

Personality Traits and Anxiety among Patients with Female Sexual Dysfunction in Health Clinics in Malaysia

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Received: 06 Jun 2024 / Accepted: 01 Aug 2024

ABSTRAK

Disfungsi Seksual Wanita (FSD) ialah sejenis penyakit yang biasa yang boleh memberi kesan kepada wanita di seluruh dunia. Terdapat data yang terhad mengenai hubungannya dengan ciri-ciri personaliti dan faktor-faktor lain. Kajian ini bertujuan untuk menentukan prevalens FSD di klinik-klinik kesihatan dan hubungannya dengan ciri-ciri personaliti dan gangguan keresahan umum (GAD). Ia merupakan sebuah kajian rentas yang melibatkan tiga buah klinik kesihatan di Melaka. Data sosio-demografi telah didapati dari responden. Soal-selidik yang digunakan ialah Inventori Fungsi Seksual Wanita Versi Bahasa Melayu (MVFSFI) yang telah divalidasi, Inventori 'Big Five' (BFI) dan Skala Gangguan Keresahan Umum-7 (GAD-7). Soal-selidik ini digunakan untuk penilaian FSD, ciri-ciri personaliti dan saringan gejala GAD. Sebanyak 362 responden telah dianalisa. Prevalens FSD ialah 10.5% manakala prevalens GAD ialah 11.3%. Gangguan keinginan seksual mencatatkan prevalen tertinggi sebanyak 23.5%. Analisis multivariat menunjukkan frekuensi seksual yang lebih rendah ($p=0.023$, AOR 4.32) dan kumpulan umur ≥ 40 tahun ($p=0.006$, AOR 4.11), tiada pendidikan tertiar ($p=0.016$, AOR 2.62) serta ciri-ciri personaliti 'neuroticism' ($p=0.001$, AOR 2.78) merupakan faktor-faktor jangkaan FSD. Sifat personaliti 'neuroticism', umur lebih tua, frekuensi seksual yang lebih rendah dan tahap pendidikan lebih rendah adalah berkait dengan FSD, tetapi tiada kaitan dengan GAD. Kajian lebih lanjut adalah penting untuk memahami bagaimana GAD boleh menjejaskan pesakit FSD di kalangan wanita di Malaysia untuk kaedah rawatan yang lebih holistik.

Kata kunci: *Disfungsi seksual wanita; keresahan; sifat personaliti*

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ABSTRACT

Female sexual dysfunction (FSD) is a common disorder that can affect females worldwide. There is limited data available about its relationship with personality traits and other factors. This research aimed to determine the prevalence of FSD in health clinics and its association with personality traits and generalised anxiety disorder (GAD). It was a cross-sectional study involving three health clinics in Melaka. The socio-demographic data was acquired from the respondents. The instruments used were Validated Malay version of Female Sexual Function Inventory (MVFSFI), Big Five Inventory (BFI) and GAD-7. These were used to assess respondent FSD, personality traits and screen for GAD symptoms. A total of 362 respondents were analysed. The prevalence of FSD was 10.5% while prevalence of GAD was 11.3%. Sexual desire disorder scored the highest prevalence which was 23.5%. Multivariable analysis showed that lower sexual frequency ($p=0.023$, AOR 4.32) and age group ≥ 40 years ($p=0.006$, AOR 4.11), no tertiary education ($p=0.016$, AOR 2.62) and neuroticism personality traits ($p=0.001$, AOR 2.78) were predictors of FSD. Neuroticism, older age, lower sexual frequency and lower education were associated with FSD but not GAD. Further research is paramount in understanding how GAD affects FSD patients for a more holistic treatment approach.

Keywords: Anxiety; female sexual dysfunction; personality traits

INTRODUCTION

Human life is incomplete without sexual intimacy. It is the result of a complex combination of physiological needs, emotions, experiences, beliefs, lifestyle and relationships. It is a strategy that we employ to address the psychological demand for a more balanced and healthier lifestyle. Based on American Psychiatric Association (APA), sexuality is defined as the capacity to derive pleasure from various form of sexual activity and behaviour particularly from sexual intercourse. While sex is defined as traits that distinguish between and female and male (American Psychiatric Association 2023). Sexuality involves a relationship between partners or spouses, independent of sexual characteristics. It is equally

vital for men and women, regardless of sexual orientation. It is also necessary for human reproduction in order to preserve life sustainability and the survival of the human species.

However, the problem may occur if it becomes dysfunctional and has an impact on human health and daily life. Women's sexual dysfunction is a frequent and significant issue, with an alarmingly high prevalence. Globally, sexual dysfunction is a highly prevalent disorder, affecting 11-67% of women (Christensen et al. 2011; Laumann et al. 1999; Valadares et al. 2008; Worly et al. 2010). The prevalence in Asian countries, including Hong Kong, Japan, Korea, Taiwan and Singapore, were reported as high as 30% (Vahdaninia et al. 2009). Studies done in Malaysia showed that the prevalence of female sexual

dysfunction (FSD) was between 5.5-29.6% (Grewal et al. 2014; Sidi et al. 2007).

