

Sexual life satisfaction of methadone-maintained Chinese patients: individuals with pain are dissatisfied with their sex lives

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Purpose: Pain is potentially associated with sexual dysfunction. Both sexual dysfunction and pain are common in methadone-maintained patients, but the association of pain with sexual dysfunction in methadone-maintained patients is rarely studied. This study examined the association between pain and sexual life satisfaction (SLS) in Chinese patients receiving methadone maintenance treatment (MMT).

Patients and methods: A total of 477 methadone-maintained patients who recently had sex with their sex partners were recruited from three MMT clinics in Wuhan, China. SLS was assessed with a single question, and the sociodemographic, psychological, and clinical data were collected with standardized questionnaires. Pain intensity was assessed with the 5-point verbal rating scale. Multiple ordinary logistic regression was used to control for potential confounders that may bias the pain–SLS relationship.

Results: The prevalence of self-reported dissatisfaction with one's sexual life was significantly higher in patients with clinically significant pain (CSP) than those without CSP (41.5% vs 19.4%, $\chi^2 = 23.567$, $P < 0.001$). After controlling for potential sociodemographic, psychological, and clinical confounders, CSP was still significantly and independently associated with an increase in sexual life dissatisfaction (OR = 1.89, $P = 0.011$).

Conclusion: Pain is significantly associated with low SLS in methadone-maintained patients. Appropriate pain management might improve SLS of patients receiving MMT.

Keywords: pain, sexual life satisfaction, methadone maintenance treatment

Introduction

Since 2006, methadone maintenance treatment (MMT) has been China's national strategy to address the issue of opioid misuse and its related public health problems such as the HIV and HCV epidemics.¹ However, approximately a third of Chinese patients discontinue MMT during the first 3 months following MMT initiation.² Studies have shown that the side effects associated with methadone treatment, in particular sexual dysfunction, are one of the most common reasons for patients' early dropout from MMT.^{3–6}

Sexual dysfunction is a prevalent problem among methadone-maintained patients, for example, in Iran, 17.8% male and 23.1% female patients under MMT reported some forms of sexual dysfunction,⁷ while in China, as high as 74% of men treated with methadone had erectile dysfunction.⁸ Yet, specialists in addiction treatment practice seldom ask about patients' sexual concerns, and patients are often reluctant to report their sexual problems to specialists,^{6,8,9} which leads to the under-recognition and under-treatment of sexual dysfunction in clinical settings. Given the clinical

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relevance of sexual dysfunction, a better understanding of the characteristics for this condition in MMT patients is the first step toward the identification and possible interventions.

Although it is commonly accepted that sexual dysfunction is a direct pharmacological effect of opioids, recent studies revealed that the etiology of sexual dysfunction in methadone-maintained patients is rather complex: methadone treatment, psychological factors (ie, psychiatric symptoms), and biological factors (ie, sex hormone) all significantly contribute to it.^{6,10} In China, studies have found that demographic variables (ie, marital status), psychosocial factors (ie, depression), physical health, and methadone dose are significant predictors of sexual function of MMT patients.^{8,11,12}

Pain is another common complaint of methadone-maintained patients, which refers to “an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.”^{13–16} Due to concerns about opioid dependence as a barrier to pain management, pain is also often undertreated or untreated in addiction treatment practice.^{13,17} Previous studies have reported a high prevalence of sexual dysfunction in patients with painful conditions (ie, chronic pelvic pain syndrome and chronic low back pain),^{18–20} which is particularly high among those with intensive and severe pain.²⁰ Therefore, we speculate that pain is associated with sexual dysfunction in methadone-maintained patients. However, results of our literature search within major Chinese and English databases (from their inception date to July 24, 2018) showed that no studies have examined the potential effect of pain on sexual function in methadone-maintained patients.

As a comprehensive subjective measure of sexual function, sexual life satisfaction (SLS) refers to the degree to which a person is satisfied or happy with the sexual aspect of his or her relationship.²¹ Having a satisfactory sexual life is an essential component of a good quality of life, since sexual life is the basis of a happy marriage and family.^{21,22} The present study examined the relationship between pain and SLS in Chinese methadone-maintained patients.

