Sexual Dysfunction in Women with Lumbosacral Disc Disease

Lumbosakral Disk Hastalığı Olan Kadınlarda Cinsel Fonksiyon Bozukluğu

Halil Ekrem AKKURT,[a]
Halim YILMAZ,[a]
Sema D. YILMAZ,[b]
Banu ORDAHAN,[a]
Zafer ŞEN,[c]
Cemal GÜRBÜZ,[a]
Hamit GÖKSU[a]

Clinics of
[a]Physical Medicine and Rehabiliation,
[c]Orthopedics and Traumatology,
Konya Training and Reseach Hospital,
[b]Department of Midwifery
Selçuk University
Faculty of Health Sciences,
Konya

Geliş Tarihi/*Received:* 15.06.2016
Kabul Tarihi/*Accepted:* 06.03.2017

Yazışma Adresi/*Correspondence:*
Hamit GÖKSU
Konya Training and Reseach Hospital,
Clinic of Physical Medicine and Rehabiliation, Konya,
TURKEY/TÜRKİYE
hamitgoksu@yahoo.com

ABSTRACT Objective: The aim of this study is to investigate the effects of lumbar disc disease (LDD) on sexual functions of women at reproductive period. **Material and Methods:** Forty-three women with LDD at reproductive period and 45 healthy controls at reproductive period were enrolled to the study. Patients and controls were evaluated with the Oswestry Disability Scale (ODS), Beck Depression Inventory (BDI), Visual Analogue Scale (VAS) and Female Sexual Function Inventory (FSFI). **Results:** Both groups had similar traits in terms of age, body mass index, duration of marriage, number of weekly intercourse before LDD, number of living children, monthly income level and family structure. The total FSFI score, the priority of sexual life score, number of weekly sexual intercourses were found to be lower than control group. Negative correlation was found between total FSFI score and BDI, ODS and VAS scores. **Conclusion:** In women with LDD, sexual function is negatively influenced and seems to be associated with increased disease activity, pain and accompanying depression level.

Key Words: Lumbosacral disc disease; sexual dysfunction; women

ÖZET Amaç: Bu çalışmanın amacı lomber disk hastalığının reprodüktif dönemdeki kadınlarda cinsel fonksiyon üzerine etkilerini araştırmaktır. **Gereç ve Yöntemler:** Lomber disk hastalığı olan reprodüktif dönemde 43 bayan hasta ve yine reprodüktif dönemde 45 sağlıklı kontrol çalışmaya dâhil edildi. Hastalar ve kontrol grubu ağrı, depresyon ve cinsel fonksiyonlar açısından Oswestry Disabilite Ölçeği (ODÖ), Beck Depresyon Ölçeği (BDÖ), Vizüel Analog Skala (VAS) ve Kadın Cinsel İşlev Ölçeği (KCİÖ) ile değerlendirildi. **Bulgular:** Her iki grup yaş, vücut kitle indeksi, evlilik süresi, lomber disk hastalığından önceki dönemdeki haftalık cinsel ilişki sayısı, yaşayan çocuk sayısı, aylık gelir düzeyi ve aile yapısı gibi özellikler açısından benzerdi. Toplam KCİÖ skoru, cinsel yaşam önem skoru ve haftalık cinsel ilişki sayısı kontrol grubunda hasta gruba göre düşük bulundu. Toplam KCİÖ skoru ile BDÖ, ODÖ ve VAS skorları arasında negatif ilişki bulundu. **Sonuç:** Lomber disk hastalığı olan bayan hastalarda cinsel fonksiyon negatif olarak etkilenmektedir ve bu etkilenim artmış hastalık aktivitesi, ağrı ve eşlik eden depresyon düzeyiyle ilişkilidir.

Anahtar Kelimeler: Lumbosakral diskopati; cinsel disfonksiyon; kadın

J PMR Sci 2017;20(1):24-30

Lumbosacral disc disease (LDD) is a common disorder in the society that may result in social and economic losses and may severely impact the quality of life of the individuals. LDD is among the most well-known causes of low back pain.