Sexual dysfunctions are characterised by disturbances in the process of a normal sexual response cycle and by pain associated with sexual intercourse (American Psychiatric Association 2013). Based on Diagnostic and Statistical Manual 5 (DSM5), FSD is defined as a group of disorder that are typically characterised by a clinically significant disturbance in a person's ability to respond sexually or to experience sexual pleasure (American Psychiatric Association 2013). Clinically, there are six clinical domains of female sexual functioning i.e. desire, subjective arousal, lubrication, orgasm, satisfaction and pain (Basson et al. 2004; Basson 2005). Poor sexual functions impact marital and interpersonal relationships difficulties and reduce the quality of life (Hatta et al. 2006). Sexual issues are linked to lower quality of life, are a key risk factor for the development of anxiety and depression and are frequently linked to other mental health issues (Shifren et al. 2008). Sexual dysfunction may exacerbate psychiatric disorders, and psychiatric diseases may exacerbate sexual dysfunction, implying a bi-directional link (Bossini et al. 2014).

The focus of this study is on personality factors and their possible link to FSD. Traits are usually referred to as global predispositions that are stable across time and oversee steering human behaviour. (John 1990; McCrae & Costa 2004). Personality factors, notably neuroticism, have been proposed as vulnerable qualities for the development and maintenance of psychopathology, including sexual issues (Peixoto & Nobre 2016). According to the Five-Factor Model, personality is defined by five qualities known as the Big

Five, i.e. openness, conscientiousness, extraversion, agreeableness and neuroticism. Neuroticism is defined by the absence of emotional stability and presence of negative affect. Extraversion is defined as the capacity to socialise as well as the existence of pleasant affect, whereas conscientiousness is defined as morals and organisation. Trust and cooperation characterise agreeableness, while intellectual curiosity and imagery ability indicate openness (Mac Donald 1995; McCrae & John 1992).

Anxiety disorder is among concerned psychiatric illnesses associated with FSD. The prevalence was found to be between 77.6-85.18% (Arafa & Senosy 2018; Shringirishi et al. 2020). The dysfunctions are commonly found in lubrication, arousal, and experience of pain, reported at 95%, 88.2% and 84.9%, respectively (Arafa & Senosy 2018). Generalised Anxiety Disorder (GAD) has been detected in association with a 2.6-fold higher risk of inhibited orgasm and a 2.1-fold greater likelihood of inhibited sexual excitement in both men and women, as well as a 2.5-fold higher risk of dyspareunia in women (Shringirishi et al. 2020). The significance of central noradrenergic systems in general arousal and autonomic outflow regulation is crucial and increase in sympathetic tone during worry might divert attention away from erotic stimuli, lowering sexual arousal (Johnson et al. 2004). The limbic system and prefrontal region are linked to affective elements of pain and govern emotional and motivational responses (Fisher et al. 2005). The intensity and degree of pain can be affected by changes in emotional and motivational cues. (Nelson 2006)

Older age and menopause, being

married longer, having more children, and an older husband, as well as a lower frequency of sexual intercourse and a higher academic standing, were found to be associated factors with FSD in the Malaysian population (Sidi et al. 2007). Various factors are associated with FSD, including poor perception of personal health status, lower education level, depression, anxiety, thyroid conditions, urinary incontinence and older age (Shifren et al. 2008). Other associated factors for FSD include poverty, being unmarried and having had a traumatic sexual experience as a child (Hatta et al. 2007). Another factor that is equally important if not more is the spouse or the partner regardless of their gender. It was reported that having a male partner or husband who has erectile dysfunction or sexual dysfunction associated with FSD (Hatta et al. 2007).

There have been local studies that studied the prevalence and its risk factors; however, there is a paucity of data in Malaysia with different socio-cultural backgrounds, such as being multiracial and multilingual. In addition, to the best of the researcher's knowledge, the study of FSD was done more than 5 years ago (Grewal et al. 2014; Sidi et al. 2007) which may render today's prevalence where it is hypothesised that the awareness is increasing if not improving. At the same time, there is no local study done between personality traits and their association with FSD and GAD. The study focused on the female factor because women whether still embarrasses or still have stigma making them not usually discuss them openly (Hatta et al. 2006). Hence, this study created a safe platform for the female respondent to express their sexuality details

without afraid being judged or stigmatised. This study focused on the woman around suburban and rural areas to maintain the heterogeneity of the sample. The wider catchment area provided a more holistic and comprehensive FSD scenario and supported the existing findings with a more recent dataset (Grewal et al. 2014; Sidi et al. 2007).

The study aimed to determine the prevalence of FSD in health clinics and its association with personality traits. Other objectives included determining the association between socio-demographic factors with FSD. This study also analysed the association between personality traits with FSD and GAD.

