determined. *Langenbeck's Archives of Surgery*, *395*(8), 1017-1024. https://doi 10.1007/s00423-010-0664-8

Langenbach, M. R., Schmidt, J., Neumann, J., & Zirngibl, H. (2003). Delay in treatment of colorectal cancer: multifactorial problem. *World Journal of Surgery*, *27*(3), 304-308. https://doi.org/10.1007/s00268-002-6678-9

Leiva, A., Esteva, M., Llobera, J., Macià, F., Pita-Fernández, S., González-Luján, L., Sánchez-Calavera, M. A., & Ramos, M. (2017). Time to diagnosis and stage of symptomatic colorectal cancer determined by three different sources of

information: A population based retrospective study. *Cancer Epidemiology, 47*, 48-55. http://dx.doi.org/10.1016/j.canep.2016.10.021

Leventhal, H., & Cameron, L. (1987). Behavioral theories and the problem of compliance. *Patient Education and Counseling, 10*(2), 117-138. https://doi.org/10.1016/0738-3991(87)90093-0

Leventhal, H., Leventhal, E. A., & Breland, J. Y. (2011). Cognitive science speaks to the common-sense of chronic illness management. *Annals of Behavioral Medicine, 41*(2), 152-163. https://doi.org/10.1007/s12160-010-9246-9

Liang, P. S., Chen, T. Y., & Giovannucci, E. (2009). Cigarette smoking and colorectal cancer incidence and mortality: Systematic review and meta-analysis. *International journal of cancer, 124*(10), 2406-2415. https://doi:10.1002/ijc.24191

Lohsiriwat, V., Chaisomboon, N., & Pattana-Arun, J. (2020). Current colorectal cancer in Thailand. *Annals of Coloproctology, 36*(2), 78-82. https://doi: 10.3393/ac.2020.01.07

Macleod, U., Mitchell, E., Burgess, C., Macdonald, S., & Ramirez, A. (2009). Risk factors for delayed presentation and referral of symptomatic cancer: evidence for common cancers. *British Journal of Cancer, 101*(S2), S92-S101. https://doi:10.1038/sj.bjc.6605398

Maringe, C., Walters, S., Rachet, B., Butler, J., Fields, T., Finan, P., Maxwell, R., Nedrebø, B., Påhlman, L., & Sjövall, A. (2013). Stage at diagnosis and colorectal cancer survival in six high-income countries: a population-based study of patients

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

diagnosed during 2000–2007. *Acta Oncologica*, *52*(5), 919-932. https://doi.org/10.3109/0284186X.2013.764008

McLachlan, S., Mansell, G., Sanders, T., Yardley, S., Van Der Windt, D., Brindle, L., Chew-Graham, C., & Little, P. (2015). Symptom perceptions and help-seeking behaviour prior to lung and colorectal cancer diagnoses: a qualitative study. *Family Practice*, *32*(5), 568-577. https://doi.org/10.1093/fampra/cmv048

Mitchell, E., Macdonald, S., Campbell, N. C., Weller, D., & Macleod, U. (2008). Influences on pre-hospital delay in the diagnosis of colorectal cancer: a systematic review. *British Journal of Cancer*, *98*(1), 60-70. https://doi.org/10.1038/sj.bjc.6604096

Moss-Morris, R., Weinman, J., Petrie, K., Horne, R., Cameron, L., & Buick, D. (2002). The Revised Illness Perception Questionnaire (IPQ-R). *Psychology & Health*, *17*(1), 1-16. https://doi.org/10.1080/08870440290001494

Mounce, L. T., Price, S., Valderas, J. M., & Hamilton, W. (2017). Comorbid conditions delay diagnosis of colorectal cancer: a cohort study using electronic primary care records. *British Journal of Cancer*, *116*(12), 1536-1543. https://doi:10.1038/bjc.2017.127

National Cancer Institute, [NCI] (2018a). *Cancer Service Plan 2018-2022*. Department of Medical Services, Ministry of public health. https://www.nci.go.th/th/File_download/filePlan/Template%20นิยามตัวชี้วัด%20Service%20Plan%20สาขามะเร็ง%20ปี61-65.pdf

National Cancer Institute [NCI]. (2018b). *Hospital-Based Cancer Registry 2018*. New Thammada Press (Thailand) Co., Ltd. https://www.nci.go.th/th/File_download/Nci%20Cancer%20Registry/Hospital%20Based_2018.pdf

National Cancer Institute [NCI]. (2019). *Hospital-Based Cancer Registry 2019*. New Thammada Press (Thailand) Co., Ltd. https://www.nci.go.th/th/File_download/Nci%20Cancer%20Registry/Hospital-Based%202019%20NCI.pdf

National Health Service England [NHS] (2018). *Implementing a timed colorectal cancer diagnostic pathway*. https://www.england.nhs.uk/wp-content/uploads/2018/04/implementing-timed-colorectal-cancer-diagnostic-pathway.pdf

Ndarukwa, P., Chimbari, M. J., Sibanda, E. N., Madanhire, T., & practice. (2020). The healthcare seeking behaviour of adult patients with asthma at Chitungwiza Central Hospital, Zimbabwe. *Asthma Research and Practice*, *6*(1), 1-7. https://doi.org/10.1186/S40733-020-00060-y

Neal, R. D., Nafees, S., Pasterfield, D., Hood, K., Hendry, M., Gollins, S., Makin, M., Stuart, N., Turner, J., & Carter, B. (2014). Patient-reported measurement of time to diagnosis in cancer: development of the Cancer Symptom Interval Measure (C-SIM) and randomized controlled trial of method of delivery. *BMC Health Services Research*, *14*(1), 1-10. https://doi.org/10.1186/1472-6963-14-3

Neal, R. D., Tharmanathan, P., France, B., Din, N. U., Cotton, S., Fallon-Ferguson, J., Hamilton, W., Hendry, A., Hendry, M., & Lewis, R. (2015). Is increased time to

diagnosis and treatment in symptomatic cancer associated with poorer outcomes? Systematic review. *British Journal of Cancer, 112*(1), S92-S107. https://doi: 10.1038/bjc.2015.48

Niederreiter, L., Adolph, T. E., & Tilg, H. (2018). Food, microbiome, and colorectal cancer. *Digestive and Liver Disease, 50*(7), 647-652. https://doi:10.1016/j.dld.2018.03.030

Norton, C., & Dibley, L. (2013). Help-seeking for fecal incontinence in people with inflammatory bowel disease. *Journal of Wound Ostomy, 40*(6), 631-638. https:// doi:10.1097/won.0b013e3182a9a8b5

Nunally, J. C., & Bernstein, I. H. (1994). Psychometric theory (2nd ed.). McGraw-Hill.

Pedersen, A. F., Hansen, R. P., & Vedsted, P. (2013). Patient delay in colorectal cancer patients: associations with rectal bleeding and thoughts about cancer. *PLoS ONE, 8*(7), 1-6. https:// doi:10.1371/journal.pone.0069700

Pita-Fernández, S., Pértega-Díaz, S., López-Calviño, B., Seoane-Pillado, T., Gago-García, E., Seijo-Bestilleiro, R., González-Santamaría, P., & Pazos-Sierra, A. (2013). Diagnostic and treatment delay, quality of life and satisfaction with care in colorectal cancer patients: a study protocol. *Health and Quality of Life Outcomes, 11*(1), 1-7. https://doi.org/10.1186/1477-7525-11-117

Phromdeang, P., Danaidutsadeekul, S., Thosingha, O., & Ramart, P. (2013). Factors Related to time to definite diagnosis in bladder cancer patients. *Nursing Science Journal of Thailand*, 31(3), 76-85. https://he02.tci-thaijo.org/index.php/ns/article/view/26065/22098

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Plumb, A. A., & Halligan, S. (2018). Investigating symptoms suggestive of colorectal cancer: Computed tomographic colonography or colonoscopy? In Olsson, L. (Ed.), *Timely Diagnosis of Colorectal Cancer* (pp. 77-92). Springer International Publishing.

Polit, D. F., & Beck, C. T. (2017). *Nursing research: Generating and assessing evidence for nursing practice* (Tenth edition.): Wolters Kluwer Health.

Poum, A., Promthet, S., Duffy, S. W., & Parkin, D. M. (2014). Factors associated with delayed diagnosis of breast cancer in northeast Thailand. *Journal of Epidemiology*, 24(2), 102-108. https://doi.org/10.2188/jea.JE20130090

Pozsgai, E., Busa, C., Fodor, D., Bellyei, S., & Csikos, A. (2019). Wait times to diagnosis and treatment in patients with colorectal cancer in Hungary. *Cancer Epidemiology*, *59*, 244-248. https://doi.org/10.1016/j.canep.2019.02.015

Pruitt, S. L., Harzke, A. J., Davidson, N. O., & Schootman, M. (2013). Do diagnostic and treatment delays for colorectal cancer increase risk of death? *Cancer Causes Control*, *24*(5), 961-977. https:// doi:10.1007/s10552-013-0172-6

Pucciarelli, S., Zorzi, M., Gennaro, N., Gagliardi, G., Restivo, A., Saugo, M., Barina, A., Rugge, M., Zuin, M., & Maretto, I. (2017). In-hospital mortality, 30-day readmission, and length of hospital stay after surgery for primary colorectal cancer: A national population-based study. *European Journal of Surgical Oncology*, *43*(7), 1312-1323. https:// doi:10.1016/j.ejso.2017.03.003

Raje, D., La Touche, S., Mukhtar, H., Oshowo, A., & Ingham Clark, C. (2006). Changing trends in the management of colorectal cancers and its impact on

cancer waiting times. *Colorectal Disease, 8*(2), 140-144. https://doi:10.1111/j.1463-1318.2005.00915.x

Ramos, M., Arranz, M., Taltavull, M., March, S., Cabeza, E., & Esteva, M. (2010). Factors triggering medical consultation for symptoms of colorectal cancer and perceptions surrounding diagnosis. *European Journal of Cancer Care, 19*(2), 192-199. https://doi: 10.1111/j.1365-2354.2008.00998.x

Ramos, M., Montaño, J., Esteva, M., Barceló, A., & Franch, P. (2016). Colorectal cancer survival by stage of cases diagnosed in Mallorca, Spain, between 2006 and 2011 and factors associated with survival. *Cancer Epidemiology, 41*, 63-70. https://doi.org/10.1016/j.canep.2016.01.001

Rasmussen, S., Larsen, P. V., Søndergaard, J., Elnegaard, S., Svendsen, R. P., & Jarbøl, D. E. (2015). Specific and non-specific symptoms of colorectal cancer and contact to general practice. *Family Practice, 32*(4), 387-394. https://doi :10.1093/fampra/cmv032

Rasmussen, S., Søndergaard, J., Larsen, P. V., Balasubramaniam, K., Elnegaard, S., Svendsen, R. P., Andersen, R. S., Pedersen, A. F., Vedsted, P., & Jarbøl, D. E. (2014). The Danish symptom cohort: questionnaire and feasibility in the nationwide study on symptom experience and healthcare-seeking among 100 000 individuals. *International Journal of Family Medicine, 2014*. https://dx.doi.org/10.1155/2014/187280

Rittitit, A., Promthet, S., & Suwanrungruang, K. (2020a). Factors associated with time intervals for diagnosis of colorectal cancer: A hospital-based study in Khon

Kaen, Thailand. *Asian Pacific Journal of Cancer Prevention, 21*(6), 1835. https://doi:10.31557/APJCP.2020.21.6.1835

Rittitit, A., Promthet, S., Suwanrungruang, K., Jenwitheesuk, K., Santong, C., Phimha, S., & Vatanasapt, P. (2020b). The time interval in patients care process of colorectal cancer: A hospital based study in Khon Kaen, Thailand. *Indian Journal of Public Health Research Developmental Psychology, 11*(7), 1114-1119.

Rossi, M., Jahanzaib Anwar, M., Usman, A., Keshavarzian, A., & Bishehsari, F. (2018). Colorectal cancer and alcohol consumption-populations to molecules. *Cancers, 10*(2), 38. https:// doi.org/10.3390/cancers10020038

Rumman, K. A., Sabra, N. A., Bakri, F., Seita, A., & Bassili, A. (2008). Prevalence of tuberculosis suspects and their healthcare-seeking behavior in urban and rural Jordan. *The American Journal of Tropical Medicine Hygiene, 79*(4), 545-551.

