

# Sexual Desire in Opiate-Dependent Men Receiving Methadone-Assisted Treatment

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## Abstract

Low sexual desire (SD) is not life threatening, but its negative impact on the quality of life and intimacy of a relationship among the patients on methadone maintenance therapy (MMT) is significant. This cross-sectional study involved 183 men on MMT who were interviewed and who completed the Malay version of the SDI-2 (SDI-2-BM), the Malay version of the self-rated Montgomery–Asberg Depression Rating Scale (MADRS–BM) and World Health Organization Quality of Life–BREF Scale (WHOQOL–BREF) questionnaires. Findings showed 32.8% ( $n = 60$ ) participants had low SD. Those who were older, had sexual partners, and were smokers achieved lower scores in both dyadic SD ( $\leq 24$ ) and solitary SD ( $\leq 6$ ), and suffered lower quality of life in their social relationship. MMT is very cost-effective in rehabilitating opioid dependence; however, as clinicians, we need to address and manage the issues of low SD and depression among patients on MMT, especially the older men.

## Keywords

sexual dysfunction, sexual desire, methadone maintenance therapy, smoking, relationship

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According to the World Drug Report by The United Nations Office on Drugs and Crime in 2016, an estimated 1 in 20 adults aged between 15 and 64 years used at least one drug in 2014 (Fedotov, 2016). Although opioid is not the most commonly abused drug in the world, it remains one of the illicit drugs which often raises great concern among health-care providers, due to its contribution to the majority of drug-related deaths (Fedotov, 2016). In Malaysia, the incidence of opioid-related death due to overdose has steadily declined over the years after the implementation of methadone maintenance therapy (MMT) in 2005. The medication-assisted therapy (MAT) program has also significantly reduced the spread of intravenous transmitted diseases such as human immunodeficiency virus (HIV), hepatitis B, and hepatitis C. MMT has not only curtailed a wide array of social and economic problems (Organization, 2004), but it is also one of the most cost-effective methods when compared to other treatment options.

Despite the effectiveness of MMT, previous studies have reported higher rates of sexual dysfunction among patients on MMT when compared with the normal population (Teoh, Yee, Danaee, Ng, & Sulaiman, 2016; Yee,

Loh, & Ng, 2014). Sexual dysfunction related to methadone use in men has been attributed to a reduction in gonadotropin-releasing hormone (GnRH) and luteinizing hormone (LH) leading to reduced plasma testosterone levels (Bawor et al., 2015). A meta-analysis reported the prevalence of sexual dysfunction in this group of patients to be 52% (95% confidence interval [CI] 0.4–0.6) and hypoactive sexual desire and low libido were most common (Yee et al., 2014). Many of the previous studies used International Index of Erectile Function 15 (IIEF-15) to assess low sexual desire among MMT men because IIEF-15 is a very common and easy-to-use

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scale. However, IIEF-15 is primarily a validated instrument for measuring erectile dysfunction in men rather than orgasmic function or sexual desire. The instrument is not expected to measure sexual desire. Therefore, this scale may not be the most suitable instrument in assessing sexual desire (Rosen, Cappelleri, & Gendrano, 2002). The IIEF-15 is designed for patients with sexual partners and primarily focuses on heterosexual activity, as there are a number of questions which are vaginal intercourse-dependent. The IIEF-15 may be less suitable when it comes to the assessment of treatment outcome for individuals who have no sexual partner, or whose primary sexual activity is not heterosexual intercourse (Rosen et al., 2002).

Levine defined sexual desire as a biopsychosocial approach. Biological drive is mainly generated by testosterone. The cognitive component includes the expectation of the sexual desire, while the psychological motivation involves a willingness to engage in sexual activity when a person is given sexual cues (Levine, 1987). Sexual desire can be different between a person with partner and one without. The person who is without a partner and possesses interest in behaving sexually by oneself (e.g., masturbation) enables that person to concentrate on his or her own sexual needs. The sexual desire in the person who has a partner may be different, as the sexual behavior that is influenced by such sexual desire is often interfered by the emotion and this allows oneself to have physical intimacy with another person. Spector, Carey, and Steinberg (1996) called the former type of sexual desire as “solitary sexual desire” and the latter type as “dyadic sexual desire.”