MATERIALS AND METHODS

Study Design and Setting

This work was a cross-sectional study design. The samples were collected from 1st October 2021 until 30th November 2021 in three governments' health clinics in Melaka. The health clinics were chosen based on convenience in terms of locations at Melaka Tengah. The health clinics also catered to villagers from rural areas.

Study Population

All female respondents were those who attended Ayer Keroh, Ayer Molek and Tengker health clinics. The inclusion criteria were (i) female; (ii) aged between 18 and 60 years; and (iii) sexually active (spouse/partner). Sexually active is defined as women engaging in sexual intercourse at least once a month; (iv) able to read and understand the study languages (Malay or English); and (v) able to sign informed

consent to participate in the study. The exclusion criteria were (i) chronic and severe medical illness(es) such as chronic renal, cardiovascular, respiratory, cerebrovascular, autoimmune, uro-gynaecological diseases, poorly controlled diabetes mellitus, other endocrine diseases, or malignancy; (ii) pregnancy; and (iii) postpartum first 2 months.

Sample size

The sample size calculator for estimations was used to compute the study sample size for prevalence. It was then increased by 15% to account for the possibility of non-response. The total number of people in the sample was 368. However, four respondents filled out the questionnaire incorrectly, and two others gave incomplete responses, resulting in a total of 362 responses being analysed.

Instruments

(i) Socio-demographic factors, sexual factors, gynaecological factors and obstetrical factor form

The respondents filled in a socio-demographic form included details of their age, ethnicity, religion, education level, occupation marital status and household incomes. They also required to fill in their gynaecological and obstetrical information such as age of menarche, menopausal or usage of hormone replacement therapy, number of pregnancies, mode of delivery number of children. Partner's info such as their age and period of marriage or relationship were also included. Details on sexual activities such as sexual frequency per week and usage of contraception.

Medical comorbidities were also included in the form. There were total of 23 questions. Some details such as medical comorbidities and usage of contraception was dichotomously asked to simplify the questions and to be analysed in categorical manner.

(ii) Female Sexual Function Index (FSFI), Malay Version Female Sexual Function Index (MVFSFI)

This is a 19-item multidimensional self-rating framework that was originally designed by Rosen and verified for usage in the Malay language (Hatta et al. 2007). The FSFI evaluated general sexual function as well as desire, arousal, lubrication, orgasm, satisfaction and pain areas. It looked at sexual function in the four weeks leading up to the questionnaire. A score of 55 on the MVFSFI was used to determine FSD (Hatta et al. 2007). The cut-off score for each domain was also established for the MVFSFI which were ≤ 5 for sexual desire disorder, ≤ 9 for sexual arousal disorder, ≤ 10 for a disorder of lubrication, ≤ 4 for orgasmic disorder, ≤ 11 for sexual dissatisfaction; and ≤ 7 for sexual pain disorder.

(iii) Big Five Inventory Malay and English version

The Big Five Inventory (BFI) is a self-assessment tool for assessing the Big Five aspects. It has a total of 44 items and is made up of short phrases with relatively simple vocabulary (John 1990). Internal consistency, convergent and discriminant validity were all good in the Malay version of the BFI. The BFI, which has been translated into Malay and verified, has

acceptable psychometric qualities and may thus be used to assess the personality of Malaysians (Haslina et al. 2018).

(iv) Generalised Anxiety Disorder-7 Malay and English version

The GAD-7, a seven-item measure for GAD, was created for use in primary care (Spitzer et al. 2006). It's a self-administered survey. The GAD-7 has been demonstrated to be an excellent case-finding tool for GAD, Panic Disorder, Social Anxiety Disorder, and Post-Traumatic Stress Disorder (PTSD), and is best used in primary care settings. (Kroenke et al. 2007). In comparison to the Composite International Diagnostic Interview (CIDI) as the reference standard, the Malay version of GAD-7 has good sensitivity and great specificity. These factors established good concurrent validity of the GAD-7 based on 8 scores (Sherina et al. 2012).

Data Collection

Female respondents were chosen through convenience sampling at outpatient clinics based on inclusion criteria. Respondents with noncommunicable diseases or who were pregnant had a different set of appointments and appointment book, thus the researcher could immediately rule them out based on the exclusion criteria. The respondent was provided with an explanation and a participant information sheet to keep and refer to. Written informed consent was acquired if the respondent accepted. If the respondent was unwilling to consent, a replacement was provided. Participants who received a significant MVFSFI score of 55 and a GAD-7 score of 8 were referred to a psychiatric clinic for

further evaluation.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) Version 28.0 software was used to analyse the data. Each variable was subjected to a descriptive analysis. Continuous variables were given as mean and standard deviation, whereas categorical data were provided as frequency and percentage. On continuous data, a normality test was performed using the Kolmogorov Smirnov and graphical methods. The bivariate analysis used the Chi-square test for categorical variables and the Mann Whitney U test for continuous data. All variables with a p-value less than 0.25 from the bivariate analysis were used in a multivariable analysis using binary logistic regression. The p-value <0.05 was chosen as the significant value.