Sankaranarayanan, R., Ramadas, K., & Qiao, Y. L. (2014). Managing the changing burden of cancer in Asia. *BMC Medicine, 12*(1). https://doi:10.1186/1741-7015-12-3

Singh, H., Shu, E., Demers, A., Bernstein, C. N., Griffith, J., & Fradette, K. (2012). Trends in time to diagnosis of colon cancer and impact on clinical outcomes. *Canadian Journal of Gastroenterology*, 26(12), 877-880. https://doi.org/10.1155/2012/363242

Songklanagarind hospital. (2020). Hospital -based tumor registry-Songklanagarind hospital annual report (2018). Cancer information cancer, Songklanagarind

hospital, faculty of medicine prince of Songkhla, Thailand. http://medinfo2.psu.ac.th/cancer/data/tumor_registry_2018.pdf

Sperber, A. D., Devellis, R. F., & Boehlecke, B. (1994). Cross-cultural translation: Methodology and validation. *Journal of Cross-Cultural Psychology*, *25*(4), 501-524. https://doi.org/10.1177/0022022194254006

Sperber, A. D. (2004). Translation and validation of study instruments for cross-cultural research. *Gastroenterology*, *126*, S124-S128. https://doi.org/10.1053/j.gastro.2003.10.016

Sreeramareddy, C. T., Panduru, K. V., Menten, J., & Ende, V. d. (2009). Time delays in diagnosis of pulmonary tuberculosis: A systematic review of literature. *BMC Infectious Diseases*, *9*(1), 91. https://doi:10.1186/1471-2334-9-91

Strous, M. T., Janssen-Heijnen, M. L., & Vogelaar, F. J. (2019). Impact of therapeutic delay in colorectal cancer on overall survival and cancer recurrence–is there a safe timeframe for prehabilitation? *European Journal of Surgical Oncology*, *45*(12), 2295-2301. https://doi.org/ 10.1016/j.ejso.2019.07.009

Switzer, G., Wisniewski, S., Belle, S., Dew, M., & Schultz, R. (1999). Selecting, developing, and evaluating research instruments. *Social Psychiatry and Psychiatric Epidemiology*, *34*(8), 399-409. https://doi:10.1007/S001270050161

Teimoorian, F., Ranaei, M., Tilaki, K. H., Shirvani, J. S., & Vosough, Z. (2018). Association of Helicobacter pylori infection with colon cancer and adenomatous polyps. *Iranian journal of pathology*, *13*(3), 325. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6322532/

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Thai Society of Clinical Oncology [TSCO] (2016). *The Thai Cancer Official Website by Thai Society of Clinical Oncology*. http://www.thethaicancer.com/Webpage/Hospital_Hospitallist.html

Tørring, M. L., Frydenberg, M., Hansen, R. P., Olesen, F., & Vedsted, P. (2013). Evidence of increasing mortality with longer diagnostic intervals for five common cancers: A cohort study in primary care. *European Journal of Cancer, 49*(9), 2187-2198. https:// doi:10.1016/j.ejca.2013.01.025

Tørring, M. L., Frydenberg, M., Hansen, R. P., Olesen, F., Hamilton, W., & Vedsted, P. (2011). Time to diagnosis and mortality in colorectal cancer: a cohort study in primary care. *British Journal of Cancer, 104*(6), 934-940. https://doi.org/10.1038/bjc.2011.60

Tørring, M. L., Murchie, P., Hamilton, W., Vedsted, P., Esteva, M., Lautrup, M., Winget, M., & Rubin, G. (2017). Evidence of advanced stage colorectal cancer with longer diagnostic intervals: a pooled analysis of seven primary care cohorts comprising 11,720 patients in five countries. *British Journal of Cancer, 117*(6), 888-897. https:// doi: 10.1038/bjc.2017.236

Unger-Saldaña, K., & Infante-Castañeda, C. B. (2011). Breast cancer delay: A grounded model of help-seeking behaviour. *Social Science & Medicine, 72*(7), 1096-1104. https:// doi:10.1016/j.socscimed.2011.01.022

van der Geest, L. G., Elferink, M. A., Steup, W. H., Witte, A. M., Nortier, J. W., Tollenaar, R. A., & Struikmans, H. (2014). Guidelines-based diagnostic process does increase hospital delay in a cohort of colorectal cancer patients: A population-based study.

European Journal of Cancer Prevention, *23*(5), 344-352. https://doi:10.1097/cej.0000000000000050

van der Velden, A. W., Sessa, A., Altiner, A., Pignatari, A. C. C., & Shephard, A. (2020). Patients with Sore Throat: A survey of self-management and healthcare-seeking behavior in 13 countries worldwide. *Pragmatic Observational Research*, *11*, 91. https:// doi. 10.2147/POR.S255872

Vega, P., Valentin, F., & Cubiella, J. (2015). Colorectal cancer diagnosis: Pitfalls and opportunities. *World Journal of Gastrointestinal Oncology*, *7*(12), 422-433. https:// doi:10.4251/wjgo.v7.i12.422

Walter, F. M., Emery, J. D., Mendonca, S., Hall, N., Morris, H. C., Mills, K., Dobson, C., Bankhead, C., Johnson, M., & Abel, G. A. (2016). Symptoms and patient factors associated with longer time to diagnosis for colorectal cancer: results from a prospective cohort study. *British Journal of Cancer*, *115*(5), 533-541. https://doi.org/10.1038/bjc.2016.221

Walter, V., Jansen, L., Hoffmeister, M., & Brenner, H. (2014). Smoking and survival of colorectal cancer patients: systematic review and meta-analysis. *Annals of Oncology*, *25*(8), 1517-1525. https:// doi:10.1093/annonc/mdu040

Walter, V., Jansen, L., Hoffmeister, M., Ulrich, A., Chang-Claude, J., & Brenner, H. (2015). Smoking and survival of colorectal cancer patients: Population-based study from Germany. *International Journal of Cancer*, *137*(6), 1433-1445. https://doi: 10.1002/ijc.29511

Weinman, J., Petrie, K. J., Moss-Morris, R., Horne, R. J. P., & health. (1996). The illness perception questionnaire: A new method for assessing the cognitive representation of illness. *11*(3), 431-445. https://doi.org/10.1080/08870449608400270

Williams, R., Black, C., Kim, H. Y., Andrews, E., Mangel, A., Buda, J., & Cook, S. (2006). Determinants of healthcare-seeking behaviour among subjects with irritable bowel syndrome. *Alimentary Pharmacology Therapeutics*, *23*(11), 1667-1675. https://doi.org/10.1111/j.1365-2036.2006.02928.x

Wong, M. C., Ding, H., Wang, J., Chan, P. S., & Huang, J. (2019). Prevalence and risk factors of colorectal cancer in Asia. *Intestinal Research*, *17*(3), 317. https:// doi: 10.5217/ir.2019.00021

Xie, L., Huang, S.-F., & Hu, Y.-Z. (2015). Factors influencing pre-hospital patient delay in patients with acute myocardial infarction. *Chinese Nursing Research*, *2*(2-3), 75-79. https:// doi:10.1016/j.cnre.2015.04.002

Young, C. J., Sweeney, J. L., & Hunter, A. (2000). Implications of delayed diagnosis in colorectal cancer. *Australian New Zealand Journal of Surgery*, *70*(9), 635-638. https://doi:10.1046/j.1440-1622.2000.01916.x

Young, J., & Solomon, M. (2018). Standardized Investigation and Referral of Alarm Symptoms for Colorectal Cancer. In L. Olsson (Ed.), *Timely Diagnosis of Colorectal Cancer* (pp. 93-101). Springer International Publishing.

Zhivotovskiy, A. S., Kutikhin, A. G., Azanov, A. Z., Yuzhalin, A. E., Magarill, Y. A., & Brusina, E. B. (2012). Colorectal cancer risk factors among the population of

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South-East Siberia: A case-control study. *Asian Pacific Journal of Cancer Prevention*, *13*(10), 5183-5188. https://doi.org/10.7314/APJCP.2012.13.10.5183.

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CHULALONGKORN UNIVERSITY

APPENDIXES

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

Appendix A
Approval of Dissertation Proposal

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

ประกาศ

(Announcement)

คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

(Faculty of Nursing, Chulalongkorn University)

เรื่อง การอนุมัติหัวข้อดุษฎีนิพนธ์

(Dissertation Approval)

ครั้งที่ 9/2563 ประจำปีการศึกษา 2563

(No. 9/2020, Academic year 2020

ตามที่คณะพยาบาลศาสตร์ ได้มีประกาศ เรื่อง การอนุมัติหัวข้อดุษฎีนิพนธ์ ครั้งที่ 7/2563 ประจำปีการศึกษา 2563 ประกาศ ณ วันที่ 18 ธันวาคม 2563 แล้วนั้น เนื่องจากมีการปรับแก้บางส่วน จึงขอยกเลิกประกาศหัวข้อวิทยานิพนธ์ฉบับดังกล่าว และใช้ประกาศฉบับนี้แทนดังนี้

นิสิตผู้ทำวิจัยและอาจารย์ที่ปรึกษาดุษฎีนิพนธ์

รหัสนิสิต *(ID)*	6077401436
ชื่อ-นามสกุล	นางสาวสายใหม ตุ้มวิจิตร
(Name)	*Miss Saimai Tumwijit*
สาขาวิชา	พยาบาลศาสตร์ (นานาชาติ)
(Academic Program)	*Doctor of Philosophy Program in Nursing Science*
ประธานกรรมการ	ศาสตราจารย์เกียรติคุณ ดร. สมจิต หนุเจริญกุล
(Chairperson)	***Prof. Dr. Somchit Hanucharurnkul***
อาจารย์ที่ปรึกษาหลัก	**รองศาสตราจารย์ ดร. ชนกพร จิตปัญญา**
(Major-advisor)	***Assoc. Prof. Dr. Chanokporn Jitpanya***
อาจารย์ที่ปรึกษาร่วม	**รองศาสตราจารย์ ดร. สุรีพร ธนศิลป์**
(Co-advisor)	***Assoc. Prof. Dr. Sureeporn Thanasilp***
กรรมการ	รองศาสตราจารย์ ดร. อรสา พันธ์ภักดี
(Examiner)	***Assoc. Prof.*** *Orasa Panpakdee*
กรรมการ	รองศาสตราจารย์ ดร. รัตน์ศิริ ทาโต
(Examiner)	***Assoc. Prof. Dr. Ratsiri Thato***
กรรมการภายนอก	รองศาสตราจารย์ ดร. สังวรณ์ งัดกระโทก
(External Examiner)	***Assoc. Prof. Dr. Sungworn Ngudgratoke***
ชื่อหัวข้อดุษฎีนิพนธ์	ความสัมพันธ์ระหว่างปัจจัยคัดสรรและการเกิดมะเร็งลำไส้ใหญ่และทวารหนักของคนไทย
(Title of Thesis)	*ASSOCIATIONS BETWEEN SELECTED FACTORS WITH COLORECTAL CANCER OCCURRENCE AMONG THAI PEOPLE*
ครั้งที่อนุมัติ	9/2563
(Announcement No.)	
ระดับ	ปริญญาเอก
(Level)	*Doctoral degree*

จากมติคณะกรรมการบริหารคณะพยาบาลศาสตร์ ครั้งที่ 7/2564 วันที่ 27 เมษายน 2564

(Approved by the Board of the Faculty of Nursing. No. 7/2021 Date April 27, 2020)

ประกาศ ณ วันที่ 29 เมษายน พ.ศ. 2564

(Announced on April 29, 2021)

(รองศาสตราจารย์ ดร. วราภรณ์ ชัยวัฒน์)

(Waraporn Chaiyawat, D.N.S., Dip. APPN.)

คณบดีคณะพยาบาลศาสตร์

Associate Professor and Dean

Appendix B
Approval of Ethical Review Committee

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Approval of the Committee Boards

1. Siriraj Hospital
2. Chonburi Cancer Hospital
3. The Research Ethics Review Committee for Research Involving Human Research Participants, Group 1, Chulalongkorn University
4. The permission letter for data collection from Mukdahan hospital

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

2 WANGLANG Rd. BANGKOKNOI
BANGKOK 10700

Tel. +66 2419 2667-72
Fax. +66 2411 0162

Siriraj Institutional Review Board

Certificate of Approval

COA no. Si 383/2021

Protocol Title(English) : Associations between selected factors with colorectal cancer occurrence among Thai people

Protocol Title(Thai) : ความสัมพันธ์ระหว่างปัจจัยคัดสรรและการเกิดมะเร็งลำไส้ใหญ่และทวารหนักของคนไทย

SIRB Protocol No. : 306/2564(IRB2)

Principal Investigator/Affiliation: Miss Saimai Tumwijit / Faculty of Nursing, Chulalongkorn University

Research site : Faculty of Medicine Siriraj Hospital

Duration of research : 1 year 6 months

Approval date : May 25, 2021

Expired date : May 24, 2022

This is to certify that Siriraj Institutional Review Board is in full compliance with international guidelines for human research protection such as the Declaration of Helsinki, the Belmont Report, CIOMS Guidelines and the International Conference on Harmonization in Good Clinical Practice (ICH-GCP)

.....
(Assoc. Prof. Siriporn Pitimana-aree, M.D.)
Chairperson

- 7 JUN 2021
.....
date

.....
(Prof.Dr. Prasit Watanapa, M.D., Ph.D.)
Dean of Faculty of Medicine Siriraj Hospital

- 8 JUN 2021
.....
date

Approval includes :

1. SIRB submission form, version 1.1 May 17, 2021
2. Proposal version 1.1 May 17, 2021
3. Participant information sheet, version 1.1 May 17, 2021
4. Informed consent form, version 1.0 April 26, 2021
5. Clarify Documents to Primary Doctor
6. Questionair, version 1.1 May 17, 2021
7. Advertisement for recruitment
8. Telephone script ,version May 24, 2021
9. Curriculum vitae

หน่วยพิมพ์โรงพยาบาลศิริราช 2341/3,000 แผ่น/ต.ค.57/92667/Mat.10023252/3060/Mo.

