

## Original Article

## Evaluation of the Sexual Function of Female Patients with Hypothyroidism or Hyperthyroidism

**Sevgi Demir, MSc**

Lecturer, Artvin Coruh University, Savsat Vocational School, Artvin, Turkey

**Emine Kiyak, PhD**

Professor, Faculty of Nursing, Ataturk University, Erzurum, Turkey.

**Correspondence:** Sevgi Demir, Lecturer, Artvin Coruh University, Savsat Vocational School, Artvin, Turkey. E-mail: sevgidemir91@hotmail.com

### Abstract

**Background:** Hypothyroidism and hyperthyroidism, are risk factors for sexual dysfunction and may have negative impacts on the sexual health of female patients.

**Aim:** This study aimed to evaluate the sexual function of female patients with hypothyroidism or hyperthyroidism.

**Methodology:** This descriptive study consisted of 166 female hypothyroid and hyperthyroid patients who attended a general surgery clinic of a state hospital. Data were collected using a questionnaire and the Female Sexual Function Index. For data analysis, variance analysis, an independent sample *t*-test, and Pearson's chi-square test were conducted.

**Results:** The average sexual function score of the participants was  $11.48 \pm 9.44$ , and 96.4% of the participants had sexual dysfunction problems. The following factors were associated with significantly low sexual function scores: a low education level, living in a rural area, obesity, and being a nonsmoker. In addition, having an arranged marriage, believing that sex was not important, not receiving sex education, and not working outside the homemaker were associated with significantly low sexual function scores. Sexual function scores were positively associated with age at the time of marriage and negatively associated with waist circumference and the duration of the disorder.

**Conclusion:** Nearly all the participants had sexual dysfunction. A low education level, living in rural areas, being obese, not smoking, believing that sex was not important, not receiving sex education, and having an arranged marriage were associated with sexual dysfunction. Based on the findings, we suggest that nurses should address sexual health issues faced by female patients with hypo- and hyperthyroidism.

**Key words:** Hypothyroidism, hyperthyroidism, sexual function, female

### Introduction

The thyroid hormone plays a crucial role in cell metabolism. Hypothyroidism and hyperthyroidism are common endocrine disorders, with the former due to a deficiency of thyroid hormone and the latter caused by excess production of the hormone (Chaker, Bianco, Jonklaas, & Peeters, 2017). Symptoms of hypothyroidism are fatigue, increased sensitivity to cold, weight gain, constipation, and dry skin (Chaker et al., 2017). Tachycardia, fatigue, tremor, anxiety, sleep disorders, weight loss, temperature intolerance, and increased sweating are symptoms of hyperthyroidism (De Leo, Lee, & Braverman, 2016). Previous research found that

thyroid diseases may pose a risk to the sexual health of females (Krassas, 2000), with hypothyroidism resulting in sexual dysfunction, such as a decrease in sexual desire, if left untreated (Veronelli, 2009). In addition to sexual dysfunction, hyperthyroidism can result in menstruation problems and infertility (Atis et al., 2011; Krassas, 2000).

Sexuality is an important component of a healthy life, life quality, and general well-being (Quinn & Browne, 2009). Sexuality is influenced by psychological, social, economic, political, cultural, ethical, legal, historical, religious, and spiritual factors (Quinn & Browne, 2009). Sexuality influences a person's well-being and

his/her relationship with partners and other people around him/her (Quinn & Browne, 2009). Nurses can play a role in sustaining the sexual health of their patients by providing a space for patients to express their sexual problems (Quinn & Browne, 2009). Previous research reported that patients expected nurses to inform them about the impacts of diseases on their sexual life and potential ways of alleviating these impacts (Bal, 2014). A numbers of studies suggested that from a holistic nursing perspective, nurses should pay special attention to the sexual function and sexual health of patients (Kutmec, 2009).

Nurses can make important contributions to the treatment of patients with hypothyroidism and hyperthyroidism by providing a consultancy service on sexual problems. A review of the literature revealed no studies of the impacts of hypothyroidism and hyperthyroidism on the sexual function of female patients in Turkey.