Patients and methods

Patients

Between June 2009 and July 2010, we conducted a cross-sectional survey to investigate the mental health of patients in three MMT clinics in Wuhan, China.²³ Eligible patients for this survey were adults aged ≥ 20 years who met *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition criteria for a lifetime diagnosis of heroin addiction. We excluded patients with alcohol dependence, organic mental

disorders, or psychotic symptoms. Patients whose physical illness was too severe to complete the survey were also excluded. We used cluster sampling to obtain the sample of methadone-maintained patients. At the time of the survey, a cross-sectional sample of 652 eligible patients of the three MMT clinics were invited to participate and 603 completed the survey. By using self-report screening questions, the current study included a subsample of 477 patients who endorsed having sex with their regular or irregular sex partners within 1 month at the time of the survey. Details of the sampling, procedures, and instruments have been described elsewhere.^{23–26}

The survey protocol was approved by the Institutional Review Board of Wuhan Mental Health Center prior to the fieldwork of the study. The protocol including the methods was performed in accordance with the Declaration of Helsinki and the relevant ethical guidelines and regulations in China. All participants provided written informed consent.

Assessments

The self-completed questionnaire, which was specifically designed for this study, consisted of five parts:

1. Sociodemographic questionnaire: gender, age, education years, marital status, and employment status.
2. Clinical characteristics questionnaire: usual route of heroin administration (smoking, injecting), duration of heroin use, duration of MMT, and methadone dosage.
3. The Chinese version of Zung's Self-rating Depression Scale (SDS):²⁶ The SDS was used to assess the severity of depressive symptoms. It has 20 items, and each item uses a 4-point rating scale (1=a little of the time to 4=most of the time). The total score of SDS varies between 20 and 80, with higher scores indicating more severe depression. A cutoff value of ≥ 40 is recommended to screen for clinically significant depression in the Chinese population.
4. SLS: A single question was used to assess SLS, which asked: “In the past month, how satisfied were you with your sex life?” Response options were: 1=very dissatisfied, 2=dissatisfied, 3=fair, 4=satisfied, and 5=very satisfied. This single-item measure of SLS has been proved to be valid and reliable and has been widely used in previous epidemiological studies of sex health.^{11,12,21} Most of the existing scales for assessing sexual dysfunction are gender-specific (ie, Arizona Sexual Experience Scale),²⁷ but SLS can simply measure and compare the quality of sexual function for both genders. In our pilot study with a sample of 48 MMT patients, SLS scores and the four subscales of Scale for Quality of Sexual Function²⁸ were moderate to

highly correlated: their intraclass correlation coefficients ranged from 0.453 (for psychosomatic quality of life) to 0.716 (for sexual dysfunction self-reflection), suggesting the satisfactory criterion validity of the SLS measure.²⁹ In this study, “very dissatisfied” and “dissatisfied” were merged into one category: sexual life dissatisfaction.

5. Pain: The intensity of pain was evaluated with the 5-point verbal rating scale (VRS) that asked respondents how intense their overall pain was at the time of the survey. The 5-category responses for the VRS were: 1=none, 2=mild, 3=moderate, 4=severe, and 5=very severe. The VRS is a valid and brief measure of pain intensity.^{25,30–32} In accordance with prior studies,^{33,34} patients were classified as having clinically significant pain (CSP) if they rated their pain was “moderate,” “severe,” or “very severe.”

Statistical analysis

The prevalence of dissatisfaction with one's sexual life was described. Rates of dissatisfaction between patients with and without CSP were compared by chi-squared test. The association between CSP and sexual life dissatisfaction was examined with multiple ordinary logistic regression that entered SLS as the outcome variable, CSP as the predictor, and sociodemographic, psychological, and clinical covariates at once to adjust for the potential confounding effects of these sociodemographic, psychological, and clinical variables. The statistical significance level was set at $P < 0.05$ (two-sided). SPSS software version 15.0 package (SPSS Inc., Chicago, IL, USA) was used for all analyses.

Results

The average age of the 477 patients was 37.6 years (SD =9.2, range =25–50), and 69.8% were men. Most of the patients (84.3%) injected heroin before being admitted to MMT, and the mean dose of methadone and duration of MMT were 67.0 mg/d (SD =30.5) and 22.8 months (SD =5.8), respectively. Detailed sociodemographic, psychological, and clinical characteristics of the study subjects are summarized in Table 1.

