

The Evaluation of Relationship between Sexual Self-concept and Sexual Dysfunction in Individuals Undergoing Methadone Maintenance Treatment

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Original Article

Abstract

Background: The present study was conducted with the aim of designing a causal model for the evaluation of sexual dysfunctions based on the variables of methadone dosage and sexual self-concept among individuals undergoing methadone maintenance treatment (MMT).

Methods: The study population of the present study consisted of married men of 20 to 45 years of age with sexual relations and undergoing MMT for a minimum of 8 weeks referring to all MMT clinics of Kerman, Iran, in 2015-2016. The subjects were selected through multi-stage cluster sampling (n = 250). Data were collected using the General Health Questionnaire (GHQ-28), Multi-Dimensional Sexual Self-concept Questionnaire (MSSQ), and Internal Index for Erectile Function (IIEF). Data were analyzed using path analysis method and Pearson correlation coefficient. The suggested model was evaluated using structural equation model (SEM), and indirect relationships were assessed using Bootstrap method.

Findings: The suggested model showed acceptable fitness with the data, and all routes, except methadone use route, to sexual function were significant. The result of the multiple indirect route showed that sexual function had a significant relationship with methadone use through sexual self-concept. In total, 60% of variance in sexual dysfunction was explained using the variables of the suggested model.

Conclusion: Further studies are suggested to be conducted regarding psychological factors effective on the sexual dysfunctions among individuals undergoing MMT, such as sexual self-concept. Moreover, more detailed evaluation of each subscale of positive and negative sexual self-concept is recommended to assess the psychological causes of sexual dysfunctions in these individuals and design psychological, behavioral, and cognitive-behavioral treatment interventions for them.

Keywords: Sexual dysfunction; Methadone; Addiction; Sexual self-concept

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Introduction

Methadone treatment is a comprehensive and effective approach to treating opiate abuse and dependence with the aim of damage reduction using methadone.¹ Methadone is a synthetic opiate and a μ -opioid receptor agonist.¹ Researches show that of the addicts who try to quit, a significant amount will present with sexual dysfunction.² Sexual dysfunction is one of the serious problems experienced by substance abusers and individuals undergoing methadone maintenance treatment (MMT). The results of previous studies show that the prevalence of sexual dysfunction is higher in individuals undergoing MMT compared to the general public and their prevalence in different studies ranges between 30% and 100%. Previous studies have found a relationship between sexual function and use of opioids. These studies showed that sexual desire increased in the first 6 months of use however, users reported a gradual reduction in sexual desire and in some cases the complete loss of sexual desire.³ Sexual dysfunction is one the most important reasons for patients' failure to adhere to MMT.⁴ Reduced satisfaction with sexual function is reported in more than 27% of men and 65% of women who have used heroin for more than 6 months.⁴ MMT has been shown to have a grave impact on opiate abuse management in patients,⁵ reduced criminal and high-risk behavior,⁶ reduced HIV transmission,⁷ reduced mortality rate,⁸ and improved occupational status.⁹

The results of studies on the effect of MMT on sexual function are ambiguous and sometimes contradictory. Hallinan et al.¹⁰ and Quaglio et al.¹¹ observed a higher rate of erectile dysfunction in individuals receiving MMT compared to those receiving buprenorphine maintenance treatment. Nevertheless, the study by Babakhanian et al.¹² showed that undergoing MMT for 6 months affects sexual dysfunctions, including erectile dysfunction, in heroin users. Researches have not determined whether the use of methadone or other factors cause sexual dysfunction during MMT.¹³ Reduction of plasma concentration of testosterone, methadone dosage, age, and depression have been considered as factors effective in the occurrence of sexual dysfunction; however, previous studies have not studied these factors in detail.¹⁴

Although there is no conclusive documentation, low testosterone level,^{15,16} and increased prolactin

level and its negative feedback on Growth Hormone (GH) discharge^{17,18} have been reported in some studies as the causes of sexual dysfunction in methadone use.

The results of another study have shown that many of the medication used by methadone users, such as antidepressants, antipsychotics, and anticholinergic drugs, are effective on the incidence of sexual dysfunction in these individuals.¹⁹ The present study aimed to evaluate the role of sexual self-concept in sexual dysfunction among individuals undergoing MMT. Sexual self-concept is individuals' emotions, views, and beliefs regarding sexual relations, and based on these emotions, views, and beliefs, they regulate their behavior. Evaluation of sexual self-concept can be an important predictor of the incidence of future behavior and its promotion can assist the psychological-sexual wellbeing of individuals. Sexual self-concept has a substantial impact on individuals' sexual health.²⁰ The aim of the present study was to evaluate the mediator role of sexual self-concept in the incidence of sexual dysfunction among patients undergoing MMT. Thus, it can be stated that the importance of the present study is that its purpose was to determine the role of methadone use in the incidence of sexual dysfunction and its mediator factors.