This study aimed to evaluate the sexual function of female patients with hypothyroidism or hyperthyroidism. The following research questions were addressed:

1. Do Turkish females with hypothyroidism or hyperthyroidism exhibit sexual dysfunction?
2. Do socio-demographic and clinical characteristics of female patients with hypothyroidism or hyperthyroidism influence sexual function?

### Methodology

**Participants:** To evaluate the sexual function of Turkish female patients with hypothyroidism or hyperthyroidism, we conducted a survey of patients diagnosed with hypothyroidism or hyperthyroidism at a general surgery clinic of a state hospital located in the eastern Black Sea region of Turkey between 10 October 2016 and 10 February 2017. The inclusion criteria were aged older than 18 years, willing to participate in the study, having an active sexual life, and ability to communicate.

The study population consisted of 171 female patients. Five of the 171 patients did not agree to participate in this research. Consequently, the final study consisted of 166 patients (hypothyroidism,  $n = 57$ ; hyperthyroidism,  $n = 109$ ).

A power analysis was conducted to determine the sample size. The effect size was 1.038, and the power was 0.99 at the 0.05 significance level and 95% confidence interval ( $n_1: 14, n_2: 55, n_3: 97, Ort$

$\pm SS_1: 23.90 \pm 6.92, Ort \pm SS_2: 17.59 \pm 7.29, Ort \pm SS_3: 6.52 \pm 6.51$ ). The results suggested that the sample size of our study was adequate (Çapık, 2014).

**Ethics Statement:** All the participants were informed about the scope of the research, and their verbal consent was obtained. This study was approved by the ethics committee of Ataturk University Department of Health Sciences (No: 2016.05.10). Written permission was also obtained from Artvin State Hospital.

### Measures

**Questionnaire:** The questionnaire consisted of 18 questions including clinical and demographic characteristics of patients, such as education, age, profession, body-mass index, marital status, medicine usage period of disease, marriage type and age of marriage.

**Female Sexual Function Index:** The Female Sexual Function Index of Rosen et al. was used to evaluate the sexual function of the females (Rosen, 2000). The scale comprises 19 questions, which evaluates sexual function in the previous 4 weeks. The scale includes questions on the domains of desire (1st to 2nd questions), arousal (3rd to 6th questions), lubrication (7th to 10th questions), orgasm (11th to 13th questions), satisfaction (14th question), and pain (17th to 19th questions). The scores for each domain range between 0 and 5, with scores equal to or lower than 3.9 for arousal, 4.4 for pain, and 3.6 for desire, satisfaction, lubrication, and orgasm indicating female sexual dysfunction (Cayan et al., 2004). The total score is obtained by summing the scores from each domain. The total index score ranges from 2 to 36, and 26.55 is the cutoff score for the scale. A total index score lower than or equal to 26.55 indicates a negative change in sexual function (Wiegel, Meston, & Rosen, 2005).

The reliability and validity of the Turkish version of the index was verified by Aygin et al. Cronbach's alpha value in the study of Aygin et al. was 0.98 (Aygin & Aslan, 2005), whereas it was 0.91 in the present study.

**Data Collection:** After each patient had been informed about the scope of the research and had provided verbal consent, the patient was taken to an empty room in the clinic, where they completed the questionnaire and Female Sexual Function Index. The patient's height, length, and waist circumference were measured and recorded. Data on thyroid-stimulating hormone (TSH), free triiodothyronine (FT<sub>3</sub>), and free thyroxine (FT<sub>4</sub>) values of the patients were obtained from the

hospital records, and the last values prior to the study were recorded.

**Statistical Analysis:** The data obtained were analyzed using SPSS 17 statistical software. The Shapiro–Wilk test was conducted to test whether the population was normally distributed. Parametric tests were performed for normally distributed data, whereas nonparametric tests were conducted for data that did not have a normal distribution. Number, percentage, average, and standard deviation values were calculated for descriptive analysis. A variance analysis test and independent sample *t*-test were performed for comparing the sexual function scores of the patients according to their characteristics. Pearson's chi-square test was used to evaluate the relation between sexual function scores and different variables, including the patients' age, duration of marriage, age at the time of marriage, body mass index (BMI), and TSH, FT<sub>3</sub>, and FT<sub>4</sub> values. The Least Significant Difference (LSD) was applied in cases of equal variance, and Dunnett's C test was applied in cases of unequal variance.