Certificate of Approval
From
Ethics Committee of Chonburi Cancer Hospital
No. 09/2021

Protocol	Associations between selected factors with colorectal cancer occurrence among Thai people
Protocol Number	No. 005/2021
Principal Investigator	Miss Saimai Tumwijit
Affiliation	Faculty of Nursing Chulalongkorn University
Research Site	Chonburi Cancer Hospital, Chonburi, Thailand
Document Approved	- Research Project - Consent form - Research Subject Information Sheet - questionnaire
Date of Approval	June 15, 2021
Date of Expiration	June 14 , 2022

The prior mentioned document have been reviewed and approved by Ethics Committee of Chonburi Cancer Hospital, Chonburi, Thailand, based on the Declaration of Helsinki and Good Clinical Practice.

Signature.....Orapin Chokchaitam.....
(Orapin Chokchaitam,D.S)
Chairman, Ethics Committee
Chonburi Cancer Hospital

AF 02-12

The Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University
Jamjuree 1 Building, 2nd Floor, Phyathai Rd., Patumwan district, Bangkok 10330, Thailand,
Tel: 0-2218-3202, 0-2218-3049 E-mail: eccu@chula.ac.th

COA No. 144/2021

Certificate of Approval

Study Title No. 087.2/64 : ASSOCIATIONS BETWEEN SELECTED FACTORS WITH COLORECTAL CANCER OCCURRENCE AMONG THAI PEOPLE

Principal Investigator : MISS SAIMAI TUMWIJIT

Place of Proposed Study/Institution : Faculty of Nursing, Chulalongkorn University

The Research Ethics Review Committee for Research Involving Human Research Participants, Group I, Chulalongkorn University, Thailand, has approved constituted in accordance with Belmont Report 1979, Declaration of Helsinki 2013, Council for International Organizations of Medical Sciences (CIOM) 2016, Standards of Research Ethics Committee (SREC) 2017, and National Policy and guidelines for Human Research 2015.

Signature: Pr. Sa. Tasanapradit
(Associate Prof. Prida Tasanapradit, M.D.)
Chairman

Signature: Raveenan Mingpakanee
(Assistant Prof. Raveenan Mingpakanee, Ph.D.)
Secretary

Date of Approval : 16 June 2021

Approval Expire date : 15 June 2022

The approval documents including;

1) Research proposal
2) Participant Information Sheet and Consent Form
3) Researcher
4) Questionnaire
5) Advertising leaflet

Protocol No. 087.2/64
Date of Approval 16 JUN 2021
Approval Expire Date 15 JUN 2022

The approved investigator must comply with the following conditions:

1. *It's unethical to collect data of research participants before the project has been approved by the committee.*
2. *The research/project activities must end on the approval expired date. To renew the approval, it can be applied one month prior to the expired date with submission of progress report.*
3. *Strictly conduct the research/project activities as written in the proposal.*
4. *Using only the documents that bearing the RECCU's seal of approval: research tools, information sheet, consent form, invitation letter for research participation (if applicable).*
5. *Report to the RECCU for any serious adverse events within 5 working days.*
6. *Report to the RECCU for any amendment of the research project prior to conduct the research activities.*
7. *Report to the RECCU for termination of the research project within 2 weeks with reasons.*
8. *Final report (AF 01-15) and abstract is required for a one year (or less) research/project and report within 30 days after the completion of the research/project.*
9. *Research project with several phases; approval will be approved phase by phase, progress report and relevant documents for the next phase must be submitted for review.*
10. *The committee reserves the right to site visit to follow up how the research project being conducted.*
11. *For external research proposal the dean or head of department oversees how the research being conducted.*

คณะพยาบาลศาสตร์
จุฬาลงกรณ์มหาวิทยาลัย
เลขรับที่: 1529
วันที่: 9 สิงหาคม 2564 เวลา:

ที่ มห ๐๐๓๒.๒/ ๒๙๔๘

โรงพยาบาลมุกดาหาร
๒๔ ถนนพิทักษ์พนมเขต มห ๔๙๐๐๐

๓๐ กรกฎาคม ๒๕๖๔

เรื่อง อนุญาตให้นิสิตดำเนินการเก็บรวบรวมข้อมูลวิจัย

เรียน คณบดีคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

อ้างถึง หนังสือคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ที่ อว ๖๔.๑๑/๐๐๔๖ ลงวันที่ ๒ กรกฎาคม ๒๕๖๔

ตามหนังสือที่อ้างถึง คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ขอความอนุเคราะห์ให้ นางสาวสายใหม ตุ้มวิจิตร นิสิตชั้นปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ดำเนินการเก็บรวบรวมข้อมูลการวิจัยในผู้ป่วยมะเร็งลำไส้ใหญ่และทวารหนัก จำนวน ๓๖ ราย โดยใช้แบบสอบถามข้อมูลส่วนบุคคล ข้อมูลทางคลินิก ระยะเวลาในการมาตรวจวินิจฉัยมะเร็งลำไส้ใหญ่ และทวารหนัก รายละเอียดที่แจ้งแล้วนั้น

โรงพยาบาลมุกดาหาร ขอเรียนให้ทราบว่า มีความยินดีอนุญาตให้ นางสาวสายใหม ตุ้มวิจิตร นิสิตชั้นปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย ดำเนินการเก็บรวบรวมข้อมูลการวิจัยในกลุ่มประชากรเป้าหมาย ดังกล่าวต่อไป

จึงเรียนมาเพื่อโปรดทราบ

ขอแสดงความนับถือ

(นายโสภณ นิลกำแหง)
รองผู้อำนวยการฝ่ายการแพทย์ ปฏิบัติราชการแทน
ผู้อำนวยการโรงพยาบาลมุกดาหาร

เรียน รองคณบดี
เพื่อทราบ และเห็นควรจัดเอกสารแจ้งนิสิตให้ดำเนินการต่อไป

11 สิงหาคม 2564 เวลา 08:15

11 สิงหาคม 2564 เวลา 08:21

กลุ่มการพยาบาล
โทร.๐-๔๒๖๑-๕๒๔๔ ต่อ ๑๓๗๗
โทรสาร.๐-๔๒๖๑-๒๙๗๘

13 สิงหาคม 2564 เวลา 09:11

Appendix C
List of the Experts

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

List of the Experts

1. Professor Dr. Varut Lohsiriwat, M.D.

   Colorectal Surgery Unit, Division of General Surgery, Department of Surgery, Faculty of Medicine Siriraj Hospital, Mahidol University

2. Somporn Sahajarupat, M.D.

   Maharaj Nakhon Si Thammarat Hospital

3. Associate Professor Dr. Suporn Danaidutsadeekul

   Department of Surgical Nursing, Faculty of Nursing, Mahidol University

4. Associate Professor Dr. Pratum Soivong

   Department of Medical Nursing, Faculty of Nursing, Chiang Mai University

5. Assistant Professor Tiraporn Junda

   Division of Adult and Gerontological Nursing, Ramathibodi School of Nursing, Mahidol University

6. Dr. Poungkamon Krisanabud

   Department of Adult and Gerontology Nursing, Faculty of Nursing, Naresuan University

7. Dr. Pichayapa Pichaya

   Advanced Practitioner Nurses (APN), A Head Nurse of Out-Patient Department (OPD), Chonburi Cancer Hospital

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Appendix D

List of the Linguistics

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

List of the Linguistics

1. Dr. Surachai Maninet

   Lecturer at Faculty of Nursing, Ubon Ratchathani University.

2. Ms. Nadsuda Chotwattanakulchai

   Lecturer at Faculty of Nursing, Rajamangala University of Technology Thanyaburi

3. Ms.Tipkamon Stitt

   Registered Nurse (RN). In Nanaimo Regional General Hospital, Nanaimo, British Columbia, Canada

4. Mrs. Linda MacDonald AITI (Nee. Sridara)

   Registered Nurse (RN), and Thai-English Professional Translator in United Kingdom.

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Appendix E

Permission Letters for Research Instrument Using

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Search | Meet Now

Reply | Delete | Archive | Junk | Sweep | Move to | Categorize | ...

RE: Asking permission to use research instrument

AR

Alfonso Leiva Rus <aleiva@ibsalut.es>
Wed 3/10/2021 7:32 AM
To: You

Dear Tumwijit,

I am glad you find of interest that question from the Deccire study, and of course you can adapt and translate for your study.
Bw

De: Saimai Tumwijit <t_saimai@hotmail.com>
Enviado: martes, 9 de marzo de 2021 15:16
Para: aleiva@ibsalut.caib.es <aleiva@ibsalut.caib.es>
Asunto: Asking permission to use research instrument

Dear Prof. Dr. Alfonso Leiva

My name is Saimai Tumwijit, a Ph.D. candidate in the Faculty of Nursing, Chulalongkorn University, Thailand. Currently, I am in the process of developing a proposal on the topic "Associations between selected factors with colorectal cancer occurrence among Thai people". My advisors are Assoc. Prof. Dr. Chanokporn Jitpanya and Assoc. Prof. Dr. Sureeporn Thanasilp. As I have reviewed the literature, I found that a socio-demographic questionnaire developed by you and colleague published in the title "Time to diagnosis and stage of symptomatic colorectal cancer determined by three different sources of information: A population-based retrospective study" in Journal of Cancer Epidemiology in 2017 has questions that ask about the perception of the seriousness of symptoms. It is a useful questionnaire that can measure the perceived seriousness of warning signs and symptoms, which is one variable in my study.

Therefore, I would like to ask your permission to translate and adapt the question to Thai patients with colorectal cancer and then use it for data collection in my study. If you have any questions or suggestions on my usage, please do not hesitate to contact me. Thank you very much in advance. I am looking forward to hearing from you.

Sincerely yours.

Miss Saimai Tumwijit, MNS (Adult Nursing), RN.
Candidate Ph.D. student,
Faculty of Nursing, Chulalongkorn University,
Bangkok 10330, Thailand

Search | Meet Now

Reply | Delete | Archive | Junk | Sweep | Move to | Categorize | ...

Re: Asking permission for using instrument from your research

You replied on Fri 3/19/2021 2:53 PM

D

Dr Syahnaz Mohd Hashim . <syahnaz@ppukm.ukm.edu.my>
Thu 3/18/2021 1:35 PM
To: You

Dear Saimai,

yes, sure.. the questionnaire is quite simple and straightforward. I'm away at the moment. Do you need the questionnaire?

I'l try to send to you in a few days time

Syahnaz

On Tue, Mar 9, 2021 at 9:48 PM Saimai Tumwijit <t_saimai@hotmail.com> wrote:

Dear Prof. Dr. Syahnaz Mohd Hashim

My name is Saimai Tumwijit, a Ph.D. candidate in the Faculty of Nursing, Chulalongkorn University, Thailand. Currently, I am in the process of developing a proposal on the topic "Associations between selected factors with colorectal cancer occurrence among Thai people". My advisors are Assoc. Prof. Dr. Chanokporn Jitpanya and Assoc. Prof. Dr. Sureeporn Thanasilp. As I have reviewed the literature, I found that the knowledge about colorectal cancer questionnaire developed by you and your colleagues and published in the Asian Pacific Journal of Cancer Prevention in 2011 is a beneficial instrument to measure the knowledge about colorectal cancer, which is one variable included in my study.

Therefore, I would like to ask your permission to translate and adapt to Thai patients with colorectal cancer and then use this questionnaire for data collection in my study. If you have any questions or suggestions on my usage, please do not hesitate to contact me. Thank you very much in advance. I am looking forward to hearing from you.

Sincerely yours.

Miss Saimai Tumwijit, MNS (Adult Nursing), RN.
Candidate Ph.D. student,
Faculty of Nursing, Chulalongkorn University,
Bangkok 10330, Thailand
Tel: (+66) 979745969

Reply | Delete | Archive | Junk | Move to | Categorize | ...