According to the definitions available in the most reliable classifications of World Health Organization (WHO) and American Psychiatric Association, sexual dysfunction implies sexual response cycle dysfunction in sexual

desire, arousal and resolution, and orgasm during sexual intercourse in such a way that the individual is deprived of a desired sexual intercourse.[1] Its prevalence has been reported as high as 30-76% in population based screenings and researches conducted in gynecology clinics.[2-4] While diseases and disabilities negatively impact sexual function in women, sexual dysfunction decreases the quality of life and may affect marital relationships. A number of studies have been conducted on sexual function in people with medical conditions including chronic pain, diabetes, heart diseases, rheumatic diseases, muscle diseases and hip prosthesis.[5-8] Although it is also expected that lumbar disc disease may impact sexual activity in women, interestingly, there is limited data on sexual functions in patients with LDD in the medical literature. This study aimed to investigate the impact of LDD on the female sexuality.

MATERIAL AND METHODS

44 sexually active female patients in reproductive period who were diagnosed with protruding disc herniation based on the physical examination and previous magnetic resonance imaging (MRI) findings and who had been suffered from low back pain for at least 6 months were included in the study group and 45 healthy women in reproductive period who have no low back pain and don't met the exclusion criteria were included in the control group. Institutional ethics committee approval was obtained for the conduct of the study. Patients who accepted to participate in the study were informed about the study and a signed consent form was obtained from each patient and each woman in control group.

Exclusion criteria included history of a chronic disease, previous hysterectomy or vaginal surgery, history of the use of antidepressant, anxiolytic or anticonvulsant medications, a history of a major psychiatric disorder, a history of inflammatory diseases such as ankylosing spondylitis and rheumatoid arthritis, urinary and fecal incontinence, limited range of motion in the hand, knee or hip joints, chronic alcohol abuse, oral or vaginal estrogen therapy, loss of motor strength due to a disc herniation or any other neurological disease and the cauda equina syndrome.

The questionnaire was administered to each patient in a room where they were alone with a female physician and so a suitable atmosphere was achieved for the patients to fill in the questionnaire. Patients were assured of the confidentiality of their information. Only the questions that were not understood by the patient were explained without making routing.

Medical history of each participant was obtained and they underwent a detailed physical examination. Sociodemographic characteristics of all participants (date of birth, marital status, residence, employment status, family structure and income status and Body Mass Index *(*BMI)) were recorded.

Sexual function of the participants was assessed by the Female Sexual Function Index (FSFI), a 0 to 10 Visual Analogue Scale (VAS) was used to assess the degree of importance of sexuality, disability in patients with LDD was measured by the Oswestry Disability Inventory (ODI) and the level of pain was measured by VAS.

FSFI; is a brief, 19-item, self-report, multi-dimensional questionnaire that was developed for the specific purpose of assessing essential domains of sexual function in women, including sexual desire, sexual arousal, lubrication, orgasm, satisfaction and pain during intercourse. In addition to a total score, 6 sub-domains of sexual function are also scored (sexual desire, sexual arousal, lubrication, orgasm, satisfaction and pain during intercourse.[9]

ODI; is constituted of 10 items including pain intensity, personal care, lifting, walking, sitting, standing, social life, sleeping, travelling and the severity of pain. Each item is scored on a 0 to 5 scale. Higher total scores indicate higher disability. The maximum score is 50 points, a score range from 31 to 50 indicates severe disability while scores range from 11 to 30 indicate a moderate disability and scores range from 1 to 10 indicate a mild disability. The total score may be converted into percentage to calculate the percentage of the disability of the patients.[10] In literature, ODI is the most commonly used functional status questionnaire with established reliability and validity.[11]

BDI; is a reliable and valid tool to evaluate symptoms of depression in a society. BDI is a 21-item inventory including items about pessimism, sense of failure, dissatisfaction, a sense of guilt, restlessness, fatigue, decreased appetite, indecisiveness, sleep disorders and social withdrawal. A BDI score of 17 or higher represents risk of depression.[12]

STATISTICAL ANALYSIS

SPSS 21.0 package software was used for statistical analysis. The Student's t test was used to compare parametric data and the chi-square test was used to compare non-parametric data. The Spearman's correlation analysis was used to analyze the correlations between FSFI scores and VAS, BDI, ODI scores, age, BMI and duration of complaints. The Mann-Whitney U test was used to analyze non-normally distributed data. The data were summarized as the mean ± standard deviation. A p value less than 0.05 was considered as statistically significant. Correlation coefficient values between 0 and 0.25 indicated no correlation, values between 0.25-0.50 indicated a weak to moderate correlation, 0.50-0.75 indicated a strong correlation and values between 0.75-1.00 indicated a very strong correlation.

