

The Effect of Heroin Use Disorder on the Sexual Functions of Women

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ABSTRACT

The effect of heroin use disorder on the sexual functions of women

Objective: This study was conducted to evaluate the sexual functions of women with heroin use disorder.

Method: This comparative-descriptive and cross-sectional study was carried out at the Research, Treatment and Training Center for Alcohol and Substance Dependence (AMATEM) of Bakirkoy Training and Research Hospital for Psychiatry Neurology and Neurosurgery. Included in the heroin use disorder group were 57 women aged 18 years or above who presented to AMATEM between June 1, 2014 and December 31, 2014 and received a diagnosis of substance use disorder according to DSM-5. Inclusion criteria were the absence of psychiatric diseases, substance withdrawal symptoms, or mental retardation, being sexually active, not being pregnant or puerperant, and having given consent to participate in the study. Healthy female relatives of 79 female patients who presented to the Gynecology Clinic of the same hospital during the same period were included in the healthy group. The data were collected through an interview form was developed by researchers, Female Sexual Function Index (FSFI), and Beck Depression Inventory (BDI).

Results: No difference was determined between the participants in both groups in terms of average age, period of education, body mass index, or employment and economic situation ($p>0.05$). It was determined that, in contrast with the healthy group, 70.4% of the women with heroin use disorder had sexual problems and 71.9% of them were not satisfied with their sexual life. It was found that women with heroin use disorder scored significantly lower than healthy controls in FSFI sub-dimensions such as desire, arousal, lubrication, orgasm, satisfaction, and pain, as well as for the total scale, while scores were higher on the BDI scale ($p<0.05$).

Conclusion: Among women with heroin use disorder, sexual functions are adversely affected and depressive symptoms appear to be increased.

Keywords: Heroin use disorder, sexual function, woman

ÖZ

Eroin kullanım bozukluğunun kadınların cinsel işlevi üzerine etkisi

Amaç: Bu çalışma eroin kullanım bozukluğu olan kadınların cinsel işlevlerinin değerlendirilmesi amacıyla yapılmıştır.

Yöntem: Karşılaştırmalı-tanımlayıcı ve kesitsel tipte planlanan çalışma Bakırköy Ruh Sağlığı ve Sinir Hastalıkları Eğitim ve Araştırma Hastanesi Alkol- Madde Araştırma, Tedavi, Eğitim Merkezinde (AMATEM) yapıldı. Araştırmada eroin kullanım bozukluğu olan gruba; 1 Haziran 2014 - 31 Aralık 2014 tarihleri arasında AMATEM'e başvuran ve DSM-5'e göre madde kullanım bozukluğu tanısı konmuş 18 yaş ve üzerinde, psikiyatrik hastalığı, madde yoksunluk bulgusu ve mental retardasyon bozukluğu olmayan, cinsel yönden aktif olan, gebe ya da lohusa olmayan, çalışmaya katılmayı kabul eden 57 kadın alınmıştır. Sağlıklı gruba aynı tarihlerde, aynı hastanenin Jinekoloji Polikliniği'ne başvuran kadın hastaların 79 sağlıklı kadın akrabası dahil edilmiştir. Verilerin toplanmasında araştırmacı tarafından hazırlanan görüşme formu, Kadın Cinsel İşlev Ölçeği (KCIÖ) ve Beck Depresyon Envanteri (BDE) kullanıldı.

Bulgular: Her iki grupta yer alan katılımcılar arasında yaş ortalaması, eğitim süresi, beden kitle indeksi, çalışma ve ekonomik durum açısından fark saptanmadı ($p>0.05$). Sağlıklı gruba göre eroin kullanım bozukluğu olan kadınların çoğunluğunun (%70.2) cinsel bir sorunu olduğu ve cinsel yaşamlarından memnun olmadıkları (%71.9) saptandı. Eroin kullanım bozukluğu olan kadınların sağlıklı gruba göre istek, uyarılma, lubrikasyon, orgazm, memnuniyet, ağrı gibi KCIÖ ölçeğinin alt boyut ve toplamından anlamlı olarak daha düşük, BDÖ ölçeğinden daha yüksek puanlar aldıkları belirlendi ($p<0.05$).