Asking permission for using instrument.

Saimai Tumwijit
Thu 1/21/2021 5:03 AM
To: line.hvidberg@ph.au.dk
Cc: You; jchanokp@hotmail.com

Dear Prof. Dr. Line Hvidberg

My name is Saimai Tumwijit, a Ph.D. candidate in Faculty of Nursing, Chulalongkorn University, Thailand. Currently, I am in the process of developing a proposal on the topic "Associations between selected factors with colorectal cancer occurrence among Thai people.". My advisors are Assoc. Prof. Dr. Chanokporn Jitpanya and Assoc. Prof. Dr. Sureeporn Thanasilp. As I have reviewed the literature, I found the modified Illness Perception Questionnaire-Revised for patients with colorectal cancer (the modified IPQ-R) was adapted by you and your colleagues from the IPQ-R of Moss-Morris et al. (2002) and published in the Journal of Health Psychology in 2014. Your questionnaire is a beneficial instrument to measure the cognitive and emotional illness representations, which are one of variables in my study.

Unfortunately, I can't find the full items of causal dimension in the paper that you published. Therefore, I would like to ask for permission to see your full items and interpretation, and ask for permission to use your instrument "the modified Illness Perception Questionnaire-Revised for patients with colorectal cancer"? The questionnaire will be translated into Thai language and modified to use in Thai patients with colorectal cancer in my research. Moreover, I will cite and acknowledge you and your colleagues in the dissertation. If you have any questions or suggestions on my usage, please do not hesitate to contact me. Thank you very much.

Sincerely yours.

Miss Saimai Tumwijit , MNS (Adult Nursing), RN.
Candidate Ph.D. student,
Faculty of Nursing, Chulalongkorn University,
Bangkok 10330, Thailand
Tel: (+66) 0979745969
E-mail: t _ saimai@hotmail.com

9+

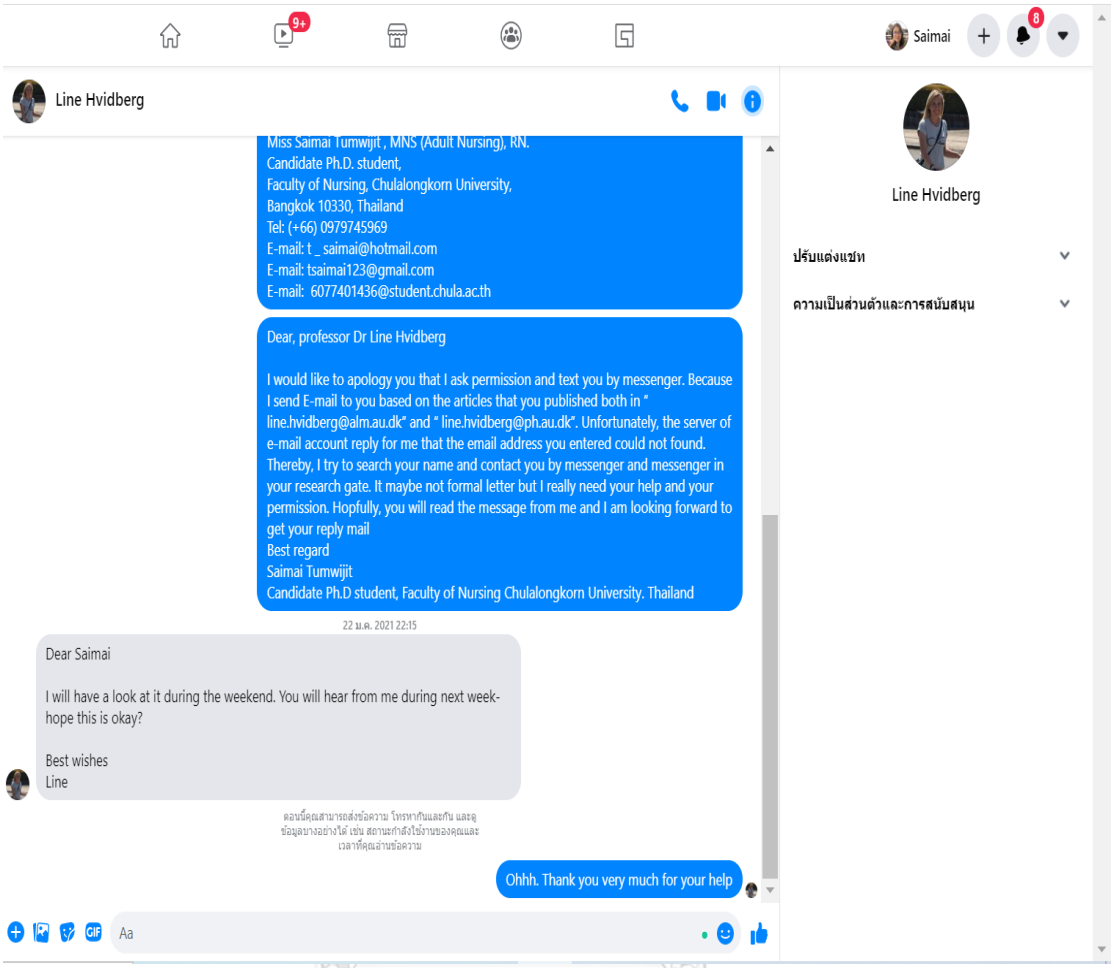
Line Hvidberg

Line Hvidberg
Facebook
คุณไม่ได้เป็นเพื่อนกันบน Facebook
อาศัยอยู่ที่ เอสบีเยร์

21 ม.ค. 2021 17:12

Subject: Asking permission for using instrument.
Dear Prof. Dr. Line Hvidberg

My name is Saimai Tumwijit, a Ph.D. candidate in Faculty of Nursing, Chulalongkorn University, Thailand. Currently, I am in the process of developing a proposal on the topic "Associations between selected factors with colorectal cancer occurrence among Thai people.". My advisors are Assoc. Prof. Dr. Chanokporn Jitpanya and Assoc. Prof. Dr. Sureeporn Thanasilp. As I have reviewed the literature, I found the modified Illness Perception Questionnaire-Revised for patients with colorectal cancer (the modified IPQ-R) was adapted by you and your colleagues from the IPQ-R of Moss-Morris et al. (2002) and published in the Journal of Health Psychology in 2014. Your questionnaire is a beneficial instrument to measure the cognitive and emotional illness representations, which are one of variables in my study.
Unfortunately, I can't find the full items of causal dimension in the paper that you published. Therefore, I would like to ask for permission to see your full items and interpretation, and ask for permission to use your instrument "the modified Illness



จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

Appendix F

Physician Information Sheet

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

เอกสารชี้แจงแพทย์เจ้าของไข้

เรื่อง ขออนุญาตเก็บรวบรวมข้อมูลการวิจัยและใช้ข้อมูลจากแฟ้มประวัติบางส่วนของผู้ป่วยที่อยู่ในความดูแลของท่าน

เรียน แพทย์เจ้าของไข้ผู้ป่วยมะเร็งลำไส้ใหญ่และทวารหนักทุกท่าน

เนื่องด้วยดิฉันนางสาวสายใหม ตุ้มวิจิตร นิสิตหลักสูตรพยาบาลศาสตรดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย กำลังดำเนินการเก็บรวบรวมข้อมูลประกอบการทำดุษฎีนิพนธ์เรื่อง “ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก” กลุ่มตัวอย่างเป็นผู้ป่วยมะเร็งลำไส้ใหญ่และทวารหนักที่ได้รับการดูแลรักษาจากท่าน วัตถุประสงค์ของการวิจัยคือศึกษาระยะเวลาในการมาโรงพยาบาลและปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก ประโยชน์ที่คาดว่าจะได้รับคือข้อมูลเกี่ยวกับปัจจัยที่มีความเกี่ยวข้องและปัจจัยที่ทำนายระยะเวลาในการมาโรงพยาบาล อันเป็นแนวทางสำคัญให้พยาบาลหรือบุคลากรในทีมสุขภาพนำไปวิเคราะห์หาแนวทางแก้ไข และพัฒนากิจกรรมการพยาบาลที่สามารถลดระยะเวลาในการมาโรงพยาบาลเมื่อสังเกตพบอาการผิดปกติ ซึ่งจะเพิ่มโอกาสในการวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนักได้ตั้งแต่ในระยะเริ่มต้น

ผู้ร่วมวิจัย/อาสาสมัครในครั้งนี้เป็นผู้ป่วยจากโรงพยาบาลศิริราช โรงพยาบาลมะเร็งชลบุรี โรงพยาบาลและโรงพยาบาลมุกดาหาร **เกณฑ์การคัดเลือกผู้ป่วยเข้าเป็นผู้ร่วมวิจัย/อาสาสมัคร** คือผู้ป่วยอายุ 18 ปีขึ้นไปที่ทราบว่าตนเองเป็นมะเร็งลำไส้ใหญ่และทวารหนัก มีอาการหรืออาการแสดงที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักอย่างน้อย 1 อาการ และไม่เคยได้รับการวินิจฉัยว่ามีความผิดปกติของระบบจิตประสาท ภาวะสมองเสื่อมหรืออัลไซเมอร์ เ**กณฑ์การคัดออก**จากการเป็นผู้ร่วมวิจัย/อาสาสมัครคือผู้ป่วยที่ได้รับการวินิจฉัยว่าเป็นมะเร็งลำไส้ใหญ่และทวารหนักจากผลการตรวจร่างกายประจำปีโดยไม่มีอาการใดใดมาก่อน และได้รับการวินิจฉัยว่าเป็นมะเร็งลำไส้ใหญ่และทวารหนักกลับเป็นซ้ำ

การเก็บข้อมูลจะเริ่มหลังจากโครงการวิจัยได้รับการอนุมัติจากคณะกรรมการวิจัยในคน โดยการให้ผู้ป่วยตอบแบบสอบถามจำนวน 6 ชุด ประกอบด้วย แบบสอบถามข้อมูลส่วนบุคคล แบบสอบถามระยะเวลาในการมาตรวจและวินิจฉัย แบบสอบถามความรู้เรื่องโรคมะเร็งลำไส้ใหญ่และทวารหนัก แบบสอบถามการรับรู้ความเจ็บป่วย แบบสอบถามพฤติกรรมแสวงหาบริการทางสุขภาพ และแบบสอบถามการรับรู้ความรุนแรงของอาการและอาการแสดงที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักจำนวนข้อคำถามที่ให้กลุ่มตัวอย่างตอบรวม 130 ข้อ ใช้เวลาในการตอบแบบสอบถามประมาณ 15 - 35 นาที สำหรับข้อมูลทางคลินิกบางส่วน เช่น ผลการตรวจทางพยาธิวิทยา ระยะของมะเร็งลำไส้ใหญ่และทวารหนัก และการรักษาที่ได้รับในปัจจุบันผู้วิจัยเป็นผู้บันทึกข้อมูลจากแฟ้มประวัติของผู้ป่วย การเก็บข้อมูลใช้เวลาประมาณ 3 เดือนหรือจนกว่าจะได้กลุ่มตัวอย่างครบตามจำนวนที่ต้องการ

จึงเรียนมาเพื่อพิจารณาและโปรดให้ความอนุเคราะห์

ลงชื่อ.....