Methods

The study population of the present study consisted of married men of 20 to 45 years of age with sexual relations and undergoing MMT for a minimum of 8 weeks referring to all MMT clinics of Kerman, Iran, in 2015-2016. The exclusion criteria consisted of having major psychiatric disorders and non-communicable chronic physical diseases and simultaneous use of other narcotic substances which was determined through interviews before the study. After obtaining informed consent from these individuals, they were entered into the study. The data collected using the questionnaires were analyzed using SPSS software (version 20, IBM Corporation, Armonk, NY, USA). First, nominal data were presented using simple tables and numerical data using center mean indices and standard deviation distribution. Then, multiple regression model and structural equation model (SEM) were used.

The Multi-Dimensional Sexual Self-concept Questionnaire (MSSQ) was designed by William Snell in the Department of psychology of Southeast Missouri State University, USA, in 1990. This questionnaire consists of 20 subscales and measures different dimensions of sexual self-concept. The reliability and validity of this questionnaire were evaluated and the standard Farsi version of the questionnaire was used in the present study. Based on Cronbach's alpha, the total reliability of the questionnaire was 0.89 and the reliability of its subscales ranged between 0.71 and 0.93, which were significant and acceptable. The evaluation of the validity of this questionnaire showed that the correlation coefficient of the questionnaire with the General Health Questionnaire (GHQ-28) was 0.3 which was significant at the 0.08 level. In addition, factor analysis showed suitable structural validity in the subscales with the 4 important factors which comprised 80% of the variance. This multi-dimensional questionnaire is one of the most practical tools for the measurement of individuals' perception of sexual relations. This questionnaire is an objective self-report tool and the Farsi version consists of 78 questions and 18 dimensions. These dimensions are divided into two main groups of negative and positive sexual self-concept. Positive sexual self-concept consists of sexual self-concept components, sexual awareness, motivation for avoidance of high-risk sexual relations, and sexual desire, sexual monitoring, sexual courage, sexual optimism, sexual motivation, sexual validity, sexual management, prevention of sexual issues, and sexual satisfaction. Negative sexual self-concept consists of sexual anxiety, self-reprobatation in sexual issues, fear of sexual relations, sexual depression, internal control of sexual issues, and individual sexual patterns. The minimum score of the positive and negative sexual self-concept dimensions was 0 and the maximum score of the

positive and negative sexual self-concept dimensions was 176 and 64, respectively.^{20,21}

General Health Questionnaire: This tool is a psychological questionnaire designed by Goldberg (1979). This questionnaire evaluates the mental status of the individuals in the previous month²² and consists of 28 questions and the 4 subscales of physical symptoms, anxiety and sleep disorders symptoms, social function, and depression symptoms indices. The total score of the questionnaire ranges between 0 and 84; lower scores represent higher general health and scores higher than 22 illustrate abnormal status.

Internal Index for Erectile Function: The Internal Index for Erectile Function (IIEF) measures the sexual function of men. The IIEF was designed by Rosen et al.²³ in 1997 and was validated in a group of men with sexual arousal disorder. Rosen et al.²³ found that the index of reliability for each of the 5 subscales and the total scale had internal consistency of higher than 0.1 and Cronbach's alpha of 0.73 and higher and 0.91 and higher in the studied population, respectively. Repetition test of correlation coefficient was significant for the 5 subscales, and high sensitivity, specific effects in the treatment group, and significant differences between the scores before and after the treatment were observed in all 5 subscales ($P = 0.001$). The IIEF consists of 15 questions in the 5 dimensions of sexual desire, orgasm, erection, sexual satisfaction, and overall satisfaction. The total score of the IIEF ranges between 0 and 75; higher scores represent better sexual functioning. The score of the IIEF illustrates the intensity of the sexual function disorder; 0-10: severe sexual function disorder, 11-16: average, 17-21: average to mild, 22-25: mild, 26-30: lack of any disorder.

Results

Table 1 illustrates the descriptive data related to mean and standard deviation, and lowest and highest scores.

