



## ORIGINAL ARTICLE

# Factors influencing sexual functions in Turkish female patients with migraine

## *Migrenli Türk kadın hastalarda cinsel işlevleri etkileyen faktörler*

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### Summary

**Objectives:** Recent studies have shown a more frequent occurrence of sexual dysfunction in patients with headache. The aim of this study was to assess the effects of demographic and clinical characteristics and psychiatric symptoms on sexual dysfunction in Turkish female patients with migraine.

**Methods:** In all, 18 sexually active patients with episodic migraine (EM), 12 patients with chronic migraine (CM), and 22 healthy controls of similar age were enrolled in the study. A numeric rating scale was administered to assess pain intensity. The psychiatric symptoms and sexual function of all of the participants were evaluated using the Beck depression and anxiety scales and the Golombok-Rust Inventory of Sexual Satisfaction (GRISS).

**Results:** The mean GRISS subscale scores did not differ significantly between the migraine groups and the control group (all  $p$  values  $<0.05$ ). A positive correlation was found between the duration of headache and GRISS subscales of noncommunication, dissatisfaction, vaginismus, and anorgasmia in EM patients. In addition, there was a negative correlation with the infrequency and avoidance subscales. No correlation was detected between the GRISS subscale scores and the demographic and clinical characteristics of the patients with CM, with the exception of the level of education. Higher pain intensity scores and the presence of anxiety or depression among the EM and CM patients significantly affected all of the subscale scores of the sexual function inventory.

**Conclusion:** Although there was no relationship between migraine chronicity and sexual dysfunction, our data indicated that patient demographic characteristics, greater pain severity, and comorbidities of depression or anxiety were associated with greater sexual dysfunction among patients with EM and CM.

Keywords: Anxiety; depression; female; migraine; sexual function.

### Özet

**Amaç:** Cinsel işlev bozukluğunun kronik ağrılı olgularda sık görülmesi, ağrının cinsel işlevler üzerindeki etkisine dikkat çekmektedir. Bu çalışmada epizodik ve kronik migrenli kadın olgularda baş ağrısının cinsel işlev bozukluklarına etkilerinin araştırılması amaçlanmıştır.

**Gereç ve Yöntem:** Çalışmamıza 18 yaş–50 yaş (ortalama yaş  $32\pm 4.24$  yıl) arasında doğurganlık döneminde 30 epizodik ve kronik migren baş ağrısı olgusu ve 22 sağlıklı kontrol dahil edildi. Olgularda demografik özellikler kaydedilerek, ağrı şiddetini belirlemek için sayısal değerlendirme ölçeği kullanıldı. Beck Depresyon ve Anksiyete Ölçekleri ve Golombok-Rust Cinsel Doyum Ölçeği (GRCDÖ) tüm migren olguları ve kontrol grubunda uygulandı.

**Bulgular:** Migren grupları ve kontrol grubunun GRCDÖ alt ölçek puanları arasında anlamlı fark saptanmadı. Epizodik migren grubunda yaş ve baş ağrısı süresi GRCDÖ alt ölçek puanları arasında pozitif korelasyon; öğrenim durumuyla negatif korelasyon göstermekteydi. Kronik migren grubunda öğrenim durumu ve ağrı şiddeti GRCDÖ alt ölçek puanları arasında negatif korelasyon saptandı. Ağrı şiddetinde artma, anksiyete ve depresyon varlığı, her iki migren grubunda cinsel işlevlerin tüm alt boyutlarını anlamlı olarak etkilemekteydi.

**Sonuç:** Çalışmamızın sonuçlarına göre migren olgularında kronikleşme ile cinsel işlev bozuklukları arasında ilişki saptanmadı ancak depresyon ve anksiyetenin eşlik ettiği kronik ve epizodik migrenli olgular sıklık, doyum, kaçınma, dokunma, vajinismus ve anorgazmi gibi cinsel işlev bozukluklarında sağlıklı bireylere göre anlamlı olarak daha fazla sorun yaşamaktadırlar.

Anahtar sözcükler: Anksiyete; depresyon; kadın; cinsel işlev; migren.