(นางสาวสายใหม ตุ้มวิจิตร)

นิสิตหลักสูตรพยาบาลศาสตรดุษฎีบัณฑิต

Appendix G

Research Subject Information Sheet and Informed Consent

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

เอกสารชี้แจงข้อมูลสำหรับผู้มีส่วนร่วมในโครงการวิจัย

(Research Subject Information sheet)

ชื่อโครงการวิจัย ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก

ชื่อผู้วิจัย นางสาวสายใหม ตุ้มวิจิตร นิสิตหลักสูตรปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย

สถานที่ติดต่อผู้วิจัย (ที่ทำงาน) คณะพยาบาลศาสตร์จุฬาลงกรณ์มหาวิทยาลัย อาคารบรมราชชนนศรีศตพรรษ ชั้น 11 ถนน พระรามที่ 1 แขวงวังใหม่ เขตปทุมวัน กรุงเทพมหานคร 10330

(ที่บ้าน) 130/39 คอนโดบางกอกน้อยวอเตอร์ไซต์ ซอยบางขุนนนท์ 16 แขวงบางขุนนนท์ เขตบางกอกน้อย กรุงเทพมหานคร 10700

โทรศัพท์มือถือ 097-9745969 E-mail : t _ saimai@hotmail.com

ขอเรียนเชิญท่านเข้าร่วมการวิจัย ก่อนตัดสินใจเข้าร่วมในการวิจัย โปรดทำความเข้าใจว่างานวิจัยนี้เกี่ยวข้องกับอะไรและทำเพราะเหตุใด กรุณาใช้เวลาในการอ่านข้อมูลต่อไปนี้อย่างรอบคอบ หากมีข้อความใดที่อ่านแล้วไม่เข้าใจหรือไม่ชัดเจน โปรดสอบถามเพิ่มเติมกับผู้วิจัยได้ตลอดเวลา ผู้วิจัยจะอธิบายจนกว่าจะเข้าใจอย่างชัดเจน โปรดอย่าลงลายมือชื่อของท่านในเอกสารนี้จนกว่าท่านจะแน่ใจว่ามีความประสงค์จะเข้าร่วมในโครงการวิจัยนี้ คำว่า “ท่าน” ในเอกสารนี้ หมายถึงผู้เข้าร่วมการวิจัยในฐานะเป็นอาสาสมัครในโครงการวิจัยนี้ หากท่านเป็น**ผู้แทนโดยชอบธรรมตามกฎหมาย**ของผู้ที่จะเข้าร่วมในโครงการวิจัย และลงนามแทนในเอกสารนี้ โปรดเข้าใจว่า “ท่าน” ในเอกสารนี้หมายถึงผู้เข้าร่วมในโครงการวิจัยเท่านั้น

1. ความเป็นมา เหตุผลและวัตถุประสงค์ของโครงการวิจัย

มะเร็งลำไส้ใหญ่และทวารหนักพบมากเป็นอันดับต้น ๆ ในประชากรไทย โดยผู้ป่วยส่วนใหญ่มาพบแพทย์เมื่อระยะของโรคอยู่ในระยะลุกลาม การมาพบแพทย์ตั้งแต่เริ่มสังเกตุพบอาการผิดปกติจะทำให้ค้นพบโรคได้ตั้งแต่ในระยะเริ่มต้นทำให้การรักษามีประสิทธิภาพและเพิ่มอัตราการรอดชีพของผู้ป่วยได้ ในขณะที่การเกิดมะเร็งลำไส้ใหญ่และทวารหนักในระยะลุกลามหรือแพร่กระจายไปยังอวัยวะอื่น ๆ ทำให้การพยากรณ์ของโรคเลวลงและอัตราการรอดชีวิตจะลดลงในที่สุด ดังนั้นการวิจัยในครั้งนี้จัดทำขึ้นเพื่อศึกษาระยะเวลาในการมาโรงพยาบาลและปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก ความรู้ที่ได้จากการศึกษาจะเป็นข้อมูลเบื้องต้นในการวางแผน หาแนวทางแก้ไข และส่งเสริมให้ผู้ป่วยรีบมารับการวินิจฉัยโดยมาพบแพทย์ตั้งแต่เริ่มรับรู้ถึงอาการผิดปกติ ไม่ไปรักษาด้วยวิธีการอื่น ๆ หรือเพิกเฉยต่ออาการเหล่านั้น ซึ่งการลดปัจจัยที่เป็นสาเหตุให้ผู้ป่วยมาพบแพทย์ล่าช้าจะช่วยเพิ่มคุณภาพชีวิตและเพิ่มอัตราการรอดชีพได้เพิ่มขึ้น

2. **ท่านจะได้รับเอกสารนี้ 1 ชุด กลับไปอ่านที่บ้าน** ท่านสามารถปรึกษาสมาชิกในครอบครัว แพทย์ผู้ให้การรักษาเพื่อขอความเห็นชอบ การเข้าร่วมในโครงการวิจัยครั้งนี้จะต้องเป็น**ความสมัครใจ**

ของท่าน ไม่มีการบังคับหรือชักจูง ถึงแม้ท่านจะไม่เข้าร่วมในโครงการวิจัย ท่านก็จะได้รับการรักษาพยาบาลตามปกติ การไม่เข้าร่วมหรือถอนตัวจากโครงการวิจัยนี้จะไม่มีผลกระทบต่อการได้รับบริการ การรักษาพยาบาล หรือผลประโยชน์ที่พึงจะได้รับของท่านแต่อย่างใด **ในกรณีที่ท่านไม่สามารถอ่านหรือเขียนหนังสือได้** ผู้วิจัยจะเป็นผู้อ่านข้อความในเอกสารนี้ให้ท่านฟัง หากมีข้อความที่ท่านอ่านหรือฟังแล้วยังไม่เข้าใจ โปรดสอบถามผู้วิจัยหรือผู้ช่วยผู้วิจัยที่ทำโครงการนี้เพื่อให้อธิบายจนกว่าท่านจะเข้าใจ

3. โครงการวิจัยนี้**ทำการศึกษากับผู้ป่วยมะเร็งลำไส้ใหญ่และทวารหนักจำนวน 240** คน จากโรงพยาบาลศิริราช โรงพยาบาลมะเร็งชลบุรี และโรงพยาบาลมุกดาหาร **ผู้ที่สามารถเข้าร่วมโครงการวิจัยได้**ต้องมีอายุ 18 ปีขึ้นไป เป็นผู้ป่วยที่ทราบว่าตนเองเป็นมะเร็งลำไส้ใหญ่และทวารหนักและไม่เคยได้รับการวินิจฉัยว่ามีความผิดปกติของระบบจิตประสาท ภาวะสมองเสื่อมหรืออัลไซเมอร์ **ท่านไม่สามารถเข้าร่วมโครงการวิจัยได้**หากท่านได้รับการวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนักจากผลการตรวจร่างกายประจำปีด้วยการส่องกล้องตรวจลำไส้ใหญ่และทวารหนักโดยไม่มีอาการใดใดมาก่อน หรือได้รับการวินิจฉัยว่าเป็นมะเร็งลำไส้ใหญ่และทวารหนักกลับเป็นซ้ำ

4. ท่านไม่ต้องเข้ารับการคัดกรองใดใดก่อนเข้าร่วมโครงการวิจัย

5. หากท่านตัดสินใจที่จะเข้าร่วมโครงการ **สิ่งที่จะขอให้ท่านปฏิบัติ**คือการตอบแบบสอบครั้งเดียวจำนวน 6 ชุด ประกอบด้วย แบบสอบถามข้อมูลส่วนบุคคลและข้อมูลทางคลินิก (ในส่วนที่ผู้ป่วยให้ข้อมูลเอง 12 ข้อ) แบบสอบถามระยะเวลาในการมาตรวจและวินิจฉัย (ในส่วนที่ผู้ป่วยตอบเอง 3 ข้อ) แบบสอบถามการรับรู้ความรุนแรงของอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก (11 ข้อ) แบบสอบถามความรู้เรื่องโรคมะเร็งลำไส้ใหญ่และทวารหนัก (22 ข้อ) แบบสอบถามการรับรู้มโนภาพความเจ็บป่วย (61 ข้อ) และแบบสอบถามพฤติกรรมแสวงหาบริการทางสุขภาพ (21 ข้อ) รวมจำนวนข้อคำถามที่ให้กลุ่มตัวอย่างตอบรวม 130 ข้อ ใช้เวลาในการตอบแบบสอบถามประมาณ 15 - 35 นาที สำหรับข้อมูลทางคลินิก จำนวน 6 ข้อ และระยะเวลาในโรงพยาบาล จำนวน 1 ข้อคำถาม ผู้วิจัยจะรวบรวมข้อมูลจากแฟ้มประวัติของท่านด้วยตัวของผู้วิจัยเอง และหากท่านไม่สะดวกที่จะอ่านข้อคำถามด้วยตนเอง ผู้วิจัยจะเป็นผู้อ่านข้อคำถามให้และให้ท่านเป็นคนเลือกคำตอบเอง

6. เนื่องจากการศึกษาในครั้งนี้เป็นการตอบแบบสอบถามจึงไม่มีความเสี่ยงหรือผลข้างเคียงใดใด อย่างไรก็ตามการแบบสอบถามอาจทำให้ท่านมีความรู้สึกไม่สะดวกหรือเสียเวลา ดังนั้นผู้วิจัยจะเลือกช่วงเวลาที่รบกวนท่านน้อยที่สุด อาจเป็นช่วงเวลารอตรวจหรือช่วงเวลารอรับยาหรือรับใบนัดตรวจครั้งต่อไป รวมถึงท่านไม่ต้องรีบตอบแบบสอบถามทั้งหมดในทันที สามารถพักระหว่างตอบแบบสอบถามได้ หากท่านรู้สึกเหนื่อยล้าหรืออาการผิดปกติในระหว่างการตอบแบบสอบถาม ผู้วิจัยจะยุติการตอบแบบสอบถามของท่านและประสานพยาบาลประจำหน่วยเพื่อช่วยเหลือท่านทันที

7. ท่านอาจไม่ได้รับ**ประโยชน์**โดยตรงจากการวิจัยนี้ แต่ผลการศึกษาที่ได้จะนำไปสู่การวิเคราะห์ระยะเวลาในการมาโรงพยาบาลและวิเคราะห์ปัจจัยที่สามารถทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก อันเป็นแนวทางสำคัญให้พยาบาลและ

บุคคลากรทีมสุขภาพนำไปวิเคราะห์ หาแนวทางการแก้ไขและพัฒนากิจกรรมที่สามารถลดระยะเวลาการมาโรงพยาบาล ซึ่งอาจช่วยลดอัตราตาย เพิ่มอัตราการรอดชีพ หรือพัฒนารูปแบบในการลดระยะเวลาการรอคอยการตรวจและวินิจฉัย รวมถึงยังเพิ่มโอกาสในการวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนักได้ตั้งแต่ระยะเริ่มต้น ซึ่งมะเร็งลำไส้ใหญ่และทวารหนักสามารถป้องกันและรักษาหายได้หากได้รับการวินิจฉัยในระยะเริ่มต้น ดังนั้นการวินิจฉัยโรคได้เร็วอาจทำให้ค่าใช้จ่ายในการบริการสุขภาพโดยรวมลดลงและอัตราการรอดชีพเพิ่มขึ้นได้ในที่สุด

8. ข้อมูลใด ๆ ที่ได้รับจากการเข้าร่วมวิจัยของท่านรวมถึงข้อมูลจากแฟ้มประวัติของท่านจะถือเป็นความลับและจะไม่เปิดเผยต่อสาธารณะเป็นรายบุคคล แต่จะถูกนำมาใช้โดยนำเสนอเป็นภาพรวมของผู้ป่วยมะเร็งลำไส้ใหญ่และทวารหนัก ผู้วิจัยจะใช้รหัสแทนชื่อและนามสกุลของท่านในแบบบันทึกข้อมูล ไม่ระบุอักษรตัวแรกของชื่อหรือสกุล ผลการวิจัยจะถูกรายงานในภาพรวมของการศึกษา ข้อมูลใดที่จะสามารถระบุถึงตัวท่านจะไม่ปรากฏในรายงาน

9. **เมื่อเสร็จสิ้นการวิจัยแล้วข้อมูลที่เกี่ยวข้องกับตัวท่านจะถูกทำลาย** โดยผู้วิจัยจะทำลายกระดาษที่เป็นแบบสอบถามโดยใช้เครื่องทำลายเอกสาร และทำลายข้อมูลไฟล์อิเลกทรอนิกส์ที่บันทึกไว้ในคอมพิวเตอร์ทั้งหมดด้วยตนเอง

10. **โครงการวิจัยนี้ไม่มีค่าชดเชยการเสียเวลา/ค่าเดินทางในการเข้าร่วมวิจัย** และไม่มีค่าใช้จ่ายตอบแทนให้ท่านที่เข้าร่วมการวิจัย

11. การเข้าร่วมการวิจัยเป็นโดย**สมัครใจ** ท่านสามารถ**ปฏิเสธ**ที่จะเข้าร่วมหรือ**ถอนตัว**จากการวิจัยได้ทุกขณะ **โดยไม่ต้องให้เหตุผล** ไม่ว่าท่านจะเข้าร่วมการวิจัยครั้งนี้หรือไม่ ท่านยังคงได้รับการพยาบาลตามปกติ การปฏิเสธที่จะเข้าร่วมหรือถอนตัวจากการวิจัยจะไม่มีผลใด ๆ ต่อการรักษาหรือการพยาบาลที่ท่านได้รับอยู่

12. **หากท่านมีข้อสงสัย**ที่จะสอบถามเกี่ยวกับการวิจัย ท่านสามารถติดต่อนางสาวสายใหม ตุ้มวิจิตร 097-9745969 หรือตามที่อยู่ที่ได้ให้ไว้ข้างต้น ได้ตลอด 24 ชั่วโมง

13. **หากได้รับการปฏิบัติไม่ตรงตามข้อมูลดังกล่าว**สามารถร้องเรียนได้ที่ คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย 254 อาคารจามจุรี 1 ชั้น 2 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์ 0-2218-3202, 0-2218-3049 E-mail: eccu@chula.ac.th

หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย (Informed Consent)

รับรองโดยคณะกรรมการวิชาการและพิจารณาวิจัยในมนุษย์

ข้าพเจ้า (นาย, นาง, นางสาว).....
ได้รับทราบโครงการวิจัยเรื่อง “ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก”

วันที่ลงนาม ...../...../.....