RESULTS

All of the participants were married. The patient group and control group were similar in age, BMI, duration of marriage, number of children, employment status, monthly income, family structure and educational status (p>0.05) (Table 1).

The mean VAS-pain score of the female patients with lumbar disc disease (LDD) was 7.25±2.35, while the mean Oswestry score was 54.95±15.68, and the mean duration of low back pain was 26.54±37.30 months.

The total FSFI score and all FSFI subdomain scores (desire, arousal, lubrication, orgasm, satisfaction and pain)the importance of sexuality score, number of weekly sexual intercourses were found to be lower than those of the control group, while the mean BDI score was higher (p<0.001) (Table 2).

TABLE 1: Characteristics of the patients with LDD and controls.

	Patients (n=44)	Controls (n=45)	P
Age (year)	34.04±6.07	34.44±8.77	0.794
BMI (kg/m²)	27.44±4.82	27.15±6.29	0.796
Duration of marriage (year)	13.46± 9.08	12.66±8.84	0.572
Parity	2.51± 1.31	2.16±1.26	0.165
Monthly income (Dollar)	758.41±502.18	658.76±250.69	0.167
Employment Status			**P**
Employed	3 (6.8%)	6 (13.3%)	0.242
Unemployed	41 (93.2%)	39 (86.6%)	
Family structure			
Nuclear family	36 (81.8%)	33(73.3%)	0.362
Large family	8(18.2%)	12 (26.6%)	
Education			
Illiterate	3(6.8%)	3(6.6%)	0.463
Primary School (8 years)	32 (72.7%)	34(75.5%)	
High School (11 years)	7 (15.9%)	5(11.1%)	
College (≥ 12 years)	2 (4.5%)	3(6.6%)	

BMI: Body Mass Index.

While the mean number of weekly sexual intercourses before the disease was 2.27±0.65 in the LDD group, the mean number of weekly sexual intercourses was 2.48±0.70 in the control group. The mean number of weekly sexual intercourse of the patients before the disease and the mean number of weekly sexual intercourses of the controls were similar (p>0.05) while the difference between the control group and LDD group was significant after the disease (p<0.05). The mean number of weekly sexual intercourse of the patients before the disease was significantly higher than the number after the disease (1.88±0.65) (p<0.05).

A BDI score of ≥17 indicated a high risk of depression and 41% of the patients were found to have high depression risk. The comparisons between these patients and the patients with BDI scores <17 revealed that patients who have high BDI scores had lower FSFI total scores and FSFI's desire and satisfaction subdomains scores and higher the VAS and ODI scores were in comparison to the non-depressed patients (p<0.05) (Table 3).

Based on the presence of radicular pain, the patients were divided into the radiculopathy positive and radiculopathy negative groups. Radicu-

TABLE 2: Intergroup comparisons of the FSFI scores.

Patients	With LDD	Control	P
Number of subjects	44	45	
FSFI			
Total	18.67± 7.74	30.29±4.70	<0.001
Desire	2.82± 0.99	4.50±0.95	<0.001
Orgasm	3.06±1.63	5.07±1.08	<0.001
Arousal	2.70±1.46	4.79±0.84	<0.001
Lubrication	3.30±1.77	5.31±1.05	<0.001
Satisfaction	3.64±1.33	5.20±1.06	<0.001
Pain	3.13±1.76	5.38±1.01	<0.001
BDI score	16.56±11.81	8.01±5.22	<0.001
Sexuality- importance score	5.79±2.43	7.97±1.95	<0.001
Mean number of weekly sexual intercourses	1.88±0.65	2.48±0.70	<0.001
Mean number of weekly sexual intercourses before the disease	2.27±0.65	2.48±0.70	> 0.05

BDI: Beck Depression Inventory; FSFI: Female Sexual Function Index.

lopathy was present in 75% of the patients. The comparisons between the radiculopathy positive and radiculopathy negative group revealed lower FSFI total and subdomain scores (desire, arousal, lubrication, orgasm, satisfaction and pain) and higher VAS, ODI and BDI scores in the radiculopathy positive group ($p<0.05$) (Table 4).