Although low sexual desire is not a life-threatening condition, it has potential impacts on the quality of life (QOL) and the intimacy of a relationship. Some previous studies reported that erectile dysfunction is associated with a lower QOL (Hwang, Lo, Tsai, & Chiou, 2007; Teoh et al., 2016). However, the evidence of the relationship between low sexual desire and QOL among men receiving MMT is still scant. A recent cross-sectional study identified that those men on MAT who scored low on the sexual desire domain in IIEF-15 reported a lower quality of life, especially in their social relationships compared to those who underwent the buprenorphine maintenance treatment (Yee, Danaee, Loh, Sulaiman, & Ng, 2016). In addition, a qualitative study also revealed that patients who had low libido reported that their quality of sexual relationships with their partners was affected (Xia et al., 2013).

The aims of this study were to determine the rates and the associated factors of low sexual desire in opiate-dependent men receiving MMT. Besides, this study also aimed to investigate the effect of low sexual desire on quality of life.

## Methods

### Sample Size

According to the previous research (Yee et al., 2014), a study with 183 MMT participants would have achieved 80% power, 95% CI with total width of 0.15, to detect the low sexual desire between them at 5% significance level, with the expected proportion of 0.51 (Hulley, Cummings, Browner, Grady, & Newman, 2013).

### Participants and Procedure

The study was approved by the University Malaya Medical Centre Ethics Committee. This cross-sectional study was carried out at the University of Malaya Medical Centre and University of Malaya Centre of Addiction Sciences from August 2016 to January 2017. This study included consecutive male subjects, aged 18 years or older with a history of opiate dependence based on the Diagnostic and Statistical Manual, Fourth Edition (DSM-IV) and those who have been on methadone-assisted treatment for at least 2 months prior to the interview. Patients with unstable medical or psychiatric illness, concurrently on antiviral medication for viral hepatitis or HIV, androgen replacement therapy, or phosphodiesterase type 5 inhibitors, use of psychotropic medications other than methadone, and those on psychotropic medication other than methadone were excluded from this study. Those who met the inclusion criteria and consented to participate were given the following questionnaires to complete, which included a sociodemographic sheet, the Malay version of the SDI-2 (SDI-2-BM), the Malay version of the self-rated Montgomery–Asberg Depression Rating Scale (MADRS–BM), and World Health Organization Quality of Life–BREF Scale (WHOQOL–BREF) questionnaires. The participants were interviewed face-to-face by the psychiatrist using the Opiate Treatment Index (OTI) to assess the drug use, HIV risk-taking behavior, social functioning, criminality, and health status for MMT users. In the drug use domain, a Q score was computed by adding the quantity of the two most recent drugs used, and dividing it with the intervals between the reported occasions over the past 4 weeks. A higher Q score corresponds to worse drug use. In other domains, all questions are scored on a Likert scale ranging from 0 (best) to 5 (worst). The score for each domain is determined by adding the scores for each question. A higher score denotes a greater degree of dysfunction (Darke, Ward, Hall, Heather, & Wodak, 1991).

The Sexual Desire Inventory-2 (SDI-2) is a 14-item self-report measure of sexual desire encompassing dyadic and solitary sexual desire. For frequency items, participants rate four items on an 8-point Likert scale ranging from 0 (not at all) to 7 (more than once a day). For

intensity items, participants rate 10 items on a 9-point Likert scale ranging from 0 (no desire) to 8 (strong desire). Dyadic sexual desire (DSD) refers to individuals' interest in or a wish to engage in sexual activity with another person and desire for intimacy. Solitary sexual desire (SSD) refers to an interest in engaging in sexual behavior by oneself. The internal consistency of the SDI-2 is good with Chronbach's  $\alpha$  of 0.86 and 0.96 for DSD and SSD, respectively (Spector et al., 1996). This scale has been translated to the Malay language and validated with good internal consistency (in press). In this study, low sexual desire is defined as DSD score  $\leq 24$ , and SSD score  $\leq 6$  (DeRogatis et al., 2012; Martin et al., 2014).

The self-rated MADRS-BM was a simple, 9-item, validated and reliable instrument for assessing the severity of depression (Yee, Yassim, Loh, Ng, & Tan, 2015). Participants rated items on a 4-point Likert scale ranging from 0 (no depressive symptoms) to 3 (worst depressive symptoms). Higher scores indicate greater symptom severity. According to the study by Yee et al. (2015), the MADRS-BM exhibited good internal consistency with Chronbach's  $\alpha$  of 0.78. The WHOQOL-BREF was used to assess the MMT users' QOL in the physical, psychological, social relationships, and environment domains. The WHOQOL-BREF, which has good psychometric properties, has also been translated into the Malay language and validated (Hasanah, Naing, & Rahman, 2003).

