CONSTIPATION AND QUALITY OF LIFE AMONG NON-ACADEMIC STAFFS IN SCHOOL OF HEALTH SCIENCE, UNIVERSITI SAINS MALAYSIA

DAMIA BATRISYIA BT MOHD SONNY

BACHELOR OF NURSING (HONOURS)
SCHOOL OF HEALTH SCIENCES
UNIVERSITI SAINS MALAYSIA

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by

DAMIA BATRISYIA BT MOHD SONNY

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CERTIFICATE

This is to certify that the dissertation entitled "Constipation and Quality of Life among Non-academic staffs in School of Health Universiti Sains Malaysia" is the bona fide record of research work done by Ms Damia Batrisyia Binti Mohd Sonny during the period from October 2022 to June 2023 under my supervision. I have read this dissertation and that in my opinion it confirms to acceptable standards of scholarly presentation is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfillment for the degree of Bachelor of Nursing (Honours).

Main Supervisor   Co-Supervisor

……………………….   …………………………

Dr Dariah Mohd Yusoff   Dr Erica Kueh Yee Cheng

Associate Professor Madya   Associate Professor Madya

School of Health Sciences   School of Health Sciences

Universiti Sains Malaysia   Universiti Sains Malaysia

Health Campus   Health Campus

16150 Kubang Kerian   16150 Kubang Kerian

Kelantan   Kelantan

Date: …………………..   Date: ……………………

DECLARATION

I hereby declare that this dissertation is the result of my own investigations, except where otherwise stated stated and duly acknowledge. I certify that this dissertation has not been previously submitted for a degree of diploma in any university or other institutions and does not contain any material previously published or written by another person except where due reference is made in the text. I grant Universiti Sains Malaysia the right to use this dissertation for teaching, research, and promotion purposes.

………………………………….

Damia Batrisyia Binti Mohd Sonny (147425)

Student of Bachelor of Nursing (Honours)

School of Health Sciences

Universiti Sains Malaysia

Health Campus

16150 Kubang Kerian

Kelantan

Date: ……………………

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ABSTRACT

Constipation is a common medical problem among adult, which may have negative consequences on their lives and most people may suffer from constipation at some point in their lives. This study aims to assess the prevalence of constipation, the level of QOL, and its association between constipation and impact towards QOL, and association between socio-demographic factors and constipation among non-academic staffs. A cross-sectional study was conducted to recruit the respondent in School of Health Sciences, (SHS), Universiti Sains Malaysia (USM). A total of 78 non-academic staff aged between 18-65 ages years old under different programmes in SHS, that fulfilled inclusion criteria involved in this study. They were selected through simple random method using a set of set self-administered questionnaire. The data was analysed with Statistical Package for Social Science (SPSS) version 26.0 windows using descriptive analysis, independent T-test and Fisher Exact Test. Constipation was indicated in 44.5% respondents. The quality of life Highest Mean was found in Domain 3 (Social Domain) Mean=85.68, Only psychological domain had significant association with constipation, which is (p=0.15). Taken medication was the only significant factor associated to constipation (p=0.005). In conclusion, constipation is highly prevalent among non-academic staffs in SHS and there is need to focus preventive measures for constipation to avoid a more severe complication.

SEMBELIT DAN KUALITI HIDUP

ANTARA KAKITANGAN BUKAN AKADEMIK DI PUSAT PENGAJIAN

SAINS KESIHATAN, UNIVERSITI SAINS MALAYSIA

ABSTRAK

Sembelit adalah masalah perubatan biasa di kalangan orang dewasa, yang mungkin membawa kesan negatif ke atas kehidupan mereka dan kebanyakan orang mungkin mengalami sembelit pada satu ketika dalam hidup mereka. Kajian ini bertujuan untuk menilai prevalens sembelit, tahap QOL, dan perkaitannya antara sembelit dan kesan terhadap QOL, dan perkaitan antara faktor sosio-demografi dan sembelit dalam kalangan kakitangan bukan akademik. Kajian keratan rentas telah dijalankan untuk merekrut responden di Pusat Pengajian Sains Kesihatan, (PPSK), Universiti Sains Malaysia (USM). Sejumlah 78 kakitangan bukan akademik berumur antara 18-65 tahun di bawah program berbeza di PPSK, yang memenuhi kriteria kemasukan yang terlibat dalam kajian ini. Mereka dipilih melalui kaedah rawak mudah menggunakan set soal selidik yang ditadbir sendiri. Data telah dianalisis dengan perisian Statistical Package for Social Science (SPSS) versi 26.0 menggunakan analisis deskriptif, ujian-T bebas dan Ujian Tepat Fisher. Sembelit ditunjukkan dalam 44.5% responden. Kualiti hidup Min Tertinggi didapati dalam Domain 3 (Domain Sosial) Min=85.68, Walau bagaimanapun, hanya domain psikologi yang mempunyai perkaitan yang signifikan dengan sembelit, iaitu (p=0.15). Pengambilan ubat adalah satu-satunya faktor penting yang dikaitkan dengan sembelit (p=0.005). Kesimpulannya, sembelit adalah sangat berleluasa di kalangan kakitangan bukan akademik di PPSK dan terdapat keperluan untuk menumpukan langkah pencegahan untuk sembelit untuk mengelakkan komplikasi yang lebih teruk.

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LIST OF ABBREVATIONS

SHS   - School of Health Science

HREC   - Human Research Ethic Committee

CAS   - Constipation Assessment Skill

BSFS   - Bristol Scale Form

WHOQOL BREF   - World Health Organization Quality of Life

CHAPTER 1

INTRODUCTION

1.1 Background of the study

In this first chapter, the background of the study is explained. This is followed by the problem statement, research questions, and hypotheses of the study. The researcher also has listed, general as well as specific objectives and benefits of conducting this study.