The average SLS score was 3.0 (SD =1.0). In total, 32.1% patients were dissatisfied with their sex lives (7.7% “very dissatisfied” and 24.4% “dissatisfied”), 28.2% rated their sex lives as “fair,” and 39.7% were satisfied (36.5% “satisfied” and 3.2% “very satisfied”).

A total of 260 patients endorsed CSP. The prevalence of self-reported dissatisfaction with one's sexual life was significantly higher in patients with CSP than those without CSP (41.5% vs 19.4%, $\chi^2 = 23.567$, $P < 0.001$).

After controlling for potential confounders, results of the multiple logistic regression analysis (Table 1) reveal that CSP was still significantly and independently associated with an increase in sexual life dissatisfaction (OR =1.89, $P = 0.011$).

Discussion

To the best of our knowledge, this is the first study in China that examined the association of pain with SLS in patients of Chinese MMT clinics. The main findings of this study are the 32.1% prevalence of sexual life dissatisfaction and its significant association with CSP among Chinese methadone-maintained patients. Compared to studies using the same measure of SLS, this dissatisfaction prevalence is much higher than that of Chinese female nurses (14.5%),²¹ married women of childbearing age (10%),³⁵ and civil servants (5.8%).³⁶ These direct comparisons on the prevalence of sexual dissatisfaction between our study and previous studies might be problematic due to heterogeneity in samples. Nevertheless, the finding, nearly one-third methadone-maintained patients were dissatisfied about their sexual life, suggests that low SLS is very common in Chinese MMT patients.

In the clinical management of opioid dependence, both methadone and buprenorphine are recommended for opioid maintenance therapy. Because methadone is more effective in maintaining heroin-dependent individuals in treatment than buprenorphine, methadone is more commonly used for maintenance treatment.³⁷ However, there is evidence that, compared to buprenorphine maintenance treatment, MMT is associated with higher likelihood of sexual side effects.³⁸ Sexual dysfunction in methadone-maintained patients can be directly induced by methadone.³⁹ Evidence shows that testosterone plays an important role in maintaining sexual desire in both men and women.⁴⁰ Pharmacological research has found that opioid medications such as heroin and methadone exert an inhibitory effect on hypothalamic–pituitary–gonadal (HPG) axis, lowering the secretion of gonadotropin-releasing hormone (GnRH).⁴¹ The decreased GnRH further leads to a reduction in the production of gonadotropins luteotropic hormone (LH) and follicle-stimulating hormone (FSH) via decreasing pituitary gonadotropin secretion. As a result, there is not enough LH and FSH to stimulate production in the testes and ovaries of gonadal hormones (testosterone, estrogens, and progesterone). The drop in testosterone resulted from the suppression of the HPG axis finally causes sexual dysfunction.⁴² This potential biological explanation is also supported by our study, because, as shown in Table 1, the significant association between a high dose of methadone and sexual life dissatisfaction was kept in the final multiple regression

Table 1 Multiple ordinary logistic regression on the association of pain with sexual life dissatisfaction, controlling for the possible confounding effects of sociodemographic, psychological, and clinical variables

Characteristics		n	Coefficient	Standard error	Wald χ^2	P-value	OR (95% CI)
Clinically significant pain	No	217	1				
	Yes	260	0.637	0.250	6.472	0.011	1.89 (1.16, 3.09)
Gender	Male	333	1				
	Female	144	-0.678	0.280	5.871	0.015	0.51 (0.29, 0.88)
Age (years) ^a	≤39	258	1				
	>39	219	0.903	0.268	11.338	0.001	2.47 (1.46, 4.17)
Education years ^a	<9	111	1				
	≥9	366	-0.963	0.281	11.743	0.001	0.38 (0.22, 0.66)
Marital status	Married	258	1				
	Unmarried ^b	219	0.28	0.256	1.199	0.273	1.32 (0.80, 2.18)
Employment	Yes	234	1				
	No	243	1.301	0.250	27.098	<0.001	3.67 (2.25, 6.00)
Route of past heroin administration	Smoking	75	1				
	Injecting	402	0.697	0.362	3.712	0.054	1.71 (0.85, 3.42)
Duration of heroin use (years) ^a	≤10	279	1				
	>10	198	0.213	0.253	0.706	0.401	1.24 (0.75, 2.03)
Duration of MMT (months) ^a	≤24	240	1				
	>24	237	-0.159	0.249	0.408	0.523	0.85 (0.52, 1.39)
Methadone dose (md/d) ^a	≤70	258	1				
	>70	219	0.546	0.251	4.723	0.031	1.72 (1.05, 2.82)
Depressive symptoms	No	273	1				
	Yes	204	1.071	0.245	19.135	<0.001	2.92 (1.81, 4.71)

Notes: ^aContinuous variables were dichotomized at the median value. ^b"Unmarried" included never-married, separated, cohabitating, divorced, and widowed.