Sonuç: Eroin kullanım bozukluğu olan kadınların cinsel işlevlerinin olumsuz yönde etkilendiği ve depresif belirtilerin arttığı belirlenmiştir.

Anahtar kelimeler: Eroin kullanım bozukluğu, cinsel işlev, kadın



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INTRODUCTION

The term substance is used for any chemical substance, taken by whichever route, that causes changes in mood, perception, cognition, and other brain functions and may lead to substance use disorder (1). It is generally used to achieve a euphoric effect on an individual's central nervous system. Substance use disorder is characterized by perseveration in the use of the substance despite self-harm, failure to discontinue the use, constant search for the substance, and gradual escalation of the dose used (1,2). Substance use disorder is a multidimensional chronic disease affecting the physical, psychological, social, and sexual health of the individual, that is becoming more prevalent every day in both sexes (2). Individuals with substance use disorder, especially women, face many social, economic, legal, and sexual health-related problems due to substance use (3).

Sexuality, which is one of the important parameters of women's quality of life, is adversely affected by substance use disorder. It is a common habit to use substances as an aphrodisiac to improve sexual performance and pleasure in both genders. Nevertheless, sexuality is unfavorably affected by substance use disorder (4). The acute effects of substances increase the levels of dopamine, norepinephrine, and serotonin, the neurotransmitters associated with sexual activity. Heroin, which is a semisynthetic form of morphine, when used acutely suppresses the central nervous system (CNS) and causes intense euphoria and relaxation by the endorphin effect (1,5). Continuous use of the substance causes psychiatric disorders and decreased interest in sexuality (2). Continuous use of opioids is reported to influence sexual functions negatively by altering levels of neurotransmitters such as serotonin, norepinephrine, and dopamine, by directly or indirectly suppressing the release of various hormones such as testosterone, estrogen, and progesterone, associated with sexual arousal, or by directly disturbing blood flow in the genital organs and other physiological mechanisms. Studies reported that 60.0% of female chronic heroin users stated to have

reduced sexual arousal, 68.0% to have lack of sexual drive, and 60.0% to have orgasm problems; and they further stated that in advanced stages of the substance use disorder, their desire for sexuality gradually decreased, even to the point that their sexual life vanished (1,4,6).

Studies support the association of substance use disorders not only with sexual dysfunction but also with depression. However, the cause-and-effect relationship between the two disorders remains unclear (1,2,5). Nonetheless, depression often accompanies substance use disorders. Loss of interest, energy loss, low self-esteem, lack of enjoyment of life, and social isolation can damage the shape and continuity of interpersonal relationships. These symptoms may harm their sexual life and relationships, leading to sexual dysfunction (1,2,5,7).

Sexual problems among women with opioid use disorder, though being common, are often neglected. A literature search showed a general tendency to investigate physical and psychological problems caused by opioid use disorder (7). The number of studies on sexual problems arising from substance or opioid use disorder in Turkey is also very limited (5). This study is one of the first in this country to disclose the problems in female sexual functioning caused by opioid use disorder that is able to contribute to thinking about a solution by creating awareness on the subject. For this purpose, the study aimed to evaluate the sexual functions of women with substance use disorder.

METHOD

This cross-sectional study was performed at the Research, Treatment and Training Center for Alcohol and Substance Dependence of Bakirkoy Training and Research Hospital for Psychiatry Neurology and Neurosurgery (AMATEM) after being approved by the local ethics committee (Ethics Committee no. 2014/57).