ก่อนที่จะลงนามในใบยินยอมให้ทำการวิจัยนี้ ข้าพเจ้าได้รับการอธิบายจากผู้วิจัยชื่อ นางสาวสายใหม ตุ้มวิจิตร นิสิตปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์จุฬาลงกรณ์มหาวิทยาลัย สถานที่ติดต่อคณะพยาบาลศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย โทรศัพท์ติดต่อ 097-9745969 ถึงวัตถุประสงค์ของการวิจัย วิธีการวิจัย ความเสี่ยง อันตราย หรืออาการที่อาจเกิดขึ้นจากการวิจัย รวมทั้งประโยชน์ที่คาดว่าจะเกิดขึ้นจากการวิจัยเรื่อง “ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก”และมีความเข้าใจดีแล้ว

ผู้วิจัยรับรองว่าจะตอบคำถามที่ข้าพเจ้าสงสัยด้วยความเต็มใจและไม่ปิดบังซ่อนเร้น จนข้าพเจ้าพอใจ

ข้าพเจ้าเข้าร่วมในโครงการวิจัยนี้ด้วยความสมัครใจ โดยปราศจากการบังคับหรือชักจูง

ข้าพเจ้ามีอิสระที่จะปฏิเสธ หรือถอนตัวจากโครงการวิจัย เมื่อใดก็ได้ โดยไม่มีผลใดๆ ต่อการรักษาพยาบาลที่ควรจะได้รับตามมาตรฐาน หรือสูญเสียผลประโยชน์ใด ๆ

ผู้วิจัยรับรองว่าจะเก็บข้อมูลเกี่ยวกับตัวข้าพเจ้าเป็นความลับ และจะเปิดเผยเฉพาะในรูปของสรุปผลการวิจัยโดยไม่มีการระบุชื่อนามสกุลของข้าพเจ้า การเปิดเผยข้อมูลเกี่ยวกับตัวข้าพเจ้าต่อหน่วยงานต่าง ๆ ที่เกี่ยวข้อง จะกระทำด้วยเหตุผลทางวิชาการเท่านั้น

ผู้วิจัยรับรองว่าหากเกิดอันตรายใด ๆ จากการวิจัย ข้าพเจ้าจะได้รับการรักษาพยาบาลและได้รับค่าชดเชยตามที่ระบุในเอกสารชี้แจงข้อมูลแก่ผู้เข้าร่วมโครงการวิจัย

ข้าพเจ้าจะได้รับเอกสารชี้แจงและหนังสือยินยอมที่มีข้อความเดียวกันกับที่นักวิจัยเก็บไว้ เป็นส่วนตัวข้าพเจ้าเอง 1 ชุด

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้ว มีความเข้าใจดีทุกประการ และลงนามในใบยินยอมด้วยความเต็มใจ

จุฬาลงกรณ์มหาวิทยาลัย
Chulalongkorn University

ลงชื่อ.....	ลงชื่อ.....
(.....)	(.....)
ผู้เข้าร่วมโครงการวิจัย	ผู้ดำเนินโครงการวิจัย
โทรศัพท์.....	โทรศัพท์.....
ลงชื่อ.....	ลงชื่อ.....
(.....)	(.....)
พยาน	พยาน
โทรศัพท์.....	โทรศัพท์.....

Appendix H

Research Instruments (example)

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

เลขที่ผู้มีส่วนร่วมในการวิจัย.....

วันที่ตอบแบบสอบถาม.....

แบบสอบถามที่ใช้ในการวิจัย
เรื่อง
"ปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก"
ของ
นางสาวสายใหม ตุ้มวิจิตร
นิสิตปริญญาดุษฎีบัณฑิต คณะพยาบาลศาสตร์จุฬาลงกรณ์มหาวิทยาลัย

<u>คำชี้แจง</u>

แบบสอบถามฉบับนี้จัดทำขึ้นเพื่อใช้ในการเก็บรวบรวมข้อมูลเกี่ยวกับปัจจัยทำนายระยะเวลาการมาโรงพยาบาลของบุคคลที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก ประกอบไปด้วย

ส่วนที่ 1 แบบสอบถามข้อมูลส่วนบุคคล และข้อมูลทางคลินิก 18 ข้อ
<u>หมายเหตุ</u> : สำหรับผู้ป่วยจำนวน 12 ข้อ สำหรับผู้วิจัยจำนวน 6 ข้อ

ส่วนที่ 2 แบบสอบถามระยะเวลาในการมาตรวจและวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนัก 4 ข้อ
<u>หมายเหตุ</u> : สำหรับผู้ป่วยจำนวน 3 ข้อ สำหรับผู้วิจัยจำนวน 1 ข้อ

ส่วนที่ 3 แบบสอบถามความรู้เกี่ยวกับมะเร็งลำไส้ใหญ่และทวารหนัก 22 ข้อ

ส่วนที่ 4 แบบสอบถามการรับรู้มโนภาพความเจ็บป่วย 61 ข้อ

ส่วนที่ 5 แบบสอบถามพฤติกรรมแสวงหาบริการทางสุขภาพ 21 ข้อ

ส่วนที่ 6 แบบสอบถามการรับรู้ความรุนแรงของอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก 11 ข้อ

ส่วนที่ 1 แบบสอบถามข้อมูลส่วนบุคคลและข้อมูลทางคลินิก

คำชี้แจง : โปรดเติมคำในช่องว่าง หรือทำเครื่องหมายถูก √ ลงในช่อง ☐ หน้าข้อความที่ตรงกับความเป็นจริงของท่านมากที่สุด

ตอนที่ 1 ข้อมูลส่วนบุคคล

1 เพศ ☐ ชาย ☐ หญิง

2 อายุ .....ปี

3 น้ำหนักตัว.....กิโลกรัม ส่วนสูง.....เซนติเมตร

4 สถานภาพสมรส

☐ โสด
☐ แต่งงาน
☐ หม้าย / หย่า / แยกกันอยู่

5 ระดับการศึกษาสูงสุด

☐ ไม่ได้เรียนหนังสือ ☐ ประถมศึกษา
☐ มัธยมศึกษาตอนต้น ☐ มัธยมศึกษาตอนปลาย
☐ อาชีวศึกษา/ประกาศนียบัตร ☐ ปริญญาตรี
☐ สูงกว่าปริญญาตรี

6 สิทธิในการรักษา

☐ ชำระเงินเอง
☐ ประกันสังคม
☐ ประกันชีวิต / ประกันสุขภาพ
☐ บัตรประกันสุขภาพถ้วนหน้า (บัตรทอง 30 บาทรักษาทุกโรค)
☐ เบิกจากต้นสังกัด/ สิทธิข้าราชการ / พนักงานรัฐวิสาหกิจ

7 รายได้ต่อเดือน (บาท)

☐ $\leq$ 15,000 บาท
☐ 15,001 – 35, 000 บาท
☐ $\geq$ 35,001 บาท

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8 การดื่มเครื่องดื่มที่มีแอลกอฮอล์ เช่น สุรา เบียร์ ไวน์

☐ ไม่ดื่มเครื่องดื่มที่มีแอลกอฮอล์

☐ ดื่มเครื่องดื่มที่มีแอลกอฮอล์เมื่อสังสรรค์

☐ ปัจจุบันยังดื่มเครื่องดื่มที่มีแอลกอฮอล์

9 การสูบบุหรี่

☐ ไม่สูบบุหรี่

☐ เคยสูบแต่ปัจจุบันเลิกสูบแล้ว

☐ ปัจจุบันยังสูบบุหรี่อยู่

10 ประวัติบุคคลในครอบครัวเจ็บป่วยด้วยมะเร็งลำไส้ใหญ่และทวารหนัก

☐ ไม่มี

☐ มี เกี่ยวข้องเป็น ☐ ญาติสายตรง เช่น พ่อแม่ บุตร พี่น้อง

☐ ญาติ เช่น ปู่ ย่า ตา ยาย ลูกพี่ ลูกน้อง ลุง ป้า น้า อา

11 ประวัติบุคคลในครอบครัว เช่น พ่อ แม่ ปู่ ย่า ตา ยาย พี่น้อง บุตร ลุง ป้า น้า อา หรือ ลูกพี่ ลูกน้อง เจ็บป่วยด้วยมะเร็งชนิดอื่น

☐ ไม่มี

☐ มี ป่วยเป็นมะเร็ง.....

11) ประวัติการได้รับรังสีรักษาบริเวณช่องท้องหรืออุ้งเชิงกราน

☐ ไม่มี

☐ มี เพื่อรักษามะเร็ง.....

12) โรคประจำตัวอื่นๆ

☐ ไม่มี

☐ มี ได้แก่ ☐ เบาหวาน

☐ ความดันโลหิตสูง

☐ โรคหัวใจและหลอดเลือดอื่นๆ

☐ โรคไต

☐ โรคทางระบบทางเดินอาหาร ระบุ.....

☐ อื่น ๆ โปรดระบุ.....

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ตอนที่ 2 ข้อมูลทางคลินิก: สำหรับผู้วิจัยบันทึกข้อมูลจากแฟ้มประวัติของผู้ป่วย

1 ประวัติติ่งเนื้อในลำไส้ใหญ่

☐ ไม่มี

☐ มี

2. ประวัติโรคลำไส้อักเสบเรื้อรัง

☐ ไม่มี

☐ มี ได้แก่ ☐ Inflammatory Bowel disease

☐ Ulcerative colitis

☐ Crohn's disease

3. ประวัติครอบครัวเป็นมะเร็งลำไส้ประเภทถ่ายทอดทางพันธุกรรม

☐ ไม่มี

☐ มี ได้แก่ ☐ FAP ☐ HNPCC (Lynch syndrome)

4 ผลการตรวจชิ้นเนื้อทางพยาธิวิทยา

☐ Adenocarcinoma

☐ Neoplasm, malignant

☐ Mucinous adenocarcinoma

☐ อื่นๆ โปรดระบุ.....

5 ระยะของมะเร็งลำไส้ใหญ่และทวารหนัก (Stage of colorectal cancer)

☐ Stage I

☐ Stage II

☐ Stage III

☐ Stage IV

☐ Other.....

ระบุชนิดของ Cancer (Colon or Rectum)

ระยะของโรคตามระบบ TNM **T=.....N=.....M=.....**

6 วิธีการรักษามะเร็งลำไส้ใหญ่และทวารหนักที่ได้รับในปัจจุบัน

☐ การผ่าตัด ☐ การผ่าตัดและเคมีบำบัด

☐ การผ่าตัดและรังสีรักษา ☐ การผ่าตัด เคมีบำบัด และรังสีรักษา

☐ เคมีบำบัด ☐ รังสีรักษา

☐ เคมีบำบัดและรังสีรักษา

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ส่วนที่ 2 แบบสอบถามระยะเวลาในการมาตรวจและวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนัก

คำชี้แจง: แบบสอบถามชุดนี้จัดทำขึ้นเพื่อใช้ในการประเมินระยะเวลาตั้งแต่วันที่ผู้ป่วยสังเกตุเห็นหรือมีอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักจนถึงวันที่ได้รับการวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนัก ข้อคำถามประกอบด้วย 2 ตอน คือระยะเวลาในการมาโรงพยาบาลและระยะเวลาในโรงพยาบาล ดังนั้นก่อนตอบแบบสอบถามชุดนี้ขอให้ท่านนึกย้อนไปถึงอาการที่ท่านเคยมีก่อนมาพบแพทย์ในโรงพยาบาล

ตอนที่ 1 ระยะเวลาในการมาโรงพยาบาล

1 ท่านสังเกตเห็น หรือมีอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักเป็นครั้งแรกเมื่อ

วันที่.....เดือน .....พ.ศ.....

2 อาการดังกล่าวคือ.....

.....

3 ท่านเข้ารับการตรวจรักษาจากแพทย์เฉพาะทางเมื่อพบอาการผิดปกติดังกล่าวครั้งแรกเมื่อ
วันที่.....เดือน.....พ.ศ.....

ตอนที่ 2 ระยะเวลาในโรงพยาบาล (สำหรับผู้วิจัยบันทึกข้อมูล)

4 วันที่ เดือน ปี ที่ผู้ป่วยได้รับการยืนยันผลการวินิจฉัยมะเร็งลำไส้ใหญ่และทวารหนัก (จากผลพยาธิวิทยาของชิ้นเนื้อจากการส่องกล้องตรวจลำไส้ใหญ่และทวารหนักหรือรังสีวินิจฉัยอื่น ๆ)

วันที่.....เดือน .....พ.ศ.....