Abbreviation: MMT, methadone maintenance treatment.

model. In addition, other factors such as poor socioeconomic status (ie, unemployment) and depression (Table 1), interacting with methadone treatment, make methadone-maintained patients at a higher risk for sexual dysfunction.

Previous studies have reported the lower frequency of sexual intercourses in pain patients than healthy controls.^{43,44} In our study, pain may interfere with patients' sexuality because of the pain itself (ie, dyspareunia), or other factors related to pain. There is evidence that pain has negative effects on patients' relationship with their partners – both mentally and physically.^{45,46} Chronic pain may change the way one sees himself or herself. As self-esteem decreases and mood becomes depressed, sexual desire and feelings of desirability also decrease. Sometimes painful chronic conditions, such as hepatitis C, can lead to endocrine deficiency, and, in turn, causes sexual dysfunction.⁴⁷

This study has several limitations. First, this is a cross-sectional study; hence, the significant association between pain and sexual life dissatisfaction we found is not, strictly speaking, causal relationship. Whether or not pain causes reduction in SLS, or sexual dissatisfaction results in pain, need to be examined by prospective longitudinal studies. Second, some other factors associated with SLS such as

characteristics of pain (ie, duration and location), body mass index, anxiety, physical conditions, relationship with partners, type of sex partners (ie, regular vs irregular), and number of sex partners were not measured and controlled in our adjustment analysis, so it is uncertain whether or not these factors would influence the association between pain and sexual life dissatisfaction in MMT patients.

Conclusion

In summary, the present study demonstrated a high prevalence of sexual life dissatisfaction in Chinese methadone-maintained patients, and the poor SLS is independently associated with pain. Findings from the current study suggest that the sexual dysfunction of MMT patients deserves special attention from specialists of addiction treatment settings. Appropriate pain management may help improve SLS of Chinese patients receiving MMT.

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Author contributions

HJL and BLZ were responsible for the design of the study and interpretation of data, HJL, YMX, and BLZ for the manuscript draft and statistical analysis, and BLZ and JHZ for the critical revision of the manuscript. All authors reviewed the data and analysis, revised the manuscript, had full access to all of the data in the study, take responsibility for the integrity of the data and the accuracy of the data analysis, and had authority over approval of final manuscript version and the decision to submit for publication.

Disclosure

The authors report no conflicts of interest in this work.

