PREVALENCE OF FEMALE SEXUAL DYSFUNCTION AND ITS ASSOCIATED FACTORS AMONG TYPE 2 DIABETES MELLITUS PATIENTS IN KUANTAN, PAHANG

BY

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A thesis submitted in partial fulfilment of the requirement for the degree of Master of Medicine (Family Medicine)

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ABSTRACT

Impaired sexual function in men is a well-recognized complication of diabetes mellitus. In contrast, sexual dysfunction is relatively less well studied among women. Information related to FSD in Malaysia remains scarce, especially among Type 2 diabetes mellitus (T2DM) patients. The purpose of the study is to assess the prevalence of female sexual dysfunction and its associated factors among T2DM patients attending primary health clinics in Kuantan Pahang. This cross-sectional study was conducted among 241 T2DM patients attending five health clinics in Kuantan. The inclusion criteria were married female who aged 18 to 65 and understand Malay. The exclusion criteria were patients with known case of psychiatric disorder, pregnant women, or those within 6 weeks postpartum and sexual inactive women. Interviewer-administered validated Malay version of Female Sexual Function Index (MVFSFI) was used to screen for FSD. The Malay version of Patient Health Questionnaire-9 (PHQ-9) was used to screen for depression. The statistical analyses were done using Mann-Whitney U test and chi-squared test, and then preceded with binary logistic regression. The median age of respondents involved was 52.9 (7.75). The majority were Malay (79.3%), Muslim (80.5%), housewives (68%), and menopause (54.4%). The prevalence of FSD was 39.8%. The most common sexual dysfunction was desire (63.5%), followed by arousal (44.4%), lubrication (35.7%), orgasm (32.8%), satisfaction (38.6%) and pain (33.6%). Multivariate analysis showed that non-Malay (AOR: 2.5, 95% CI: 1.24 to 5.23), depression (AOR: 4.5, CI: 1.30 to 15.57), and longer duration of marriage (AOR 1.08, CI: 1.03 to 1.14) were significantly associated with FSD while having more children is a protective factor (AOR: 0.82, CI: 0.69 to 0.97). This study shows that nearly 40 percent of T2DM female patients in primary health clinics had FSD. The clinicians should concern sexual health as an essential aspect to be focused on when treating T2DM patients, especially among non-Malay, patients with a longer duration of the marriage, a lesser number of children, and those who presented with depressive symptoms.

APPROVAL PAGE

I certify that I have supervised and read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Master of Medicine (Family Medicine).

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DECLARATION

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LIST OF ABBREVIATION

BISF-W	Brief Index of Sexual Functioning for Women
BDI	Beck Depression Inventory
BMI	Body Mass Index
BSSC	Brief Sexual Symptom Checklist
CES-D	Center for Epidemiologic Studies for Depression
CPG	Clinical Practice Guideline
DM	Diabetes Mellitus
DSM	Diagnostic and Statistical Manual of Mental Disorder
FCAD	Female Genital Arousal Disorder
FGAD	Female Cognitive Arousal Disorder
FSAD	Female Sexual Arousal Disorder
FMS	Family Medicine Specialist
FOD	Female Orgasm Disorder
FSD	Female Sexual Dysfunction
FSFI	Female Sexual Function Index
HADS	Hospital Anxiety and depression scale
HbA1c	Hemoglobin A1c
HSDD	Hypoactive Sexual Desire Disorder
ICD 10	10th Revision of the International Classification of Diseases and Related Health Problems
ICD 11	11th Revision of the International Classification of Diseases and Related Health Problems
ICSM	International Consultation on Sexual Medicine
IDF	International Diabetes Federal
ISSWSH	International Society for the Study of Women's Sexual Health
KK	Klinik Kesihatan
MREC	Medical Research and Ethics committee
MVFSFI	Malay Version of Female Sexual Function Index
NHMS	National Health and Morbidity Survey
NMRR	National Medical Research Register
OGLD	Oral Glucose Lowering Agent
PGAD	Persistent genital arousal disorder
PHQ-9	9-Item Patient Health Questionnaire
PIS	Patient Information Sheet
SD	Sexual Dysfunction
T2DM	Type 2 Diabetes Mellitus
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

This chapter comprises an overview of female sexual dysfunction (FSD) among T2DM female population in section 1.1. Section 1.2 to section 1.7 corresponds to the problem statement, study purpose, research objective, research questions, theoretical framework and research hypothesis. The significance and limitations of the study are discussed in detail in section 1.8 and 1.9 respectively. Definition of term mentioned in section 1.10.