The study population consisted of 93 adult women (>18 years of age) who presented to AMATEM between June 1, 2014 and December 31, 2014 with a diagnosis of substance use disorder based on DSM-5 criteria. Generated by non-probability sampling method, the

case population included 57 women with use disorder who had no additional psychiatric disorders, withdrawal signs, or mental retardation disorder and had been sexually active during the last three months. Informed consent was given. The reasons for the exclusion of potential subjects were as follows: eighteen women did not agree to participate in the study; nine others had not performed regular sexual activity within last three months; six patients had a severe psychotic disorder; three had signs of withdrawal. The healthy control group consisted of 79 women who presented to the gynecology department of the same hospital as outpatients during the same period, meeting the following criteria: no alcohol or other substance use disorder, no chronic disease, no medication use, not being in the perimenopausal, postpartum, lactation, or pregnancy period; and giving consent to participate in the study.

Measures

Data were collected by Personal Information Form, Female Sexual Function Index (FSFI) and Beck Depression Inventory (BDI).

Personal Information Form: The form consists of 35 questions about participants' sociodemographic characteristics, chronic diseases, persistent drug and substance use, and sexual health.

Female Sexual Function Index (FSFI): The FSFI was developed by Rosen et al. (8) in 2000 to assess the sexual function of women over the last four weeks. The index is a multidimensional measure consisting of six subdivisions (desire, arousal, lubrication, orgasm, satisfaction, and pain) and 19 items. Items 1 and 2 are five-level Likert-type (1-5 points), and the others are six-level Likert-type questions (0-5 points). The highest score to be reached on the scale is 36 and the lowest score is 2. The reliability and validity for Turkey was confirmed by the Turkish Society of Andrology and Aygin-Aslan in 2005 (9). The cut-off point for the scale was 26.55, where subjects with a score of ≤ 26.55 are assumed to have a negative alteration in sexual function (10).

Beck Depression Inventory (BDI): BDI is a self-report scale developed by Beck (11) in 1961 to measure emotional, cognitive, somatic, and motivational components of depression. It consists of 21 items which are answered on four-level Likert-type scales which are graded between '0' and '3'. The lowest and highest scores that can be achieved at the completion of scale are 0 and 63, respectively. Higher scores indicate increased level of depression symptoms. Cut-off point is usually accepted as 17. The study was validated for Turkey by Hisli (12).

Procedure

Data were collected through three forms filled in as a self-report at the same time. Both verbal and written information about the study was given to the participants, who then gave informed consent.

Statistical Analysis

The collected data were analyzed using the SPSS (Version 21.0) software package. Chi-square test was used to compare the categorical variables and Student's t-test to compare parametric variables between the study groups; Pearson correlation was used to analyze the association for normally distributed variables. The results were accepted as statistically significant if p-value was < 0.05 for a 95% confidence interval.

RESULTS

There was no difference between the two groups in terms of mean age, duration of education, body mass index, employment, and economic status ($p > 0.05$), except for smoking status, where the rate of non-smokers in the control group was found to be higher (69.6%) (Table 1).

Heroin-related characteristics of the case group showed age at onset of the substance use to be 19.57 ± 5.20 years (range: 10-40 years), the duration of intensive heroin use was 3.36 ± 2.26 years (range: 1-10 years), and the daily dose 3.17 ± 1.99 g (range: 1-7g).

The mean duration of heroin use was 6.66 ± 4.43 years. It was mostly taken by nasal route (68.4%), while the remaining patients used it intravenously (31.6%).