## Results

In the study population, 45.8% of the participants had only a primary school education, and 85.5% were homemaker. Among the participants, 75.3% had nuclear families, 53.6% lived in provincial centers, 34.9% were class I obese, 36.1% smoked, and 89.8% reported feeling stressed. Of the 166 participants, 34.3% had hypothyroidism, and 65.7% had hyperthyroidism. In addition, 77.1% used medicine regularly, 56% had an arranged marriage, 58.4% stated that sexuality was not important, and 92.2% had received no sex education (Table 1).

The average age of the patients was 44.20 (SD = 11.95; range = 21–75) years. The average duration of the disorder was 7.89 (SD = 8.39; range = 1–40). The average duration of marriage was 22.92 (SD = 13.13; range = 1–55) years, and the average age at the time of marriage was 20.71 (SD = 4.17; range = 14–44) years. The average BMI was 30.02 (SD = 5.72; range = 17.19–55.20), and the average waist circumference was 111.72 cm (SD = 24.87; range = 52–172). The average TSH value was 3.09 (SD = 7.15; range = 0–55.72) uIU/mL. The average FT<sub>3</sub> value was 3.04 (SD = 0.57; range = 0.94–4.44) pq/mL, and the average FT<sub>4</sub> value was 1.30 (SD = 0.37; range = 0.23–2.97) ng/dL (Table 1).

The average sexual function score was 11.48 (SD

= 9.44; range 2.0–30.8), and 96.4% of the participants had sexual dysfunction. The average scores in the sexual function domains were 2.19 (SD: 1.25; range: 1.20–2.19) for desire, 1.69 (SD = 1.55; range: 0.00–4.80) for arousal, 1.79 (SD = 1.75 range: 0.00–4.80) for lubrication, 1.75 (SD = 1.88; range = 0.00–5.60) for orgasm, 2.13 (SD = 1.62; range = 0.80–6.00) for satisfaction, and 1.94 (SD = 2.15; range = 0.00–6.00) for pain. In the study, 90.4% of participants experienced sexual dysfunction in the domain of desire and arousal, whereas 87.3%, 80.7%, 80.1%, and 85.5% of participants experienced dysfunction in the domains of lubrication, orgasm, satisfaction, and pain, respectively (Table 2).

Patients with lower education levels had significant sexual dysfunction ( $F = 16.109$ ;  $p = .000$ ). Dunnett's C test revealed that illiterate and literate participants had lower sexual function scores than primary school, high school, and university graduates. Regarding professions, being a homemaker was associated with sexual dysfunction ( $t = -2.822$ ;  $p = .005$ ). Living in districts or villages was also associated with sexual dysfunction ( $F = 5.084$ ;  $p = .007$ ). The LSD test confirmed that participants from rural areas, including districts and villages, had lower sexual function scores than those living in provincial centers. Furthermore, obesity was associated with sexual dysfunction ( $F = 5.671$ ;  $p = .000$ ), as shown by Dunnett's C test, which revealed that the average sexual function score of obese participants was lower than that of patients with normal weight. The following factors were also associated with sexual dysfunction: not smoking ( $t = 2.335$ ;  $p = .021$ ), having an arranged marriage ( $t = -7.980$ ;  $p = .000$ ), and believing that sexuality was not important ( $F = 76.893$ ;  $p = .000$ ). The LSD test revealed that the sexual function scores of participants who believed that sexuality was important were significantly higher than those who believed that sexuality was partially important or unimportant. In addition, not receiving sex education was related to sexual dysfunction ( $t = -2.675$ ;  $p = .008$ ). On the other hand, there was no significant difference in sexual function scores according to family type, feelings of stress, and regular use of medicine. Compared with the hypothyroid patients, sexual dysfunction was more prevalent in hyperthyroid patients. However, the difference in sexual dysfunction between these two groups of patients was not statistically significant ( $p > .05$ ) (Table 1).

Regarding the direction and significance of the

relationship between variables, we found a significant positive relationship between age at the time of marriage and sexual function scores ( $r = 0.285$ ;  $p = .000$ ). Sexual function scores showed a significant negative relationship with waist circumference ( $r = -0.245$ ;  $p = .043$ ) and duration

of the disorder ( $r = -0.331$ ;  $p = .005$ ). However, sexual function scores did not show a significant relationship with the participant's age, duration of marriage, BMI, TSH, FT<sub>3</sub>, or FT<sub>4</sub> ( $p > .05$ ) (Table1).

