

Effects of intrauterine devices on female sexual function: a cross-sectional study

Feyza Bayram[✉], Nergis Kender Ertürk[✉]

Department of Obstetrics and Gynecology, University of Health Sciences, Bursa Yüksek İhtisas Training and Research Hospital, Bursa, Turkey

ABSTRACT

Objectives: To examine the differences in sexual functions between women using copper intrauterine device (Cu-IUD) and levonorgestrel intrauterine system (LND-IUS).

Methods: A total of 125 women between the ages of 20 and 40 were included in the study. The demographic data of all participants were recorded. Female Sexual Function Index (FSFI) was performed to all participants. Study participants were divided into 3 groups; 42 Cu-IUD users, 42 LND-IUS users, and 41 control (not use contraceptive) group, then compared. Women with a total score lower than ≤ 26.5 were considered as having sexual dysfunction.

Results: The prevalence of female sexual dysfunction (FSD) was 56.8% among the participants. The total FSFI scores of Cu-IUD and LNG-IUS groups were similar. Moreover, the FSFI score of both IUD users was lower than the control group, and the difference was statistically significant ($p < 0.001$). The presence of Cu-IUD affected arousal more than pain, satisfaction, lubrication and orgasm scores ($p = 0.016$). Pain score was similar among IUD groups and significantly lower than controls ($p < 0.001$). Moreover, orgasm and satisfaction scores were found to be significantly higher in the control group than in the both IUD groups ($p < 0.001$). All of three groups were also similar about desire and lubrication domains of FSFI.

Conclusions: In conclusion, this study found that Cu-IUD and LNG-IUS users did not differ in terms of sexual function according to scores calculated by FSFI.

Keywords: Female sexual dysfunction, female sexual function index, copper intrauterine device, levonorgestrel intrauterine device, sexuality

Intrauterine device (IUD) is the second most widely used modern contraceptive method worldwide [1]. IUD is a safe and effective method of contraception that primarily acts by inhibition of fertilization mechanisms [2, 3]. Approximately 23% of women in the world prefer the IUD as a contraceptive method, this ratio is around 14% in our country, Turkey [4].

Intrauterine contraceptives (IUCs) include the copper intrauterine device (Cu-IUD) and the levonorgestrel-releasing intrauterine system (LNG-IUS).

The LNG-IUS could induce amenorrhea or irregular and mild intermenstrual bleeding in most of its users. The Cu-IUD users may complain about intermenstrual or prolonged menstrual bleeding and pelvic discomfort [5]. The features such as being long-acting, safe, cost-effective, independent from sexual intercourse, not inhibiting breastfeeding, rapid return of fertility after the method is stopped, make this method preferred by millions of women. Despite having several advantages, IUD might have some adverse effects on

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Address for correspondence: Feyza Bayram, MD., University of Health Sciences, Bursa Yüksek İhtisas Training and Research Hospital, Department of Obstetrics and Gynecology, Bursa, Turkey. E-mail: drfeyzauludag@hotmail.com, Phone: +90 224 295 50 00

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women's overall health, especially on their sexual health [6].

Sexual health is defined by the World Health Organization (WHO) as a state of physical, emotional, mental and social well-being with sexuality [7]. Sexual life is one of the important factors affecting the women's quality of life. Female sexual dysfunction (FSD) is a group of psycho-sexual disorders that include some or all of the problems such as sexual desire, orgasm, arousal disorders and sexual pain [8]. FSD is a common problem worldwide, and its prevalence varies by ethnicity, race, religion and region of residence [9]. Various scoring systems have been developed for the diagnosis of FSD. The most widely used of these is "Female Sexual Function Index" (FSFI). FSFI is an index that investigates the physiological and psychological aspects of patients' sexual functions together and was first defined by Rosen *et al* in 2000 [10].

Contraception method preferences of women may be affected by the physical and psychological side effects that the current method might cause. In this context, the fact that the method may cause sexual dysfunction emerges as an important factor that may affect the choice decision. Although there are various studies on the adverse effects of the IUD on women's health, there seems to be insufficient data on its effects on sexual function. Therefore, we aimed to investigate whether the use of Cu-IUD or LNG-IUS in women has any effects on sexual function. For this aim, we calculated and compared the FSFI scores of women using the IUDs and not using any contraceptive methods.