### Statistical Analysis

Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 23 (SPSS, Inc.). Continuous variables were tested for normality using Kolmogorov-Smirnov test. Difference between low sexual desire and normal sexual desire groups on continuous variables was tested using independent sample  $t$  test. Difference between groups on categorical variables was tested using  $\chi^2$  test or Fisher's exact test. Logistic regression analysis was then performed to further explore the relationship between significant variables and low sexual desire. The physical, psychological, social relationships, and environment domains of the WHOQOL-BREF were compared between patients with low sexual desire and patients with normal sexual desire. All demographic and clinical variables associated with a lower QOL which showed statistical significance at the level of  $p < .05$  in the univariate analysis was included in multiple linear regression analysis.

## Results

### Study Population Characteristics

A total of 183 male patients who were on MMT completed the study. The patients were of the mean age of 43.8 years

(standard deviation [ $SD$ ] = 9.7) and were predominantly Malays (83.6%,  $n = 153$ ), married (64.5%,  $n = 118$ ), had secondary education level (79.2%,  $n = 145$ ), had full-time employment (79.2%,  $n = 145$ ), and had no family history of substance use (82.5%,  $n = 151$ ). The mean dose of methadone is 72.5 mg ( $SD = 32.8$  mg) over the mean duration of 49.9 months ( $SD = 35.6$ ). Further, 36.6% of patients tested positive for hepatitis C, 4.4% were hepatitis B positive, while 2.2% had other medical illnesses such as hypertension, diabetes mellitus, and dyslipidemia.

### Sexual Desire

In this study, 32.8% ( $n = 60$ ) of the MMT male patients had low DSD and SSD, 26.8% ( $n = 49$ ) had normal DSD but low SSD, and 9.8% ( $n = 18$ ) had low DSD but normal SSD. The patients were divided into low sexual desire (SD) and normal desire group; 32.8% ( $n = 60$ ) of the MMT male patients had low SD as defined as DSD score  $\leq 24$  and SSD score  $\leq 6$  (DeRogatis et al., 2012; Martin et al., 2014). There was a significant difference in age, Q score of tobacco, and social functioning in OTI between those with low SD and those without (Table 1). In the logistic regression analysis, older age ( $p = .04$ ), with sexual partner ( $p = .01$ ), and frequent smoker as measured using Q score of tobacco ( $p = .02$ ) predicted low SD (Table 2).

### Quality of Life

In Table 3, the patients with low SD generally had lower scores than those without in all domains of WHOQOL-BREF. Only the social relationships domain appear to be statistically significantly ( $p = .02$ ).

Table 4 reports the multiple linear regression analysis for each WHOQOL-BREF domain. Patients who had low SD had significantly poorer score in WHOQOL-BREF in social relationships ( $p < .01$ ) domain as compared to those without. Meanwhile, patients who scored higher in total MADRS-BM had statistically poorer score in all WHOQOL-BREF domains. Patients who were older ( $p < .05$ ) also had significantly lower social relationships scores. Patients who had higher OTI score on social functioning had a significantly psychological ( $p < .01$ ) and environment ( $p < .05$ ) score.

## Discussion

This study reported that 32.8% ( $n = 60$ ) of the MMT male patients had low DSD and SSD, 26.8% ( $n = 49$ ) had normal DSD but low SSD, and 9.8% ( $n = 18$ ) had low DSD but normal SSD. Up to 32.8% of the patients on MMT are diagnosed with low sexual desire (DeRogatis et al., 2012; Martin et al., 2014). Factors such as older age ( $p = .04$ ), those with sexual partners ( $p = .01$ ), and those who were

