

**QUESTIONNAIRE TRANSLATION,
VALIDATION AND RELATIONSHIP
DETERMINANTS OF MARITAL QUALITY
WITH CLINICAL ATTRIBUTES OF
FUNCTIONAL DYSPEPSIA, IRRITABLE BOWEL
SYNDROME AND ITS OVERLAP SYNDROME IN
MALAY WOMEN**

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UNIVERSITI SAINS MALAYSIA

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MALAY WOMEN**

by

NURHAZWANI BINTI HAMID

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LIST OF SYMBOLS

χ^2	Chi-square
N	Number of items
n	Frequency
Λ	Factor loading
β	Probability of Type II error / Regression coefficient
α	Probability of Type I error / Significance level
P	p-value
$\%$	percentage
<	Less than
>	More than

LIST OF ABBREVIATIONS

AD	Anxiety/Depression
ANX	Anxiety
CAT	Catastrophizing
CFA	Confirmatory Factor Analysis
CI	Confidence Interval
CM	Conflict Management
COH	Cohesion
CON	Consensus
CSQ-CAT	Coping Strategies Questionnaire-Catastrophizing Scale
DEP	Depression
Df	Degree of freedom
DGBI	Disorders of gut-brain interaction
DI	Dominance Isolation
EFA	Exploratory Factor Analysis
EQV/EQ VAS	EuroQol Visual Analog Scale
EV	Emotional Verbal
FD	Functional Dyspepsia
FGID	Functional Gastrointestinal Disorder
GFI	Goodness of Fit Indices
GI	Gastrointestinal
HADS	Hospital Anxiety Depression Scale
HUSM	Hospital Universiti Sains Malaysia
IBS	Irritable Bowel Syndrome

FD-IBS overlap	Functional Dyspepsia-Irritable Bowel Syndrome overlap
JEPEM	Human Research Ethics Committee
MOB	Mobility
MPI	Multidimensional Pain Inventory
NA	Not Applicable
NR	Negative Responses
PA	Path Analysis
PD	Pain/Discomfort
PMWI-F	Short Version Psychological Maltreatment of Women Inventory
QoL	Quality of Life
RDAS	Revised Dyadic Adjustment Scale
RDS	Relationship Dynamic Scale
RMSEA	Root Mean Square Error of Approximation
SC	Self-care
SD	Standard Deviation
SPSS	Statistical Product and Service Solutions
SR	Solicitous Responses
SRMR	Standardised Root Mean Square Residual
TLI	Tucker Lewis Index
UA	Usual activities
USM	Universiti Sains Malaysia
Var	Variables
WHO	World Health Organisation

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**PENTERJEMAHAN, KESAHAN SOAL SELIDIK DAN HUBUNGKAITAN
KUALITI PERKAHWINAN DENGAN CIRI-CIRI KLINIKAL SINDROM
GANGGUAN PERUT, SINDROM GANGGUAN USUS DAN SINDROM
TINDIHAN DALAM KALANGAN WANITA MELAYU**

ABSTRAK

Sindrom Gangguan Perut (*FD*), Sindrom Gangguan Usus (*IBS*), dan Sindrom Tindihan *FD-IBS* adalah mengganggu, melibatkan pesakit pelbagai latar belakang, terutamanya wanita. Kajian sedia ada menunjukkan berkurang soal selidik Bahasa Malaysia berkaitan kualiti perkahwinan dengan tekanan psikologikal, keterukan simptom, dan tahap kualiti hidup di kalangan wanita *FD*, *IBS* dan tindihan *FD-IBS* adalah amat terhad. Fasa I, kajian ini bertujuan untuk menghasilkan alat ukuran kualiti perkahwinan dalam Bahasa Malaysia. Kedua (Fasa II), kajian ini akan menentukan perbezaan purata, korelasi dan perkaitan hubungan antara kualiti perkahwinan dengan sifat-sifat klinikal termasuk tekanan psikologikal, keterukan simptom dan tahap kualiti hidup di kalangan wanita Melayu yang mengalami *FD*, *IBS*, dan tindihan *FD-IBS*. Fasa I dan II menggunakan reka bentuk kajian secara keratan rentas dan kaedah persampelan *convenience*. Fasa I mengandungi soal-selidik termasuk *Revised Dyadic Adjustment Scale (RDAS)*, *Relationship Dynamic Scale (RDS)*, *the Short Version Psychological Maltreatment of Women Inventory (PMWI-F)*, *Multidimensional Pain Inventory (MPI)*, dan *Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT)* akan diterjemah ke Bahasa Malaysia. Kesemua soal-selidik akan diuji kesahan isi kandungan berdasarkan *content validity index (CVI)*, *face validity index (FVI)*, kesahan konstruk melalui kajian