METHODS

This cross-sectional study was conducted in Bursa Yüksek İhtisas Training and Education Hospital gynecology clinic after obtaining local ethics approval (2018/12-35). Women applying for routine gynecology examination using any contraceptive methods for at least six months were asked to fill the FSFI. 38 women did not want to fill the questionnaire, 125 women aged between 20-40 years were included in the study. Each participant's age, body mass index (BMI), parity, educational status, income, partner's age, duration of sexual intercourse, contraceptive method, duration of contraception were recorded. In-

come was divided into three subgroups as low- < 2000 Turkish liras (TL) per month, medium- 2000-5000 TL per month, high- > 5000 TL. Education status was defined as primary school- five or eight years, high school and college.

Women diagnosed with systemic diseases, endometriosis, pelvic inflammatory disease, previous pelvic surgery, premature menopause, pelvic organ prolapse, incontinence and infertility, smokers, women taking any medicine, obese patients were excluded from the study. Individuals were grouped according to their contraceptive methods. Cu-IUD (Nova TCu380A[®]) group consisted of 42 women. 42 women were in LNG-IUS (52 mg, Mirena[®]; Bayer) group. 41 women using no contraception (either using traditional methods or desiring pregnancy) were defined as control group.

Female sexual function was evaluated using a validated FSFI questionnaire [10]. FSFI is a questionnaire that consists of nineteen multiple choice questions, includes desire, arousal, lubrication, orgasm, satisfaction and pain subtitles. A total score less than ≤ 26.5 was considered as FSD. Higher scores indicated better sexual function [11]. The scale shows the sexual function of women in the last 4 weeks by calculating 6 subgroup scores and FSFI score. After the first evaluation, women who were eligible for the study were asked to fill in FSFI in a private, quiet hospital room under the supervision of the researchers. After the questionnaires were filled, they were taken by the researchers and archived to form a database.

Statistical Analysis

Data were analyzed by SPSS 22.0 for Windows (SPSS Inc, Chicago, IL, USA) statistics programme. The normality of distribution was assessed by Shapiro-Wilk test. Analysis of variance (ANOVA) and Kruskal-Wallis tests were used for analysis of continuous variables. Chi-square test was used for categorical data. Spearman rho coefficients were calculated for correlation analysis. $p < 0.05$ was considered statistically significant.

RESULTS

Both IUD users and control individuals were similar among age, parity, BMI, partner age, duration of using

Table 1. Demographic, clinical characteristics and FSFI scores of patients among groups

Characteristics	Copper IUD (n = 42)	LNG-IUS (n = 42)	Control (n = 41)	<i>p</i> value
Age (years)	33.50 ± 4.64	34.69 ± 4.80	32.70 ± 4.13	0.139
Parity	2 (1-5)	2 (1-4)	2 (1-5)	0.149*
BMI (kg/m ²)	25.88 ± 4.55	25.17 ± 3.16	26.39 ± 4.37	0.125
Partner's age (years)	37.09 ± 4.92	38.00 ± 6.33	35.34 ± 6.42	0.121
Duration of relationship (years)	12.97 ± 5.47	13.40 ± 7.01	10.31 ± 6.01	0.059
Duration of use (months)	29.35 ± 10.56	31.50 ± 10.19	32.07 ± 10.93	0.467
Income				0.061**
Low	13 (31.0)	5 (11.9)	5 (12.2)	
Medium	26 (61.9)	28 (66.7)	27 (65.9)	
High	3 (7.1)	9 (21.4)	9 (22.0)	
Education				0.216**
Primary school (5 years)	18 (42.9)	16 (38.1)	9 (22.0)	
Primary school (8 years)	11 (26.2)	8 (19.0)	11 (26.8)	
High school	9 (21.4)	11 (26.2)	10 (24.4)	
College	4 (9.5)	7 (16.7)	11 (26.8)	
FSFI subgroups				
Desire	6.83 ± 1.32	6.40 ± 1.90	6.65 ± 1.23	0.432
Arousal	13.85 ± 2.48	12.35 ± 1.97	12.90 ± 2.61	0.016
Lubrication	14.40 ± 2.06	13.38 ± 2.32	14.31 ± 2.69	0.095
Orgasm	9.35 ± 2.26	10.30 ± 1.99	11.31 ± 1.75	< 0.001
Satisfaction	8.47 ± 2.72	10.42 ± 2.50	11.85 ± 1.74	< 0.001
Pain	9.83 ± 2.36	9.95 ± 2.42	12.43 ± 2.11	< 0.001
Total FSFI Score	23.64 ± 3.48	23.84 ± 3.58	26.40 ± 2.95	< 0.001

Values are given as mean±standart deviation or number (%). IUD = intrauterine device, LNG = levonorgestrel, FSFI = female sexual function index.