Constipation is a common health problem that can be a symptom of serious disease. The estimated prevalence of constipation is between 1% to 80%, worldwide, where the condition is characterized by a wide geographical variation (Forootan et al., 2018). According to Dore et al., (2018), constipation is a common complaint, and the prevalence of self-reported constipation in the adult population is estimated at 30%. Forootan et al., (2018) added that constipation is a common functional gastrointestinal disorder resulting in infrequent stools and difficult stool passage with pain and stiffness.

Based on the Global Guidelines of the World Gastroenterology Organization 2012, constipation is defined as continuous stress or incomplete defecation or rare bowel movements every three to four days or less (Yurtdaş et al., 2020). Some of the symptoms are the symptoms of constipation are straining, lumpy or hard stool, a sensation of incomplete evacuation, the sensation of anorectal blockage, manual maneuver to facilitate defecation and having less than three defecations per week (Patimah, et. al., 2017). Additional symptoms of constipation may include abdominal pain, discomfort, and bloating (Dore et al., 2018). A person may be considered as having constipation if experiencing two or more of these symptoms (Dore et al., 2018). Moreover, based on Rome III criteria, constipation is a combination of objectives measures such as stool

frequency, and manual maneuvers needed for defecation and is subjective including straining, lumpy, or hard stools (Roque & Bouras, 2015). In addition, all these conditions must be met for the past 3 months with the onset of the symptoms at least 6 months before diagnosis (Yamamoto et al., 2022).

However, there are the alarm sign of constipation that should be stressed on includes rectal bleeding or bloody stool, a patient having a sudden change in persistent usual bowel rhythm more than six, especially for those over 50 years old age, having an iron deficiency, anemia, weight loss, significant abdominal pain, family, or personal history of colorectal cancer or having inflammatory bowel disease and a palpable mass (Serra et al., 2017). National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), (2021), also recommends that people should seek medical advice if the symptoms still occur or if recognize the symptoms such as persistent abdominal pain, pain in the lower back, a feeling that gas is trapped, vomiting, fever, unexplained weight loss and a sudden change in bowel movements. All of these symptoms indicates the presence of a more serious disease such as colon cancer and irritable bowel disease (Heidelbaugh et al., 2021).

Constipation can be divided into two types, primary and secondary, which is based on different causes. Primary (idiopathic) or known as functional constipation can be further categorized conceptually into three other types. Firstly, based on the pathophysiology of patients with normal colonic transit. Secondly, those with slow colonic transit, and finally, those with functional defecatory disorders (Moezi et al., 2018). While secondary constipation refers to people who have an underlying disease such as organic (colorectal cancer), endocrine or metabolic (pregnancy), neurological (spinal cord injury), myogenic (myotonic dystrophy), anorectal (anal fissure), drugs

(opiates or antidepressant), diet (low fiber diet), dehydration and an inactive lifestyle (Tack et al., 2011).

Many factors can contribute to constipation such as demographic, lifestyle, and health-related factors (Werth & Christopher, 2021). Besides that, several other associated factors have been identified such as lower social economic status, lower parental education, medication, depression, physical and sexual abuse, or everyday life event that also can contribute to constipation (Yurtdaş et al., 2020). Other factors such as withholding behavior after experiencing a difficult and painful bowel movement are known to induce functional constipation in children and lead to stool retention, rectal distension, and overflow fecal incontinence (Basilisco & Coletta, 2013). A randomized clinical trial reported that biofeedback is more effective than both three feedback and laxatives, particularly in the sub-group of patients with defecation disorders as 76% responded to biofeedback and only 46% to standard laxative therapy (Basilisco & Coletta, 2013).

There are other associated factors to constipation, which is the present of comorbidities such as anorectal, colon, and urological disorders. A study by Serra et al., (2017) indicated that hemorrhoids, anal fissures, rectal prolapse, stercoral ulceration, fecal impaction, fecal incontinence, megacolon, volvulus, diverticular disease, urinary tract infections, enuresis, urinary incontinence were associated to chronic constipation. Constipation harms social and professional life as it can cause absenteeism and loss of productivity, reducing the quality of life, and is a heavy economic burden due to the costs related to its diagnosis, treatment, and management (Bellini et al., 2021).

Constipation can occur at various ages. However, for the purposed of this study, the researcher focused on constipation among adults, which is among non-academic staffs of School of Health Sciences (SHS), Universiti Sains Malaysia, (USM). Currently, there are 123 support staffs in the SHS who helps with administrative matters and various affairs in the SHS. They are allocated in various workplaces in the SHS including departments, units, clinics, labs, offices, and programs of study.

1.2 Problem Statement

Although cases of mortality and fatality rate related to constipation are very low, persistent and transient constipation however, could lead to an increase in mortality rate up to 2.8% and 2% respectively, compared to the people without constipation (Gibson, 2020). This result revealed a general decline in the 10-year survive rate of people with constipation than those without constipation (Gibson, 2020). In addition, it is estimated that one in seven of all adults is affected by constipation at any one time, with 30% of hospital admissions in those aged 75 years and over (Dowden, 2021).

As mentioned earlier, constipation if left untreated can lead to chronic constipation and consequently, can cause other more serious health problems. However, it is not known to what extent the public's awareness of the dangers of the untreated constipation. According to Dowden, (2021), unaware of this health problem is like underestimating the condition of pain and there are likely to be many patients who have to suffer for a long time without proper treatment (Dowden, 2021). Moreover, based on the researcher's observation, there is almost no awareness campaign on bowel health has been held or discussed in the media, leaving the public to believe that constipation is a less common, and less serious health problem (Bowel Interest Group's, 2019).