Obstetric/gynecological comparison of the groups showed that the heroin group had a significantly lower mean age at both onset of sexual intercourse and pregnancy compared to the control

Table 1: Comparison of the study groups by their demographic characteristics

	Heroin Group (n=57)				Control Group (n=79)				t	p
	Mean	SD	Min.	Max.	Mean	SD	Min.	Max.		
Age	26.22	6.64	18	44	27.21	2.00	20	32	-1.238	0.218
Education status (years)	9.29	2.95	5	15	8.98	2.98	5	17	0.601	0.549
			n	%			n	%	χ^2	p
BMI (kg/m ²)										
18.49< underweight	17			29.8	11			13.9		
18.49-24.99	36			63.2	57			72.2	5.890	0.053
25> overweight	4			7.0	11			13.9		
Employment status										
Employed	23			40.4	37			46.8	0.565	0.452
Unemployed	34			59.6	42			53.2		
Economic status										
Income<expenses	24			42.1	37			46.8	0.300	0.584
Income \geq expenses	33			57.9	42			53.2		
Smoking status										
Smoker	57			100.0	24			30.4	66.629	<0.001
Non-smoker	-			-	55			69.6		

t: Student's t test, χ^2 : Chi-square test, SD: Standard deviation, BMI: Body mass index

Table 2: Comparison of the study groups by their sexual and obstetrical-gynecological parameters

	Heroin Group (n=57)		Control Group (n=79)		t	p
	Mean	SD	Mean	SD		
Age at the first sexual intercourse	17.35	2.51	22.59	3.11	-10.832	<0.001
Number of sexual intercourses (per week)	2.19	1.30	2.86	1.19	-3.096	0.002
Age at first pregnancy	19.41	2.97	23.69	3.31	-5.950	<0.001
Number of pregnancies	2.55	2.10	1.60	0.91	2.509	0.016
Number of deliveries	1.31	0.56	1.25	0.55	0.453	0.652
Number of abortions	1.38	1.74	0.27	0.66	3.556	<0.001
			n	%	χ^2	p
Sexual partners						
Single	37	64.9	78	98.7	29.008	<0.001
Multiple	20	35.1	1	1.3		
Satisfaction with sex life						
Satisfied	16	28.1	77	97.5	73.754	<0.001
Dissatisfied	41	71.9	2	2.5		
Current family planning method						
Effective method	27	47.4	65	82.3	18.437	<0.001
Ineffective method	30	52.6	14	17.7		
Menstrual cycles						
Regular	13	22.8	78	98.7	86.215	<0.001
Irregular	44	77.2	1	1.3		

t: Student's t test, χ^2 : Chi-square test, SD: Standard deviation

Table 3: Comparison of the study groups by mean FSFI and BDI scores

	Heroin Group (n=57)		Control Group (n=79)		t	p
	Mean	SD	Mean	SD		
Desire	2.26	1.18	4.09	0.79	-10.134	<0.001
Arousal	2.20	1.07	4.38	0.90	-12.803	<0.001
Lubrication	2.94	1.43	4.98	0.74	-9.821	<0.001
Orgasm	2.40	1.18	4.72	0.91	-12.394	<0.001
Satisfaction	2.76	1.36	5.12	0.83	-14.574	<0.001
Pain	4.67	1.47	5.22	0.95	-2.447	0.016
Total FSFI	17.25	6.05	28.54	3.94	-12.319	<0.001
BDI	30.56	10.29	6.00	6.99	15.603	<0.001

t: Student's t test, SD: Standard deviation, FSFI: Female Sexual Function Inventory, BDI: Beck Depression Inventory

Table 4: Correlation of BDI score to total FSFI and its subdomains among women with heroin use disorder (n=57)

	Desire		Arousal		Lubrication		Orgasm		Satisfaction		Pain		Total FSFI	
	r	p	r	p	r	p	r	p	r	p	r	p	r	p
BDI	-0.260	0.110	-0.161	0.327	-0.097	0.556	-0.056	0.734	-0.036	0.826	-0.062	0.709	-0.143	0.417

r: Pearson correlation, FSFI: Female Sexual Function Inventory, BDI: Beck Depression Inventory

group ($p < 0.05$). In addition, the mean number of pregnancies and abortion and rates of promiscuousness, dissatisfaction with sexual life, menstrual irregularity, and use of ineffective contraception methods were significantly higher in the heroin group than in the healthy controls ($p < 0.05$, Table 2).