RESULTS

Baseline Characteristic of Respondents

A total of 368 number of respondents were recruited in this study. However, only 362 of them completed the questionnaire with 98.4% response rate. Majority of the respondents aged less than 40-year-old (n=265, 73.2%); of Malay ethnicity (n=333, 92.0%); Islam in religion (n=335, 92.5%); had tertiary level of education (n=203, 56.1%); currently employed (n=261, 72.1%); and came from B40 economic status (n=207, 57.2%).

Apart from that, most of them were non-smokers (n=357, 98.6%) and did not consume alcohol (n=358, 98.9%). Regarding their gynaecological history, majority of the respondents achieved

menarche at the age of 12-year-old (n=155, 42.8%). The mean and standard deviation of the age of menarche were 12.5 and 1.2, respectively.

Most of the respondents were married (n=356, 98.3%) and had a frequency of intercourse once or twice a week (n=271, 74.9%). About 31.2% (n=113) were on contraception. More than half (n=198, 54.2%) of the last childbirth was more than 2 years ago, and 58.0% (n=219) gave birth normally. Most of the respondents (n=214, 59.6%) had two children and below, while

the majority had been married less than 5 years (n=143, 39.5%). The partner’s age group of between 30 to 39-year-old was noted to be the majority (n=153, 42.3%) compared to the other age group. The information was summarised in Table 1.

The mean score for FSFI and GAD score obtained in this study were 70.03 (sd=17.05) and 3.52 (sd=3.81), respectively. As for the personality traits, the mean score for domain extraversion, agreeableness, conscientiousness, neuroticism and openness were 3.36 (sd=0.52), 3.78

TABLE 1: Sociodemographic distributions, gynaecological, medical and sexual characteristics

No	Variable	Count (n)	Percentage (%)
1.	Age group (years)		
	< 40	265	73.2
	≥ 40	97	26.8
2.	Ethnicity		
	Malay	333	92.0
	Chinese	12	3.3
	Indian	13	3.6
	Others	4	1.1
3.	Religion		
	Islam	335	92.5
	Christianity	3	0.8
	Buddhism	11	3.0
	Hinduism	13	3.6
4.	Education		
	No tertiary education	159	43.9
	Has tertiary education	203	56.1
5.	Employment status		
	Working	261	72.1
	Not working	101	27.9
6.	Household financial status		
	B40	207	57.2
	M40	129	35.6
	T20	26	7.2
7.	Smoking status		
	Smoker	5	1.4
	Non-smoker	357	98.6
8.	Alcohol intake		
	Yes	4	1.1
	No	358	98.9
9.	Age of menarche	12.5 ^a	1.2 ^b

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10.	Period cycle		
	Regular	313	86.5
	Irregular	49	13.5
11.	Dysmenorrhea		
	Yes	154	42.5
	No	208	57.5
12.	Menopause		
	Yes	15	4.1
	No	347	95.9
13.	Use of hormone replacement therapy		
	Yes	6	1.7
	No	356	98.3
14.	Personal medical history		
	Yes	71	19.6
	No	291	80.4
15.	Marital status		
	Married	356	98.3
	Unmarried	6	1.7
16.	Sexual frequency		
	1 – 2	271	74.9
	≥ 3	91	25.1
17.	Contraception		
	Yes	113	31.2
	No	249	68.8
18.	Last childbirth		
	Nil	53	14.6
	< 2 years	111	30.7
	> 2 years	198	54.7
19.	Mode of delivery		
	Nulliparous	54	14.9
	Normal	219	58.0
	Instrumental	98	27.1
20.	Number of children		
	< 3	214	59.6
	≥ 3	148	40.9
21.	Age of partner		
	< 30	86	23.8
	30 – 39	153	42.3
	40 – 49	91	25.1
	> 50	32	8.8
22.	Period of marriage (years)		
	< 5	143	39.5
	6 – 10	85	23.5
	11 – 15	64	17.7
	16 – 20	40	11.0
	20 - 25	28	7.7
	≥ 26	2	0.6

^a mean; ^b standard deviation

(sd=0.42), 3.57 (sd=0.47), 3.57, 2.66 (sd=0.62) and 3.25 (sd=0.40), respectively.

Prevalence of Female Sexual Dysfunction and its Subdomains and Prevalence of GAD

The overall prevalence of FSD was 10.5% (38/362), as shown in Table 2. However, there was variability in the level of prevalence according to specific domains.

The prevalence of domain sexual desired disorder was 23.5% (85/362), while for the low sexual arousal domain, the prevalence was 10.5% (38/362). The prevalence for domain lubrication disorder and orgasmic disorder was 7.7% (28/362) and 6.9% (25/362). While the remaining two domains, i.e., sexual dissatisfaction and pain disorder, had an exact prevalence of 9.9% (36/362). Prevalence of GAD in this study population was 11.3%.