สำหรับผู้วิจัย : ระยะเวลาในการมาตรวจและวินิจฉัย คำนวนจากผลรวมของตัวเลขคิดเป็นวัน จากระยะเวลาในการมาโรงพยาบาลและระยะเวลาในโรงพยาบาล

รวมระยะเวลาในการมาโรงพยาบาล =.....วัน ระยะเวลาในโรงพยาบาล=.....วัน

จำนวนรวมระยะเวลาในการมาตรวจและวินิจฉัย.....วัน

ส่วนที่ 3 แบบสอบถามความรู้เกี่ยวกับมะเร็งลำไส้ใหญ่และทวารหนัก

คำชี้แจง: แบบสอบถามนี้จัดทำขึ้นเพื่อใช้ในการประเมินความรู้และความเข้าใจของท่านเกี่ยวกับมะเร็งลำไส้ใหญ่และทวารหนัก ขอให้ท่านทำเครื่องหมาย √ ในช่องว่าง “ถูก” ในข้อความที่ท่านคิดหรือเข้าใจว่าถูกต้อง และทำเครื่องหมาย √ ในช่องว่าง “ผิด” ในข้อความที่ท่านคิดหรือเข้าใจว่าไม่ถูกต้อง

ข้อคำถาม	ถูก	ผิด
1 อาการต่อไปนี้เป็นอาการที่พบได้ในคนที่เป็นมะเร็งลำไส้ใหญ่และทวารหนัก ถูกหรือผิด 1.1 มีเลือดออกทางทวารหนัก		
1.2 คลำพบก้อนเนื้อที่บริเวณปากทวารหนัก		
. . . .		

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ส่วนที่ 4 แบบสอบถามการรับรู้ความเจ็บป่วย

คำชี้แจง แบบสอบถามชุดนี้จัดทำขึ้นเพื่อใช้ในการประเมินการรับรู้ความเจ็บป่วยด้านความคิดและด้านอารมณ์ของท่าน ประกอบไปด้วย 3 ตอนดังต่อไปนี้

ตอนที่ 1 การรับรู้อาการที่เกี่ยวข้องและเป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก
ตอนที่ 2 การรับรู้ความเจ็บป่วยด้านความคิดและอารมณ์
ตอนที่ 3 การรับรู้สาเหตุที่เกี่ยวข้องกับอาการและการเจ็บป่วย

ตอนที่ 1 การรับรู้อาการที่เกี่ยวข้องและเป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก

คำชี้แจง แบบสอบถามนี้เป็นการประเมินความคิดเห็นของท่าน ข้อความต่อไปนี้อาจเป็นอาการที่เกิดหรือไม่เกิดขึ้นกับท่าน โปรดระบุว่าตามความคิดเห็นของท่านอาการเหล่านี้เกี่ยวข้องหรือเป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักของท่านหรือไม่

โปรดเติมเครื่องหมาย √ ลงในช่องขวามือที่ตรงกับความคิดของท่าน คำตอบของท่านไม่มีถูกหรือ ผิดเนื่องจากเป็นการสอบถามความคิดเห็นของท่าน

อาการ	อาการนี้เกี่ยวข้องหรือเป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักของฉัน	
	ใช่	ไม่ใช่
ID 1 มีเลือดออกทางทวารหนัก		
ID 2 ถ่ายเป็นมูกเลือด		
. . . .		
ID 11 น้ำหนักลดโดยไม่ทราบสาเหตุ		

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ตอนที่ 2 แบบสอบถามการรับรู้ความเจ็บป่วยด้านความคิดและอารมณ์

คำชี้แจง แบบสอบถามนี้เป็นการประเมินความคิดเห็นของท่านเกี่ยวกับการรับรู้ความเจ็บป่วยด้านความคิดและอารมณ์ ขอให้ท่านนึกย้อนถึงตอนที่ท่านมีอาการก่อนที่จะมาพบแพทย์ และโปรดทำเครื่องหมาย (√) ลงในช่องขวามือที่ตรงกับความคิดเห็นของท่านโดยเลือกตอบได้เพียงคำตอบเดียว การเลือกตอบมีเกณฑ์ดังนี้

1 หมายถึง ท่านไม่เห็นด้วยอย่างยิ่ง
2 หมายถึง ท่านไม่เห็นด้วย
3 หมายถึง ท่านรู้สึกเฉยๆ
4 หมายถึง ท่านเห็นด้วย
5 หมายถึง ท่านเห็นด้วยอย่างยิ่ง

ข้อคำถาม	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	เฉยๆ	เห็นด้วย	เห็นด้วยอย่างยิ่ง
	1	2	3	4	5
IP1 ฉันคิดว่าอาการที่เกิดขึ้นจะคงอยู่ในช่วงเวลาสั้น ๆ					
IP 2 ฉันคิดว่าอาการของฉันเป็นอาการที่เกิดขึ้นแบบถาวรมากกว่าเป็นอาการที่เกิดขึ้นแบบชั่วคราว					
. . . .					
IP 32 อาการที่เกิดขึ้นกับฉัน ทำให้ฉันรู้สึกกลัว					

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ตอนที่ 3 แบบสอบถามการรับรู้สาเหตุที่เกี่ยวข้องกับอาการและการเจ็บป่วย

คำชี้แจง แบบสอบถามส่วนนี้ต้องการทราบความคิดเห็นว่า อะไรที่ท่านคิดว่าอาจเป็นสาเหตุของอาการและการเจ็บป่วยที่เกิดขึ้นกับท่านในครั้งนี้ ท่านอาจมีความคิดเห็นที่แตกต่างจากบุคลากรทางการแพทย์หรือคนในครอบครัว คำตอบของท่านไม่มีถูกหรือผิดเนื่องจากเป็นการสอบถามความคิดเห็น

โปรดเติมเครื่องหมาย (√) ลงในช่องขวามือที่ตรงกับความคิดเห็นของท่าน โดยเลือกคำตอบได้เพียงคำตอบเดียว การเลือกตอบมีเกณฑ์ดังต่อไปนี้

1 หมายถึง ท่านไม่เห็นด้วยอย่างยิ่งกับข้อความดังกล่าว
2 หมายถึง ท่านไม่เห็นด้วยกับข้อความดังกล่าว
3 หมายถึง ท่านรู้สึก เฉยๆกับข้อความดังกล่าว
4 หมายถึง ท่านเห็นด้วยกับข้อความดังกล่าว
5 หมายถึง ท่านเห็นด้วยอย่างยิ่งกับข้อความดังกล่าว

สาเหตุ	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	เฉยๆ	เห็นด้วย	เห็นด้วยอย่างยิ่ง
	1	2	3	4	5
1 ความเครียด หรือความกังวล					
2 ปัญหาในครอบครัวหรือความกังวลเกี่ยวกับสิ่งต่าง ๆ ในครอบครัว					
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18 การมีแผลปริขอบทวารหนัก					

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ส่วนที่ 5 แบบสอบถามพฤติกรรมแสวงหาบริการทางสุขภาพ

คำชี้แจง แบบสอบถามชุดนี้จัดทำขึ้นเพื่อใช้ในการประเมินพฤติกรรมแสวงหาบริการทางสุขภาพ ขอให้ท่านนึกถึงตอนที่ท่านมีอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักก่อนที่ท่านจะมาพบแพทย์ในโรงพยาบาล และโปรดระบุว่าท่านปฏิบัติตามข้อความดังต่อไปนี้ “ ใช่” หรือ “ ไม่ใช่” หากท่านตอบว่า “ใช่” กรุณาระบุว่าท่านปฏิบัติตามข้อความดังกล่าวบ่อยครั้งเพียงใดเมื่อมีอาการ โดยทำเครื่องหมาย √ ลงในช่องว่างด้านขวามือของข้อความกล่าว การเลือกตอบมีเกณฑ์ดังนี้

1 หมายถึง ท่านปฏิบัติตามข้อความดังกล่าวนาน ๆ ครั้ง หรือ 1 - 2 ครั้ง
2 หมายถึง ท่านปฏิบัติตามข้อความดังกล่าวเป็นบางครั้ง หรือ 3 - 5 ครั้ง
3 หมายถึง ท่านปฏิบัติตามข้อความดังกล่าวสม่ำเสมอ หรือทุกครั้งเมื่อท่านมีอาการ

พฤติกรรมแสวงหาบริการทางสุขภาพ	เมื่อท่านมีอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก ท่านปฏิบัติตามข้อความดังต่อไปนี้		หาก “**ใช่**” ท่านปฏิบัติกิจกรรมเหล่านี้บ่อยครั้งเพียงใด		
	ไม่ใช่	ใช่	ปฏิบัตินาน ๆ ครั้ง (1)	ปฏิบัติเป็นบางครั้ง (2)	ปฏิบัติสม่ำเสมอ (3)
1 ซื้อยาแผนปัจจุบันหรือยาสามัญประจำบ้านมารับประทานเอง เช่น ยาลดกรด ยาแก้ปวดท้อง ยาระบาย					
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21 อื่น ๆ (โปรดระบุ).....					

ส่วนที่ 6 แบบสอบถามการรับรู้ความรุนแรงของอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก

คำชี้แจง : แบบสอบถามนี้เป็นการประเมินการรับรู้ของท่านต่ออาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนัก ขอให้ท่านวงกลมคำตอบที่ตรงกับความรู้สึกของท่านมากที่สุด คำตอบของท่านไม่มีถูกไม่มีผิด

1 "ท่านคิดว่าอาการที่เป็นสัญญาณเตือนของมะเร็งลำไส้ใหญ่และทวารหนักดังต่อไปนี้ มีความรุนแรงในระดับใด"

1.1 มีเลือดออกทางทวารหนัก

1	2	3	4	5
ไม่รุนแรงเลย	เล็กน้อย	ปานกลาง	รุนแรงมาก	รุนแรงมากที่สุด

1.2 ถ่ายเป็นมูกเลือด

1	2	3	4	5
ไม่รุนแรงเลย	เล็กน้อย	ปานกลาง	รุนแรงมาก	รุนแรงมากที่สุด

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1.11 น้ำหนักลดโดยไม่ทราบสาเหตุ

1	2	3	4	5
ไม่รุนแรงเลย	เล็กน้อย	ปานกลาง	รุนแรงมาก	รุนแรงมากที่สุด

Appendix I

Preliminary analysis and statistics

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Normality testing of variables

Statistics

		KL	Cognitive	Emotional	PS	HCSB	Time to hospital
N	Valid	240	240	240	240	240	240
	Missing	0	0	0	0	0	0
Mean		14.0792	140.3208	13.4042	35.4542	20.3250	77.49
Std. Error of Mean		.20966	1.14436	.27014	.48599	.55157	6.684
Median		14.0000	139.0000	13.0000	36.0000	19.0000	32.00
Mode		16.00	131.00	10.00	32.00[a]	16.00	31
Std. Deviation		3.24811	17.72834	4.18495	7.52888	8.54490	103.550
Variance		10.550	314.294	17.514	56.684	73.015	10722.686
Skewness		-.439	.460	.165	-.311	.286	2.411
Std. Error of Skewness		.157	.157	.157	.157	.157	.157
Kurtosis		-.450	.715	-.464	.163	-.606	6.221
Std. Error of Kurtosis		.313	.313	.313	.313	.313	.313
Range		15.00	118.00	20.00	42.00	41.00	631
Minimum		6.00	92.00	5.00	13.00	3.00	1
Maximum		21.00	210.00	25.00	55.00	44.00	632
Sum		3379.00	33677.00	3217.00	8509.00	4878.00	18598
Percentiles	25	12.0000	127.0000	10.0000	31.0000	14.0000	16.00
	50	14.0000	139.0000	13.0000	36.0000	19.0000	32.00
	75	16.0000	152.0000	16.0000	41.0000	27.0000	93.00

a. Multiple modes exist. The smallest value is shown

KL = Knowledge about CRC, Cognitive = cognitive illness perception, Emotional = Emotional illness perception, PS= perceived seriousness of warning signs and symptoms