penerokaan (*EFA*) dan juga kesahan kebolehpercayaan (alfa Cronbach). Dalam Fasa II, pertama, *multivariate analysis of variance (MANOVA)* akan digunakan untuk membandingkan perbezaan purata, kedua, korelasi antara pembolehubah dan ketiga, analisis model hubungan (*PA*) untuk menjelaskan perkaitan diantara pembolehubah yang dikaji. Kesemua soal-selidik yang diterjemah disahkan kandungan dengan kesahan muka (kedua-dua *CVI* dan *FVI* > 0.80). Untuk Fasa I, terdapat 150 peserta (*mean* umur 34.1 tahun, sisihan piawai, *SP*=9.5 tahun) dan untuk Fasa II, 513 peserta (*mean* umur 37.2 tahun, *SP*=9.3 tahun). Fasa I melalui penerokaan menggunakan model *EFA* dengan pemuatan faktor menunjukkan bukti kesahan dan juga kebolehpercayaan (alfa Cronbach antara 0.7 hingga 0.9). Fasa II menunjukkan perbezaan purata bererti yang paling bermakna adalah dijumpai antara *FD versus IBS* dan *FD versus* tindihan *FD-IBS* dan untuk kualiti perkahwinan, domain paling terlibat adalah *consensus, conflict management, negative responses*, dan *solicitous responses*. Melalui korelasi Pearson, *FD* menunjukkan korelasi yang paling tinggi dengan semua sifat-sifat klinikal (nilai korelasi, $r > 0.5$). Untuk analisis model *PA*, secara keseluruhan, pengukuran indeks untuk *FD*, *IBS*, dan tindihan *FD-IBS* didapati bersesuaian dengan data. Dengan *PA*, hubungan paling tinggi adalah tindihan *FD-IBS* ($n=30$), *FD* ($n=26$), dan *IBS* paling rendah ($n=24$). Melalui *PA* juga, untuk domain kualiti perkahwinan dan keterukan simptom, tindihan *FD-IBS* menunjukkan hubungan yang paling ketara. Untuk domain tekanan psikologikal, hipotesis yang paling disokong adalah *FD*. Pertama, alat ukuran dalam Bahasa Malaysia bertambah untuk kualiti perkahwinan telah disahihkan dan boleh digunakan dalam kajian melibatkan *FD*, *IBS*, dan tindihan *FD-IBS*. Kedua, hipotesis menyokong perkaitan yang bermakna di antara kualiti perkahwinan dan sifat-sifat klinikal di kalangan wanita Melayu yang mempunyai *FD*, *IBS*, dan tindihan *FD-IBS*.

**QUESTIONNAIRE TRANSLATION, VALIDATION AND RELATIONSHIP
DETERMINANTS OF MARITAL QUALITY WITH CLINICAL ATTRIBUTES
OF FUNCTIONAL DYSPEPSIA, IRRITABLE BOWEL SYNDROME AND ITS
OVERLAP SYNDROME IN MALAY WOMEN**

ABSTRACT

Functional Dyspepsia (FD), Irritable Bowel Syndrome (IBS), and FD-IBS overlap are common and bothersome disorders affecting people of diverse backgrounds, predominantly women. Research is limited in measurement tools available for marital quality, and the association of marital quality with psychological distress, symptom severity, and quality of life (QoL) of Malay women with FD, IBS, and FD-IBS overlap. Phase I, to develop valid measurement tools for marital quality in the Malay language. Secondly (Phase II), to compare mean differences, correlation between study variables, and to examine path relationships between marital quality with clinical attributes including psychological distress, symptom severity, and QoL among Malay women with FD, IBS, and FD-IBS overlap. Phases I and II were conducted using cross-sectional design and by convenience sampling. Phase I consisted of translation into the Malay language and validation of questionnaires including Revised Dyadic Adjustment Scale (RDAS), Relationship Dynamic Scale (RDS), Short Version Psychological Maltreatment of Women Inventory (PMWI-F), Multidimensional Pain Inventory (MPI), and Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT). All questionnaires were examined for content validity index (CVI), face validity index (FVI), exploratory factor analysis (EFA), and reliability (Cronbach's alpha). For phase II, first, multivariate analysis

of variance (MANOVA) would be used to determine mean differences between variables, second, correlation analysis of all variables and third, path analysis (PA) model to map inter-relationships between variables. All the newly translated Malay questionnaires were found to have CVIs and FVIs > 0.80 . There were 150 participants (mean age 34.1 years old, standard deviation (SD)=9.5 years) and 513 participants (mean age 37.2 years old, SD=9.3 years) who have participated in phase I and II respectively. For phase I, all factor loadings were found satisfactory with EFA and the Cronbach's alpha of RDAS-M, RDS-M, PMWI-F-M, MPI-M, and CSQ-CAT-M was ranged between 0.7 and 0.9. For phase II, with MANOVA, the most significant mean differences were seen between groups of FD versus IBS, and FD versus FD-IBS overlap, and the marital quality most significantly affected included consensus, conflict management, negative responses, and solicitous responses. With Pearson correlation analysis, FD demonstrated the most significant correlations with all clinical attributes ($r > 0.5$). With PA of overall model, the fit indices for FD, IBS, and FD-IBS overlap were found to be acceptable. FD-IBS overlap had the most number of paths ($n=30$), followed by FD ($n=26$), and IBS the least ($n=24$). With PA, the most supported hypothesis for the domains marital quality and symptom severity was demonstrated with FD-IBS overlap. Whereas, for the domain psychological distress, the most supported hypothesis using PA was demonstrated for FD. First, the tools to measure marital quality have been translated into the Malay language, and are validated. Second, there is significant inter-relationships of marital quality with clinical attributes of FD, IBS, and FD-IBS overlap in the Malay women.