1.1 BACKGROUND OF THE STUDY

Diabetes mellitus is a chronic metabolic disease characterized by a raised level of glucose. In Type 2 diabetes mellitus (T2DM), hyperglycemia results from the body's inability to respond fully to insulin, a condition termed insulin resistance. There are 463 million persons with diabetes mellitus worldwide, according to International Diabetes Federation (IDF) in 2019 and expected to reach 700 million by 2045 (IDF, 2021). According to the National Health and Morbidity Survey (NHMS) 2019, the overall prevalence of elevated blood glucose among adults aged 18 and above was 18.3%(IPH, NIH, & Malaysia, 2019). Type 2 diabetes mellitus (T2DM) is the most common form of diabetes mellitus in Malaysia, accounting for more than 90% of all occurrences of adult-onset diabetes mellitus (Ministry of Health Malaysia, 2020). Insulin deficiency can cause damage to multiple organ damage and subsequently leading to disabling and life-threatening complications. It is well recognized that diabetes mellitus causes microvascular and macrovascular complications. It has been associated with sexual dysfunction in males. However, its impact on sexual functions among females has not been well explored.

Sexual health, as defined by the World Health Organization (WHO), is a condition of physical, emotional, mental and social well-being in regard to sexuality, not only the absence of disease, dysfunction or disability (World Human Organization, 2017). In the proposed diagnostic guidelines for International Classification of Diseases and Related Health Problems (ICD -11), sexual response is described as a complex interaction of psychological, interpersonal, social, cultural, physiological, and gender influences (Reed et al., 2016). Either of any factors may cause to the development of sexual dysfunction. The dysfunctions present for at least several months and present frequently lead to clinically significant distress. ICD-11 diagnostic guideline organizes sexual dysfunction into 4 main groups which are sexual desire and arousal dysfunction; orgasmic dysfunction; ejaculatory dysfunctions; and other specified sexual dysfunction. Sexual pain disorder is grouped under separate grouping. According to the latest Diagnostic and Statistical Manual of Mental Disorder (DSM) 5, female sexual dysfunction (FSD) is classified into 3 groups which are sexual interest/ arousal disorder, female orgasmic disorder and genitopelvic pain/ penetration disorder (Gabriel Tobia, 2013). There are slight differences in DSM 5 and ICD 11 classification for sexual dysfunctions.

FSD is a complex condition that affects both subjective and objective elements of sexual function. Hormonal, psychological, interpersonal and societal factors all play a role (Gupta, Prakash, Khandelwal, Kalra, & Kalra, 2018). The cause of sexual dysfunction in diabetes people is still a subject of debate. The aetiology of sexual dysfunction in diabetics has been linked to a number of neurological, vascular, endocrine and psychological factors. Many studies have shown that psychosocial factors played a more important role in FSD than sexual dysfunction among diabetic men. Moreover, depression tends to happen among diabetic patients. Diabetes mellitus

is a chronic disease that might progress in multiple complications and indirectly causing disability. For chronic and debilitating conditions will mainly cause the patient to experience more stress in coping with daily activity, and subsequently, quality of life in these patients will be affected. Many authors mentioned that the occurrence of sexual disorder in T2DM women was related to concurrent depressive symptoms (Bąk et al., 2017; Bjerggaard, Charles, Kristensen, Lauritzen, & Giraldi, 2015; Elyasi, Kashi, Tasfieh, Bahar, & Khademloo, 2015). Depression impaired quality of life of diabetic patient; indirectly, quality of sexual function might be affected (Barbagallo et al., 2020).