A negative correlation was found between the total FSFI score and BDI, Oswestry and VAS scores (r:-0.344, p: 0.022; r:-0.304, p: 0.045; r:-0.412, p:0.00, respectively). No correlation was found between the total FSFI score and the age, BMI, income level, duration of marriage, duration of complaints low back pain, number of living children (r:-0.275, p:0.071; r:0.096, p:0.534; r:0.120, p:0.436; r:-0.265, p:0.082; r:0.132, p:0.393,r:-0.161, p:0.302, respectively).

TABLE 3: Comparisons between patients with and without depression in FSFI scores.

	BDI score ≥17	BDI score <17	P
N	18(%41)	26(%59)	
FSFI			
Total	15.72 ± 7,13	23.46 ± 5.18	0.034
Desire	2.40 ± 1.10	3.11 ± 0.79	0.017
Orgasm	32.57 ± 1.58	3.40 ± 1.60	0.101
Arousal	2.28 ± 1.27	3.00 ± 1.53	0.111
Lubrication	2.86 ±1.81	3.60 ± 1.72	0.181
Satisfaction	2.86 ± 1.10	4.18 ± 1.21	0.001
Pain	2.73 ± 1.76	3.41 ± 1.74	0.212
VAS	8.22 ± 1.46	6.28 ± 2.58	0.006
ODI score	66.11 ± 13.69	47.23 ± 12.00	0.000

VAS: Visual Analogue Scale; FSFI: Female Sexual Function Index; ODI: Oswestry Disability Index; BDI: Beck Depression Inventory

DISCUSSION

In this study, the mean scores of FSFI and all subdomains of FSFI (desire, arousal, lubrication, orgasm, satisfaction and pain), sexuality-importance score and the mean weekly sexual intercourse numbers were found lower in women with LDD in comparison to the control group. These data indicate a negative impact of LDD on the sexual functions scores of the patients. Based on our data it can be interpreted that sexual dysfunction in patients with LDD is related with pain, depression, LDD-related disability and LDD-related radiculopathy.

When lumbosacral diseases are considered as a whole, there is no consensus on the ratio of sexual dysfunction caused by these diseases.[13] Although LDD and sexual dysfunction concurrently occur, sexual function is barely questioned during the processes of diagnosis, treatment and follow up of LDD.[14,15]

Low back pain is one of the most common types of pain, particularly in developed and devel-

TABLE 4: The comparisons between groups with and without radiculopathy in FSFI scores.

	Group with radiculopathy	Group without radiculopathy	P
N	33(%75)	11(%25)	
FSFI			
Total	16.56±7.48	25.00±4.46	0.001
Desire	2.54±0.88	3.65±0.82	0.001
Orgasm	2.66±1.64	4.25±0.86	0.004
Arousal	2.33±1.45	3.81±0.77	0.003
Lubrication	2.87±1.77	4.58±1.03	0.004
Satisfaction	3.33±1.27	4.58±1.04	0.006
Pain	2.81±1.80	4.10±1.25	0.033
VAS	7.95±1.66	4.45±2.29	0.006
ODI score	58.42±13.99	44.54±16.49	0.009
BDI score	18.96±11.93	9.36±8.24	0.018

BDI: Beck Depression Inventory; FSFI: Female Sexual Function Index; ODI: Oswestry Disability Index; BDI: Beck Depression Inventory.

oping countries and leads to physical, psychological and economical losses.[16] Frequent complications of the disc disease include neurological impairments, severe pain and limitations of physical activity, which may often lead to a lower quality of life or may result in apathy or depression. All these factors may influence not only social life of the individual, but also their sex life and their relationships with their partner.[14]

In our study the level of LDD-related disability was determined by the ODI. A correlation was found between the sexual function and the level of the disability determined by the ODI. This finding indicates that increased level of LDD-related disability may result in sexual dysfunction, independently from other parameters. In line with reports on the improvements in sexual functions following surgical treatment of lumbar disc disease, sexual problems may be alleviated by the improvement in disability following the treatment of LDD.[15,17]

LDD-related chronic pain makes it difficult to perform daily living activities for patients and has a negative impact on the quality of life.[14] Pain associated with chronic diseases may decrease sexual desire, sexual satisfaction, the number and duration of sexual intercourses. A previous study reported the negative impact of another chronic disease-rheumatoid arthritis on sexual functions.[18] In line with the medical literature, we found that the level of pain measured by VAS correlated with sexual functions assessed by the FSFI, regardless the pain was radicular or localized.[14] The results of this research support the idea that pain relief may lead to an improvement in sexual functions.