CHAPTER 1

INTRODUCTION

This chapter proposed introducing the research information related to the present study before the detailed elaborations proceeded in the following chapters. The information in this chapter included the background of the study, problem statement, rationale, significance, research question, hypothesis, objectives, assumption, organisation of the thesis, and chapter summary.

1.1 Background of the Study

Functional Dyspepsia (FD), Irritable Bowel Syndrome (IBS), and FD-IBS overlap are the most prevalent sub-groups of Functional Gastrointestinal Disorder (FGID) worldwide (Goyal et al., 2021; Losa et al., 2021; Noddin et al., 2005; Nurko & Di Lorenzo, 2023). These condition should be evaluated globally (Oshima & Miwa, 2015; Stanghellini, 2017; Tan, 2017; Von Wulffen et al., 2019) as they are considered disorders of gut-brain interaction (DGBI) (Drossman & Hasler, 2016; Wei et al., 2022). DGBI are characterised by chronic or recurrent gastrointestinal (GI) symptoms in the absence of structural abnormalities (Black et al., 2020; Ford et al., 2020) and are often associated with psychosocial co-morbidity, lower quality of life (QoL), and increase healthcare utilization. The presence of DGBI is also commonly associated with overlapping symptoms between anatomical regions, which can further worsen the negative associations' psychosocial co-morbidity, QoL, and healthcare utilization (Jan & Drossman, 2022).

The high economic burden of DGBI emphasizes the need for effective management strategies to improve patients' health-related quality of life (HRQoL), reduce healthcare utilization, and increase work productivity (Bjelović et al., 2017; Hantoro et al., 2018; Lacy et al., 2013). In addition, given the significant impact of marital quality on psychological distress and HRQoL in patients with DGBI (Nurko et al., 2022; Trindade et al., 2022), healthcare providers should consider addressing and managing any marital problems early on as part of a comprehensive approach to managing these disorders (Vu Et al., 2014). Moreover, efforts should be made to raise public awareness about the significant impact of DGBI on HRQoL and the need for early detection and intervention (Keefer et al., 2022; Sayuk & Tack, 2022).

While marital quality may not be a life-threatening issue, it can have a significant impact on a person's overall well-being and quality of life. Poor marital quality and psychological distress can lead to various impairments in a person's life, such as divorce, decreased motivation, increased pain, anxiety and depression, and poor social well-being (Carlsson et al., 2019; Firth et al., 2019). Additionally, patients with poor marital support may experience a decrease in their quality of life, particularly those suffering from gastrointestinal diseases (Habibi et al., 2017). Therefore, addressing marital problems and improving marital quality can have positive implications for an individual's overall health and well-being.

Indeed, the direction of causality between marital quality and health can be difficult to determine. While some studies have found that unhappy relationships can contribute to poorer health, others have found that poor health can contribute to declines

in marital quality (Roberson et al., 2018). However, it is clear that a supportive and positive marital relationship can have significant benefits for overall health and well-being (Holt-Lunstad, 2019). In the case of patients with FD, IBS or FD-IBS overlap in Malaysia, addressing both their physical and mental health needs, as well as their psychological distress and marital quality, could potentially improve their overall functioning and well-being. This may involve providing interventions and support to help patients manage their symptoms, as well as providing resources and support for improving their psychological distress and addressing any issues related to marital quality.

Understanding the various components that contribute to the well-being of individuals with FD, IBS, and FD-IBS overlap is crucial for improving their QoL and reducing the risk of productivity deflation. Marital quality and psychological distress are important factors to consider when addressing physical health issues, particularly in women. In addition, prioritising the well-being of all segments of society, as outlined in the Eleventh Malaysia Plan, is a step towards achieving a more equitable and prosperous nation. Through continued attention to economic and social well-being, as well as a focus on strengthening family institutions, we can work towards a future where all Malaysians can enjoy good health and a high quality of life.

1.2 Epidemiology of Adult DGBI included FD, IBS and FD-IBS Overlap

The variations in prevalence may also be attributed to differences in study methodology, population demographics, and cultural factors (Jung & Myung, 2022; Sperber et al., 2017; Sperber et al., 2021). Some studies found that certain populations are

more prone to experiencing DGBI due to cultural dietary habits, stressors, and health-seeking behaviors (Carbone et al., 2020; Chuah et al., 2021). The global prevalence of DGBI among adults ranged 1.8% to 57% according to the Rome IV criteria (Barberion et al., 2020; Wei et al., 2020). Contrast within the context of DGBI according Rome III with prevalence ranging from 1.8% to 17.5% (Lei et al., 2019; Min et al., 2014). Moreover, the prevalence has changed due to different diagnostic criteria, starting from the Manning criteria to the recently published Rome IV criteria (Gwee et al., 2018). Therefore, it is essential to consider these factors when interpreting and comparing prevalence rates across different populations and geographic regions. Nonetheless, the high prevalence of DGBI and their impact on HRQoL and healthcare utilization highlight the need for effective management and prevention strategies (Nam et al., 2021; Von Wulffen et al., 2019).