Table 1. Descriptive data on the studied variables for all participants

Variables	Minimum score	Maximum score	Mean \pm SD
Age (year)	21	45	36.50 \pm 7.51
Methadone dosage (mg)	10	110	33.28 \pm 24.82
Positive sexual self-concept	0	174	110.40 \pm 31.41
Negative sexual self-concept	0	64	38.50 \pm 6.46
GHQ	6	76	37.10 \pm 22.57
IIEF	0	71	29.68 \pm 19.32

GHQ: General Health Questionnaire; IIEF: Internal Index for Erectile Function

Table 2. Correlation matrix of variables in the suggested model

Variables	Positive sexual self-concept	Negative sexual self-concept	IIEF	Methadone dosage	GHQ
Positive sexual self-concept	1.00	-	0.670*	0.410*	-0.57*
Negative sexual self-concept	-	1.00	-0.430*	-0.370*	0.64*
IIEF	-0.67*	-0.43*	1.000	-0.048	-0.71*
Methadone dosage	0.41*	-0.37*	-0.048	1	-
GHQ	-0.57*	0.64*	-0.710*	-	1

* $P < 0.010$

GHQ: General Health Questionnaire; IIEF: Internal Index for Erectile Function

Sexual function disorder was reported in 49% of participants and 51% of subjects had no sexual disorder. Among the participants who had sexual function disorder, 18%, 10%, 9%, and 12% had mild, mild to average, average, and severe disorder, respectively.

Table 2 illustrates all correlation coefficients between the studied variables (the significance level for all coefficients are illustrated with a star in the table). All P values of less than 0.01 were considered significant.

The scores of positive and negative sexual self-concept had a significant correlation with the sexual function score of the participants. Positive sexual self-concept had positive relationship with sexual function ($r = 0.67$). High sexual self-concept scores were accompanied with high sexual function scores. Negative sexual self-concept and sexual function had a significant negative relationship ($r = -0.43$); individuals with a high sexual function score had low negative sexual self-concept scores.

Positive sexual self-concept had positive and negative correlation coefficients, respectively, with methadone dosage ($r = 0.41$) and GHQ ($r = -0.57$), which were statistically significant. Increase in methadone dosage was followed with

higher positive sexual self-concept scores which were, in turn, accompanied with lower GHQ scores (favorable mental and general health status).

Negative sexual self-concept had negative and positive correlation coefficient with methadone dosage ($r = -0.37$) and GHQ ($r = 0.64$), respectively, which were statistically significant. Higher negative sexual self-concept scores were accompanied with higher GHQ scores (unfavorable general health status).

The results of the present study showed that sexual function had a negative correlation coefficient with methadone dosage ($r = -0.048$); however, this correlation of not statistically significant, meaning that the sexual function of the subjects was not dependent on methadone dosage.

The relationship between sexual function and GHQ was statistically significant and negative ($r = -0.71$); individuals with lower sexual functioning had higher GHQ scores and, in other words, unfavorable mental health status.

In Figure 1, the final model of the causal relationship between methadone dosage and sexual function with the mediation of the positive and negative sexual self-concept was illustrated. Table 3 presents the coefficients related to the suggested model (linear multiple regression model).

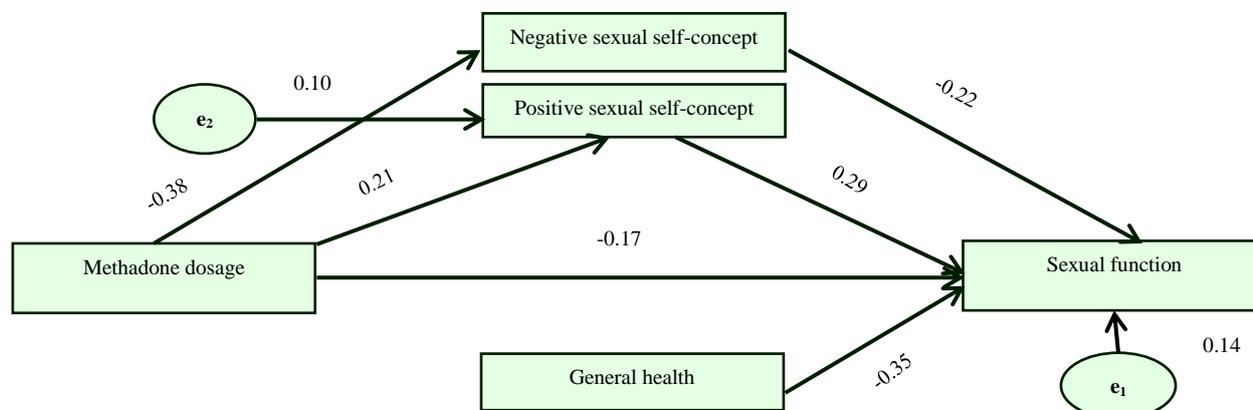
**Figure 1.** The causal relationship of methadone dosage and sexual dysfunction with the mediation of sexual self-concept