**Table 1. Comparison of the mean scores on the female sexual function index according to the characteristics of the patients (n = 166)**

Characteristics	n	%	Sexual function index score			
			Mean	SD	t	p
<b>Education</b>						
<i>Illiterate</i>	30	(18.1)	3.78	3.78		
<i>Literate</i>	23	(13.9)	6.87	6.83		
<i>Primary school</i>	76	(45.8)	12.55	9.21	F=16.10 9	0.001
<i>High school</i>	25	(15.1)	17.47	9.31		
<i>University</i>	12	(7.1)	20.38	7.51		
<b>Profession</b>						
<i>Homemaker</i>	142	(85.5)	10.65	9.25	t = - 2.822	0.005
<i>Worker/Civil servant</i>	24	(14.5)	16.41	9.20		
<b>Family type</b>						
<i>Nuclear family</i>	125	(75.3)	12.02	9.55	t =1.278	0.203
<i>Extended family</i>	41	(24.7)	9.85	9.00		
<b>Place of residence</b>						
<i>Provincial center</i>	89	(53.6)	13.48	9.55		
<i>District</i>	47	(28.3)	10.05	9.04	F=5.084	0.007
<i>Village</i>	30	(18.1)	7.78	8.42		
<b>BMI</b>						
<i>Normal weight</i>	33	(19.9)	17.60	8.18		
<i>Overweight</i>	48	(28.9)	11.78	10.14		
<i>Class I obesity</i>	58	(34.9)	9.22	8.53	F=5.671	0.001
<i>Class II obesity</i>	20	(12.1)	7.90	8.75		
<i>Class III obesity</i>	7	(4.2)	9.59	7.21		
<b>Smoking</b>						
<i>Yes</i>	60	(36.1)	13.73	9.93	t =2.335	0.021

No	106	(63.9)	10.21	8.95		
<b>Feeling of stress</b>						
Yes	149	(89.8)	11.53	9.38	t=0.203	0.839
No	17	(10.2)	11.04	10.25		
<b>Diagnosis</b>						
Hypothyroid	57	(34.3)	12.29	9.01	t =0.794	0.428
Hyperthyroid	109	(65.7)	11.09	9.67		
<b>Used medicine Regularly</b>						
Yes	128	(77.1)	10.86	9.19	t =-1.556	0.122
No	38	(22.9)	13.57	10.08		
<b>Marriage type</b>						
Arranged marriage	93	(56)	7.07	8.03		
Companionate marriage	73	(44)	17.10	8.04	t =-7.980	0.001
<b>Importance given to sexuality</b>						
Highly important	14	(8.4)	23.90	6.92		
Partly important	55	(33.2)	17.79	7.29	F=76.89	0.001
Unimportant	97	(58.4)	6.12	6.51	3	
<b>Received education on sexuality</b>						
Yes	13	(7.8)	18.08	8.98	t =-	0.008
No	153	(92.2)	10.92	9.29	2.675	
	<b>Min</b>	<b>Max</b>	<b>Mean</b>	<b>SD</b>	<b>r</b>	<b>p</b>
Age (year)	21	75	44.20	11.95	r =-0.188	0.825
Duration of marriage (year)	1	55	22.92	13.13	r=-0.177	0.146
Age of marriage	14	44	20.71	4.17	r=0.285	0.001
BMI (kg/cm <sup>2</sup> )	17.19	55.20	30.02	5.72	r=-0.204	0.092
Waist circumference (cm)	52	172	111.72	24.87	r=-0.245	0.043
Duration of disease (year)	1	40	7.89	8.39	r=-0.331	0.005
TSH (uIU / mL )	0	55.72	3.09	7.15	r=0.012	0.920
FT <sub>3</sub> (pq/ mL )	0.94	4.44	3.04	0.57	r=-0.006	0.943
FT <sub>4</sub> (ng/ dL )	0.23	2.97	1.30	0.37	r=-0.099	0.240