The prevalence of FD, IBS, and FD-IBS overlap, as well as the individual conditions themselves, are generally higher in women than in men (Narayanan et al., 2021; Rasmussen et al., 2015; Suzuki & Hibi, 2011; Tan, 2017). Possible reasons for this sex difference include hormonal factors, differences in gut physiology and motility, and psychosocial factors such as stress and anxiety, which have been linked to diagnosis of FD, IBS, and FD-IBS overlap (Levy et al., 2018; Van Oudenhove et al., 2016). Additionally, some studies have suggested that cultural and societal factors may also play a role in the higher prevalence of these conditions in women (Chua et al., 2019; Mahadeva & Ford, 2016). It is worth noting that the prevalence varies across different regions and populations, as mentioned earlier, and it is important to take these factors into consideration when interpreting epidemiological data (Kim et al., 2018; Oh et al., 2020).

The change from Rome III to Rome IV criteria for DGBI has had a significant impact on the diagnosis and prevalence of FD, IBS, and FD-IBS overlap in Asians compared to Western subjects. The differences noted in sample size, symptom duration, and methods used to collect prevalence data (Barberio et al., 2020; Ford et al., 2015; Talley et al., 2016). While the Rome IV criteria are widely used and provide a standardized approach to the diagnosis of these conditions, they do have limitations and have been subject to criticism. Some experts have suggested that a more comprehensive approach, including assessment of biomarkers and other clinical parameters, may be necessary to fully understand and diagnose FD, IBS, and FD-IBS overlap (Talley & Holtmann, 2020; Thabane et al., 2019). FD and IBS are both heterogeneous diseases but appear to overlap with the term “FD-IBS overlap” and share similar underlying pathophysiological mechanisms (Bortoli et al., 2018; Choi et al., 2017; Von Wulffen et al., 2019).

Therefore, it is important to consider the context and population when interpreting the results of studies on the prevalence and frequency of DGBI. The use of standardized criteria, such as Rome IV, is crucial for accurate diagnosis and comparison across studies. However, researchers should also be aware of potential variations in study populations, data collection methods, and cultural and social factors that may impact the presentation and diagnosis of DGBI.

1.3 Understanding the Impact Factors on FD, IBS, and FD-IBS Overlap

Understanding the diagnosis of FD, IBS, or FD-IBS overlap could be important to explore the impact factors for these disorders. For example, Mearin and Calleja (2011) defined FD as “bad digestion” and Yao et al., (2020) defined IBS as “altered bowel habits”. In Malaysia, Malays seem to complain about a lot of wind and bloating in the “stomach.” when referring to FD (Goh, 2011). Indeed, it is important to explore the impact of FD, IBS, and FD-IBS overlap on an individual's well-being and productivity, as well as the potential economic impact on the country. Poor QoL, mood disturbance, and limitations in daily activities can have a significant impact on an individual's ability to perform in the workplace, leading to loss of productivity and absenteeism. Additionally, the high cost of healthcare associated with these conditions can also impact the economy. Further research in this area may provide insights into effective management strategies for these conditions.

It is also interesting to note that differences in marital status have been observed between individuals with FD and IBS (Kim et al., 2018), which could potentially increase the risk of developing FD-IBS overlap. It is also important to understand the role of marital quality in the management of these conditions, as it may have a significant impact on an individual's overall well-being. Addressing marital problems at an early stage of intervention planning can improve marital quality and help reduce symptom severity. Therefore, healthcare providers should consider preventive-oriented strategies aimed at addressing underlying factors before they lead to symptom severity.

Research has consistently shown that individuals in healthy, positive marriages experience better physical health, emotional well-being, and longevity compared to those in unsatisfactory marriages or those who are not married at all (Holt-Lunstad et al., 2010; Liu & Reczek, 2012; Proulx et al., 2007). Positive marital quality can also protect against mental health issues such as depression and anxiety, and contribute to positive family dynamics and child development (Conger & Donnellan, 2007; Whisman & Uebelacker, 2012). On the other hand, poor marital quality and relationship problems can lead to increased stress, poorer health outcomes, and negative effects on family functioning and child development (Amato, 2010; Robles et al., 2014). Therefore, exploring the factors that contribute to marital quality can have significant implications for individual and relational health and well-being.

Apart from marital quality mentioned above, another important clinical attributes that affect symptom severity of FD, IBS, and FD-IBS overlap is psychological distress. psychological distress, such as anxiety, depression, stress, and somatization, can greatly impact the symptom severity and quality of life for patients with FD, IBS, and FD-IBS overlap (Bijkerk et al., 2019; Drossman, 2016; Lackner et al., 2018). Studies have shown that patients with DGBI are more likely to have comorbid psychological disorders, and that the severity of psychological symptoms is positively correlated with the severity of GI symptoms (Ganci et al., 2019; Hausteiner-Wiehle & Henningsen, 2018). However, many patients with DGBI do not receive adequate screening, diagnosis, or treatment for their psychological symptoms, leading to a poorer prognosis and decreased QoL (Lackner et al., 2018; Palsson & Whitehead, 2013).