Sexual dysfunction in male and women have long been closely considered taboo in Malaysia. Still, sexual dysfunction among females is more difficult to diagnose and treat because of the complexity of the female sexual response. Therefore, people are less likely to discuss or seek treatment for their sexual problems. There is insufficient information on the relationship between type 2 diabetes and sexual function in Malaysia. The latest CPG of type 2 diabetes mellitus 6th Edition 2020 recommends that all diabetic women be screened for FSD and managed if appropriate. In such a scientific background, this study may provide additional data on the relationship between type 2 diabetes mellitus and sexual dysfunction among female diabetic patients in Malaysia. On top of that, depressive symptoms will be assessed using 9-item patient health questionnaires (PHQ-9) among the study population. This study can ascertain the association between FSD and depressive symptoms.

1.2 PROBLEM STATEMENT

What is the prevalence of FSD among type 2 diabetes in Malaysia? From the online articles and journals published in Malaysia, the previous study of FSD among T2DM patients was in a small sample size which might not significantly represent our populations.

The associated factors that may contribute to FSD among T2DM patients include the sociodemographic data, including age, educational level, and occupational status, which had been much identified in most studies. On top of that, the clinical features of diabetes mellitus remain controversial in different studies for FSD. From the literature review, most studies have shown that diabetic control has no significant association with FSD. Therefore, we should explore the presence of depressive symptoms among T2DM patients. On top of that, we should like to assess the association of sexual dysfunction with marital backgrounds, such as husband age, duration of the marriage, and the number of children.

Thus, this study aims to assess the prevalence of FSD among T2DM patients. Secondly, the sociodemographic profile and associated factors of FSD among diabetic patients can be identified. Using the MVFSFI questionnaire can identify the domains of sexual dysfunction. The PHQ-9 questionnaire could be used to identify those with depressive symptoms. Subsequently, the association between FSD and depression could be assessed.

1.3 PURPOSE OF THE STUDY

The purpose of the study is to assess the prevalence of female sexual dysfunction and its associated factors attending the primary health clinics.

1.4 RESEARCH OBJECTIVE

1.4.1 General Objective

1. To measure the prevalence of female sexual dysfunction among T2DM patient attending primary health clinic and its associated factors.

1.4.2 Specific Objective

1. To describe the sociodemographic of female sexual dysfunction among T2DM patient attending primary health clinic.
2. To measure prevalence of female sexual dysfunction and its subtype among T2DM patients.
3. To identify factors associated with female sexual dysfunction among T2DM patients.

1.5 RESEARCH QUESTIONS

1. What is the prevalence of female sexual dysfunction among T2DM patients in Malaysia?
2. Is depressive symptoms related to female sexual dysfunction among T2DM patients?
3. Is diabetic controls affecting FSD?
4. Which factors are significantly related to FSD among T2DM patients in Kuantan, Pahang?