**Table 2. Average scores of the participants obtained from the female sexual function index scale (n=166)**

	n	Min-Max	Mean	SD	Participants with sexual dysfunction	
					n	%
<b>Female Sexual Function Scale Total Score</b>	166	2.00-30.80	11.48	9.44	160	96.4
<b>Female Sexual Function Domains</b>						
<i>Desire</i>	166	1.20-6.00	2.19	1.25	150	90.4
<i>Arousal</i>	166	0.00-4.80	1.69	1.55	150	90.4
<i>Lubrication</i>	166	0.00-4.80	1.79	1.75	145	87.3
<i>Orgasm</i>	166	0.00-5.60	1.75	1.88	134	80.7
<i>Satisfaction</i>	166	0.80-6.00	2.13	1.62	133	80.1
<i>Pain</i>	166	0.00-6.00	1.94	2.15	142	85.5

## Discussion

Previous research demonstrated a significant relationship between thyroid diseases and sexual dysfunction (Atis et al., 2010; Veronelli et al., 2009) and suggested that thyroid diseases posed a serious threat to the sexual health of female patients (Krassas, 2000). The results of the present study of female hypothyroid and hyperthyroid patients in Turkey found that the average sexual function score of the participants was  $11.48 \pm 9.44$  and that 96.4% of the participants had sexual dysfunction. In contrast, in a study of females with thyroid diseases in Italy, the average sexual function score was  $20.1 \pm 7.1$ , and 46.1% of the female participants had sexual dysfunction (Pasquali et al., 2013).

In our study, the hyperthyroid patients had lower sexual function scores as compared with those of the patients with hypothyroidism, although the difference was not statistically significant. Similarly, a study conducted in Italy found that the prevalence of sexual dysfunction was more common in hyperthyroid than hypothyroid patients (Pasquali et al., 2013). Other studies reported that sexual dysfunction was common among both hypothyroid (56%) (Atis et al., 2010)

and hyperthyroid (60%) patients (Atis et al., 2011). In the present study, most of the participants had problems in the domains of desire ( $2.19 \pm 1.25$ ), arousal ( $1.69 \pm 1.55$ ), lubrication ( $1.79 \pm 1.75$ ), orgasm ( $1.75 \pm 1.88$ ), satisfaction ( $2.13 \pm 1.62$ ), and pain ( $1.94 \pm 2.15$ ). Previous research also reported problems related to sexual desire ( $3.1 \pm 1.0$ ), arousal ( $3.4 \pm 2.0$ ), orgasm ( $3.9 \pm 1.6$ ), and pain ( $2.8 \pm 1.1$ ) in female hyperthyroid patients (Pasquali et al., 2013b). Similar to our findings, other studies found that hypothyroid patients suffered from problems related to desire, satisfaction, and pain. Similar to our findings, other studies found that hyperthyroid patients suffered from problems related to orgasm (Oppo, Franceschi, Atzeni, Taberlet, & Mariotti, 2011).

In our study, female patients with hypothyroidism or hyperthyroidism who had lower education levels had lower sexual function scores, on average, than those with higher education levels. This finding was in contrast to the literature, which found that education level was not associated with sexual function in female patients with thyroid disorders in Turkey (Atis et al., 2011). In the present study, problems related to obtaining data from participants with poor educational levels and the absence of a suitable place for data gathering

may have resulted in an increase in the percentage of reported sexual dysfunction. The fact that discussing sexuality is considered taboo in Turkish society may have resulted in the participants refraining from reporting sexual problems.

Previous research on the issue of female sexuality in Turkey suggested that sexuality was related to societal values, mate selection, and marriage preferences (İncedere & Küçük, 2017). Arranged marriages are favored in rural regions in Turkey. In most cases, the father, mother, or members of the extended family decide on the partner that the son of the family will marry. "Arrangers" then visit the house of the potential bride. The arrangers consist of a group made up of the mother of the potential groom, groom's sister, relatives, and neighbors. If the prospective husband does not voice any preference, the arrangers take charge of deciding upon his future wife. However, the male family members make the final decision regarding the selection of a mate in arranged marriages in Turkey (Sezen, 2005). In Turkey, in an arranged marriage, females have no say in the selection of their future partner. According to data obtained by the Turkish Statistical Institute, 59.9% of marriages in 2016 were the result of arranged marriages. In our study, more than half the participants (56%) had an arranged marriage. Participants that had arranged marriages reported sexual dysfunction problems related to sexual desire and arousal (Gölbaşı, Tuğut, Erenel, & Eroğlu, 2014). Previous research reported that sexual dysfunction was more frequent among females who had an arranged marriage than among those who had not (Özerdoğan, Sayiner, Köşgeroğlu, & Ünsal, 2009).