Lumbosacral radicular pain refers to a pain radiating into one or more dermatomes, Different rates of radicular pain have been reported in different studies. In a study conducted by Freynhagenet al. in patients with low back pain, the rate of radicular pain radiating from below the knee to the foot was found as 40%, while the radicular pain was present in 75% of the subjects in our study conducted only in female patients with a protruding disc.[19] Radicular symptoms have been found to be associated with a decreased sexual activity. In this case, the decrease in sexual activity may occur as a consequence of either direct or indirect (depression, decreased quality of life, decreased mobility) causes.[20] Hypothetically, a root compression that leads to radicular pain, may lead to damage to the parasympathetic nerve that regulates the release of nitric oxide. This damage has been reported to cause erectile dysfunction in male patients with LDD.[21] Furthermore, improvements in FSFI scores were reported in a female patient with a ruptured disc at L5-S1 who used sildenafil that has effects upon the mechanism of action of the nitric oxide.[22] These results suggest that the same mechanism may exist in females. In line with the medical literature, in our study, a significantly greater effect was ob-

served on the FSFI total and subdomain scores of the patients who presented with radiculopathy in comparison to the patients without radiculopathy. The findings of this study suggest that sexual functioning should be questioned in patients with radiculopathy and should be taken into consideration in the assessment of treatment options for patients with LDD.

The association between the low back pain and psychological disorders has been demonstrated in a number of studies.[1] Psychological disorder may be a pre-existing condition and/or may occur after the beginning of low back pain.[23] A number of studies have demonstrated that psychological disorders have a minor role in the development of acute low back pain, while psychological disorders play a major role in the course of chronic low back pain.[24] Long-standing low back pain may lead to sadness and helplessness in patients by decreasing their quality of life. Furthermore, the prevalence of depression in patients with chronic pain was reported as 30 to 54 % in the medical literature.[25,26] Reports also indicate that depression may be associated with a decreased libido, difficulty in becoming aroused, orgasm disorders and lack of desire.[27,28] In line with these results, the rate of depression was found as 41% in the patients that participated in our study.

In parallel line with the study that reported an association between depression and sexual dysfunction in patients with LDD, the level of dysfunction was higher in women with multiple sclerosis (MS) and a negative correlation was found between the total FSFI score and BDI score.[16] Our results demonstrate that depression is prevalent among the female patients with LDD and negatively impacts sexual functions. Furthermore, the comparison between depressed patients and non-depressed patients indicate that the FSFI total score and the scores obtained from the desire and satisfaction subdomains of FSFI were significantly lower in depressed patients ($p<0.05$). Our results suggest that female patients with LDD should be closely monitored in terms of a possible depression and when diagnosed, the treatment of depression may have positive effects on pain and sexual life of patients.

CONCLUSION

LDD has undesirable effects on sexual functions as well as pain and depression. Especially patients with radiculopathy must be investigated in terms of sexual dysfunction. Treatment of LDD may also improve sexual dysfunction directly or with decreasing pain and depression symptoms.

This study has a couple of limitations. Only female patients who attended a single site were included in this study. More pronounced results require larger, multicenter studies that include both males and females and the spouses of the patients as well. Some of the medications (steroids, amantadine, anticholinergic, antidepressants and proton pump inhibitors) used by the subjects are known to affect sexual functioning. Furthermore, our patients were not precisely stratified on the basis of the medicines they were using.

REFERENCES

1. Ahmadzadeh G, Shahin A. Sexual dysfunctions in the patients hospitalized in psychiatric wards compared to other specialized wards in Isfahan, Iran, in 2012. Adv Biomed Res 2015;4:225.
2. Spector IP, Carey MP. Incidence and prevalence of the sexual dysfunctions: a critical review of the empirical literature. Arc Sex Behav 1990;19(4):389-408.
3. Kohn IJ, Kaplan SA. Female sexual dysfunction: What is known and what remains to be determined. Contemp Urol 1999;9:54-72.
4. Rosen RC, Taylor JF, Leiblum SR, Bachmann GA. Prevalence of sexual dysfunction in women: results of a survey study of 329 women in an outpatient gynecologial clinic. J Sex Marital Ther 1993;19(3):171-88.
5. Spector IP, Leiblum SR, Carey MP, Rosen RC. Diabetes and female sexual function: a critical review. Ann Behav Med 1993;15:257-64.
6. Steinke E, Patterson-Midgley P. Sexual counseling following acute myocardial infarction. Clin Nurs Res 1996;5(4):462-72.
7. Maigne JY, Chatellier G. Assessment of sexual activity in patients with back pain compared with patients with neck pain. Clin Orthop Relat Res 2001;(385):82-7.
8. Laffosse JM, Tricoire JL, Chiron P, Puget J. Sexual function before and after primary total hip arthroplasty. Joint Bone Spine 2008;75(2):189-94.

9. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The Female Sexual Function Index (FSFI): a multidimentional self-report instrument for the assessment of female sexual function. J Sex Marital Ther 2000;26(2):191-208.
10. Durmuş D, Akyol Y, Cengiz K, Terzi T, Cantürk F. Effects of therapeutic ultrasound on pain, disability, walking performance, quality of life, and depression in patients with chronic low back pain: a randomized, placebo controlled trial. Turk J Rheumatol 2010;25(2):82-7.
11. Resnik L, Dobrykowski E. Outcomes measurement for patients with low back pain. Orthop Nurs 2005;24(1):14-24.
12. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. Arch Gen Psychiatry 1961;4:561-71.
13. Kulaksizoglu H, Kaptan H. An unappreciated correlation: surgical treatment of lumbosacral disc disease and erectile dysfunction. J Korean Neurosurg Soc 2010;47(4): 282-6.
14. Dzierżanowski M, Dzierżanowski M, Wrzecion K, Słomko W, Radzimińska A, Kaźmierczak U, et al. Discopathy of the lumbar-sacral segment and its influence on sexual dysfunction. Adv Clin Exp Med 2013;22(1):93-100.
15. Akbaş NB, Dalbayrak S, Külcü DG, Yilmaz M, Yilmaz T, Naderi S. Assessment of sexual dysfunction before and after surgery for lumbar disc herniation. J Neurosurg Spine 2010;13(5):581-6.
16. Bonica-Loeser JD. Low back pain. In: Loeser JD, Bonica JJ, eds. Bonica's Management of Pain. 3rded. Philadelphia: Lippincott Williams & Wilkins; 2001. p.1508-64.
17. Orlin JR, Klevmark B. Successful disc surgery after 17 years of erectile dysfunction caused by a "silent" disc protrusion. Scand J Urol Nephrol 2008;42(1):91-3.
18. Yilmaz H, Polat HA, Yilmaz SD, Erkin G, Kucuksen S, Salli A, et al. Evaluation of sexual dysfunction in women with rheumatoid arthritis: a controlled study. J Sex Med 2012;9(10): 2664-70.
19. Freynhagen R, Baron R, Tölle T, Stemmle et al, Screening of neuropathic pain components in patients with chronic back pain associated with nerve root compression: a prospective observational pilot study (MIPORT), Curr Med Res Opin. 2006 Mar;22(3):529-37.
20. Long DM. Decision making in lumbar disc disease. Clin Neurosurg 1992;39:36-51.
21. Burnett A. Neurophysiology of erectile function and dysfunction. In: Hellstrom WJ, ed. Handbook of Sexual Dysfunction. San Francisco CA: The American Society of Andrology; 1999. p.12-7.
22. Ferrara D, Zaslau S. Success of sildenafil treatment in neurogenic female sexual dysfunction caused by L5-S1 intervertebral disk rupture: a case report. Int J Urol 2007;14(6): 566-7.
23. Bogduk N. Psychology and low back pain. Int J Osteopath Med 2006;9(2):49-53.
24. Truchon M, Fillion L. Biopsychosocial determinants of chronic disability and low-back pain: a review. J Occup Rehabil 2000;10(2): 117-42.
25. Mannion AF, Junge A, Taimela S, Müntener M, Lorenzo K, Dvorak J. Active therapy for chronic low back pain: part 3. Factors influencing self-rated disability and its change following therapy. Spine (Phila Pa 1976) 2001;26(8):920-9.
26. Banks SM, Kerns RD. Explaining high rates of depression in chronic pain: a diathesis-stress framework. Psychol Bull 1996;119(1):95-110.
27. Graziottin A. The biological basis of female sexuality. Int Clin Psychopharmacol 1998;13 Suppl 6:S15-22.
28. Schmidt EZ, Hofmann P, Niederwieser G, Kapfhammer HP, Bonelli RM. Sexuality in multiple sclerosis. J Neural Transm (Vienna) 2005;112(9):1201-11.