TABLE 2: Prevalence of female sexual dysfunction and its domains

Domain/ Subdomain	Prevalence (n=362)	
	n	%
Female sexual dysfunction (≤ 55)	38	10.5
Sexual desired disorder	85	23.5
Low sexual arousal	38	10.5
Lubrication disorder	28	7.7
Orgasmic disorder	25	6.9
Sexual dissatisfaction	36	9.9
Pain disorder	36	9.9

Factors associated with female sexual dysfunction

Table 3 demonstrated the factors associated with FSD using bivariate analysis. Out of 28 variables under study, only 8 factors yielded significant results, as shown in the table. Female with sexual dysfunction was associated with respondents who aged more than 40-year-old (52.6%, p <0.001); who did not have tertiary level of education (60.5%, p=0.04); came from B40 household income (71.1%), p=0.04); had sex frequency once or twice a week (92.1%, p=0.002); not using contraception (89.5%, p=0.005); and those who were married for less than 5 years (39.5%,

p=0.03). Apart from that, two continuous variables with significant results for FSD were the GAD score (p=0.023) and neuroticism personality traits (p=0.001).

Predictors of Female Sexual Dysfunction

Out of 14 factors included, only four factors yielded significant predictors: age of the respondent, education level, frequency of sexual activity and neuroticism trait. All the above independent factors with a p-value <0.25 from the bivariate analysis proceeded into binary logistic regression analysis. The results were shown in Table 4. It was found that female aged 40 years

TABLE 3: Factors associated with female sexual dysfunction (FSD)

No	Variable	Female sexual dysfunction n (%)	Normal sexual dysfunction n (%)	χ^2	p-value
1.	Age group (years)			14.45	<0.001 ^{ae}
	< 40	18 (47.4)	247 (76.2)		
	≥ 40	20 (52.6)	77 (23.8)		
2.	Ethnicity			0.85	0.34 ^b
	Malay	33 (86.8)	300 (92.6)		
	Non-Malay	5 (13.2)	24 (7.4)		
3.	Religion			4.73	0.13 ^e
	Islam	302 (93.2)	33 (86.8)		
	Christianity	2 (0.6)	1 (2.6)		
	Buddhism	10 (3.1)	1 (2.6)		
	Hinduism	10 (3.1)	3 (7.9)		
4.	Education			4.75	0.04 ^e
	No tertiary education	23 (60.5)	136 (42.0)		
	Has tertiary education	15 (29.5)	188 (58.0)		
5.	Employment status			1.69	0.25 ^e
	Working	24 (63.2)	237 (73.1)		
	Not working	14 (36.8)	87 (26.9)		
6.	Household financial status			6.11	0.04 ^{ae}
	B40	27 (71.1)	180 (55.6)		
	M40	7 (18.4)	4 (10.5)		
	T20	4 (10.5)	22 (6.8)		
7.	Smoking status			-	0.99 ^a
	Smoker	0 (0.0)	5 (1.5)		
	Non-smoker	38 (100.0)	319 (98.5)		
8.	Alcohol intake			-	0.99
	Yes	0 (0.0)	4 (1.2)		
	No	38 (100.0)	320 (98.8)		
9.	Age of menarche	13 (1)	12 (1)	6640.00	0.40 ^d
10.	Period cycle			2.01	0.21 ^e
	Regular	30 (78.9)	283 (87.3)		
	Irregular	8 (21.1)	41 (12.7)		
11.	Dysmenorrhea			0.01	0.99
	Yes	16 (42.1)	138 (42.6)		
	No	22 (57.9)	186 (57.4)		
12.	Menopause			2.74	0.10 ^{be}
	Yes	4 (10.5)	11 (3.4)		
	No	34 (89.5)	313 (96.6)		
13.	Use of hormone replacement therapy			0.03	0.63 ^b
	Yes	0 (0.0)	6 (1.9)		
	No	38 (100.0)	318 (98.1)		
14.	Personal medical history			3.86	0.05 ^e
	Yes	12 (31.6)	59 (18.2)		
	No	26 (68.4)	265 (81.8)		
15.	Marital status			0.25	0.99
	Married	37 (97.4)	319 (98.5)		
	Unmarried	1 (2.6)	5 (1.5)		