References

- Mariénfeld C, Liu P, Wang X, Schottenfeld R, Zhou W, Chawarski MC. Evaluation of an implementation of methadone maintenance treatment in China. *Drug Alcohol Depend.* 2015;157:60–67.
- Zhang L, Chow EP, Zhuang X, et al. Methadone maintenance treatment participant retention and behavioural effectiveness in China: a systematic review and meta-analysis. *PLoS One.* 2013;8(7):e68906.
- Wu F, Peng CY, Jiang H, et al. Methadone maintenance treatment in China: perceived challenges from the perspectives of service providers and patients. *J Public Health.* 2013;35(2):206–212.
- Yee A, Danaee M, Loh HS, Sulaiman AH, Ng CG. Sexual dysfunction in heroin dependents: a comparison between methadone and buprenorphine maintenance treatment. *PLoS One.* 2016;11(1):e0147852.
- Xia L, Zhang QS, Cx L, Ma J, Cai CL, Deng XL. Effects of methadone maintenance treatment on function of hypothalamic pituitary gonadal axis in male heroin addicts. *Chin J Drug Depend.* 2015;24(1):23–26.
- Gerra G, Manfredini M, Somaini L, Maremmanni I, Leonardi C, Donnini C. Sexual dysfunction in men receiving methadone maintenance treatment: clinical history and psychobiological correlates. *Eur Addict Res.* 2016;22(3):163–175.
- Kheradmand A, Amini Ranjbar Z, Zeynali Z, Sabahy AR, Nakhaee N. Sleep quality and sexual function in patients under methadone maintenance treatment. *Int J High Risk Behav Addict.* 2015;4(4):e23550.
- Zhang Y, Wang P, Ma Z, Xu Z, Li Y, Zi M. Sexual function of 612 male addicts treated by methadone. *Zhong Nan Da Xue Xue Bao Yi Xue Ban.* 2011;36(8):739–743.
- Xia Y, Zhang D, Li X, et al. Sexual dysfunction during methadone maintenance treatment and its influence on patient's life and treatment: a qualitative study in South China. *Psychol Health Med.* 2013;18(3):321–329.
- Zhang M, Zhang H, Shi CX, et al. Sexual dysfunction improved in heroin-dependent men after methadone maintenance treatment in Tianjin, China. *PLoS One.* 2014;9(2):e88289.
- Zhu JH, Zhong BL, Lj X, Chen RY. Sex life satisfaction and its associated factors among heroin-dependent male patients receiving methadone maintenance treatment. *Chin J Andrology.* 2015;29(12):37–41.
- Shan JM, Chen GD, Kong YB, et al. Sexual satisfaction and its related factors among heroin-dependent women receiving methadone maintenance treatment. *Chin J Behav Med & Brain Sci.* 2015;24(7):625–628.
- Nordmann S, Vilotitch A, Lions C, et al; ANRS Methaville Study Group. Pain in methadone patients: time to address undertreatment and suicide risk (ANRS-Methaville trial). *PLoS One.* 2017;12(5):e0176288.
- Liu Y, Zhong BL, Zhu JH. Pain and its association with quality of life in heroin-dependent patients receiving methadone maintenance treatment. *Chin J Pain Med.* 2017;23(1):44–48.
- Wang J, Zhong BL, Zhu JH. Relationship between pain and sleep in heroin-dependent patients receiving methadone maintenance treatment. *Chin J Drug Depend.* 2016;25(6):513–516.
- Gorczyca R, Filip R, Walczak E. Psychological aspects of pain. *Ann Agric Environ Med.* 2013;20(S1):23–27.
- Dunn KE, Brooner RK, Clark MR. Severity and interference of chronic pain in methadone-maintained outpatients. *Pain Med.* 2014;15(9):1540–1548.
- Li HJ, Kang DY. Prevalence of sexual dysfunction in men with chronic prostatitis/chronic pelvic pain syndrome: a meta-analysis. *World J Urol.* 2016;34(7):1009–1017.
- Nikoobakht M, Fraidouni N, Yaghoobidoust M, Burri A, Pakpour AH. Sexual function and associated factors in Iranian patients with chronic low back pain. *Spinal Cord.* 2014;52(4):307–312.
- Ajo R, Segura A, Inda MM, et al. Opioids increase sexual dysfunction in patients with non-cancer pain. *J Sex Med.* 2016;13(9):1377–1386.
- Ji F, Jiang D, Lin X, et al. Sexual life satisfaction and its associated socio-demographic and workplace factors among Chinese female nurses of tertiary general hospitals. *Oncotarget.* 2017;8(33):54472–54477.
- Brody S. The relative health benefits of different sexual activities. *J Sex Med.* 2010;7(4 Pt 1):1336–1361.
- Zhong BL, HJ L, Zhu JH, Chen HH. Depression, anxiety and insomnia among methadone maintenance treatment outpatients: detection rates, comorbidity and correlates. *Chin J Drug Depend.* 2010;19(5):371–375.
- Xu YM, Zhong BL, Chen WC, Zhu JH, Lu J. Suicidal ideation among Chinese methadone-maintained patients: prevalence and correlates. *Oncotarget.* 2017;8(49):86181–86187.
- Yang YJ, Xu YM, Chen WC, Zhu JH, Lu J, Zhong BL. Prevalence of pain and its socio-demographic and clinical correlates among heroin-dependent patients receiving methadone maintenance treatment. *Sci Rep.* 2017;7(1):8840.
- Zhong BL, Xu YM, Zhu JH, Liu XJ. Non-suicidal self-injury in Chinese heroin-dependent patients receiving methadone maintenance treatment: Prevalence and associated factors. *Drug Alcohol Depend.* 2018;189(8):161–165.
- Wang XD, Wang XL, Ma H. Rating scales for mental health. *Chin Ment Health J.* 1999;13(Suppl):122–124.
- Heinemann LA, Potthoff P, Heinemann K, Pauls A, Ahlers CJ, Saad F. Scale for quality of sexual function (QSF) as an outcome measure for both genders? *J Sex Med.* 2005;2(1):82–95.
- Zhang HS, Xu YM, Zhu JH, Zhong BL. Poor sleep quality is significantly associated with low sexual satisfaction in Chinese methadone-maintained patients. *Medicine.* 2017;96(39):e8214.
- Zhong BL, Li SH, Lv SY, et al. Suicidal ideation among Chinese cancer inpatients of general hospitals: prevalence and correlates. *Oncotarget.* 2017;8(15):25141–25150.
- Li CR, Zhang W, Fan BF. A comparison between numeric rating scale (NRS) and verbal rating scale (VRS) in elderly patients with chronic pain. *Chin J Pain Med.* 2016;22(9):683–686.
- Ferreira-Valente MA, Pais-Ribeiro JL, Jensen MP. Validity of four pain intensity rating scales. *Pain.* 2011;152(10):2399–2404.
- Jakubczyk A, Ilgen MA, Kopera M, et al. Reductions in physical pain predict lower risk of relapse following alcohol treatment. *Drug Alcohol Depend.* 2016;158:167–171.
- Ilgen MA, Trafton JA, Humphreys K. Response to methadone maintenance treatment of opiate dependent patients with and without significant pain. *Drug Alcohol Depend.* 2006;82(3):187–193.
- Liu Y, Chang Y. Quality of sexual life and related factors for Chinese married women of childbearing age. *Chin J Fam Planning.* 2002;10(2):98–101.
- Qiu H, Liang R, Liu W. Correlation between sexual life quality and happiness index of civil servants in Guangzhou. *Chin J Human Sex.* 2012;21(3):46–49.
- Whelan PJ, Remski K. Buprenorphine vs methadone treatment: a review of evidence in both developed and developing worlds. *J Neurosci Rural Pract.* 2012;3(1):45–50.
- Bliesener N, Albrecht S, Schwager A, Weckbecker K, Lichtermann D, Klingmüller D. Plasma testosterone and sexual function in men receiving buprenorphine maintenance for opioid dependence. *J Clin Endocrinol Metab.* 2005;90(1):203–206.