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## Introduction

Sexual dysfunction is defined as a decrease in objective performance due to a negative impact on personal pleasure and/or sexual desire.<sup>[1]</sup> Adverse effects of sexual dysfunction and its negative effects on quality of life have been reported in patients with chronic pain.<sup>[2]</sup> Psychiatric, neurological, vascular diseases, and some drugs can cause sexual dysfunctions.<sup>[3]</sup> Although the prevalence of migraine headache is common among women and the effects of chronic pain on quality of life and psychosocial functioning are well known from menarche to menopause, there are limited number of studies evaluating the sexual function among these patients.<sup>[4]</sup>

Psychiatric comorbid conditions such as depression and anxiety are common in patients with migraine.<sup>[5-7]</sup> Depression and anxiety can also lead to sexual dysfunction.<sup>[8,9]</sup> Evaluation of the effect of comorbid psychiatric conditions on sexual dysfunction in migraine cases may be an important step in the management of migraine type headaches. In addition, in migraine headache cases, there may be sexual dysfunction independently associated with psychiatric problems in parallel with the frequency and severity of pain. Even though there are some studies reporting sexual dysfunction of migraine cases, the effect of chronicity of migraine on sexual functions has not been adequately explored.<sup>[10,11]</sup> The aim of this study was to assess sexual dysfunction in female patients with episodic and chronic migraine and to evaluate the influencing factors on sexual dysfunction.

## Material and Methods

This cross-sectional, clinic-based study was approved by the ethics committee of the participating university and carried out in accordance with the Declaration of Helsinki. Written and verbal informed consents were obtained from the participants. Sexually active episodic (n=12) and chronic (n=18) female migraineurs aged 18–50 years who have been followed in headache outpatient unit were recruited prospectively. The diagnosis of headache was made according to their neurological examination, cranial magnetic resonance imaging (MRI) findings, and all diagnoses were based on The International Classification of Headache Disorders, 2013, ICHD-3 beta version. The control group consisted of 22 age - matched and sexually active healthy female volunteers. Episodic and chronic

migraine patients without prophylactic treatment more than 3 months or medication overuse headache were included in the study. Patients under antipsychotic, antidepressant or other medications that may affect the sexual functions for the last 3 months or patients with a history of comorbid secondary headache and those with a neurological disorder other than headache namely psychiatric disorders, cardiovascular disease, endocrine disorders, urogynecologic diseases, alcohol and substance abuse, pregnant, lactating and postmenopausal cases were excluded.

Headache characteristics (pain frequency, severity, duration) and accompanying symptoms were recorded. Numerical rating scale (NRS, 1 to 10) was used to determine the severity of pain. A 21-item Beck Depression Inventory was used to determine the presence and severity of depression. In addition to emotional symptoms such as despair and guilt, physical symptoms such as fatigue and weight loss are also questioned. The Turkish validity and reliability study of the Beck Depression Inventory was performed by Hisli in 1989 and found it suitable for use in Turkish society.<sup>[12]</sup> Beck Anxiety Inventory was used to determine the presence of anxiety. Beck Anxiety Inventory was developed by Beck et al. (1988) and used to determine the frequency of anxiety symptoms experienced by individuals. Thirteen items assess physiological symptoms, 5 items explain the direction of grip, and 3 items represent both somatic and grip symptoms. The reliability and validity in Turkey (1998) were made by Ulusoy et al.<sup>[13]</sup> Sexual function was assessed by using Golombok-Rust Sexual Satisfaction Scale (GRISS) questionnaire. The GRISS has 28 items and is used for assessing the existence and severity of sexual problems. The validity and reliability of Turkish version of GRISS were conducted by Tuğrul et al.<sup>[14]</sup> Questions are answered on a five-point Likert type scale from 'always', through 'usually', 'sometimes', and 'hardly ever', to 'never'. Re-sponses are summed up to give a total raw score range 28-140, with high scores indicating greater problems. GRISS provides information on the quality of sexual functions of the participant by questioning the frequency of sexual intercourse, peer communication, sexual satisfaction, avoidance, frequency of touch, presence of vaginismus and anorgasmia.

Statistical Package for Social Sciences (SPSS) 23.0 package program was used for statistical evaluation.