In the heroin group, mean scores for desire, arousal, lubrication, orgasm, satisfaction, and pain subdomains of FSFI and total FSFI were detected to be significantly lower compared to those in the control group ($p < 0.05$, Table 3). The cut-off point for FSFI showed negatively altered sexual activity in 30.4% of healthy women and in 91.2% of women in the heroin group. The mean BDI score was significantly higher in the heroin group, and depressive symptoms were found in 87.7% of heroin-addicted women compared with 10.1% of healthy controls, as determined by the BDI cut-off point ($p < 0.001$, Table 3).

No significant association was found in the case group between BDI scores and scores on the FSFI for the total scale or any of the FSFI subdomains ($p > 0.05$, Table 4).

DISCUSSION

Substance use disorder is a multidimensional chronic disorder. Substance use disorder developed by the abuse of substances also affects the physical, mental, social, and sexual aspects of women's life, and these effects change over time. Several studies reported substance use disorder to cause sexual problems and sexual dissatisfaction among women (4,5,13). In fact, sexual dysfunction caused by substance use has been described in a separate section of the DSM-5 as a situation where "clinically significant sexual dysfunction that results in marked distress or interpersonal difficulty predominates in the clinical picture" (13). Substance use disorder, which negatively affects quality of life and sexual health, is perceived as a serious health problem that is becoming increasingly widespread throughout the world. A limited number of studies performed in recent years suggests the problem to be more common among men; however, a rapid increase of substance use disorder is also found among young women in many countries, including Turkey (14). Sociodemographic characteristics such as age, gender, employment status, economic level, and

educational status were also evaluated as risk factors in substance use disorder studies, especially in treatment-focused studies. Sociodemographic characteristics were also compared in the current study, and it was determined that both groups were similar. The similarity of socio-demographic characteristics of women with and without heroin use disorder is positive in terms of comparison of sexual function and depression levels. In this study, women with heroin use disorder were more likely to smoke than the non-addicted group. Smoking has been suggested as a transition in the substance use disorder continuum (15). In accordance with our findings, Karsidag et al. (16) reported that smokers were 3-4 times more likely to drink alcohol and 5 times more likely to use other substances than those who did not smoke.

Studies revealed that the first substance use is usually observed during youth. As the dose and duration of the substance used increased, the negative effects experienced were more prominent among women compared to their male counterparts, given women's more sensitive physiological nature due to lower body lipid/water ratio or higher variability of their hormones according to the phase of their menstrual cycle (17). In this study, it was found that the age of starting substance use was 19.57 ± 5.20 years and the mean duration of heroin use was 6.66 ± 4.43 years. Moreover, the period between intensive substance use and seeking medical help was very short. This might be explained by the possibility of a relatively early start of negative effects of substance use disorder on general health level, quality of life, and sexual life (18,19).

Studies on substance use disorder in females frequently reported that, under the influence of the substance used, especially adolescents experienced sexuality at an early age, had unprotected sexual intercourse, and went through more pregnancies and abortions at an early age (20,21). Women in all societies are expected to have high moral values in the social and sociocultural context (21). Women who use substances have been considered as "weak-willed, easily available" to the society and are frequently exposed to any kind of sexual trauma like harassment or rape when they

are under the influence of a substance (20-22). Repeated substance use can also lead to economic hardship in women's lives. Therefore, women may perform risky sexual acts such as having multiple partners or engaging in unprotected sexual intercourse aimed at money or substance exchange to supply the substance they abuse (21-23). In consistence with the literature, our study showed heroin users to be more likely to have their first sexual intercourse under the age of 18, a higher number of pregnancies or abortions, earlier age at their first pregnancy, and higher rates of ineffective birth control method usage and menstrual irregularities.