There are many studies on constipations in adults published elsewhere. However, most of these studies were conducted in Western countries (B. Werth, 2019; Yurtdaş et al., 2020). Also, most of the studies involved hospitalized patients and elderly as the study populations (Iovino et al., 2013; Rao & Go, 2010). In Malaysia recently, there is a published study by Patimah et. al., (2017a), but again, the study was done among the elderly. Obviously, such study in a specific adult population such as in working age population between 18 years of age to 65 years old is still lacking in Malaysia.

According to Alina Islam, a holistic nutritionist, "good gut health, or good digestion, is the gateway to overall health and wellbeing", as cited in Malik, (2018). Therefore, it is very important to take care of bowel health and prevent bowel diseases such as constipation so that the overall health can be preserved.

With all these issues in mind, the researcher conducted a study with the aims to assess the prevalence and quality of life in an adult population in order to bridge the research gap related to constipation.

1.3 Research Question

1. What is the prevalence of constipation among non-academic staffs in School of Health Sciences (SHS), Universiti Sains Malaysia USM?

2. What is the level quality of life among non-academic staffs with and without constipation in SHS, USM?

3. Is there any association between constipation and impact on quality of life among the non-academic staffs in SHS, USM?

4. Is there any association between socio-demographic factors (age, gender, level of education, occupation, income, medical history, drug/medication, dietary intake,

fluid intake, type of toilet used, and smoking) and constipation among the non-academic staffs in SHS, USM?

1.4 Research Objective

1.4.1 General Objectives

To determine the prevalence of constipation and the impact of quality of life among non-academic staff in the School of Health Sciences (SHS), (USM).

1.4.2 Specific Objectives

The specific objectives of this study are:

1. To identify the prevalence of constipation among non-academic staff in SHS, USM.
2. To determine the level of quality life among non-academic staffs with and without constipation in SHS, USM
3. To determine the association between constipation and impact on quality of life among the non-academic staff in SHS, USM.
4. To determine the relationship between socio-demographic factors (age, gender, level of education, occupation, income, medical history, drug/medication, fluid intake, dietary intake, smoking habit and type of toilet used) with constipation among the non-academic staffs.

1.5 Research Hypothesis

Hypothesis 1:

Ho: There is no significant association between constipation and impact on quality of life among the non-academic staffs in the SHS, USM.

H$_A$: There is a significant association between constipation and impact on quality of life among the non-academic staffs in the SHS, USM.

Hypothesis 2:

Ho: There is no significant association between socio-demographic factors and constipation among the non-academic staffs in the SHS, USM

H$_A$: There is a significant association between socio-demographic factors and constipation among the non-academic staffs in the SHS, USM

1.1 Conceptual and Operational Definitions

Terms	Conceptual Definitions	Operational Definition
Constipation	Constipation is characterized by difficult or infrequent bowel movements, accompanied by excessive exertion during the defecation process or a feeling of incomplete evacuation. Furthermore, in most cases, it does underlie organic cause and is considered chronic idiopathic constipation and it is also known as chronic functional constipation (Serra et al., 2017).	In this study, the prevalence of constipation will be assessed among the non-academic staffs in SHS using the Bristol Stool Chart Form (BSFS).
Quality of life	An individual's perception of their position in life in the culture and value systems in which they live and in relation to their goals, expectation, standards, and concerns (WHO, 2012)	In this study, the quality of life of the non-academic staffs with and without constipation will be assessed using the WHOQOL-BREF questionnaire.

Non-academic Staffs	The people who work for an organization to keep it running and to support the people who are involved in the organization's main business: (Cambridge Dictionary,2022)	The non-academic staff in this study refers to the university workers other than the academician that help support the management of the school (SHS).
Adult	Adult is a person older than 19 years of age is considered adult (WHO, 2016)	In this study, all adults are referring to non-academic staffs, aged 18 years old and above as the respondents.
Prevalence	Prevalence is defined as a fact that something is very common or happens often, Cambridge Dictionary, (2020).	In this study, the prevalence of constipation will be identified among the non-academic staffs of SHS, using the Constipation Assessment Scale (CAS).
Associated factors	Refers to a study to identify if one thing is associated with another, or two things may relate to each other Reverso, (2022); Cambridge dictionary, (2022).	In this study, the possible associated factors of constipation are the socio-demographic characteristics that will be tested among the non-academic staffs of SHS.

1.7 Significance of the Study

The findings of this study will provide data on the prevalence of constipation among adult (non-academic staffs in the SHS) and their quality of life. It will also be an additional knowledge and will act as a baseline data in this area of care. It is also hoped that the findings of this study will be used as evidence that constipation is prevalent and there is a need to increase the public's awareness on constipation and bowel health.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter reviews the current literature related to constipation among adults. The literature search was done by using main keywords such as 'constipation' and 'quality of life', 'Non-academic staffs', 'prevalence', 'associated factors and 'adults'. This chapter also will discuss the instruments and the conceptual as well as the theoretical framework that will be used in this study.

2.2 Prevalence of Constipation

Constipation is a common problem worldwide. However, many people have a misconception about constipation, in that it is not a health problem and can be cured on its own. Accordingly, very few seek treatment, and thus, its exact prevalence is difficult to ascertain. Consequently, reports of its prevalence are varied widely, ranging from 0.7% to 29.6% in children and from 2% to 35% in adults in Europe, Oceania, and North America (Mugie et al., 2011).