Table 3. Coefficients, standard deviation, and significant level of the suggested model

	Routes	B	β	t	P
Positive sexual self-concept	Sexual function	0.592	0.291	3.564	0.002
Negative sexual self-concept	Sexual function	-0.351	-0.228	-3.161	0.010
Methadone dosage	Positive sexual self-concept	0.291	0.213	2.534	0.030
Methadone dosage	Negative sexual self-concept	-0.410	-0.383	-3.096	0.001
Methadone dosage	Sexual function	-0.114	-0.171	-7.353	0.090
General health	Sexual function	-0.430	-0.352	-5.741	0.020

The results presented in table 3 show that the methadone dosage route with positive and negative sexual self-concept were positive and negative and significant ($P = 0.030$) ($P = 0.001$), respectively. The route of positive and negative sexual self-concept to sexual function was positive and negative and significant ($P = 0.002$) ($P = 0.010$), respectively.

The route of GHQ to sexual function was negative and significant ($P = 0.020$).

To evaluate the mediatory or indirect relationship between the studied variables, the boat strap method of Macro Pitcher and Heinz (2008) was used. Based on the results presented in table 4, the confidence interval of the table showed the lack of 0 in the multiple indirect path of methadone dosage and sexual function with the mediation of sexual self-concept. Hence, the overall hypothesis of this multiple path was approved.

Discussion

Sexual disorder is one of the serious problems experienced by substance abusers and individuals undergoing MMT, and one the most important causes of patients' failure to adhere to MMT.⁴ The findings of studies conducted on the effect of MMT on sexual function and its dependence on dosage are ambiguous and sometimes contradictory.¹⁷

The results of the present study showed that methadone dosage had a negative relationship with sexual function ($r = -0.048$), but this relationship was not statistically significant. In other words, the lack of relationship of methadone dosage with sexual function (lack of dose dependence of methadone sexual dysfunction) was observed.

Cushman also reported the lack of relationship

between methadone dosage and sexual dysfunction.¹⁷ However, Spring et al. reported a significant relationship between methadone dosage and sexual dysfunction; with increase in methadone dosage, more sexual dysfunctions were observed.¹⁴

No previous studies have been able to prove that methadone-related sexual dysfunctions are related to methadone dosage. This possible lack of dose-dependence of methadone-related sexual dysfunctions can be a good indicator for clinicians that the reduction of methadone dosage may have no effect on the improvement of the sexual function of patients undergoing MMT. The present study was conducted in order to evaluate the mediatory role of sexual self-concept in the sexual function of individuals undergoing MMT. The results showed that the relationship between positive sexual self-concept and sexual function was positive and statistically significant ($r = 0.67$).

High positive sexual self-concept scores were accompanied with higher sexual function score, and thus, favorable sexual function status. Moreover, the results showed that negative sexual self-concept had a negative significant relationship with sexual function ($r = -0.43$). Therefore, increase in negative sexual self-concept score was accompanied with low sexual function score, and thus, higher sexual dysfunction (Table 2).

Positive sexual self-concept had positive and negative significant relationships with methadone dosage ($r = 0.41$) and GHQ ($r = -0.57$), respectively, meaning that high positive sexual self-concept score was accompanied with low GHQ score (favorable general and mental health status). Increase methadone dosage resulted in higher positive sexual self-concept scores.

Table 4. The results of boat strap analysis of the multiple indirect hypotheses

Hypothesis	Data	Boat	Bias	SD	Low level	High level
The relationship of methadone dosage and sexual function with the mediation of sexual self-concept	0.06	0.07	0.001	0.03	0.03	0.10

SD: Standard deviation

Negative sexual self-concept had negative and positive significant relationships with methadone dosage ($r = -0.37$) and GHQ ($r = 0.64$). In other words, higher negative sexual self-concept scores were accompanied with unfavorable mental and general health status. Increases methadone dosage resulted in lower negative sexual self-concept scores.

The relationship between sexual function and the GHQ was also negative and statistically significant ($r = -0.71$). In other words, individuals with higher sexual function had more favorable general health status. Aref Nasab et al. found a significant improvement in the general and mental health status of individuals addicted to opiates after MMT, and the continuation of MMT for 6 months resulted in the increasing of this improvement.²⁴

The findings of studies conducted on the impact of MMT on sexual function seem ambiguous and contradictory. Most of these studies have not determined whether methadone causes sexual disorders or other factors during MMT. In previous studies, reduction in plasma concentration of testosterone, methadone dosage, age, and depression have been reported as factors effective on the incidence of sexual dysfunction in methadone use, but have not been studied in detail. In the present study, a novel step was taken and the role of sexual self-concept, as a mediatory factor, was evaluated in the incidence of sexual dysfunction in individuals undergoing MMT.