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16.	Sexual frequency				
	1 – 2	35 (92.1)	236 (72.8)	11.89	0.01 ^{ae}
	≥ 3	3 (7.9)	88 (27.2)		
17.	Contraception				
	Yes	4 (10.5)	109 (33.6)	8.46	0.005 ^e
	No	34 (89.5)	215 (66.4)		
18.	Last childbirth				
	Nil	6 (15.8)	47 (14.5)	0.98	0.64
	< 2 years	9 (23.7)	102 (31.5)		
	> 2 years	23 (60.5)	175 (54.0)		
19.	Mode of delivery				
	Nulliparous	6 (15.8)	48 (14.8)	0.78	0.68
	Normal	24 (63.2)	186 (57.4)		
	Instrumental	8 (21.1)	90 (27.8)		
20.	Number of children				
	< 3	25 (65.8)	189 (58.3)	0.78	0.38
	≥ 3	13 (34.2)	135 (41.7)		
21.	Age of partner				
	< 30	9 (23.7)	77 (23.8)	7.12	0.06 ^{ae}
	30 – 39	12 (31.6)	141 (43.5)		
	40 – 49	9 (23.7)	82 (25.3)		
	> 50	8 (21.1)	24 (7.4)		
22.	Period of marriage (years)				
	< 5	15 (39.5)	128 (39.5)	11.82	0.03 ^{ae}
	6 – 10	6 (15.8)	79 (24.4)		
	11 – 15	5 (13.2)	59 (18.2)		
	16 – 20	6 (15.8)	34 (10.5)		
	20 - 25	4 (10.5)	24 (7.4)		
	≥ 26	2 (5.3)	0 (0.0)		
23.	Generalised Anxiety Disorder ^c	5 (6)	2 (5)	7529.50	0.023 ^{de}
Personality traits					
24.	Extraversion ^c	3.19 (0.88)	3.25 (0.75)	5663.00	0.42 ^d
25.	Agreeableness ^c	3.67 (0.47)	3.78 (0.53)	6169.50	0.98 ^d
26.	Conscientiousness ^c	3.67 (0.44)	3.56 (0.67)	6333.50	0.77 ^d
27.	Neuroticism ^c	2.94 (0.63)	2.63 (0.75)	8155.50	0.001 ^{de}
28.	Openness ^c	3.20 (0.50)	3.20 (0.50)	6517.50	0.55 ^d

^a Fisher exact test; ^b Yate's continuity correction; ^c Median (Interquartile range); ^d Mann Whitney U test;
^e Variables that were included in multivariable analysis

and more had four times the odds of having FSD as compared to those who was less than 40-year-old ($p=0.006$), after adjusting for the confounders. Apart from that, those with no tertiary education has almost three times the odds of having FSD as compared to those with tertiary education ($p=0.016$).

The study also revealed that female who had sexual intercourse frequency once or twice a week had four times more odds as compared to those with frequency of more than three times a week ($p=0.023$). On the other hand, an increase in one unit score of neuroticism score may almost triple

TABLE 4: Multivariable regression for Female Sexual Dysfunction

No	Variable	Crude OR ^a	B	S.E.	Wald	df	p-value	Adjusted OR	95% CI
1.	Age group (years) ≥ 40 < 40	3.56	1.41	0.51	7.62	1	0.006	4.11 1	1.51-11.22
2.	Education level No tertiary education Has tertiary education	2.12	0.96	0.40	5.84	1	0.016	2.62 1	1.20-5.73
3.	Sexual frequency 1 – 2 ≥ 3	4.35	1.46	0.65	5.16	1	0.023	4.32 1	1.22-15.30
4.	Neuroticism	2.02	1.02	0.31	10.64	1	0.001	2.78	1.50-5.13

^a Crude Odds Ratios (OR) were obtained using Simple logistic regression. Binary Logistic (Backward LR method). Adjusted for: age, education, religion, employment status, household income, cycle period, menopausal status, personal medical history, sexual frequency, contraception, age of partner, period of marriage, Generalised Anxiety Disorder (GAD), and neuroticism trait. Hosmer and Lemeshow test, p= 0.148, indicating model fitness. Nagelkerke R square = 0.273

the odds of having FSD. The multivariate logistic regression model demonstrated a good fit, as indicated by the Hosmer and Lemeshow test (p=0.15). It exhibited high overall accuracy at 90.9%, with a specificity of 99.7%, meaning it accurately identified the absence of the condition in most cases. However, the sensitivity, which measures the model’s ability to correctly identify the presence of the condition, was relatively low at 15.8%. The Nagelkerke R² value was 0.273, meaning the model explained 27.3% of the differences in the outcomes, indicating moderate explanatory power. This suggested that while the model captured some of the factors influencing the outcome, there were other important factors not included in this analysis and thus out of the scope of this study. However, the analysis was valid as the factors included had p-values of less than 0.25. Other potential factors were outside the scope of this study.

DISCUSSION

There were not many studies done regarding FSD among Malaysian women. The prevalence of FSD in this study was 10.5%, comparable to the other studies done in Malaysia, which showed rates between 5.5% to 29.6% (Grewal et al. 2014; Sidi et al. 2007).

The use of a one-to-one trained interviewer was also a factor that may improve the detection of FSD; however, it was still quite challenging to conduct in the Malaysian context. The protocol was adopted due to cultural sensitivity regarding sexuality, whereby people might be reluctant to open up and be forthcoming to tell details of their sexuality. Women in Malay society are not expected to openly discuss their sexual demands or discontent. Most of the Malay society is Muslim, and it is believed that Islam forbids public sexual disclosure except for medical reasons (Hatta et al. 2006). However, contrary to the popular social

belief, sexual intercourse is not restricted and only valid to treatment purpose only. It is the rights of both male and female to have a healthy sexual intimacy and in Islam, the teaching taught the believers to treat it as sacred and only reserve to be done in a respectful and permissible halal manner which is in marriage. Islamic teaching was the first to place women respectfully and equally. Women are encouraged to be self-sufficient and forward-thinking.