The average prevalence of constipation in adults has been estimated as 16% worldwide (varies between 0.7% and 79%). Whereas the prevalence of 33.5% was attributed to older adult aged 60 to 110 years (Forootan et al., 2018). It is estimated that approximately 14% of the world's population suffers from constipation. However, in this study, the researcher will focus on adult populations. Adult according to World Health Organization (2016), is a person older than 19 years of age.

Based on a study done on Turkish population, the prevalence of constipation varies between 8.3% and 40% (Yurtdaş et al., 2020). In a survey of over 10 0000

individuals in the United State, 14.7% met the criteria for constipation and 45% of these respondents reported having the condition for 5 years or more (Tack et al., 2011). According to ((Wald & Sigurdsson, 2011), the estimation prevalence of adult population in western countries about 15% with ranges varying from 4% to 28%.

While a study conducted in Spain revealed the prevalence between 14 - 30% (Serra et al., 2017). In Canada, based on the survey study, from 1149 respondent, 27.2% self-reported constipation within the past 3 months, and 16.7% and 14.9% had functional constipation according to Rome I and II, criteria, respectively (Pare et al., 2001). In contrast to this, a cross-sectional study among 543 adults conducted in Saudi Arabia reported the prevalence at 4.4% only (Ahmad et al., 2021).

In Asian countries such as in China, the prevalence of constipation has increase and it becomes a serious public health issue. For example, based on 39 studies involving 1,240,79 respondents in China, the overall pooled prevalence of constipation using the Rome diagnostic criteria was 8.5% (95% CI: 6.0–11.8) (Chen et al., 2022). In addition, in a study from South Korea, there is 26 patients have irritable bowel syndrome (IBS), who complained that they were passing hard stools, only 7 met the definition of hard stool by the Rome III criteria (Bristol stool form scale type 1 or type 2) (Park et al., 2011).

While in Malaysia, the researcher only managed to find a study that was conducted among university students, whereby the prevalence of constipation was 16.2%, with a significantly higher in female (17.4%) than male students (12.5%) (Jye et al., 2016)

2.3 Factors Associated to Constipation

There are several factors associated to constipation as indicated in the literature. These include age, gender, body mass index, systolic and diastolic blood pressure, educational level, socio-economic status, marital status, ethnicity, physical activity,

smoking, opium, and alcohol consumption, and self-reported medical diseases (Jye et al., 2016; Moezi et al., 2018; Yurtdaş et al., 2020). However, in this study, the researcher will focus on socio-demographic factors only. These includes age, gender, income, occupation, marital status, educational level, dietary intake, medication, disease, and physical activity which will be explained in the following sections.

2.3.1 Age

Off 13 studies included in this review, all studies are looking at prevalence of constipation and in all ages. Overall, the results of these studies indicated that constipation is more prevalent after the age of 60 years, with the largest increase after 70 years (Basilisco & Coletta, 2013). Only three studies concluded that there is a relationship between self-reported constipation and aging. However, the other studies stated that there is no true effect of aging on bowel movement frequency (Verkuijl et al., 2020a; Yurtdaş et al., 2020).

In a cross-sectional study by Yurtdas et al., (2020) conducted in the central district of Ankara, Turkey, a total of 5040 adults aged between 18-65 years old participated in the study. A statistically significant relationship between constipation and age (p<0.001) was indicated in this study. They found that the prevalence increased with advancing age, from 12.6% in the 18–29 age group, to 27.3% in the 60–65 age group (p<0.05) (Yurtdaş et al., 2020).

Lim et al., (2016) added that older individual might have difficulty in defecation due to a few factors such as changes in anorectal physiology and gradual colonic dysfunction, impaired rectal sensation and low calories intake that caused reduction in stool volume and bulk.

2.3.2 Gender

Higher prevalence of constipation among women was indicated in most of the reviewed studies (Moezi et al.2018(B. L. Werth & Christopher, 2021a), with the ratio of 2.1 in female-to-male worldwidely (Moezi et al., 2018). Constipation affects 15% to 23% among women and about 11% among men, with an increasing trend in the last decade (Roque & Bouras, 2015). Similar finding was indicated in Ahmed, et. al., (2021) that constipation is more prevalent among females (79.2%) than males (20.8%). Women are at high risk of constipation due to hormonal factors, for example, in the luteal phase of the menstrual cycle, the hormone progesterone will increase the risk of constipation. Anothers causes are due to gynecological surgery and pelvic floor muscles can be damaged (Yurtdaş et al., 2020).

Besides that, constipation is also common during pregnancy (Dowden, 2021). This is because during pregnancy, osmotic and stimulant laxatives are not absorbed systemically, and their use has not been associated with an increased risk of malformations (Trottier et al., 2012). While in other study reported that the proportion of cesarean sections was greater in women with functional constipation (66.97%) compared to those without constipation group (27.29%). Additionally, the prevalence of postpartum hemorrhoids was also higher in women with constipation compared to non-constipated women (23.52% and 13.40%, respectively) (Shi et al., 2015).

2.3.3 Educational Level

There are a few studies found that highly educated individuals had higher constipation disorders (Suares & Ford, 2011). Based on a study conducted among 360 pregnant women by Shi et al., (2015), those with a master's degree or higher education had higher prevalence of constipation (27.22%), with a statistically significat differences

(P < 0.05). Therefore, education may be the main factor influencing the prevalence of constipation in pregnant women only(Shi et al., 2015)

2.3.4 Occupation

In terms of occupation, Shi, et. al., (2015) had done a study on constipation based on three types of job classes; business, service industries, agriculture and technology to see which types of jobs would have a more serious impact of constipation. The result showed that those who work in the business field had a higher prevalence of constipation (28.5%), compared to those who work in the service industry, and agriculture and technology, with a statistically significant difference (P < 0.05), indicating that more sedentary work was associated with a higher prevalence of constipation (Shi et al., 2015).