1.6 THEORETICAL FRAMEWORK

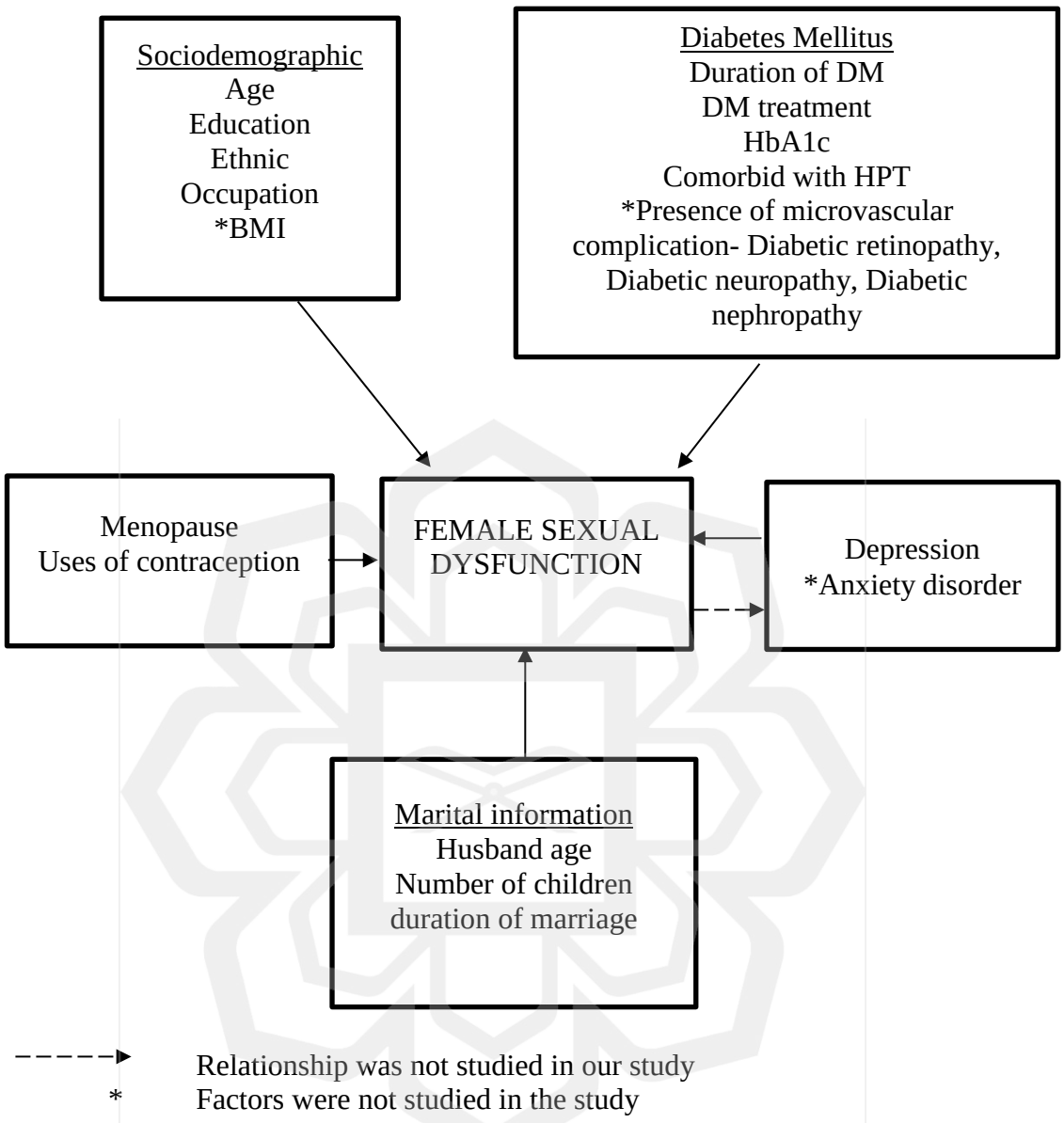

Figure 1.1 Theoretical framework

1.7 RESEARCH HYPOTHESIS

The research hypothesis was a higher prevalence of FSD among T2DM patients. Multiple factors are related to FSD including their sociodemographic profiles, marital history, and diabetic profile. Depressive symptoms which defined by a positive PHQ-9 questionnaire had a positive correlation with FSD.

1.8 SIGNIFICANCE OF THE STUDY

In Malaysia, FSD was believed to be underdiagnosed disease. The prevalence of FSD among T2DM patients was not well reflected in previous studies in view of low sample size. With this study, the prevalence of female sexual dysfunction among the T2DM female patient will reflect the magnitude of the disease among the Malaysian population. The prevalence of FSD was known to be higher among T2DM patients compared to general populations as shown in multiple different studies but most of studies have shown that diabetic controls was not a significant associated factor. Hence, we would like to investigate what are the associated factors with FSD. Duration of marriage, husband age, and the number of children were investigated as associated factors. Sexual satisfaction and marriage stability have beneficial effects on one's health and well-being. A couple in a committed relationship may experience a series of marriage-related issues, which can affect their sexual satisfaction and overall quality of life. Those with more children and a longer duration of marriage were noted to have low sexual function among the general population (Hassanin & Kaddah, 2019). Hence, we would like to investigate T2DM patients to see the association. Besides, several studies have found that people with diabetes have a higher rate of depression than the normal population (Md.Aris M.A, Said A.H., Han T.M., Johari A.H., 2018). We would like to see if a psychological issue like depression has a role in developing of sexual dysfunction.