Despite the dissonance, the respondents exhibited an interest in sexual health, as shown by the high response rate of 98.4%, compared to 75.6-93% in another Malaysian survey (Grewal et al. 2014; Sidi et al. 2007). Even if sexual matters are less taboo among Chinese and Indians than among Malays (Hatta et al. 2006), most of the respondents in this study were Malays. Most non-Malay respondents were not fluent in Bahasa Melayu or English; hence they were reluctant to participate in the research and might cause disparity in the heterogeneity of the samples. There was possible selection bias in this study in choosing those three clinics and the convenience sampling method used. There were other races like Chinese and Indian attending the clinics, but the language barrier may limit the participation of non-Malay patients due to the usage of questionnaires in Malay and English. The researchers were also Malay, so the non-Malay respondents might feel there is cultural difference that they might not be able to understand if they choose to participate in the study.

Personality qualities have been identified as vulnerability features for developing and maintaining psychopathology and sexual issues (Peixoto & Nobre 2016). The absence of emotional stability and the

presence of negative emotions characterise neuroticism. Neuroticism was found to be a personality trait linked to FSD in this study. Neuroticism is highly and negatively associated with sexual desire and difficulty reaching orgasm, according to the findings of multiple additional studies (Harris et al. 2008; Kennedy et al. 1999). In DSM5, anxiety can be manifested with physical symptoms such as muscle tension, easily fatigue as well as sleep disturbances (American Psychiatric Association 2013). The constant free floating of anxiousness can also affect their sexual functions. Eysenck et al. (1971) connected sexual factors with the three-factor psychoticism, extraversion, and neuroticism (PEN) personality model in a study. He claimed that neuroticism's negative emotionality (anxiety, guilt, and self-consciousness) would be a disincentive to sexual expression (Eysenck 1971). Another study indicated a moderate association between neuroticism and sexually specific phobias, as well as a negative relationship between anxiousness and sexual drive (Heaven et al. 2003). A study was done among female patients attending healthcare in Iran found that the score of extroversion was higher in the individuals without sexual dysfunction, while the score of neuroticism was higher among those with sexual dysfunction (Hosseini et al. 2020). A more recent study found that neuroticism acted as a moderator on the relationship between sexual abuse thoughts, lack of erotic thoughts and positive affective states, and sexual functioning, regardless of sexual orientation (Peixoto 2021).

Sexual dysfunction has been connected to anxiety disorders. With panic disorder, Kaplan estimated a prevalence of sexual dysfunction of 75% (Kaplan 1988). Women

with social phobia are more likely to have concomitant desire disorder (46%), pain during sex (42%), and decreased frequency of sexual thoughts and sexual intercourse, according to other studies (Bodinger et al. 2002). Females with obsessive-compulsive disorder (OCD) have a 39% prevalence of sexual dysfunction (Freund & Steketee 1989). The major symptoms and indirect implications of the link between anxiety illness and sexual dysfunction have been addressed in two symmetrical orientations. The complex link can theoretically be stated as anxiety causing sexual failure or sexual disorder causing anxiety. Anxiety and sexual dysfunction, on the other hand, may be different manifestations of the same process, or they may not be causally associated (Corretti et al. 2007).

In this study, it was established that GAD had no relationship with FSD. While many studies have found a significant association between FSD and GAD, there are also studies that have not demonstrated a strong link between these two conditions. For instance, a study by Aslan et al. (2008) assessed sexual function in women with anxiety disorders and found no significant difference in sexual dysfunction between those with anxiety disorders and a control group without psychiatric conditions. Similarly, another study by Uguz et al. (2013) examining sexual dysfunction in women with OCD and other anxiety disorders, including GAD, did not find a significant correlation between the severity of anxiety symptoms and sexual dysfunction. These findings suggest that there is a notable body of evidence supporting the association between FSD and GAD, the relationship may not be universally observed, indicating the influence of other mediating factors such

as individual psychological, physiological, and contextual differences. However, many issues about the comorbidity of sexual dysfunction and anxiety disorders remain unanswered (Figueira et al. 2001; Laurent & Simons 2009). OCD was found to be more harmful than social anxiety or GAD in a small number of investigations (Aksaray et al. 2001; Fontenelle et al. 2007). As a result, more research is needed in the future, possibly using different sorts of more specialised and diagnostic devices.