*Kruskal-Wallis test was used, values are given as median (range).

**Chi square test was performed.

the contraceptive method, income and educational status (Table 1).

FSFI scores of patients are also given in Table 1. Groups were similar among desire and lubrication domains of FSFI. Arousal score was 13.85 ± 2.48 in Cu-IUD group and significantly higher than the other groups (*p* = 0.016). Orgasm and satisfaction scores were 11.31 ± 1.75 and 11.85 ± 1.74 in the control group. Post-Hoc analysis revealed that orgasm score and satisfaction score were significantly high in control groups (*p* < 0.001). Pain score was similar among IUD groups and significantly lower than controls (*p* < 0.001). According to the post-hoc analysis total FSFI

score was highest in the control group, significantly different from IUD groups. The total FSFI scores of Cu-IUD and LNG-IUS groups were similar (Table 1). Seventy-one of 125 women had sexual dysfunction. Percentage of women with FSD were higher than women without FSD in both IUD groups (*p* = 0.049). On the other hand in the control group 41.5 percent of women had FSD (Table 2).

The relationship between FSFI domains were calculated. There was positive significant correlation between pain and satisfaction scores, likewise in orgasm and satisfaction scores (*r* = 0.490, *p* < 0.001; *r* = 0.664, *p* < 0.001). No correlation was found between desire

Table 2. Distribution of female sexual dysfunction among groups

Groups*	Women with FSD n (%)	Women without FSD n (%)
Copper IUD	28 (66.7)	14 (33.3)
LNG-IUS	26 (61.9)	16 (38.1)
Control	17 (41.5)	24 (58.5)
Total	71 (56.8)	54 (43.2)

Data are given as number (%). FSD = female sexual dysfunction, IUD = intrauterine device, LNG = levonorgestrel

*Chi square test was performed ($p = 0.049$).

and satisfaction. Also arousal and lubrication scores were correlated ($r = 0.410$, $p < 0.001$).

DISCUSSION

In this study, we aimed to examine the sexual function differences among women using the Cu-IUD and the LNG-IUS. Approximately 40% of women in the world experience one or more sexual problems [9]. While the FSD rate is reported to be approximately 43-57% in Turkey [12-14], these rates are given as 34-40% for women in the USA and Europe [15]. Consistent with the literature, the prevalence of FSD among all participants in our study was determined to be 56.8%. The sexual dysfunction is affected by various individual factors such as psychological, biological, social, economic, political, ethnic characteristics, and religious beliefs. Therefore, the regional differences in incidence remain acceptable.

In many previous publications, it has been reported that LNG-IUSs worsen sexual function and have a higher rate than Cu-IUDs [16, 17]. These results are mainly due to unplanned bleeding effect and possibly other progestogenic side effects of LNG-IUSs [17, 18]. In a cross-sectional study, in 153 women with Cu-IUDs and LNG-IUSs, it was reported that the women using LNG-IUS as a contraceptive method were five times more likely to report a subjectively negative effect on sexual function compared to those using Cu-IUD [19]. However, inclusion criteria and characteristics of the patient population were not

clearly specified in this study, and a valid questionnaire was not used. On the other hand, there are several studies reporting that LNG-IUSs have no effect on sexual function. In an observational study, the authors analyzed whether 31 users of the LNG-IUS showed any differences in quality of life and sexual function 12 months after the IUD implantation, and whether IUD had any effect on these variables. They found no significant difference in the results [20]. Furthermore, Sanders *et al.* [21] followed the LNG-IUS and the Cu-IUD users for one-year, they could not detect any differences between the compliance rates of the users. Bastianelli *et al.* [22] applied the FSFI questionnaire to 158 women before and one year after the LNG-IUS implantation and reported that there was no significant difference between the two questionnaire scores. Similarly, in our study, there was no significant difference between the total FSFI scores of the Cu-IUD and the LNG-IUS groups. In this study, risk factors that may cause FSD were examined and there was no significant difference between individual characteristics of all groups.