The present study revealed that sexual dysfunction was common among homemaker and female participants from rural areas. In Turkey, such areas are characterized by a low educational status, and sexuality is considered a private issue or taboo. The aforementioned issues may have affected the ability of the Turkish respondents to answer the questions in the questionnaire. Thus, they may continue to suffer from sexual problems.

Obesity is described as an increase in the body fat index, with adverse health consequences (Kose, Canakci, Arabaci, & Saglam, 2012). A previous study suggested that obese individuals suffered from sexual dysfunction and reduced sexual desire and satisfaction (Kolotkin et al., 2008). Research on an obese population reported that obesity

showed a negative relationship with arousal, lubrication, orgasm, and satisfaction (Esposito et al., 2007). Another study found that obesity was an important risk factor for sexual dysfunction and that it had a negative impact on various aspects of sexuality (Kadioglu et al., 2010). Abdominal obesity was reported to lead to sexual dysfunction (Davis et al., 2012). In the present study, sexual dysfunction was more common among obese than nonobese participants, and it was positively correlated with an increased BMI and waist circumference.

Disease can have a marked impact on sexual desire, sexual intercourse, and decisions regarding reproduction (Quinn & Browne, 2009). In the present study, sexual dysfunction increased in parallel with the increase in the duration of the disorders. This finding was in accordance with that of previous research, which reported a rise in sexual dysfunction among multiple sclerosis patients in parallel with the duration of the disease (Zorzon et al., 2001). On the other hand, another study of patients with diabetes detected no relationship between the duration of the disorder and sexual dysfunction (Sivrikaya, Ünsal, & Karabulutlu, 2014).

In the current study, sexual dysfunction was common among patients (58.4%) who believed that sexuality was not important. In a similar vein, a study of multiple sclerosis patients in Turkey found that patients who did not consider sexuality important had a high percentage of sexual problems (Akkuş & Duru, 2011). A previous study concluded that disease can influence the process of sexual development and the way that patients express their sexuality (Quinn & Browne, 2009) and that reduced sexual desire in females may culminate in sexual dysfunction (Valadares, Pinto-Neto, de Souza, Osis, & da Costa Paiva, 2011). As reported previously, women in Turkey refrain from expressing sexual problems due to religious, social, and cultural factors (Akkus Nakas, & Kalyoncu, 2010).

The results of the present study demonstrated that 92.2% of the participants had not received sex education and that a lack of sex education was associated with sexual dysfunction. Sexual problems can be resolved in some cases by sexual health education and support services (Quinn & Browne, 2009). Sexuality is an important and valuable part of human life that should be respected. Regardless of ethnic origin, social status, or gender, all humans have the right to

receive information and education on sexuality and sexual health (Kijak, 2011). A lack of sex education and the idea of sexuality as taboo may increase the frequency of sexual dysfunction (Akkus et al., 2010).

In our study, the average age of the participants at the time of marriage was  $20.71 \pm 4.17$ , and we found a significant relationship between age at the time of marriage and sexual function. A previous study of infertile women reported that older age at the time of marriage showed a negative association with sexual function (Oskay, Beji, & Serdaroglu, 2010). In our study, the participants who adhered to their drug treatment had higher sexual dysfunction than the participants who did not adhere to their treatment protocol. However, the between-group difference in sexual dysfunction was not significant. Another study found that hypothyroid treatment resulted in an improvement in sexual function domains of pain and desire but no change in the domains of arousal and orgasm (Oppo et al., 2011).

We found no significant relationship between sexual function scores and the participant's TSH, FT<sub>3</sub> or FT<sub>4</sub>. One study found that hypothyroid and hyperthyroid women all FSFI domains were directly correlated with serum FT<sub>4</sub> (Oppo et al., 2011).