Substance abuse may decrease the quality of life and cause sexual dysfunction by affecting a person's social life, emotional health, human relations, and school/work performance (7). A small number of available studies reported that continuous use of a substance led to sexual dysfunction and decreased sexual desire (2,24). In fact, though substance-induced sexual dysfunction is discussed in separate sections both in ICD-10 and in DSM-5, it has been less studied in women. A limited number of studies among addicted men and women reported a decrease in arousal, orgasm, vaginal intercourse, and sexual desire after starting heroin use (6,20,25). Human and animal studies with opioids reported that these drugs suppressed the secretion of luteinizing hormone-releasing hormone and gonadotropin, resulting in decreased testosterone levels and abnormal menstrual function. In fact, this was described as opioid-induced androgen dysfunction (24,25). Gonadal dysfunction associated with substance use disorder may lead to decreased libido, sexual dysfunction, amenorrhea, oligomenorrhea, fatigue, depression, and osteoporosis in women (3,6,13). Another theory that explains the effects of opioids on sexual functioning involves mesolimbic pathways, i.e. the dopaminergic reward system. This system encourages behavior and actions that benefit the individual. Substances, including heroin, have been reported to elicit sexual dysfunction by causing a rapid deterioration of behaviors that are normally rewarding, like sex (6,13).

Substance women with use disorder often find it

problematic to establish a close and harmonious relationship with a partner or spouse, while the status of psychological well-being and the ability to establish close relationships are important determinants of healthy sexuality (24). Women with substance use disorders are reported to have many physical, behavioral, and social problems that negatively influence sexual functions (19). Sexuality, shaped by the interaction of psychological, social, and biological variables, may lose functioning as a result of the inhibition of any of these components (25). In line with similar research, our study showed that 91.2% of women with substance use disorder had negatively altered sexual functions, and the mean scores for desire, arousal, lubrication, orgasm, satisfaction, pain and total FSFI were significantly lower in the heroin group.

It has been reported that substance use disorder frequently causes psychological problems, which may further adversely affect the mood and sexual life of the individual (27,28). Our study did not include subjects with comorbid psychiatric disorders. However, depressive symptoms were found to increase in the heroin group. Besides, no correlation was detected between depression level and sexual functioning in the heroin group. This suggests that female sexual dysfunction is not only related to psychological factors, but rather constitutes a complex process involving pharmacological, physical, social, and cultural components.

This study has several limitations, the most important one being the low sample size, which was partly due to the low number of presenting female heroin use disorder patients who were followed by the treatment center and partly due to our relatively strict participant selection criteria, including patients with an active sexual life and excluding those with depression or additional substance use. In addition, the evaluation of the level of relationship and sexual intimacy of the participants were based on their own statements; their partners were not included in the study. Another limitation is that sexual function-related questionnaires play merely a complementary

role in the diagnosis and treatment of female and male sexual dysfunction. The definitive diagnosis of such disorders requires completion of a detailed medical history, physical examination, and laboratory tests and as well as a multidisciplinary evaluation. As the study was conducted in an treatment center for substance use disorder, no comprehensive evaluation by a multidisciplinary team could be performed. Furthermore, the study was performed in a single center, which could be seen as another limitation.

In conclusion, the study shows that in women with heroin use disorder, sexual functioning is adversely affected and depressive symptoms are increased. This study is the first to evaluate sexual functions among woman with heroin use disorder in comparison with a control group. Despite some limitations, it provides important insights and clues to the field thanks to its comparative and descriptive structure. There are only a few studies regarding the effects of substance use disorder on the sexual functions of women in Turkey. The study findings need to be confirmed and supported by further comprehensive and multicenter prospective studies.

Contribution Categories		Author Initials
Category 1	Concept/Design	M.D.
	Data acquisition	M.D.
	Data analysis/Interpretation	M.D.
Category 2	Drafting manuscript	M.D.
	Critical revision of manuscript	M.D.
Category 3	Final approval and accountability	M.D.
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