There are many studies in the literature evaluating the effects of the Cu-IUD, the LNG-IUS or other contraceptive methods on female sexuality. However, there are few data comparing the effects of two types of IUD on sexual dysfunction with control (not use contraceptive) group [6]. In this study although the IUDs groups had similar FSFI scores, the total FSFI score was the highest in the control group, significantly different from the IUDs groups ($p < 0.001$). Menstrual abnormalities (hypermenorrhea or menorrhagia, etc.) caused by the Cu-IUD might be the reason for the lower FSFI scores of these women. So considering that the Cu-IUD may increase menstrual flow or LNG-IUS may cause spotting and irregular bleeding, the lower scores of sexual function in women using IUDs could be attributed to this situation. According to the epidemiological studies, we could mention that the possible side effects of the IUDs on female sexuality have conflicting results and are still controversial.

In this study, the scores of the FSFI domains were also evaluated separately. The presence of Cu-IUD seems to affect arousal score. All groups were also similar among desire and lubrication domains of FSFI. But in another research, it was reported that the desire

and arousal scores of women using LNG-IUS were higher than Cu-IUD and control groups [6]. In our study, pain score was similar among IUD groups and significantly lower than controls ($p < 0.001$). Likewise, several previous studies have found that IUDs can reduce pain scores in sexual function [6, 23, 24]. On the other hand, Sakinci *et al.* [25] reported that Cu-IUDs increased sexual pain compared to women with no contraception, and this finding may negatively affect female sexuality. The patient's age and Cu-IUD status were found to be correlated with FSFI domain of pain. Elnashar *et al.* [26] found that 31.5% of the healthy women experienced pain problems during sexual intercourse, while Valadares *et al.* [27] was determined this rate as 39.5%. Valadaras *et al.* [27] stated in their study that the risk of experiencing dyspareunia decreased in those whose frequency of sexual intercourse was more than 3 times a week. In our study and most previous studies, there is no data about the frequency of sexual intercourse for all participants [23-25]. More studies are needed to explore the physical and psychological aspects of partners' sex lives.

In the present study, we showed that there might be a decrease in sexual function scores and an increase in the rate of FSD in the presence of IUDs in women. The data of previous reports are challenging due to the heterogeneity of individuals' sociodemographic characteristics. Moreover, our groups were similar among some characteristics such as age, parity, BMI, partner's age, duration of contraceptive use, income, and education level. Thus, the present research could contribute to a better understanding of the effects of both IUDs on sexual function scores, unlike many literature publications.

The strength of this study is the use of valid standardized questionnaire to investigate the level of sexual dysfunction in infertile women. Moreover, the addition of a control group contributed to the power of the study.

Limitations

There are also some limitations of this study such as being single center and having a relatively small sample size. If an additional quality of life assessment questionnaire had been administered to the participants, more information about the participants could have been obtained and a more reliable interpretation of the results could have been made. In addition, the

educational status, socio-cultural and socio-economic levels of the participants might have affected the answers given and indirectly the results of the study.

CONCLUSION

This study found that the FSFI scores of women using the Cu-IUD and the LNG-IUS were similar and these results were significantly lower than women who did not use any contraceptive method. The potential effects of a contraceptive method on a woman's quality of life and sexual function might influence the choice of the method. In this respect, current literature data is still insufficient to understand and manage the relationship between IUD types and sexual dysfunction, and further studies with larger populations are needed.

Authors' Contribution

Study Conception: FB, NKE; Study Design FB, NKE; Supervision: FB, NKE; Funding: NKE; Materials: FB; Data Collection and/or Processing: FB, NKE; Statistical Analysis and/or Data Interpretation: NKE; Literature Review FB; Manuscript Preparation: FB and Critical Review: FB.

Conflict of interest

The authors disclosed no conflict of interest during the preparation or publication of this manuscript.