**Table 1.** Demographic and clinical characteristics of patient and control groups

	Chronic migraine	Episodic migraine	Control group	p
Number of patients	18	12	22	–
Age	42±7.1	36.3±8.4	36.2±8.9	0.434*
Marital Status	Single: 12			
Married: 6	Single: 8			
Married: 4	Single: 13			
Married: 9	0.551**			
Level of education (n)	Primary: 10			
Secondary/university: 8	Primary: 7			
Secondary/university: 5	Primary: 10			
Secondary/university: 12	0.229**			
Level of income (n)	None:6			
Min.wage or above: 12	None:4			
Min.wage or above: 8	None:7			
Min.wage or above: 15	0.991**			
Duration of headache (year)	7.04±5.29	6.84±3.78	–	0.075***
Mean numeric ratig scale	7.7±2.3	6.8±2.1	–	0.313***

\*: Kruskal Wallis test results; \*\*: Chi-square test results; \*\*\*: Mann Whitney U test results.

**Table 2.** Participants' mean sexual function scores for each GRISS subscale

GRISS subscale	Patients and control groups			Mean rank comparison	
	Chronic migraine	Episodic migraine	Control group	Test score	p
Infrequency	5.11±0.46	3.90±0.59	3.82±3.76	5.44	0.066
Non-communication	4.44±0.58	4.30±0.87	3.32±0.55	2.12	0.347
Dissatisfaction	4.78±0.83	4.50±1.10	3.38±0.78	1.36	0.507
Avoidance	4.33±0.93	2.90±0.72	3.45±0.72	0.93	0.628
Nonsensuality	4.83±0.86	5.40±1.55	3.68±0.78	1.38	0.503
Vaginismus	6.00±0.90	6.40±1.11	4.45±0.78	3.24	0.198
Anorgasmia	6.44±1.14	6.20±1.30	4.91±0.82	1.24	0.539

\*: Kruskal Wallis test results; GRISS: Golombok Rust Inventory of Sexual Satisfaction Scale.

Descriptive statistics were shown as mean±standard deviation for continuous variables. Kruskal-Wallis test was used for comparison of multiple groups. Mann-Whitney U test was used for comparison of two groups. The relationship between the variables was evaluated by Spearman Correlation Analysis. The level of significance was accepted as  $p < 0.05$ .

## Results

Thirty female patients were enrolled, of which 12 were episodic migraine (EM) and 18 had chronic migraine (CM). The mean age of patients was  $32 \pm 4.24$

(range 18 to 50). We compared patients with EM, patients with CM, and 22 age - matched and sexually active healthy controls in terms of age, marital status, level of education, and income. No significant differences among the three groups in terms of those parameters were detected (all  $p$  values  $> 0.05$ ). There was no difference between the mean NRS scores of patients groups and onset of headache ( $p > 0.05$ ). Details of demographic and clinical features of participants were given in Table 1.

The mean Beck Depression Inventory (BDI) scores of the CM patients was  $14.4 \pm 10.5$ ; EM patients' scores

**Table 3.** Correlation analysis of GRISS subscale scores and demographic and clinical characteristics of patient and control groups

Demographic and clinical characteristics	GRISS subscale scores							
	Infrequency	Noncommunication	Dissatisfaction	Avoidance	Nonsensuality	Vajinismus	Anorgasmia	
Age								
Chronic migraine								
rho	0.11	0.12	0.07	0.42	0.03	-0.17	0.14	
p	0.67	0.64	0.77	0.09	0.89	0.49	0.59	
Episodic migraine								
rho	0.77	0.27	0.54	0.29	0.35	0.07	0.05	
p	<b>0.01</b>	0.45	0.11	0.41	0.32	0.84	0.89	
Control								
rho	0.40	0.33	0.45	-0.01	0.33	0.44	0.39	
p	0.06	0.14	<b>0.03</b>	0.95	0.13	<b>0.04</b>	0.08	
Level of education								
Chronic migraine								
rho	-0.55	0.21	-0.52	-0.65	-0.40	-0.57	-0.44	
p	<b>0.02</b>	0.40	<b>0.03</b>	<b>0.00</b>	0.10	<b>0.01</b>	0.07	
Episodic migraine								
rho	-0.83	-0.04	-0.33	-0.68	-0.45	0.01	-0.07	
p	<b>0.00</b>	0.92	0.34	<b>0.03</b>	0.19	0.97	0.84	
Control								
rho	-0.38	-0.35	-0.34	-0.07	-0.44	-0.39	-0.29	
p	0.08	0.11	0.12	0.77	<b>0.04</b>	0.07	0.19	
Marital status								
Chronic migraine								
rho	0.29	-0.28	0.43	0.36	0.18	0.23	0.21	
p	0.24	0.26	0.07	0.14	0.48	0.35	0.40	
Episodic migraine								
rho	0.31	-0.23	0.15	0.31	0.15	-0.19	0.04	
p	0.38	0.52	0.67	0.39	0.67	0.60	0.92	
Control								
rho	-0.07	0.10	0.23	0.44	0.13	0.14	-0.21	
p	0.77	0.65	0.30	<b>0.04</b>	0.56	0.54	0.35	
Level of income								