**Table 1.** Demographic and Clinical Characteristics of In-Patients With and Without Current Low Sexual Desire (SD).

	Normal SD (n = 123)	Low SD (n = 60)	df	$\chi^2$ , Z, t	p value
Age, y, mean $\pm$ SD	43.15 $\pm$ 9.17	46.7 $\pm$ 10.38	181	2.36	.02*
Daily dose, mean $\pm$ SD	70.00 $\pm$ 31.52	79.26 $\pm$ 34.61	181	1.73	.09
Duration of MMT, months, mean $\pm$ SD	50.74 $\pm$ 38.03	52.75 $\pm$ 31.67	181	0.17	.87
BMI, mean $\pm$ SD	23.23 $\pm$ 4.56	23.73 $\pm$ 5.37	137	0.58	.56
Sexual partner, n (%)	99(80.5)	38(63.3)	1	6.31	.02*
Ethnic group, n (%)					
Malay	105(85.4)	48(80.0)	2	1.19	0.55
Chinese	15(12.2)	9(15.0)			
Indian	3(2.4)	3(5.0)			
Religion, n (%)					
Islam	121(86.4)	35(76.1)	3	5.31	0.51
Christian	6(4.3)	1(2.2)			
Buddha	11(7.9)	8(17.4)			
Hindu	2(1.4)	2(4.3)			
Education level, n (%)					
No education	1(1.7)	1(0.8)	3	2.76	0.43
Primary	11(8.9)	7(11.7)			
Secondary	96(78.0)	49(81.7)			
Tertiary	15(12.2)	3(5.0)			
Employment, n (%)	106(86.2)	47(78.3)	1	1.81	0.20
Family history of drug use, n (%)	21(17.1)	11(18.3)	1	0.04	0.84
HBV, n (%)	5(4.1)	3(5.0)	1	0.08	0.72
HCV, n (%)	44(35.8)	23(38.3)	1	0.11	0.75
OTI, mean $\pm$ SD					
Q scores of drugs use <sup>a</sup>					
Tobacco	10.08 $\pm$ 8.24	13.36 $\pm$ 10.65	181	-2.07	0.04*
Alcohol	0.001 $\pm$ 0.009	0.04 $\pm$ 0.26	181	-1.72	0.09
Benzodiazepine	0.09 $\pm$ 0.0008	0	181	-0.57	0.57
Marijuana	0.003 $\pm$ 0.0003	0.014 $\pm$ 0.02	181	-0.03	0.97
Amphetamines	0.002 $\pm$ 0.09	0.001 $\pm$ 0.006	181	-0.49	0.62
Heroin	0.02 $\pm$ 0.13	0.06 $\pm$ 0.37	181	-2.25	0.03*
HIV Risk-taking <sup>a</sup>	7.56 $\pm$ 6.33	6.15 $\pm$ 7.00	181	-1.37	0.17
Criminality <sup>a</sup>	0.02 $\pm$ 0.27	0.02 $\pm$ 0.13	181	-0.56	0.58
Social functioning <sup>a</sup>	5.16 $\pm$ 5.29	6.42 $\pm$ 4.73	181	-2.47	0.01*
Health <sup>a</sup>	0.50 $\pm$ 0.94	0.49 $\pm$ 0.67	181	-0.87	0.39
Total MADRS-BM score, mean $\pm$ SD <sup>a</sup>	2.62 $\pm$ 3.59	2.11 $\pm$ 3.83	181	-1.58	0.11

Note. <sup>a</sup>Based on Mann–Whitney test. MMT = methadone maintenance treatment; BMI = body mass index; HBV = hepatitis B; HCV = hepatitis C; OTI = opioid treatment index; MADRS–BM = self-rated Montgomery–Asberg Depression Rating Scale; Mal–IIEF–15 = Malay version of the International Index of Erectile Function 15; df = degrees of freedom; SD = standard deviation; t = t-test;  $\chi^2$  = chi-square test; Z = z-test.

\* $p < .05$ .

regular smokers ( $p = .02$ ) were associated with low SD, which had significant association with a lower QOL in social relationships.

In the previous studies, the prevalence of hypoactive sexual desire and low libido was very high, in which the meta-analytical pooled prevalence of 51%, ranged from 27% to 74% (Yee et al., 2014). Previous studies also measured sexual desire by either examining self-reported sexual behavior, such as frequency of intercourse, or simply asking what the intensity of a person's

sexual desire was. Sexual desire is a subjective experience that cannot be readily observed. Beck, Bozman, and Qualtrough (1991) identified that sexual behavior can occur without sexual desire or vice versa. This is the first study using the self-administered validated SDI-2 questionnaire to measure sexual desire among the male patients on MMT. Although prevalence of the low sexual desire in this study is lower than that of those previous studies, SDI-2 remains the instrument that is commonly used for measuring sexual desire.

**Table 2.** Logistic Regression Analysis of Significant Sociodemographic and Clinical Variables Associated With Low Sexual Desire (SD).

Variable	Odds ratio	p value	95% Confidence interval	
			Lower	Higher
Age	1.05	.03*	1.004	1.10
Sexual partner	3.59	.01*	1.32	9.80
OTI Q score in tobacco	1.07	.01*	1.02	1.13
OTI Q score in heroin	2.03	.36	2.03	0.44
OTI social functioning	1.03	.49	0.95	1.13

Note. Dependent variable (dummy variable), normal sexual desire = 0, low sexual desire = 1. OTI = opioid treatment index.

\*p < .05.