Based on the results of the present study, the suggested model showed acceptable fitness with the data (Figure 1), and the result of the multiple indirect route showed that sexual function had a significant relationship with methadone use through sexual self-concept (Tables 3 and 4).

Researches have shown that sexual self-concept, in addition to sexual behavior, is effective on sexual dysfunction, and thus, this variable can be used as an important factor in the

assessment of sexual dysfunctions.

It is hoped that the presentation of novel theories and models will assist in the determination of the causes of sexual dysfunction and presentation of suitable solutions for their prevention in individuals undergoing MMT. Furthermore, considering the results of the present study and previous studies in this regard, it is recommended that all factors that directly or indirectly impact the incidence of these disorders in individuals undergoing MMT be considered and studied in the future.

Conclusion

It is suggested that further studies be conducted regarding psychological factors effective on the sexual dysfunctions among individuals undergoing MMT, such as sexual self-concept. Moreover, the more detailed evaluation of each subscale of positive and negative sexual self-concept is recommended in order to assess the psychological causes of sexual dysfunctions in these individuals and design psychological, behavioral, and cognitive-behavioral treatment interventions for them.

Limitations: The lack of consideration of age as a factor effective on sexual function, and only questioning the subjects on simultaneous use of other substances and not performing any tests in this regard are the limitations of the present study and must be considered the generalization of results.

Conflict of Interests

The Authors have no conflict of interest.

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ارزیابی ارتباط بین خودپنداره جنسی و اختلالات عملکرد جنسی در افراد تحت درمان نگهدارنده با متادون

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مقاله پژوهشی

چکیده

مقدمه: مطالعه حاضر با هدف تدوین یک مدل علی جهت بررسی اختلالات جنسی بر اساس متغیرهای میزان مصرف متادون و خودپنداره جنسی در میان افراد تحت درمان نگهدارنده با متادون (Methadone maintenance treatment یا MMT) انجام شد.

روش‌ها: جامعه آماری این پژوهش، مراجعه کنندگان مرد متأهل در بازه سنی ۲۰ تا ۴۵ سال تحت MMT بودند که از تمام کلینیک‌های ترک اعتیاد و درمان شهر کرمان در سال ۹۵-۱۳۹۴ انتخاب شدند. نمونه‌گیری به صورت خوشه‌ای چند مرحله‌ای انجام شد و ۲۵۰ نفر برگزیده شدند. داده‌ها از طریق پرسش‌نامه سلامت عمومی-۲۸ (General Health Questionnaire یا GHQ-۲۸)، پرسش‌نامه چند وجهی خودپنداره جنسی (Multi-Dimensional Sexual Self-concept Questionnaire یا MMSQ) و پرسش‌نامه شاخص بین‌المللی عملکرد نعوظی (Internal Index for Erectile Function یا IIEF) جمع‌آوری شد. داده‌ها با استفاده از روش تحلیل مسیر و ضریب همبستگی Pearson مورد تجزیه و تحلیل قرار گرفت. ارزیابی مدل پیشنهاد شده با استفاده از روش الگویابی معادلات ساختاری انجام گردید. جهت آزمون روابط غیر مستقیم، از روش Bootstrap استفاده شد.

یافته‌ها: مدل پیشنهاد شده از برازش قابل قبولی با داده‌ها برخوردار بود و تمام مسیرها به جز مسیر مصرف متادون به عملکرد جنسی، معنی‌دار بود. نتایج مسیر غیر مستقیم چندگانه نشان داد که ارتباط معنی‌داری بین مصرف متادون با عملکرد جنسی از طریق خودپنداره جنسی وجود داشت. در مجموع، ۶۰ درصد از واریانس اختلال جنسی از طریق متغیرهای مدل پیشنهاد شده تبیین شد.

نتیجه‌گیری: پیشنهاد می‌شود با انجام مطالعات بیشتر در زمینه بررسی عوامل روان‌شناختی مؤثر در اختلالات جنسی افراد تحت MMT از جمله خودپنداره جنسی و بررسی دقیق هر یک از زیرمقیاس‌های خودپنداره جنسی مثبت و منفی جهت بررسی علل روان‌شناختی اختلالات جنسی در این افراد و طراحی مداخلات درمانی روان‌شناختی، رفتاری و شناختی رفتاری آن‌ها گام‌های مثبت و نوینی برداشته شود.

واژگان کلیدی: اختلال عملکرد جنسی، متادون، اعتیاد، خودپنداره جنسی

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