**Table 3 (cont).** Correlation analysis of GRISS subscale scores and demographic and clinical characteristics of patient and control groups

Demographic and clinical characteristics	GRISS subscale scores						
	Infrequency	Noncommunication	Dissatisfaction	Avoidance	Nonsensuality	Vaginismus	Anorgasmia
Chronic migraine							
rho	-0.37	-0.34	-0.22	-0.20	-0.06	-0.30	-0.05
p	0.13	0.17	0.38	0.42	0.80	0.22	0.85
Episodic migraine							
rho	-0.49	-0.17	-0.11	-0.15	-0.29	-0.17	0.16
p	0.15	0.63	0.76	0.68	0.42	0.64	0.67
Control							
rho	0.03	-0.18	-0.30	-0.46	-0.23	0.08	-0.16
p	0.89	0.43	0.18	<b>0.03</b>	0.31	0.73	0.48
Duration of headache							
Chronic migraine							
rho	-0.29	0.28	-0.24	0.14	0.03	-0.05	0.01
p	0.24	0.26	0.34	0.59	0.90	0.86	0.96
Episodic migraine							
rho	-0.08	0.73	0.65	0.47	0.49	0.71	0.88
p	0.83	<b>0.02</b>	<b>0.04</b>	0.17	0.15	<b>0.02</b>	<b>0.00</b>

\*rho: Spearman's rank correlation coefficient.

were  $11.7 \pm 10.7$ , and  $6.9 \pm 5.7$  in the control group ( $p > 0.05$ ). The mean Beck Anxiety Inventory (BAI) scores of the CM patients was  $19.8 \pm 12.3$ ; EM patients were  $19.9 \pm 14.7$ , and  $8.9 \pm 8.6$  in the control group ( $p > 0.05$ ). The mean anxiety scores of the migraine groups was significantly higher than the control group ( $p = 0.03$ ).

The overall GRISS score and the score for each subscale did not show significant difference in migraine groups and controls ( $p > 0.05$ ). Comparison of scores of sexual dysfunction in studied patients according to GRISS questionnaire were demonstrated in Table 2. The correlation between demographic and clinical data of the participants and the GRISS subscale scores; infrequency, non-communication, dissatisfaction, avoidance, nonsensuality, vaginismus, and anorgasmia were shown in Table 3.

Age had no significant effect on GRISS subgroup scores except infrequency scores of episodic migraines on which getting older had a growing effect ( $p = 0.01$ ;  $r = 0.77$ ). In patients with chronic migraine; education level showed negative correlation with 4 subscale scores, such as infrequency ( $p = 0.02$ ;  $r = -0.55$ ), dissatisfaction ( $p = 0.03$ ;  $r = -0.52$ ), avoidance ( $p = 0.00$ ;  $r = -0.65$ ) and vaginismus ( $p = 0.01$ ;  $r = -0.57$ ); where as in patients with episodic migraine it showed negative correlation with only 2 subscale scores, namely infrequency ( $p = 0.00$ ;  $r = -0.83$ ) and avoidance ( $p = 0.03$ ;  $r = -0.68$ ). Despite having no significant relation with subscale scores of chronic migraine group, onset of headache had positive correlation with 4 out of 6 subscale scores in episodic migraine group, such as non-communication ( $p = 0.02$ ;  $r = 0.73$ ), dissatisfaction ( $p = 0.04$ ;  $r = 0.65$ ), vaginismus ( $p = 0.02$ ;  $r = 0.71$ ) ve anorgasmia ( $p = 0.00$ ;  $r = 0.88$ ). There were no significant relation between subscale scores and level of income.