2.3.5 Income

Most studies reviewed have reported the association of financial status and on constipation in that lower income individuals were more likely to suffer from constipation than those with higher income (Forootan et al., 2018; Pinto Sanchez & Bercik, 2011; Wald et al., 2008a). Furthermore, Squares and Ford (2011) indicated that lower socio-economic status is at risk for functional constipation. (De Giorgio et al., 2015) relate this to the financial burden that is quite expensive to cover the cost of treatment, obtaining investigations, consultations, and purchasing drugs.

2.3.6 Other comorbidity/ Disease

There are several diseases and and health condition that have been reported to be potentially associated with constipation (B. L. Werth & Christopher, 2021a). for example, diabetes was found to be frequently associated with chronic constipation and ranged between 4.7% to 11.8% (Nellesen et al., 2013). Other gastrointestinal commodities were

also studied includes overweight, obesity, depression, and urinary disorders and found that all of them were associated with constipation (Serra et al., 2017). Besides, stroke was also found as associated with chronic constipation in a Brazilian study (Schmidt et al., 2016).

2.3.7 Drug/Medication

Constipation can also occur due to drug consumption (i.e., opioids) (Bellini et al., 2021). However, those with the condition either tend to self-medicate using over the counter medications or self-modify their lifestyle (Yamamoto et al., 2022). Another cause of constipation is the use of too many laxatives and enemas to encourage bowel opening. Using laxatives too often however, is not advisable as the guts may forget their normal functions and start to depend on that medication (National Institute on Aging, 2022).

2.3.8 Fluid Intake

Based on a study among an adult population, the findings reported that there is an association between low fluid intake and intestinal constipation (Nunes Boilesen et al., 2017). Restriction in fluid intake has association with the reduction of fecal weight, and decreases the frequency of bowel movements (Nunes Boilesen et al., 2017). Another study also reported the same finding that constipation was inversely related to fluid intake, whereby respondents who drank less than 1.5 L water per day, had a significant higher prevalence of constipation, compared to those who took more fluid (Verkuijl et al., 2020a).

The European Food Safety Authority, (2010) has recommends a daily water intake of 2500 ml/d for men and 2000 ml/d for women (Yurtdaş et al., 2020) as a way to prevent constipation. According to National Institute Diabetes and Digestive and Kidney Disease (NIDDK), (2018), consume plenty of water is important to avoid dehydration and

improve gut function. Overall, greater water intake may be beneficial for the prevention and treatment of mild intestinal constipation.

2.3.9 Dietary Intake

Dietary intake is among the factors that cause constipation in adults. This is due to the lack of vegetables or high fiber intake (Forootan et al., 2018). A study by (Basilisco & Coletta, 2013) stated that a poor fiber diet can induce constipation, while a high fiber diet can increase stool weight, which resulting in a decreased of colon transit time.

In general, fiber is important in helping to ease the process of defecation to prevent constipation by moving food through the digestive system more easily and increasing the frequency of defecation on a regular basis. The average fiber requirement for adults is 25g to 30g per day and varies by gender (Yusoff, n.d.). In addition, according to Ahmed, et. al., (2021), successful behavior to avoid constipation consists of lifestyle changes such as more an appropriate diet containing fruits, fluids, and probiotics. The presence of prebiotics in the intestine is very important to maintain the balance of microflora (good bacteria and fungi) in the intestine for intestinal health (Yusoff, n.d.).

2.3.10 Smoking Habit

According to (Stewart et al., 1999) in a study concucted in United States, smooking is also another risk factors for constipation. However, a contrast finding was reported in (B. L. Werth & Christopher, 2021b) when they found that there were no significant differences in the prevalence of chronic constipation among smokers and non-smokers. In fact, cigarette smoking affects all parts of the body, including the digestive system because nicotine affects the small bowel and colon. Nicotine also has a stimulating effect on the transit or movement of food/stool through the intestines, helping to keep bowel movements regular (Martin, n.d.).

2.3.11 Type of Toilet Used

Most studies under review have included the types of toilets used as a potential risks factors of constipation. For example, in a study by Alan et al., (2020), they stated that there are two types of toilets commonly used in Turkey, which toilet bowl (bidet toilets) and (squat toilet) used for squatting rather than sitting. The findings reported that the use of bidet facilitates defecation and personal hygiene (Alan et al., 2020). They also suggested that the use of a bidet to the anal region before defecation eases defecation and reduces the severity of constipation in pregnant women.

However, squat toilet has its own advantages such as makes elimination faster, easier, and in a complete form. This helps prevent "fecal stagnation," a prime factor in colon cancer, appendicitis, and inflammatory bowel disease. It also protects the nerves that control the prostate, bladder, and uterus from becoming stretched and damaged. Moreover, this type of toilet for pregnant women, helps to avoid pressure on the uterus and daily squatting also helps to prepare the woman for a more natural delivery (*Asian Squat Toilet vs. Western Sit Toilet: The Down and Dirty - Teaching Nomad*, n.d.).

2.4 The Impact of Constipation on Quality of Life

Constipation can affect almost everyone from time to time, particularly when it turns to chronic and causing more burden to its sufferer (Dowden, 2021). Constipation has a negative impact on quality of life (Nikjooy et al., 2018). Quality of life is defined as those aspects that make life worth living, such as health and the physical, social, and psychological well-being of an individual (Nayak, George & Vidyasagar, 2017). The impact of constipation on the quality of life will be presented on the aspects of physical health, psychological health, and social relationship in the following sections.