Psychological factors, such as anxiety and depression, have been found to be associated with FD, IBS, and FD-IBS overlap (Nakov et al., 2022). Patients with these conditions often experience a higher prevalence of psychological symptoms than the general population, and this is particularly true for women (Bangamwabo et al., 2020; Lackner et al., 2014). Therefore, it is crucial for healthcare providers to assess and address the psychological needs of patients with DGBI to provide comprehensive and effective care. However, the detection and management of these psychological factors in patients with DGBI remains a challenge, and more efforts are needed to improve the recognition and treatment of psychological comorbidities in these patients.

Additionally, catastrophizing has also been linked to increased healthcare utilization and costs (van Tilburg et al., 2015). Patients who catastrophize are more likely to seek medical attention, undergo more diagnostic tests, and receive more medical treatments, leading to increased healthcare costs. Therefore, identifying and addressing catastrophizing in patients with DGBI may not only improve symptom severity and QoL but also have a positive impact on healthcare utilization and costs. By taking into account the impact of these factors, healthcare professionals can develop more comprehensive treatment plans and improve health outcomes for their patients.

It is commendable that this study aims to investigate the relationship between marital quality and clinical attributes in Malay women, specifically in the context of FD, IBS, and FD-IBS overlap. Additionally, as mentioned, early detection of marital problems can prevent adverse outcomes, such as divorce, and facilitate effective healthcare planning. It is crucial to address not just the clinical symptoms but also the psychological

distress and symptom severity i.e. catastrophizing that contribute to the development and progression of these conditions. Understanding the impact of marital quality on these conditions can help healthcare providers develop more targeted and effective interventions to improve the QoL of patients.

1.4 Problem Statement

Based on our knowledge from the review of literature, no gold standard definition exists on marital quality. One striking finding in our previous study was the association between a positive marital status and FD in the Malay population, however, association does not necessarily indicate a causal relationship. It can be challenging to compare married and single women due to confounding factors such as age and socioeconomic status (Lee et al., 2013). It is possible that other factors, such as cultural norms or societal pressures, may influence both the likelihood of marriage and the occurrence of DGBI (Adibi et al., 2016; Kim & Kim, 2020).

To date, there are no studies on the path-relationship between marital quality, psychological distress, symptom severity, and quality of life among patients with FD, IBS or FD-IBS overlap. More evidence is needed to clarify the role of marital quality in the context of functional GI symptoms. Furthermore, no validated Malay version questionnaires exist on marital quality. It is crucial to address the specific needs of marital quality in women with GI disorders.

Quality of marriage may be more important than marital status in understanding the relationship of marriage to health and symptoms. This study is crucial because it identifies the associated factors of marital quality, including psychological distress, symptom severity, and QoL that could help with effective treatments recommended by the physician to patients. However, the role of marital quality was unclear because of limited evidence. Further research is hence needed to better understand the complex interplay of factors that contribute to the development and progression of DGBI and other GI disorders in the Malay population, and to develop targeted interventions that address the unique needs of this population.

One major challenge to understanding the relationship between marital quality and health is the direction of causality. Unhappy relationships may contribute to poorer health (Bulanda et al., 2016; Lawrence et al., 2019; Whisman et al., 2018), and chronic medical conditions in spouses may contribute to declines in marital quality (Roberson et al., 2018; Robles et al., 2014; Slatcher & Schoebi, 2017). A comprehensive approach to understanding these relationships can help identify potential areas for intervention to improve health outcomes and enhance the well-being of both the patient and their family.

Meanwhile, the psychological factors were recognized as the risk factor associated with the severity of GI symptoms in FD and IBS, which may mediate the relationship between marital satisfaction and GI symptom severity or QoL (Pasricha et al., 2021; Van Oudenhove et al., 2008). Besides that, psychological stress and anxiety were associated with IBS symptom severity (Defrees & Bailey, 2017; Drossman et al., 2002; Vasant et al., 2021). Psychological distress was associated with poor outcomes in DGBI patient and it

had reduced their daily activities based on the severity of symptoms (Keefer et al., 2022; Person & Keefer, 2021). As illness severity increases, psychological distress becomes more critical and could impacts marital quality (Keefer et al., 2018; Palsson & Whitehead, 2013; Van Oudenhove et al., 2016). These psychological managements would enhance emotional well-being and reduce the need for healthcare services (Palsson & Whitehead, 2013).

1.5 Rationale of the Study

Women have played a crucial role in the development and progress of societies throughout history regarding future generation come from vital role of women (Berens et al., 2020; Kovács et al., 2022; Luo et al., 2022). However, their health and well-being are often overlooked, especially in the context of DGBI like FD, IBS, and FD-IBS overlap (Kim et al., 2021). The common affect of marital relationship among women including spouse relationship (Stronge et al., 2019), self-confidence (Simon & Barrett, 2010), and emotional problem (Mickelson et al., 2006).