The correlation between mean GRISS subscale scores and Beck Depression and Anxiety Inventory scores and NRS scores for each groups was demonstrated in Table 4. Depression scores had a positive correlation with infrequency, dissatisfaction, avoidance, non-sensuality and vaginismus ( $p=0.00$ ; between  $r=0.61-0.87$ ) in chronic migraine group, and with dissatisfaction ( $p=0.01$ ;  $r=0.75$ ), avoidance ( $p=0.00$ ;  $r=0.87$ ), nonsensuality ( $p=0.01$ ;  $r=0.78$ ) in episodic migraine group. Anxiety scores also showed positive correlation with subscale scores, such as avoidance ( $p=0.01$ ;  $r=0.61$ ), vaginismus ( $p=0.02$ ;  $r=0.54$ ) and anorgasmia ( $p=0.02$ ;  $r=0.55$ ) in chronic migraine group, and with dissatisfaction ( $p=0.01$ ;  $r=0.75$ ), avoidance ( $p=0.00$ ;  $r=0.87$ ), nonsensuality ( $p=0.01$ ;  $r=0.78$ ) in episodic migraine group. Despite the fact that avoidance ( $p=0.02$ ;  $r=0.55$ ) and anorgasmia ( $p=0.02$ ;  $r=0.53$ ) were affected by NSR scores in chronic migraine group, no significant relation found between NRS scores and all GRISS subscales in episodic migraine group.

## Discussion

This study was conducted to evaluate the existence and types of sexual dysfunctions in women with episodic and chronic migraine, determine the effects of concomitant depression and anxiety on sexual functions and to investigate its association with patients' characteristics. A lower level of education and higher age and duration of headache were the major characteristics of patients that affected all sexual functions. Furthermore, higher pain severity scores were related to higher total GRISS scores. Our findings showed that the chronicity of migraine was not related to sexual dysfunction. However, higher anxiety and depression scores appeared to be associated with decreased sexual functioning in both migraine groups.

In a study by Aksoy et al.,<sup>[3]</sup> in which sexual functions, especially erectile function, were evaluated in male patients with migraine and tension type headache, it was reported that sexual functions were significantly affected in both groups compared to the healthy control group, but they did not find any difference between the headache groups. The authors did not find a relation of sexual dysfunction with Beck depression scores in these primary headache patients. They stated that there should be other heterogeneous factors causing the sexual dysfunctions in patients with primary headaches other than psychiatric

symptoms. Our study, which showed the increase in pain severity affected the sexual functions in both episodic and chronic migraine patient groups, supports the opinion of Aksoy et al.

Bestepe et al.<sup>[10]</sup> compared the features of sexual functions between patients with tension type headaches, migraine and healthy controls and found no statistically significant difference in headache frequency, severity of pain, and duration between patients with migraine and tension type headache. Our research differs from this study in some features. In the current study, the effects of chronicity of migraine on sexual functions were assessed. Unlike their study, demographic and clinical variables such as age, level of education and duration of headache have been shown to have negative impacts on sexual functions in our cases. Similar to our findings, Maizels et al.<sup>[15]</sup> reported that they did not find an association between frequency of headache and sexual dysfunction in migraineurs. Eraslan et al.<sup>[11]</sup> reported that sexual dysfunction was not related to migraine related disability, frequency of headache attacks, pain severity or anxiety. The authors suggested that the most important factor that predicted sexual function was depression. Our findings implicated that depression affected sexual satisfaction, avoidance, frequency of touch in patients with episodic migraine and all sexual functions in patients with chronic migraine. However, anxiety has been found to be related to sexual dysfunction in our patient settings. In this study, comparison of the patients with episodic and chronic migraine may have resulted in different outcomes from their study. According to our results, it can be concluded that comorbid depression and anxiety symptoms may contribute to worsening of sexual functions in patients with episodic and chronic migraine even though underlying pain frequency is different.