2.4.1 Impact on Physical Health

According to (Dowden, 2021), when a person continues to strain to pass stool due to constipation, it can cause pain, and discomfort, and subsequently cause rectal bleeding. Bleeding also occurs because of a small tear due to the hard stool around the anus called anal fissures, but it is more often caused by hemorrhoids. Hemorrhoids is referring to swollen blood vessels that form in the lower part of the rectum and anus. According to (Ibegbu, n.d.), hemorrhoids and anal fissures are two complications of chronic constipation.

Internal hemorrhoids may cause bloody stools, while external hemorrhoids, may contribute to rectal itchiness as well as pain when having a bowel movement. Additionally, constipation also causes stool impaction leading to the problem of stercoraceous perforation of the colon. Although this case is rare, it can cause a life-threatening disease over a long period of time (De Giorgio et al., 2015). The presence of the symptoms and complications of constipation affects the sufferers' health and daily activities (Dantas et al., 2020).

According to a study in United States, 52% of the respondents claimed that constipation has impacted their quality of life in all ages. Moreover, (Cardin et al., 2010) indicated that increased physical activity is associated with decreased rates of constipation. Iovino, et. al., (2013) supported this as inactive physical activity can prolong colonic transit. It is also reported that constipation affected their performance at work or at school (69%) and caused absence from work or school in the preceding month (12%), with a mean non-attendance period of 2.4 days (Belsey et al., 2010). While Dantas et al., (2020) indicated that constipation had also causing mobility problems in women such as standing, moving, and walking. The respondents also complaint of stomach pain and imsomnia due to constipation (Dantas et al., 2020). According to (Khanijow et al., 2015),

the increased odds of constipation with insomnia could be postulated as the function of the sympathetic and parasympathetic nervous systems. While a study on Chinese women aged over 50 years showed that poor sleep quality increased the chance of constipation up to three times (Moezi et al., 2018)

2.4.2 Impact on Psychological Health

Forootan et al., (2018) stated that, constipation causes a lot of physical and mental problems for many patients and can significantly affect their daily life and well-being. In a community study among 126 respondents, it was reported that those with chronic constipation had lower quality of life score against mental health, physical function, general health perception, and body pain when compared to respondents without constipation (De Giorgio et al., 2015). Constipation can cause emotional disturbance when the sufferers could not open their bowel as usual. They felt frustrated and results in mood changes because of discomfort and worried. Much et al., (2016) supported this that the sufferers' can eventually experience mental health pressure in a state of prolonged constipation.

It is believed that digestive processes are specifically connected to the emotional and cognitive regions of the brain (Borre et al., 2014). This connection controls homeostatic processes that are typically believed to be primarily gut-and brain-centered. Constipation might therefore be projected to have a negative impact on cognitive processes by generating a decline in daily life activities and development of a variety of mental illnesses, such as depressive disorders (Kagan, n.d.). Neu at al., (2019) emphasized that persons with depressive disorders had much more cognitive impairment than people without the disease.

2.4.3 Impact on Social Relationship

Constipation is a remarkably common and a costly condition that can negatively impact the quality of life and result in a major social and economic burden (Pinto Sanchez & Bercik, 2011). Someone with constipation may experience a loss of interest in socializing due to mood changes because of constipation. They also always feel tired and thus, avoiding any social activities. If they have to go out, they will make sure to be close to the toilet all the times causing activities less fun (Munch, et. al., 2016). This will consequently result in decreased social activity (Bouras&Tangalos., 2009; Friedrichsen & Erichsen, 2004; Lee & Warden, 2011).

2.4.4 Impact on Environment Health

Besides physical, psychological and social relationship, constipation also has some impact on the sufferers' productivity that may results in a high economic burden on the healthcare services (Pinto Sanchez & Bercik, 2011). For example, in the United States, about 85% of constipated patients using laxatives and approximately 82 million dollars were spent on over-the-counter laxatives every year (De Giorgio et al., 2015). Healthcare costs among patients are significantly considerable, indicating that hundreds of millions of dollars are annually spent on laxatives use (Forootan et al., 2018).

The financial burden covers direct costs of the healthcare system such as consultations with doctors and healthcare givers, investigations to identify health problems and treatment, and drug therapy (De Giorgio et al., 2015). Thus, diagnosis and treatment of constipation impose a significant cost on the individual and the healthcare system, while constipation prevention programs will lead to cost savings (Forootan et al., 2018).

2.5 Instrument used in this study

There will be two scales used to detect self-reported constipation and a scale to measure the quality of life among the respondents in this study.

### 2.5.1 Constipation Assessment Scale (CAS)

Constipation Assessment Scale (CAS), is used to identify constipation among non-academic staffs in SHS. It was developed by McMillan and Williams in 1989 to assess the incidence and severity of constipation. The CAS is a self-rated questionnaire on constipation and contains eight items include identification of abdominal distention or bloating, change in the amount of gas passed rectally, less frequent bowel movements, oozing liquid stool, rectal fullness or pressure, rectal pain with bowel movements, small volume of stool and inability to pass stool. Respondents will be required to choose of the suitable responds of the 3- point Likert scale of "no problems" (0), "some problems" (1) and "severe problems" (2) (Madsen et al., 2016).