Furthermore, gastrointestinal problems can have a significant impact on public health and healthcare costs (Dhanasekaran & Oxentenko, 2013). The burden of these conditions can be high, both in terms of patient suffering and economic costs (Quinteros-Fernandez, 2015). In addition, research is necessary to better understand the causes and mechanisms underlying these conditions, which could lead to the development of more effective treatments and preventative measures. For example, a study by Solmaz et al. (2018) found that spouses of patients with IBS reported lower levels of marital quality

compared to spouses of healthy controls. Similarly, another study by Chang et al. (2010) found that IBS was associated with lower marital satisfaction and increased marital stress. These findings suggest that gastrointestinal symptoms and disorders can have a significant impact on marital relationships, highlighting the need for further research in this area.

Unfortunately, there are many GI issues, so it was easy to mistakenly neglect them. Some GI problems are mild and usually go away on their own (Bach, 2020), but some conditions are serious enough that people have to see a physician or gastroenterologist because continued to pose a significant and expanding threat to public health (Quigley et al., 2016). Gastrointestinal diseases may cause of more health issues with symptoms vary in duration and frequency from one person to another. FD, IBS, and FD-IBS overlap are often associated with worse psychological effects and QoL (Pohl et al., 2018; Savas et al., 2009; Singh et al., 2022), possibly including marriage relationships. Understanding the impact of DGBI on marital quality is essential in Asian countries, where cultural and societal factors may affect the manifestation and treatment of these conditions.

Indeed, understanding the impact of FD, IBS, and FD-IBS overlap on marital quality among married Malay women could be crucial in improving the overall quality of life for these women. By investigating the relationship between marital quality and clinical attributes, such as psychological distress, symptom severity, and QoL, healthcare providers can develop targeted interventions that address the specific needs of these women. Moreover, by prioritising preventive healthcare services and promoting healthy lifestyle habits, we can reduce the burden of these diseases and improve the economic and social well-being of the population (Stake-Nilsson et al., 2013).

Early detection and treatment of GI problems can have a significant impact on not only the individual's health and QoL but also on the country's economy by reducing healthcare costs and increasing productivity. Additionally, promoting marital quality and providing interventions to prevent marital problems from progressing could lead to better overall mental and physical health outcomes for individuals and their families (Simon et al., 2022). At the same time, the impact of diseases specific to FD, IBS, and FD-IBS overlap could devastate the quality of life and marital relationships.

Another important finding, the validation data in present study could become effective tools of adding existing measures in local language for applied in resources management. This information can provide insights into the factors that contribute to the development and exacerbation of these conditions, as well as inform the development of effective treatment. Furthermore, having validated measures in the local language can facilitate future research, contributing to a more comprehensive understanding of these conditions and their impact on QoL and marital relationships globally.

1.6 Significance of the Study

The present study could contribute significantly to the current knowledge gap in the field by providing insights into the relationship between marital quality and clinical attributes of FD, IBS, and FD-IBS overlap. The inclusion of psychological distress, symptom severity, and QoL as associated factors in predicting marital quality could help identify modifiable factors that could improve the overall well-being of patients with these conditions.

The study's findings could also guide the development of effective interventions and treatments that consider the impact of marital quality on disease outcomes. This study could be a starting point for future research to collect and analyze essential marital quality data among individuals with gastrointestinal diseases, especially in the Malay population. This would help healthcare providers to identify the potential impact of these diseases on marital quality and develop appropriate interventions to improve patient outcomes. Moreover, it would provide a better understanding of the complex interrelationships between marital quality and clinical attributes, which could contribute to the development of more effective treatments and interventions for gastrointestinal diseases. Furthermore, by focusing on preventive care and addressing marital issues alongside disease management, healthcare systems can improve cost-effectiveness and promote better family relationships.

To the researcher's knowledge, limited research has assessed the path relationships of marital quality with clinical attributes of FD, IBS, and FD-IBS overlap, and still no study around the globe has performed in married Malay women. Thus, this study acts as a pioneer study in assessing inter-relationship and understanding of marital quality among Malay women with FD, IBS, and FD-IBS overlap while taking into account associated factors in predicting QoL. Indeed, the present study could contribute significantly to the current knowledge gap in the field by providing insights into the relationship between marital quality and clinical attributes of FD, IBS, and FD-IBS overlap. The inclusion of psychological distress, symptom severity, and QoL as associated factors in predicting marital quality could help identify modifiable factors that could improve the overall well-being of patients with these conditions.

Furthermore, this study also validates measurement tools for marital quality in local language. Additionally, this study may could have applied preventive strategies by getting information on marital relationship instead of focus for disease management only. The transition from disease management to preventive care regarding marital relationship may result in long-term cost-effectiveness for patients and the healthcare system, besides an improvement in family institution. By collecting and analysing data on marital quality and associated clinical attributes, healthcare providers can identify patients who may be at risk of experiencing symptoms or reduced QoL due to marital problems. This can help guide early interventions, such as marital counselling and behavioural therapy, to improve marital relationships and prevent negative health outcomes in the long term.