In a study conducted by Abdollahi, the prevalence of sexual dysfunction in women with migraine was reported to be significantly more frequent than the general population in Iran.<sup>[16]</sup> Moreover, desire and arousal disorder were found to be the most common types of sexual dysfunction among Iranian migraineurs. However, dissimilar to our data, the researchers found an association between sexual dysfunction and headache frequency. According to

**Table 4.** Correlation analysis of GRISS subscale scores and mean depression, anxiety and Numeric Rating Scale scores of patient and control groups

Demographic and clinical characteristics	GRISS subscale scores							
	Infrequency	Noncommunication	Dissatisfaction	Avoidance	Nonsensuality	Vajinismus	Anorgasmia	
Depression								
Chronic migraine								
rho	0.61	0.20	0.73	0.72	0.73	0.65	0.87	
p	<b>0.01</b>	0.44	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	
Episodic migraine								
rho	0.49	0.41	0.75	0.87	0.78	-0.01	0.53	
p	0.15	0.24	<b>0.01</b>	<b>0.00</b>	<b>0.01</b>	0.97	0.11	
Control								
rho	-0.08	0.10	0.26	0.57	0.51	0.20	-0.06	
p	0.73	0.66	0.24	<b>0.01</b>	<b>0.01</b>	0.36	0.81	
Anxiety								
Chronic migraine								
rho	0.36	-0.15	0.40	0.61	0.26	0.54	0.55	
p	0.14	0.56	0.10	<b>0.01</b>	0.29	<b>0.02</b>	<b>0.02</b>	
Episodic migraine								
rho	0.59	0.54	0.79	0.81	0.78	0.20	0.55	
p	0.07	0.11	<b>0.01</b>	<b>0.00</b>	<b>0.01</b>	0.58	0.10	
Control								
rho	-0.27	-0.26	-0.19	0.33	0.41	0.00	-0.09	
p	0.23	0.24	0.40	0.13	0.06	0.99	0.70	
Numeric rating scale								
Chronic migraine								
rho	0.43	-0.24	0.41	0.55	0.35	0.41	0.53	
p	0.08	0.35	0.09	<b>0.02</b>	0.15	0.09	<b>0.02</b>	
Episodic migraine								
rho	-0.36	0.21	0.02	-0.15	-0.23	0.73	0.40	
p	0.31	0.56	0.95	0.68	0.53	<b>0.02</b>	0.25	

\*rho: Spearman's rank correlation coefficient.

our results, different types of sexual functions got affected among episodic and chronic migraineurs regardless of the chronicity of migraine. This can be explained by the differences in cultural and psychosocial factors of migraine patients.

Sexual dysfunction and related problems may cause psychosocial problems such as low self-esteem, social withdrawal, isolation, divorce, and serious decrease in quality of life for the patient and his/her partner.<sup>[17,18]</sup> Fear of onset of pain during sexual activity may also have a negative effect on sexual functions.<sup>[2]</sup> Bestepe et al. reported a patient with tension type headache during the sexual intercourse.<sup>[10]</sup> Özcan et al.<sup>[19]</sup> presented a case of primary headache associated with sexual activity. Furthermore, it is reported that migraine type headaches might be aggravated by sexual abuse.<sup>[20]</sup> In our series, none of the participants reported headaches related to sexual activity.

We acknowledge some limitations in this study. These include the small sample size and using self report inventories. Nevertheless, the strength of our study includes that we compared our results with healthy subjects. Besides this, we evaluated the psychiatric symptoms and sexual functions using an objective and validated inventory in our study and found a relationship between migraine and depression and anxiety. The fact that we are an Islamic country may have brought differences in the perception of sexuality according to western countries. The GRISS, which we use for evaluating sexual functions, is a highly detailed scale and evaluates many aspects of sexual functions. The scores of the scale were interpreted by experienced psychologists who were blinded to the clinical data. Including chronic migraine patients without migraine prophylactics prevented the heterogeneity caused by the medication known to have an effect on sexual function.

## Conclusion

Conforming to the results of our research, it can be concluded that there is an association between sexual dysfunction, psychiatric comorbidity, and pain severity in patients with episodic and chronic migraine. There are not enough studies evaluating the chronicity of migraine and sexual dysfunction in the current literature. Our study may be improved by assessing the effects of migraine prophylactic treat-

ments and concurrent medication use, and evaluating headache patients with medication overuse in future research.