**Limitations:** The first limitation of this study was the small sample size. In addition, some of the patients may have had trouble answering questions on the Female Sexual Function Index, as any discussion of sexuality is considered taboo in Turkish society. Therefore, the patients may not have wished to disclose aspects of their lives they considered private.

**Conclusion:** This study found that the sexual function of Turkish female patients with hyperthyroidism or hypothyroidism was poor and that nearly all the participants had sexual dysfunction. The majority of the participants reported problems related to the sexual function domains of desire, arousal, lubrication, orgasm, satisfaction, and pain. Factors associated with significantly low sexual function scores were low education levels, obesity, living in a rural area, receiving no sex education, and an arranged marriage. In addition, homemaker, being a nonsmoker, and not considering sexuality important were associated with low sexual function scores. Sexual function showed a positive relationship with age at the time of marriage and a

negative relationship with waist circumference and the duration of the disorder. Sexual function scores did not show a statistically significant relationship with family type, stress, or regular drug usage. As compared with hypothyroid patients, those with hyperthyroidism had higher sexual dysfunction, although the between-group difference was not statistically significant. Finally, we found no significant relationship between sexual function scores and the participant's age, duration of marriage, BMI, TSH, FT<sub>3</sub> or FT<sub>4</sub>.

The findings of the present study suggest that nurses should take appropriate measures to improve the sexual health of female patients with hyperthyroidism or hypothyroidism. Special education programs could be put in place to help resolve sexual problems faced by hyperthyroid and hypothyroid patients and to increase their knowledge of sexual health and well-being. Nurses as consultants may provide sexual health support services to these patients. To address sexual dysfunction among Turkish female patients with hyperthyroidism and hypothyroidism, improvements in education are needed. Their obesity and arranged marriage should be prevented. A similar study could be conducted to shed light on sexual dysfunction among male patients with hyperthyroidism or hypothyroidism.

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## References

- Akkus Y, Duru G. (2011). Problems and factors affecting the sexual lives of patients with multiple sclerosis living in Turkey. *Sex Disabil* 29: 55-63.
- Akkus Y, Nakas D, Kalyoncu U. (2010). Factors affecting the sexual satisfaction of patients with rheumatoid arthritis and ankylosing spondylitis. *Sex Disabil* 28: 223-232.
- Atis G, Dalkilinc A, Altuntas Y, Atis A, Caskurlu T, Ergenekon E. (2010). Sexual dysfunction in women with clinical hypothyroidism and subclinical hypothyroidism. *JSM* 7: 2583-2590.
- Atis G, Dalkilinc A, Altuntas Y, Atis A, Gurbuz C, Ofluoglu Y, Caskurlu T. (2011). Hyperthyroidism: A risk factor for female sexual dysfunction. *JSM* 8: 2327-2333.
- Aygin D, Aslan FE. (2005). The Turkish adaptation of the female sexual function index. *Turkiye Klinikleri Journal of Medical Sciences* 25: 393-399.
- Bal MD. (2014). The nurse's attitudes and beliefs towards sexuality. *Journal of Education and Research in Nursing* 11: 38-42.