Normality testing for sub-dimensions of illness perception

Statistics

		Identity	Timeline (acute vs. chronic)	Consequence	Personal control	Treatment control	Illness coherence	Timeline (cyclical)	Cause
N	Valid	240	240	240	240	240	240	240	240
	Missing	0	0	0	0	0	0	0	0
Mean		7.7375	20.1333	13.1750	14.2917	10.5708	12.7250	10.7417	50.9458
Median		8.0000	20.0000	14.0000	14.0000	11.0000	12.0000	10.0000	50.0000
Mode		8.00	20.00	16.00	16.00	10.00	12.00	10.00	56.00
Std. Deviation		2.19972	3.63832	3.73082	2.70408	1.43593	3.74716	3.66368	8.24984
Variance		4.839	13.237	13.919	7.312	2.062	14.041	13.423	68.060
Skewness		-.566	.037	-.279	-.292	-.609	.243	.255	.464
Std. Error of Skewness		.157	.157	.157	.157	.157	.157	.157	.157
Kurtosis		-.076	.331	-.855	-.245	1.812	-.265	-.933	.878
Std. Error of Kurtosis		.313	.313	.313	.313	.313	.313	.313	.313
Range		10.00	23.00	16.00	14.00	9.00	19.00	15.00	52.00
Minimum		1.00	9.00	4.00	6.00	5.00	5.00	4.00	32.00
Maximum		11.00	32.00	20.00	20.00	14.00	24.00	19.00	84.00
Sum		1857.00	4832.00	3162.00	3430.00	2537.00	3054.00	2578.00	12227.00
Percentiles	25	6.0000	18.0000	10.0000	12.0000	10.0000	10.0000	8.0000	46.0000
	50	8.0000	20.0000	14.0000	14.0000	11.0000	12.0000	10.0000	50.0000
	75	9.0000	23.0000	16.0000	16.0000	12.0000	15.7500	14.0000	56.0000

Table 1 Descriptive statistics for the major studied variables (n = 240)

Variables	***Min***	***Max***	**$\bar{X}$**	**SD**	**CV**	**Sk**	**Ku**
Knowledge about colorectal cancer	6	21	14.07	3.24	23.02	-.439	-.450
Cognitive illness perception	92	210	140.32	17.72	12.62	.460	.715
Emotional illness perception	5	25	13.40	4.18	31.19	.165	-.464
Health care seeking behaviors	3	44	20.32	8.54	42.02	.286	-.606
Perceived seriousness of warning signs and symptoms	13	55	35.45	7.52	20.45	-.311	.163
Time to hospital	1	632	77.49	103.55	133.63	2.411	6.221

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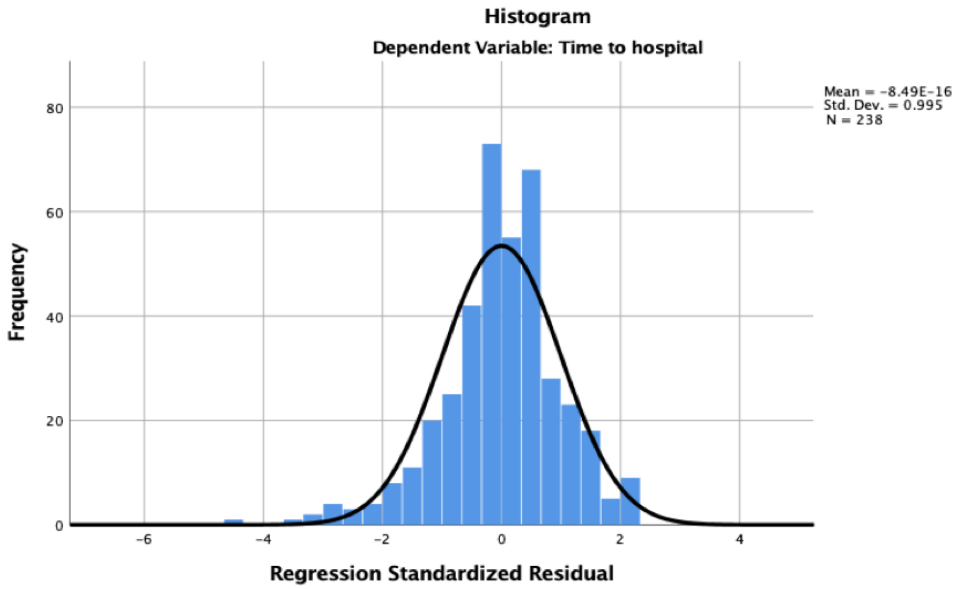
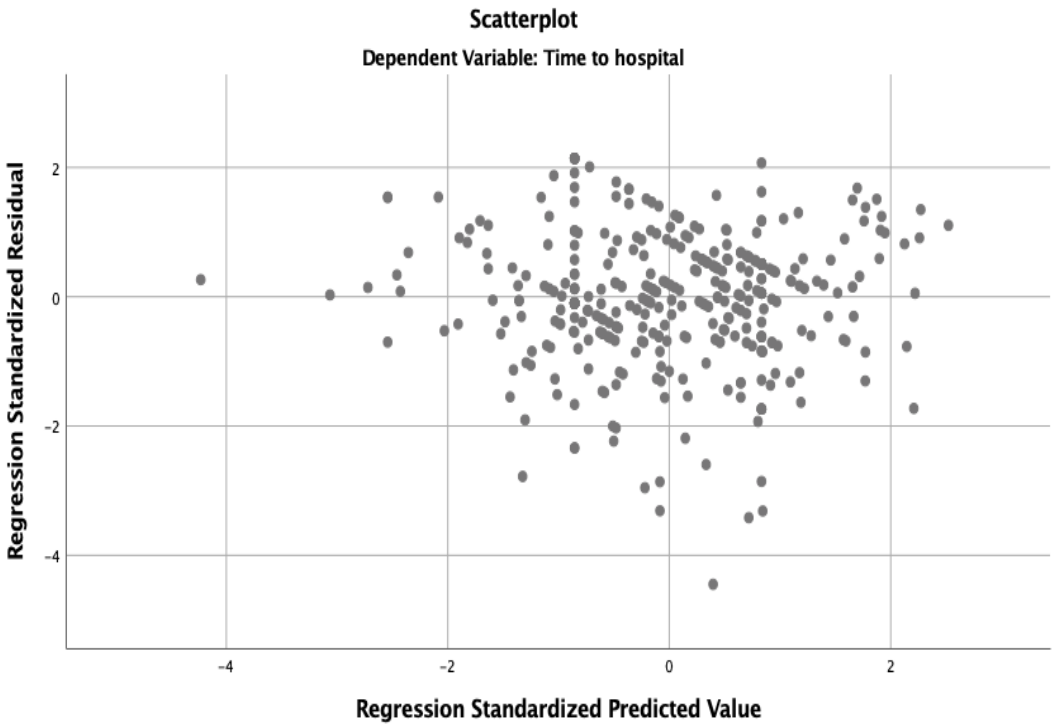
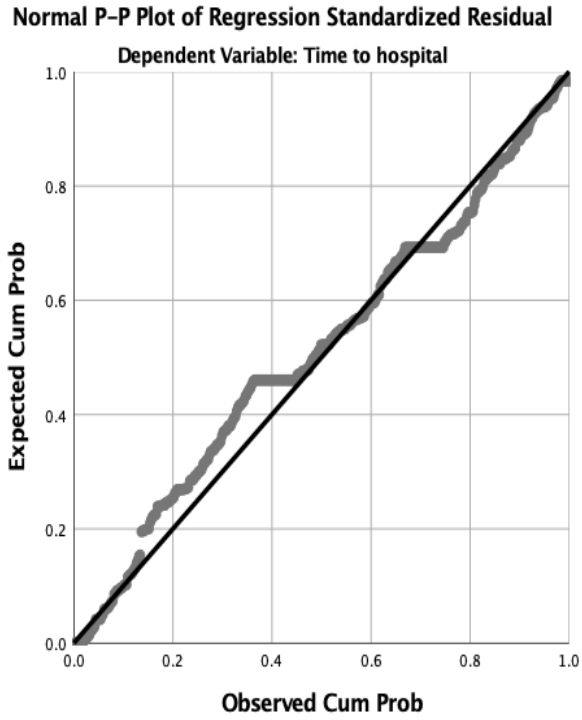
Normal distibution of time to hospital after log transformation natural log (logN)



Residual scatterplot of Time to hospital



Homoscedasticity and linearity testing: Normal P-P Plot Regression



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Multicollinearity testing

	K1	K2	K3	K4	C1	C2	C3	C4	C5	C6	C7	C8	EMO	H1	H2	H3	H4	H5	PS	TTH
K1	1																			
K2	.192**	1																		
K3	.344**	.199**	1																	
K4	.238**	.240**	.445**	1																
C1	.179**	0.051	.130*	.128*	1															
C2	-.288**	-0.029	-0.096	-0.016	-0.023	1														
C3	-.247**	-.203**	-.169**	-.206**	-0.093	.246**	1													
C4	0.013	-0.042	0.035	-0.035	0.061	.267**	.209**	1												
C5	-0.041	-0.052	0.1	0.046	-0.025	0.099	-0.022	.155*	1											
C6	-.265**	-0.062	-.135*	-0.06	-0.084	.462**	.395**	.164*	0.066	1										
C7	-.315**	-.141*	-.139*	-.128*	-0.054	.402**	.391**	0.111	-0.026	.621**	1									
C8	-0.063	-0.01	-0.066	-0.078	0.102	.299**	.326**	.161*	.158*	.399**	353**	1								
EMO	-.142*	-0.011	-0.017	-0.087	0.049	.316**	.441**	0.043	-0.064	.530**	.172**	0.114	1							
H1	0.033	-0.008	-0.067	-0.012	0.1	0.034	.136*	0.037	0.071	0.025	.129*	.169**	.302**	1						
H2	-0.055	0.002	-0.063	-0.055	0.042	.134*	0.071	0.082	0.124	.173**	-.130*	-0.08	.246**	0.051	1					
H3	.280**	0.066	.245**	.175**	.316**	-.153*	-.189**	-0.01	0.047	-.321**	-.315**	-.130*	-0.08	.246**	0.051	1				
H4	-0.015	0.085	0.052	0.107	0.078	0.021	-0.079	-0.065	0.058	.202**	.176**	0.014	0.102	.187**	.163*	.263**	1			
H5	.131*	.170**	.179**	.260**	.265**	0.079	-0.053	-0.109	-0.006	0.042	0.028	0.03	0.082	.160*	0.001	.391**	.450**	1		
PS	.167**	-0.017	-0.043	0.057	.232**	-0.102	-0.013	-0.031	0.081	-0.007	-0.08	0.063	0.036	0.088	0.015	.160*	.176**	.152*	1	
TTH	-0.044	-0.038	-0.012	-0.88**	-0.04	.151*	-0.63**	-0.036	0.096	.149*	0.78**	0.106	.137*	0.58**	0.077	-0.1	-0.034	-0.066	-0.079	1

Abbreviations: K1 = knowledge about symptom of CRC, K2 = knowledge about age-related risk of CRC, K3 = knowledge about risk factor of CRC, K4= knowledge about CRC screening method. C1=Identity subscale, C2=Timeline (acute vs. chronic), C3 = Consequence sub- scale, C4= Personal control sub- scale, C5= Treatment control sub- scale, C6 = Illness coherence sub- scale C7=Timeline (cyclical) sub- scale, C8= Cause sub- scale. EMO= Emotional illness perception . H1=HCSB (Self-Medicating), H2= HCSB (Complementary and alternative medicine), H3= HCSB (Counselling), H4 = HCSB (Emotional-focused coping), H5= HCSB (Problem -focused coping). PS= Perceived seriousness of warning signs and symptoms, TTH= Time to hospital

Appendix J

Number and frequency of perceived seriousness of waning sing and symptoms

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Number and frequency of perceived seriousness of warning signs and symptoms

	Perceived seriousness of warning signs and symptoms				
	Not at all N (%)	**Mildly N (%)**	**Moderately N (%)**	**Very N (%)**	**Extremely N (%)**
Rectal bleeding	13 (5.42)	29 (12.08)	34(14.17)	90(37.50)	74(30.83)
Mucous bloody	13 (5.42)	32(13.33)	40(16.67)	96(40.00)	59(24.58)
Blood in the stool	15(6.25)	37(15.42)	63(26.25)	99(41.25)	26(10.83)
Dark or back stools	17(7.08)	57(23.75)	79(32.92)	69(28.75)	18(7.50)
A change in bowel habits (e.g., shape of the stool smaller or more narrow than usual)	17(7.08)	63(26.25)	80(33.33)	66(27.50)	14(5.83)
Tenesmus	14(5.83)	44(18.33)	80(33.33)	82(34.17)	20(8.33)
Abdominal pain or discomfort in the lower abdomen	10(4.17)	36(15.00)	68(28.33)	88(36.67)	38(15.83)
Bloating up, fullness, or gas in the stomach	30(12.50)	66(27.50)	81(33.75)	57(23.75)	6(2.50)
Chronic constipation or diarrhea	19(7.92)	71(29.58)	69(28.75)	70(29.17)	11(4.58)
Decreased appetite	25(10.42)	48(20.00)	73(30.42)	81(33.75)	13(5.42)

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