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## References

1. Srivastava R, Thakar R, Sultan A. Female sexual dysfunction in obstetrics and gynecology. *Obstet Gynecol Surv* 2008;63(8):527–37. [\[CrossRef\]](#)
2. Kwan KS, Roberts LJ, Swalm DM. Sexual dysfunction and chronic pain: the role of psychological variables and impact on quality of life. *Eur J Pain* 2005;9(6):643–52. [\[CrossRef\]](#)
3. Aksoy D, Solmaz V, Cevik B, Gencten Y, Erdemir F, Kurt SG. The evaluation of sexual dysfunction in male patients with migraine and tension type headache. *J Headache Pain* 2013;14(1):46. [\[CrossRef\]](#)
4. Nappi RE, Terreno E, Tassorelli C, Sances G, Allena M, Guaschino E, et al. Sexual function and distress in women treated for primary headaches in a tertiary university center. *J Sex Med* 2012;9(3):761–9. [\[CrossRef\]](#)
5. Buse DC, Silberstein SD, Manack AN, Papapetropoulos S, Lipton RB. Psychiatric comorbidities of episodic and chronic migraine. *J Neurol* 2013;260(8):1960–9. [\[CrossRef\]](#)
6. Sharma K, Remanan R, Singh S. Quality of life and psychiatric co morbidity in Indian migraine patients: a headache clinic sample. *Neurol India* 2013;61(4):355–9. [\[CrossRef\]](#)
7. Doksat MK. The Psychiatric aspects of headache. *Turkiye Klinikleri J Int Med Sci* 2005;1:50–6.
8. Hayes RD, Dennerstein L, Bennett CM, Sidat M, Gurrin LC, Fairley CK. Risk factors for female sexual dysfunction in the general population: exploring factors associated with low sexual function and sexual distress. *J Sex Med* 2008;5(7):1681–93. [\[CrossRef\]](#)
9. Burri A, Spector T, Rahman Q. The etiological relationship between anxiety sensitivity, sexual distress, and female sexual dysfunction is partly genetically moderated. *J Sex Med* 2012;9(7):1887–96. [\[CrossRef\]](#)
10. Bestepe E, Cabalar M, Kucukgoncu S, Calikusu C, Ornek F, Yayla V, et al. Sexual dysfunction in women with migraine versus tension-type headaches: a comparative study. *Int J Impot Res* 2011;23(3):122–7. [\[CrossRef\]](#)
11. Eraslan D, Yalınay Dikmen P, Ilgaz Aydınlar E, Incesu C. The relation of sexual function to migraine-related disability, depression and anxiety in patients with migraine. *J Headache Pain* 2014;15(1):32. [\[CrossRef\]](#)

12. Hisli N. Beck Depresyon Envanterinin Üniversite Öğrencileri için Geçerliliği ve Güvenirligi. *Psikoloji Dergisi* 1989;7:3–13.
13. Ulusoy M. Beck Anksiyete Envanteri: Geçerlik ve güvenilirlik çalışması. Yayınlanmamış Uzmanlık Tezi. İstanbul: Bakırköy Ruh ve Sinir Hastalıkları Hastanesi, 1999.
14. Tuğrul C, Öztan N, Kabakçı E. Golombok Rust Cinsel Doyum Ölçeği'nin Standardizasyon Çalışması. *Türk Psikiyatri Derg* 1993;4(2):83–8.
15. Maizels M, Burchette R. Somatic symptoms in headache patients: the influence of headache diagnosis, frequency, and comorbidity. *Headache* 2004;44(10):983–93. [\[CrossRef\]](#)
16. Abdollahi M, Toghae M, Raisi F, Saffari E. The prevalence of female sexual dysfunction among migraine patients. *Iran J Neurol* 2015;14(1):8–11.
17. Hashizume M, Yamada U, Sato A, Hayashi K, Amano Y, Makino M, et al. Stress and psychological factors before a migraine attack: a time-based analysis. *Biopsychosoc Med* 2008;2:14. [\[CrossRef\]](#)
18. Althof SE. Quality of life erectile dysfunction. *Urology* 2002;59(6):803–10. [\[CrossRef\]](#)
19. Özcan T, Yancar Demir E, İşcanlı MD. Primary headache associated with sexual activity: A case report. *Agri* 2017;29(2):79–81.
20. Kaleağasi H, Ozge A, Toros F, Kar H. Migraine type childhood headache aggravated by sexual abuse: case report. *Agri* 2009;21(2):80–2.