Additionally, present study applied path analysis (PA) model to identify the most marital problem when associated with psychosocial dysfunction, symptom severity, and QoL among patients. Path analysis model is a useful statistical method that can help to identify the direct and indirect relationships among variables in a complex system. It can provide a more accurate picture of the inter-relationships between study variables by taking into account the correlated risk factors of marital quality and clinical attributes, and help to identify the factors that have the greatest impact on patient outcomes. By using this method, healthcare providers can develop more effective prevention and management strategies for FD, IBS, and FD-IBS overlap, and improve the overall quality of care for patients.

Ultimately, since data on marital quality could affect the severity of disease, by highlighting the significance of marital quality in the management of FD, IBS, and FD-IBS overlap, this study can help policymakers and healthcare providers to develop more effective and holistic approaches to address the needs of married Malay women suffering from these conditions. This could include the development of targeted interventions to improve marital quality and psychosocial well-being, as well as the implementation of preventive strategies to reduce the severity of symptoms and improve overall quality of life. For example, this could give data for revising existing approach to support family with marital problem and reorienting services towards prioritising preventive approaches that target in-need married women based on the evidence regarding marital quality issues. Ultimately, this could lead to better health outcomes for patients and more efficient use of healthcare resources. By promoting awareness and prioritizing research on the topic, national level authorities can gain a better understanding of the risk factors associated with marital quality and develop more effective healthcare services.

The present research provided new insight into how marital quality and psychosocial can act as an alternative for the promotion of health early intervention among young adults. Thus, the present study aimed to examine the inter-relationship between marital quality, psychological distress, and symptom severity towards QoL. These could provide information for future intervention studies to create better environments that can increase QoL and hence lengthen years of life. By examining social support, psychological variables, and quality of life, this study can help identify areas where interventions and support can be provided to improve the well-being of married women with these conditions.

Promoting good marital quality and addressing psychosocial dysfunction and symptom severity is not only crucial for improving the quality of life for individuals, but it can also lead to positive outcomes for families, communities, and society as a whole. Understanding the interplay between marital quality, psychological distress, symptom severity, and quality of life in patients with gastrointestinal diseases like IBS, FD, and FD-IBS overlap can help healthcare providers identify new areas of health to focus on and improve healthcare services in Malaysia. This study's findings can also inform future research and intervention studies aimed at promoting better health outcomes and increasing the quality of life of patients with gastrointestinal diseases.

Nevertheless, this study aimed to provide the evidence and benchmark as a pioneer inter-relationship study of marital quality with clinical attributes among FD, IBS, and FD-IBS overlap in Malay women. It is important to note that this study has the potential to contribute to the existing literature on the inter-relationship between marital quality and clinical attributes among married Malay women with FD, IBS, and FD-IBS overlap. The findings from this study can also inform the development of effective interventions and strategies to improve the quality of life of married Malay women with FD, IBS, and FD-IBS overlap, with a focus on the marital relationship.

1.7 Research Questions

Phase I:

1. What is the content and face validity of Malay translated versions of the Revised Dyadic Adjustment Scale (RDAS), Relationship Dynamic Scale (RDS), Short Version Psychological Maltreatment of Women Inventory (PMWI-F), Multidimensional Pain Inventory (MPI), and Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT)?
2. What is the factor validity of the Revised Dyadic Adjustment Scale (RDAS), Relationship Dynamic Scale (RDS), Short Version Psychological Maltreatment of Women Inventory (PMWI-F), Multidimensional Pain Inventory (MPI), and Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT) in the assessment of marital quality and symptom severity?
3. What is the internal reliability of Malay versions of the Revised Dyadic Adjustment Scale (RDAS), Relationship Dynamic Scale (RDS), Short Version Psychological Maltreatment of Women Inventory (PMWI-F), Multidimensional Pain Inventory (MPI), and Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT) internally reliable to assess marital quality and symptom severity, among healthy married Malay women in Kelantan, Malaysia?

Phase II:

1. Is there any mean differences in marital quality and clinical attributes, including psychosocial dysfunction, symptom severity, and quality of life between disorders of FD, IBS or FD-IBS overlap?
2. What are the correlations between marital quality with clinical attributes, including psychosocial dysfunction, symptom severity, and quality of life in Malay women with FD, IBS or FD-IBS overlap?
3. What are the path relationships between marital quality with clinical attributes, including psychosocial dysfunction, symptom severity and quality of life in Malay women with FD, IBS or FD-IBS overlap?

1.8 Research Objectives

1.8.1 General Objective

The general aim of the current study was to examine the validation of translated Malay questionnaires among healthy married Malay women and inter-relationships between marital quality with clinical attributes among Malay women with FD, IBS and FD-IBS overlap.