39. Brown RT, Zueldorff M. Opioid substitution with methadone and buprenorphine: sexual dysfunction as a side effect of therapy. *Heroin Addict Relat Clin Probl.* 2007;9(1):35–44.
40. Kingsberg S. Testosterone treatment for hypoactive sexual desire disorder in postmenopausal women. *J Sex Med.* 2007;4(Suppl 3):227–234.
41. Tenhola H, Sinclair D, Alho H, Lahti T. Effect of opioid antagonists on sex hormone secretion. *J Endocrinol Invest.* 2012;35(2):227–230.
42. Boloña ER, Uruga MV, Haddad RM, et al. Testosterone use in men with sexual dysfunction: a systematic review and meta-analysis of randomized placebo-controlled trials. *Mayo Clin Proc.* 2007;82(1):20–28.
43. Bahouq H, Fadoua A, Hanan R, Ihsane H, Najia HH. Profile of sexuality in Moroccan chronic low back pain patients. *BMC Musculoskelet Disord.* 2013;14:63.
44. Laursen BS, Overvad K, Olesen AS, Delmar C, Arendt-Nielsen L. Ongoing pain, sexual desire, and frequency of sexual intercourse in females with different chronic pain syndromes. *Sex Disabil.* 2006;24(1):27–37.
45. Morgan MA, Small BJ, Donovan KA, Overcash J, Mcmillan S. Cancer patients with pain: the spouse/partner relationship and quality of life. *Cancer Nurs.* 2011;34(1):13–23.
46. Vivekanantham A, Campbell P, Mallen CD, Dunn KM. Impact of pain intensity on relationship quality between couples where one has back pain. *Pain Med.* 2014;15(5):832–841.
47. El-Atrebi KA, El-Atrebi MA, El-Bassyouni HT. Sexual dysfunction in males with hepatitis C virus: relevance to histopathologic changes and peginterferon treatment. *Saudi J Gastroenterol.* 2011;17(6):406–410.

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