2.5.2 Bristol Stool Chart (BSC)

There are several types of scale used to detect constipation. One of the tools is the Bristol Stool Chart (Figure 2.1). This stool chart was developed in 1997 by Ken Heaton, MD, from the University of Bristol, with the help of 66 volunteers (Bristol Stool Chart: Types of Poops - Shapes, Textures & Consistency, n.d.) as a clinical assessment tool. It is a helpful visual aid that was created to facilitate the evaluation of patients with constipation by using simple visual descriptors, it can illustrate the common stool forms and consistency based on seven characteristics of feces (Tack et al., 2011).

According to Continence Foundation of Australia (CFA) (2022), the Bristol Stool Chart is generally used as a research tool to evaluate the effectiveness of treatments for various diseases of the bowel by looking at the shapes and types of stools. Apart from

that, it is also used to diagnose constipation, diarrhea, and irritable bowel syndrome (CFA, 2021).
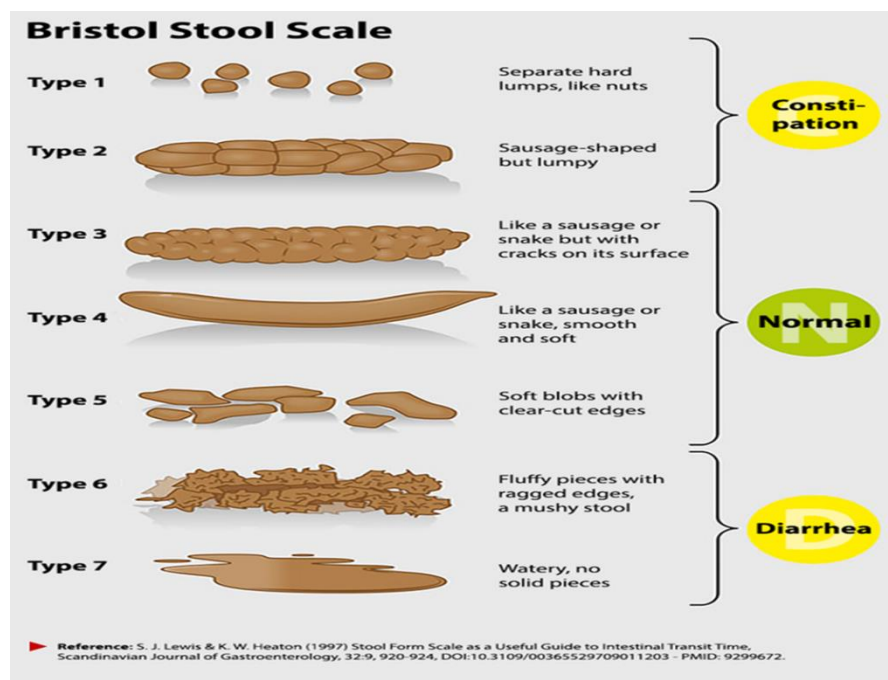
Figure: 2.1 Bristol Stool Scale. Source: Lewis SJ, Heaton KW (1997)

Based on this chart, feces can be classified into seven groups, which is based on the texture degree and morphology of feces and correlates with gastrointestinal transit times. The first two levels represent slow intestinal transit, while stool consistency levels 6 and 7 correlate to accelerated transit and diarrhea (Werth & Christopher, 2021b). Type 1 and type 2 indicates constipation, while type 3 and type 4 are the ideal stool consistency as it is easy to pass. Whereas type 5 to type 7 indicates diarrhea and need urgency (Lewis & Heaton, 2009)

In terms of shape, type 1 is referring to separate hard lumps, while the shape of type 2 is sausage-shaped but lumpy. Both types of feces are hard, dry, and difficult to pass, and the color is darker. The reason is due to food passes too slowly through the digestive system and the colon absorbs too much water. In addition, the shape of the feces for type 3 is like a sausage or snake but with cracks on the surface, while type 4 has a

comparable appearance to type 3 but with a smooth and soft surface. Both can be considered the most healthy and typical stool forms. While feces of type 5 are soft blobs with clear-cut edges that a person can pass easily. Lastly, for feces type 6 looks mushy that appears to consist of fluffy pieces with ragged edges, while type 7 is entirely liquid with no solid pieces (Lewis & Heaton, 2009). The color is lighter because passing the stool through the digestive system too quickly makes the bowel unable to absorb water (Medical News Today, 2021).