Moreover, the exact data obtained from this study will help the policy marker and clinician increase awareness of the disease. Early detection of FSD might prompt us to have a concern toward mental health, especially depression issues that tend to higher risk among the T2DM patient. Furthermore, the current study suggests having more large-scale studies in Malaysia to obtain accurate and representative results. It will

be interesting to explore the prevalence of FSD in a different state in Malaysia. More studies are warranted, particularly studies on the treating physician's awareness and competency in the management of FSD.

1.9 LIMITATION OF THE STUDY

There were several limitations identified in the study. First, the questionnaire that we used was developed in years of 2000 by Rosen. Throughout the years, there have been different classifications from different organizations to classify female sexual dysfunction. There are differences in various domain of sexual problems identified. The questionnaire remains the most common screening stool used by the clinician to determine female sexual dysfunction. Female sexual dysfunction is a disease that has seldom been explored by a clinician or treated by the clinician in primary care. The treatment offered in the primary care setting might be limited. Hence, it might be underestimated in the clinical setting. FSD among T2DM patients might be higher than the general population even though the clinical outcome of diabetes might not affect FSD directly. The limitation of this study was purposive sampling, which is a biased sampling method. Purposive sampling is prone to a high level of researcher bias, and the finding might not represent the general finding of the population. The purposive sampling method was opted because it was easier to recruit respondents as our target population have to focus on married women. Case-controlled studies were maybe more compatible in predicting the outcome of FSD in T2DM patients. On top of that, our data collection period was during the COVID-19 pandemic era. There was a limitation in getting respondents because of limited appointments during the diabetes clinic.

1.10 DEFINITION OF TERMS

Table 1.1 Definitions of Term

Variable	Category	Definition
Age (year)		Number of completed years from year of birth accurate up to one year
Ethnicity	1= Malay 2= Chinese 3= Indian 4= other	Race according to parents and birth certificate as claimed by respondent
Education level	1= No formal education 2= Primary school 3= Secondary school 4= college/university	Level of curriculum/learning process received by respondent
Religion	1= Islam 2= Hindu 3= Buddha 4= Christian 5= Others	Religious or spiritual belief of preference as reported by respondents
Working status	1= Employed 2= Unemployed/Housewife	The state of being employed or unemployed
Menopause	1= Yes 2= No	Amenorrhea more than 12 month
Duration of marriage		Interval of time between day, month and year of marriage to date- expressed in completed year
Husband age		Number of completed years from year of birth of the husband at the time of interview
Number of children		The number of kids in a family nucleus
Use of contraception	1= Yes 2= No	Method of contraception that patient practiced with the intention of avoid conception
Method of contraception	1= intrauterine device 2= Progestogen only contraception 3= Combined hormonal contraception 4= Bilateral tubal ligation 5= barrier method 6= others	

Table 1.1 Continued

Variable	Category	Definition
HbA1c		Glycated hemoglobin test The recent reading taken from the patient's record
Treatment of diabetes Mellitus	1= Diet control 2= Oral glucose lowering agent (OGLD) 3= OGLD+ Insulin 4= Insulin	Treatment of diabetes mellitus that respondents received
Sexually inactive women		No partnered sexual activity in the past 1 year.
Sexually active		Any activity that is sexually arousing to the respondents including masturbation.
Depressive symptoms	1= Yes (score 10 and more) 0= No (score 0-9)	Based on 9 questions from PHQ-9 questionnaire evaluated with scale
Female sexual dysfunction	1= Yes (MVFSFI ≤ 55) 2= No (MVFSFI >55)	Based on Malay version of Female sexual function Index (MVFSFI) score

CHAPTER TWO

LITERATURE REVIEW

The first part of this chapter gives an overview of female sexual dysfunction. Chapter 2.2 described the prevalence of female sexual dysfunction in diabetes mellitus patients worldwide. Then, section 2.3 described the FSD studies in Malaysia. The associated factors of FSD will be described in chapter 2.4 in detail. The last part of section 2.5 will be described the screening tools of sexual dysfunction in detail.