Aside from that, this study discovered a link between FSD and a reduced frequency of sexual intercourse. Females who have sexual intercourse once or twice a week had four times the odds of those who do it more than three times a week, according to the study, which was similar to prior Malaysian studies (Grewal et al. 2014; Sidi et al. 2007). The vaginal lining might grow thinner and less elastic as sexual frequency decreases. Dyspareunia (painful intercourse) can result from these factors (Angela & Thomas 1988). In this study, it was also found that females aged 40 years and more have four times the odds of having FSD than those less than 40-year-old. Estrogen decline in perimenopausal women disrupts many physiological responses characteristic of sexual arousal, including smooth muscle relaxation, vasocongestion, and vaginal lubrication; genital tissues depend on continued estrogen and androgen stimulation for normal function (Goldstein & Alexander 2005). Aging causes biological processes to be disrupted or sexual phases to be inhibited, resulting in sexual dysfunction. A decrease in estrogen reduces blood flow to the pelvic region, which can lead to diminished genital feeling and the need for more time to build arousal

and reach orgasm. When hormone levels drop, sexual desire drops as well (Angela & Thomas 1998). However, with enough stimulation, such as prolonged foreplay and adequate lubrication, sexual functioning can be improved (Angela & Thomas 1998; Navya et al. 2022).

In addition, people without a tertiary degree had nearly three times the risk of FSD as those with a tertiary education. Higher educational position is seen to imply a greater understanding of sexual needs and rights, as well as a greater willingness to communicate sexual unhappiness and lack of enjoyment (Sidi et al. 2007). People with a lower level of education, on the other hand, make a different observation. They may lack the same level of acceptability and ability to communicate sexual dissatisfaction, demands, and rights, making them more hesitant to divulge intimate details about their sexual lives. These findings also corresponded to the previous studies in Malaysia (Grewal et al. 2014; Sidi et al. 2007).

The strength of the study was that it was the first local study to investigate the association between FSD with personality traits. All instruments used had been translated to Malay and English language as well as had been validated. Identifying the type of personality that the patients may help to manage patients more holistically and comprehensively. These findings have important implications and considerations for the comprehension of sexual problems and developing prevention and treatment strategies. Hopefully, the findings of this study encourage health practitioners to include the screening of personality traits in the treatment of FSD. At the same time, policymakers also enhance the promotion

to create awareness of these issues so that it would be less stigmatisation and the society come forward to address the issues.

In terms of limitations, most respondents were Malay female hence it might not represent all the female with various background in the population. Most non-Malays were not fluent in Bahasa Melayu or English hence they were reluctant in participating in the study. With these limitations, the authors recommended the use of other validated FSFI questionnaires in various language such as Mandarin or Tamil. The lack of inclusion of all sexually active females, regardless of their sexual inclinations, was another constraint we faced.

This limitation could also lead to a lack of understanding of the true prevalence of sexual dysfunction in the general population. In the past studies in Malaysia (Grewal et al. 2014; Sidi et al. 2007), only married couple were included because in Malaysia most of the people are unable to accept extramarital sexual relationships (Hatta et al. 2006). In this study, those who were not married was approached and only 1.7% of the respondent was unmarried but sexually active participated. It shows that cultural and religious sensitivity is still an issue and also one of the limitations in these studies despite growing campaign of awareness on female general health including sexual dysfunction. The stigma behind sexual dysfunction is still a hindrance in understanding at the same time helping the person who is experiencing it.

Other limitation was the study design of the research. Due to limitation of time and resources, the researchers chose cross sectional study as the study design.

However, in cross sectional, the study might not be able to really grasp the sexual issues faced by the respondent. A qualitative study or prospective study is recommended in the future to assess the dynamic and fluidity of the sexual matters. Other limitation was the convenience sampling in which the sample might not be representative of the population. Due to the multifactorial nature of FSD, important factor such as the husband or partner's sexual function was not assessed in the study including relationship issues or level of marital/ relationship satisfaction which plays a vital role in sexual functioning. It is recommended in the future research to include all these factors as well. Other limitations that we had was the medical illness control was based on self-report which might not reflect the true number of the respondent with medical illness. Medical illness can also be affected by other factors. In the future, it is recommended to have a multidisciplinary approach i.e to get input from the primary team that has been managing the respondent to know the control and stability of their medical condition. It is also recommended to include respondent with medical illness because it is also important to assess their sexuality needs and function. Even though some medical illness such as diabetes mellitus can be a cofounder to sexual dysfunction, it is important to address the issue in them to provide a more holistic treatment approach.

CONCLUSION

Prevalence of FSD was 10.5%. FSD has been linked to the neuroticism personality trait as well as other factors such as age, sexual frequency and education level.

Prevalence of GAD in this study was 11.3%. There was no link between GAD and FSD. To implement a more holistic approach to treatment, additional study is needed to understand how anxiety illness affects patients with FSD in Malaysian women.

ETHICAL CONSIDERATION

Informed consent was obtained from all individual participants included in the study. The research was approved by the National Medical Research and Ethics Committee (MREC) Ministry of Health Malaysia via the National Medical Research Registry (NMRR) (Registration number: NMRR-21-1397-60192 (IIR)). All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

ACKNOWLEDGEMENT

The authors would like to offer their heartfelt gratitude to everyone who took part in this study. The authors would also like to acknowledge the health clinic staff for their unwavering support and for allowing us to use their facilities and resources and Ministry of Health Malaysia and Faculty of Medicine Universiti Teknologi MARA Malaysia for the ethical clearance of the study.

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