**Table 3.** Comparison of WHOQOL–BREF Between Patients With and Without Current Low Sexual Desire (SD).

WHOQOL–BREF domains	Normal SD (mean ± SD)	Low SD (mean ± SD)	t	p value
Physical health	13.61 ± 2.11	12.94 ± 2.25	-1.97	.05
Psychological	13.88 ± 2.30	13.21 ± 2.40	-1.81	.07
Social relationships	15.21 ± 3.09	14.05 ± 3.45	-2.29	.02*
Environment	15.15 ± 2.84	14.51 ± 2.45	-1.50	.13

Note. WHOQOL–BREF = World Health Organization Quality of Life–BREF Scale.

\*p < .05.

**Table 4.** Multiple Linear Regression: Demographic and Clinical Variables Significantly Associated With WHOQOL–BREF Domains.

	Standardized coefficient (b)			
	Physical health	Psychological	Social relationships	Environment
	R <sup>2</sup> = .14	R <sup>2</sup> = .20	R <sup>2</sup> = .22	R <sup>2</sup> = .14
Age			-0.21*	
Social functioning		-0.24**		-0.19*
Total MADRS–BM	-0.31***	-0.35***	-0.39***	-0.31***
Sexual desire			-0.19**	

Note. Dummy variables, normal sexual desire = 0, low sexual desire = 1. WHOQOL–BREF = World Health Organization Quality of Life–BREF Scale; MADRS–BM = Montgomery–Asberg Depression Rating Scale.

\*p < .05. \*\*p < .01. \*\*\*p < .001.

SD is a complex phenomenon that is associated with various factors such as personal, relationship, social, certain drugs, and so forth. In this study, the older age men were associated with low SD. SD typically decreases with advancing age among men in the general population (Regan, 2016). Surprisingly, those with sexual partners were reported to suffer from lower sexual desire compared to those without. This finding seems contradictory to the previous study (Quaglio et al., 2008). One of the possible explanations could be that men who have sexual partners might have possessed a better insight of their sexual desire. Those men with sexual partners are also more aware of the impact of low SD on their intimate

relationship. One previous qualitative study (Xia et al., 2013) reported that men who were receiving methadone generally thought that low SD decreased the quality of their sexual life and damaged their intimate relationships. In view of the negative impact of reduced plasma testosterone on male sexual function, which subsequently leads to poor QOL, a recent randomized controlled trial showed improvement in sexual desire with testosterone replacement (Basaria et al., 2015). In the current study, having low sexual desire also predicted a lower QOL in the social relationship domain. Although currently there is no evidence to identify that there is any negative impact of low SD on social relationship among MMT men with sexual

partners, previous studies among the general population did show that low SD is associated with a lower QOL (Martin et al., 2014; Mitchell et al., 2013). According to Xia et al. (2013), men who suffer from low SD will tend to reject, escape, or alienate a partner's invitation. This attitude might have caused their partners to doubt their marital relationship (Xia et al., 2013). Furthermore, in this study, SD, aging, and depression were strongly associated with lower QOL in the social relationship domain.

It is observed that MMT patients have a significantly higher smoking rate than the general population. A systematic review reported that the smoking rates for MMT patients ranged from 73.5% to 94.0% (Guydish et al., 2011). However, the evidence for the effects of smoking on sexual desire in this group of patients remains limited. There are studies which identified that with increase in the mean number of cigarettes smoked daily, erectile functions were statistically significantly impaired (Bolat et al., 2015). In the current study, the increased frequency and number of cigarettes smoked daily were associated with low SD. The higher prevalence of smoking in MMT patients results in a significantly increased risk of tobacco use-related morbidity and mortality. The need for an effective smoking cessation treatment among patients on MMT should be prioritized.

This study has several limitations. First, due to the cross-sectional nature of this study, directionality between the sexual desire and associated factors is unknown. The relationship between sexual desire and the variables of interest remains a complexity, and it is difficult to establish whether low sexual desire is necessarily attributable to MMT. Future longitudinal studies should be conducted to examine the directionality of sexual desire and methadone. Second, the samples were taken in only one urban hospital, which may not be representative of all methadone users in the community. Finally, this study had to rely on self-report data based on patients' memory, which could have resulted in recall bias.

## Conclusion

MMT is very cost-effective in rehabilitating opioid-dependent patients. However, the impact of low sexual desire, though not life-threatening, will play a crucial role in the QOL among patients undergoing the rehabilitation program. This study seems to indicate that patients who are of older age, with sexual partners, and who smoke cigarettes have lower SD, and therefore lower QOL in their social relationships. Therefore, clinicians need to address and manage the issue of SD among patients on MMT, especially the older patients.

## Authors' Note

All the authors contributed equally to the work.


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