2.1 FEMALE SEXUAL DYSFUNCTION- DEFINITION AND CLASSIFICATION

To comprehend what female sexual dysfunction entails, we first must understand what female sexual response implies. Few models had been proposed to characterize the sexual response. There were disparities in the sexual responses of males and females.

In the earlier years, Masters and Johnson proposed a linear model of male and female sexual response in 1966. A linear model of four-phase sexual response consisted of excitement, plateau, orgasm, and resolution. The idea of sexual desire was included in this model by Kaplan, and the sexual response model was known as Kaplan's triphasic model, which encompassed desire, arousal, and orgasm (Kaplan, 1977). Desire was thought to be a prerequisite for subsequent excitement/arousal and orgasm. This model remained the linearity of the sexual response. Over the decades, this male-biased linearity of sexual response had been criticised. The idea that sexual desire is spontaneous and automatic is not fit with women's experience of sexual response. In contrast to the linear model, the new model by Bassons redefined the phases of the female response into a nonlinear model. Women may not necessarily experience desire

as the first phase of sexual response. Female sexual response is often a reaction to partner's interest in sex rather than spontaneous guiding (Basson, 2000). Once the sexual activities commenced, increasing arousal could lead to desire for a continuation of sexual response. The desire could then be feedback to increase the arousal level. Besides, this model integrates the importance of emotional intimacy, sexual stimuli, and satisfaction with the relationship. This model allowed that phases of the sexual response might overlap in time. On top of that, this model emphasizes that the goal of sexual activity is personal satisfaction instead of orgasm. Personal satisfaction may be represented by physical satisfaction demonstrated as orgasm, or emotional satisfaction, defined as intimacy and connection with a partner (Damjanović, Duišin, & Barišić, 2013).

Female sexual dysfunction can be classified according to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), International Classification of Diseases and Related Health Problems (ICD), International Society for the Study of Women's Sexual Health (ISSWSH), and the Fourth International Consultation on Sexual Medicine (ICSM). According to the World Health Organization, sexual health is described as a condition of physical, emotional, mental and social well-being in relation to sexuality (World Human Organization, 2017). It necessitates a respectful and positive attitude toward sexuality and sexual relationships. Sexual response is a complex interaction of psychological, interpersonal, social, cultural, physiological and gender influenced processes. Any of these factors could contribute to the onset of sexual dysfunction. It was defined as a syndrome in which people struggle to engage individually rewarding, non-coercive sexual activities in a variety of ways (McCabe et al., 2016).

ICD-10 was accepted by the World Health Organization in 1990 and published in 1992, whereas ICD-11 was approved by the 72nd World Health Assembly in May 2019 and will be implemented in January 2022. The previous ICD-10 classification of sexual dysfunction is divided into organic and non-organic. “Organic” sexual dysfunctions are categorized into the ICD-10 chapter of diseases of the genitourinary system, while “non-organic” sexual dysfunctions are classified in the mental and behavioral disorder chapter. In view of demonstrating data showing sexual dysfunction typically included a combination of physical and psychological factors; a new chapter on conditions related to sexual health was subsequently included in ICD-11. ICD-11 diagnostic guidelines organize sexual dysfunction into 4 main groups: sexual desire and arousal dysfunction, orgasmic dysfunctions, ejaculatory dysfunction and other specified sexual dysfunction (Reed et al., 2016). Sexual pain disorders have another separate grouping. Generally, sexual dysfunction should be considered if the problem has been persistent for at least several months and frequently occur, though the severity may vary. The problem should be associated with clinically significant distress. However, in the cases of acute sexual dysfunction due to injury or medication, duration is not considered in the diagnosis criteria for earlier initiation of treatment. According to the proposed diagnostic guideline, there is no universally accepted standard for sexual activity. The individual with satisfactory sexual functioning can engage in sexual activity and maintain a sexual relationship as desired. A sexual dysfunction should not be diagnosed if the individual is satisfied with her sexual activities, although it differs from what other people find satisfactory. Sexual dysfunction cannot be diagnosed based on a partner’s unrealistic expectation, the disparity in sexual desire between partners, or inadequate sexual stimulation. Sexual pain penetration disorders are classified into the genitourinary chapter in ICD-11. In this ICD-11, the system does not require to divide