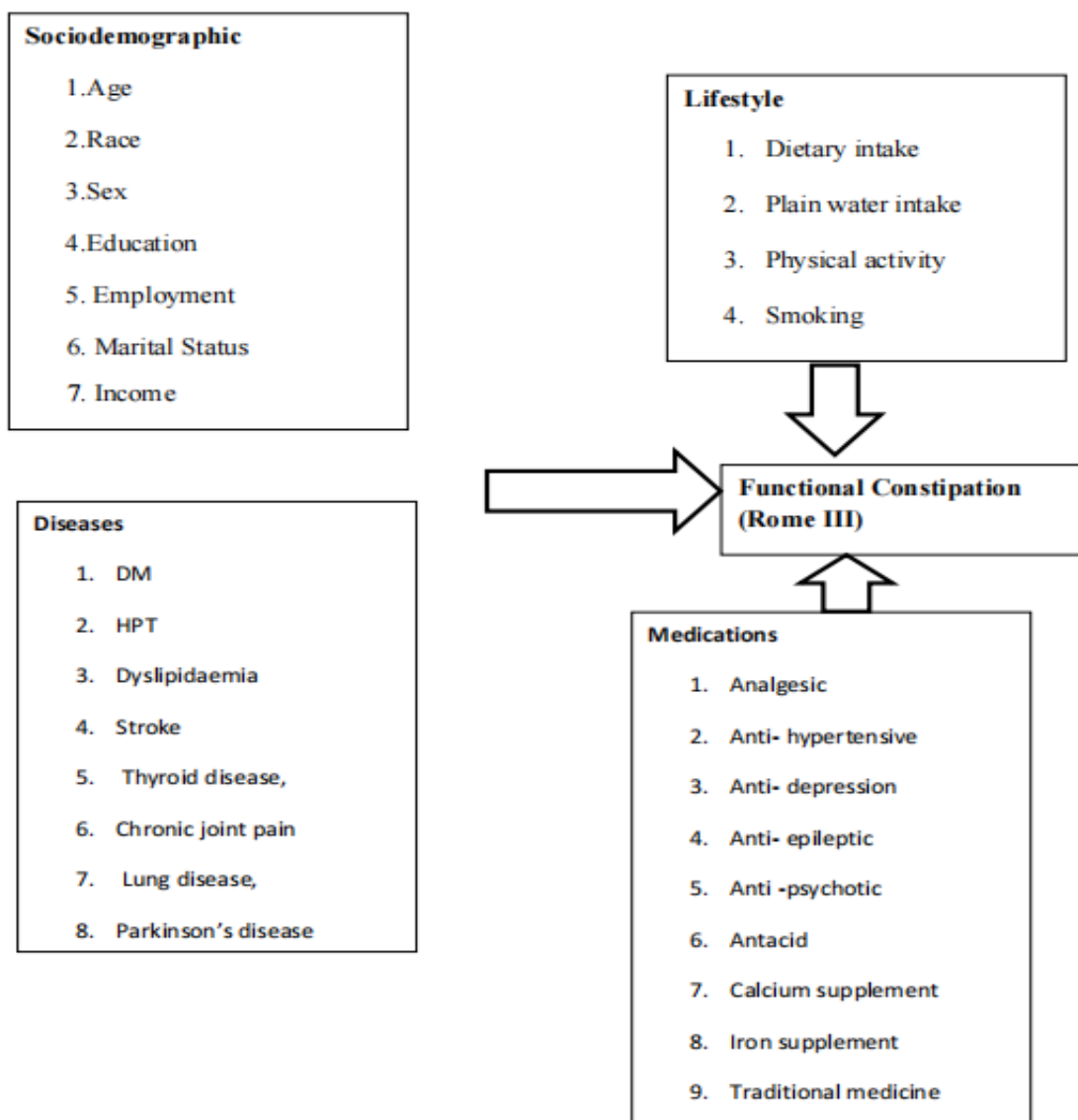### 2.5.3 World Health Organization Quality of Life Questionnaire (WHOQOL-BREF)

The original WHOQOL has 100 items questionnaire develeped by WHO (Hasanah et al., n.d.). This instrument has been developed for cross-sectional study comparison of quality of life (Vahedi, 2010). It has also been used in assessing quality of life by 15 countries. However, it was found as too lengthy and difficult to apply. Therefore, it was later on shortened to 26 items as a short form of the WHOQOL in 2003. The WHOQOL-BREF 26 items of questionnaire is more applicable in clincal trial and the measure are needed (Vahedi, 2010) . This questionnaire covers four domains which are physical, psychological, social and environment and is under cross-cultural validation by the WHOQOL group (Hasanah et al., n.d.).

Of 26 questions, two questions are used to assess the perception of quality of life and the overall of health satisfaction. While the remaining 24 questions representing four different domains. Overall, these 24 questions are used to explain how respondent attribute to each their life aspect and how problematic or satisfactory they perceive from their overall quality of life (Iqbal et al., 2020). Each item is rated on a 5- point likert scale.

2.6 Theoretical/ Conceptual Framework

The theory that used to guide this study is the relationship between associated factors with constipation theory by Mohammad (2017). This conceptual framework shows the linkage between different factors in constipation. It shows that factors affecting constipation are independent variable which is prevalence of constipation. This theory talks about socio-demographics, disease, lifestyles, and medication. Based on this theory, the socio-demographic factor that was explained refer to age, race, sex, education, employment, marital status, and income (Patimah et al., 2017).

According to Mohammad's (2017) theory, another factor that is involved and associated with constipation is include lifestyle factors such as consuming fluid intake, doing physical activity, and smoking. In addition, (Yurtdaş et al., 2020) reported that lifestyle factors such as insufficient dietary fiber, water, and fluid intake have contributed to the risk of constipation. Low consumption of fruits and vegetables and low physical activity are also similar and has associated with constipation. For the medication factors, medication that involved in this framework are analgesic, anti-hypertensive, anti-depression, anti-epileptic, anti-psychotic, antacid, calcium supplement and iron supplement. Lastly, one of the factors in the framework is the presence of the comorbidity (disease). The disease that can cause constipation includes Diabetes Mellitus, Hypertension, Dyslipidemia, Stroke, Thyroid Disease, Chronic Joint Paint, Lung Disease, and also Parkinson's Disease.

Sociodemographic

    1.Age

    2.Race

    3.Sex

    4.Education

    5. Employment

    6. Marital Status

    7. Income

Lifestyle

    1. Dietary intake

    2. Plain water intake

    3. Physical activity

    4. Smoking

Functional Constipation (Rome III)

Diseases

    1. DM

    2. HPT

    3. Dyslipidaemia

    4. Stroke

    5. Thyroid disease,

    6. Chronic joint pain

    7. Lung disease,

    8. Parkinson's disease

Medications

    1. Analgesic

    2. Anti- hypertensive

    3. Anti- depression

    4. Anti- epileptic

    5. Anti -psychotic

    6. Antacid

    7. Calcium supplement

    8. Iron supplement

    9. Traditional medicine

Figure: 2.2 The relationship between associated factors and constipation by Mohamad (2017)