- Cayan S, Akbay E, Bozlu M, Canpolat B, Acar D, Ulusoy E. (2004). The prevalence of female sexual dysfunction and potential risk factors that may impair sexual function in Turkish women. *Urologia Internationalis* 72: 52-57.
- Chaker L, Bianco AC, Jonklaas J, Peeters RP. (2017). Hypothyroidism. *The Lancet* 390:1550-1562.
- Capik C. (2014). Statistical power analysis and its use in nursing studies: basic information. *Journal of Anatolia Nursing and Health Sciences* 17: 268-274.
- Davis SR, Castelo-Branco C, Chedraui P, Lumsden MA, Nappi RE, Shah D, Villaseca P. (2012). Understanding weight gain at menopause. *Climacteric* 15:419-429.
- De Leo S, Lee SY, Braverman LE. (2016). Hyperthyroidism. *Lancet* 388: 906-918.
- Eminsoy MG, Sözen F. (2015). Thyroid function tests. *Turkiye Klinikleri Journal of Family Medicine Special Topics* 6: 1-10.
- Esposito K, Ciotola M, Giugliano F, Bisogni C, Schisano B, Autorino R, Giugliano D. (2007). Association of body weight with sexual function in women. *IJIR* 19: 353-357.
- Golbasi Z, Tugut N, Erenel AŞ, Eroğlu K. (2014). Prevalence and some related factor of sexual dysfunction among married women admitted to gynecologic outpatient clinic. *Cumhuriyet Medical Journal* 36:1-10.
- Incedere A, Kucuk L. (2017). Sexual life and associated factors in psychiatric patients. *Sex Disabil* 35: 89-106.
- Kadioglu P, Yetkin DO, Sanli O, Yalin AS, Onem K, Kadioglu A. (2010). Obesity might not be a risk factor for female sexual dysfunction. *BJU International* 106: 1357-1361.
- Kutmec C. (2009). Sexual dysfunction in women and nursing care. *Firat Health Services Journal* 4: 111-136.
- Kijak RJ. (2011). A desire for love: Considerations on sexuality and sexual education of people with intellectual disability in Poland. *Sex Disabil* 29:65-74.
- Kolotkin RL, Binks M, Crosby RD, Qstbye T, Mitchell JE, Hartley G. (2008). Improvements in sexual quality of life after moderate weight loss. *International Journal of Impotence Research* 20: 487-492.
- Kose O, Canakci V, Arabaci T, Sağlam, E. (2012). Obesity and periodontitis. *Clin Exp Health Sci* 2: 89-100.
- Krassas GE. (2000). Thyroid disease and female reproduction. *Fertility and Sterility* 74: 1063-1070.
- Oppo A, Franceschi E, Atzeni F, Taberlet A, Mariotti S. (2011). Effects of hyperthyroidism, hypothyroidism, and thyroid autoimmunity on female sexual function. *J Endocrinol Invest* 34: 449-453.
- Oskay UY, Beji NK, Serdaroglu H. (2010). The issue of infertility and sexual function in Turkish women. *Sexuality and Disability* 28: 71-79.
- Ozerdogan N, Sayiner FD, Kosgeroglu N, Unsal A. (2009). The prevalence of sexual dysfunction and depression and other factors associated in women 40 to 65 years old. *Maltepe University Journal of Nursing Science and Art* 2:46-59.
- Pasquali D, Maiorino MI, Renzullo A, Bellastella G, Accardo G, Esposito D, Esposito K. (2013). Female sexual dysfunction in women with thyroid disorders. *J Endocrinol Invest* 36: 729-733.
- Quinn C, Browne G. (2009). Sexuality of people living with a mental illness: a collaborative challenge for mental health nurses. *Int. J. Ment. Health Nurs.* 18: 195-203.
- Rosen C, Brown J, Heiman S, Leiblum C, Meston R, Shabsigh D, Ferguson R, D'Agostino R. (2000). The female sexual function index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *J. Sex Marital Ther* 26: 191-208.
- Sezen L. (2005). Marriage Formats in Turkey. *Atatürk University Turkic Studies Research Institute Journal* 11: 27.
- Sivrikaya SK, Unsal A, Karabulutlu EY. (2014). Sexual dysfunction and depression in Turkish women with type 2 diabetes mellitus. *Sex Disabil* 32: 3-13.
- Valadares AL, Pinto-Neto AM, de Souza MH, Osis MJ, da Costa Paiva LH. (2011). The prevalence of the components of low sexual function and associated factors in middle-aged women. *JSM* 8:2851-2858.
- Veronelli A, Mauri C, Zecchini B, Peca MG, Turri O, Valitutti MT, Pontiroli AE. (2009). Sexual dysfunction is frequent in premenopausal women with diabetes, obesity, and hypothyroidism, and correlates with markers of increased cardiovascular risk. A preliminary report. *JSM* 6:1561-1568.
- Wiegel M, Meston C, Rosen R. (2005). The female sexual function index (FSFI): Cross-validation and development of clinical cutoff scores. *J. Sex Marital Ther* 31:1-20.
- Zorzon M, Zivadinov R, Bragadin L, Monti Moretti R, De Masi R, Nasuelli D, & Cazzato, G. (2001). Sexual dysfunction in multiple sclerosis: A 2-year follow-up study. *J. Neurol. Sci.* 187: 1-5.