1.8.2 Specific Objectives

Phase I:

1. To translate the questionnaires Revised Dyadic Adjustment Scale (RDAS), Relationship Dynamic Scale (RDS), Short Version Psychological Maltreatment of Women Inventory (PMWI-F), Multidimensional Pain Inventory (MPI), and Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT) into the Malay language.
2. To assess the content and face validity of the Malay translated versions of the questionnaires RDAS, RDS, PMWI-F, MPI, and CSQ-CAT.
3. To examine the construct validity of the Malay versions of the questionnaires RDAS, RDS, PMWI-F, MPI, and CSQ-CAT.
4. To examine the internal reliability of the Malay versions of the questionnaires RDAS, RDS, PMWI-F, MPI, and CSQ-CAT.

Phase II:

1. To compare mean differences in marital quality and clinical attributes, including psychological distress, symptom severity and quality of life among Malay women with FD, IBS or FD-IBS overlap.
2. To determine the correlation matrix between marital quality with clinical attributes among Malay women with FD, IBS or FD-IBS overlap.

3. To determine the path relationships between marital quality and clinical attributes among Malay women with FD, IBS or FD-IBS overlap.

1.9 Research Hypotheses

Phase I:

1. According to EFA, the Malay versions of the questionnaires Revised Dyadic Adjustment Scale (RDAS), Relationship Dynamic Scale (RDS), Short Version Psychological Maltreatment of Women Inventory (PMWI-F), Multidimensional Pain Inventory (MPI), and Coping Strategies Questionnaire-Catastrophizing Scale (CSQ-CAT) are valid among married Malay women in Kelantan, Malaysia.
2. The Malay version of the questionnaires RDAS, RDS, PMWI-F, MPI, and CSQ-CAT are reliable to be used among married Malay women in Kelantan, Malaysia based on internal consistency.

Phase II:

1. Among married Malay women with FD, IBS or FD-IBS overlap, there are significant mean differences in marital quality, psychological distress, symptom severity and quality of life.
2. There are significant correlations between marital quality, psychological distress, symptom severity and quality of life among married Malay women with FD, IBS or FD-IBS overlap.

3. There are significant path relationships between marital quality with psychological distress, symptom severity and quality of life in Malay women with FD, IBS or FD-IBS overlap.

The sub-hypotheses within research hypothesis 3 (phase II)

The sub-hypotheses could give five hypotheses including i.e. marital quality is significantly related to psychological distress, marital quality is significantly related to symptom severity, marital quality is significantly related to QoL, psychological distress is significantly related to QoL, and symptom severity is significantly related to QoL.

1.10 Organisation of the Thesis

The thesis is organised into nine chapters. Chapter 1 introduces the study and provides an overview of the content of the thesis. It includes the background of the study, the problem statement, rationale, and research objectives. Chapter 2 is a comprehensive literature review of disorders such as FD, IBS, and FD-IBS overlap, with a focus on their clinical attributes such as symptom severity, psychosocial dysfunction, and quality of life. Additionally, the literature review covers marital quality and ends with a theoretical framework that explains the relationship between the study variables.

Chapter 3 will provide a detailed explanation of the methodology used for the entire study, which is important for understanding how the data was collected and analysed. Chapters 4-7 will provide a more in-depth look at the specific methods and

results for each phase of the study. Chapter 4 and Chapter 5 will describe the research methods and results of phase I. Meanwhile, Chapter 6 and Chapter 7 elaborate on the plans and outcomes for phase II. These chapters (Chapter 4 and Chapter 6) elaborate on the chosen approach target population and study procedures such as study design, eligible criteria, sample size determination, data collection, and analysis for each phase. The findings are presented in tables or figures after being described descriptively or inferentially (Chapters 5 and 7).

Chapter 8 will tie everything together by discussing the results in relation to the research objectives, and Chapter 9 will provide conclusions and recommendations for future research. Overall, it seems like a thorough and rigorous approach to investigating the relationship between marital quality, psychosocial dysfunction, symptom severity, and quality of life in individuals with FD, IBS, and FD-IBS overlap.

1.11 Chapter Summary

This chapter included the section incorporates a prologue to FD, IBS, and FD-IBS overlap, the foundation of the review, and the issue based on the problem statement. In addition, the rationale of the study was provided to emphasise the significance of this study. Then, the review of the general and specific objectives was presented to underscore the meaning of this study. The following chapter, Chapter 2, reviews the relevant literature on the present study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of existing literature to establish a comprehensive understanding of the current state of research on the topic being studied. The aim of this literature review is to facilitate the researchers' comprehension of the information regarding marital quality, psychosocial dysfunction, symptom severity, and quality of life (QoL) that has been previously explored in other studies. This review focused on the research questions and objectives (see earlier chapter sections 1.6 and 1.7).

The search terms utilized were focused on exploring the correlation between marital quality and the impact of psychosocial dysfunction, symptom severity, and QoL on individuals with FD, IBS, or FD-IBS overlap. Furthermore, searches were conducted to identify relevant questionnaires associated with the present study, validate the study in terms of Malay identity, and develop a path analysis (PA) model. This chapter also addresses the gaps in the current research and concludes by presenting the conceptual framework of the study.