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REFERENCES

1. Finer LB, Jerman J, Kavanaugh ML. Changes in use of long-acting contraceptive methods in the United States, 2007-2009. *Fertil Steril* 2012;98:893-7.
2. Buhling KJ, Zite NB, Lotke P, Black K. Worldwide use of intrauterine contraception: a review. *Contraception* 2014;89:162-73.
3. Hubacher D, Chen PA, Park S. Side effects from the copper IUD: do they decrease over time? *Contraception* 2009;79:356-62.
4. Koc I. Prevalence and sociodemographic correlates of consanguineous marriages in Turkey. *J Biosoc Sci* 2008;40:137-48.
5. Cim N, Soysal S, Sayan S, Yildizhan B, Karaman E, Cetin O, et al. Two years follow-up of patients with abnormal uterine

- bleeding after insertion of the levonorgestrel-releasing intrauterine system. *Gynecol Obstet Invest* 2018;83:569-75.
6. Skrzypulec V, Drosdzol A. Evaluation of quality of life and sexual functioning of women using levonorgestrel-releasing intrauterine contraceptive system Mirena. *Coll Antropol* 2008;32:1059-68.
 7. World Health Organization. Reproductive Health, Comprehensive cervical cancer control: a guide to essential practice. World Health Organization 2006.
 8. Banaei M, Alidost F, Ghasemi E, Dashti S. A comparison of sexual function in primiparous and multiparous women. *J Obstet Gynaecol* 2020;40:411-8.
 9. Jaafarpour M, Khani A, Khajavikhan J, Suhrabi Z. Female sexual dysfunction: prevalence and risk factors. *J Clin Diagn Res* 2013;7:2877-80.
 10. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The female sexual function index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther* 2000;26:191-205.
 11. Basson R, Althof S, Davis S, Fugl-Meyer K, Goldstein I, Leiblum S, et al. Summary of the recommendations on sexual dysfunction in women. *J Sex Med* 2004;1:24-34.
 12. Oksüz E, Malhan S. Prevalence and risk factors for female sexual dysfunction in Turkish women. *J Urol.* 2006;175:654-8.
 13. Cayan S, Akbay E, Bozlu M, Canpolat B, Acar D, Ulusoy E. The prevalence of female sexual dysfunction and potential risk factors that may impair sexual function in Turkish women. *Urol Int* 2004;72:52-7.
 14. Koseoglu SB, Deveer R, Akin MN, Gurbuz AS, Kasap B, Guvey H. Is there any impact of copper intrauterine device on female sexual functioning? *J Clin Diagn Res* 2016;10:21-3.
 15. Wiegel M, Meston C, Rosen R. The female sexual function index (FSFI): cross-validation and development of clinical cutoff scores. *J Sex Marital Ther* 2005;31:1-20.
 16. Backman T, Huhtala S, Blom T, Luoto R, Rauramo I, Koskenvuo M, et al. Length of use and symptoms associated with premature removal of the levonorgestrel intrauterine system: a nation-wide study of 17,360 users. *BJOG* 2000;107:335-9.
 17. Ferreira J, Carreiro A, Fernandes A, Bahamondes L. Sexual function and quality of life in a cohort of Brazilian users of two kind of intra-uterine contraceptives. *Res Bras Ginecol Obstet* 2019;41:236-41.
 18. IMoreira IFA, Bianchini MP, Moreira GRC, Almeida AM, Rezende BA. Sexual function and metabolic/hormonal changes in women using long-term hormonal and non-hormonal contraceptives: a pilot study. *BMC Women's Health* 2020;20:240.
 19. Malmborg A, Brynhildsen J, Hammar M. A survey of young women's perceptions of the influence of the Levonorgestrel-Intrauterine System or copper-intrauterine device on sexual desire. *Sex Reprod Healthc* 2019;21:75-80.
 20. Neri M, Piras B, Paoletti AM, Vallerino V, Corda V, Ronchetti C, et al. Long-acting reversible contraception (LARC) with the intrauterine system with levonorgestrel (6 mcg/d): observational study on the acceptability, quality of life, and sexuality in Italian women. *Gynecol Endocrinol* 2018;34:532-5.
 21. Sanders JN, Turok DK, Royer PA, Thompson IS, Gawron LM, Storck KE. One-year continuation of copper or levonorgestrel intrauterine devices initiated at the time of emergency contraception. *Contraception* 2017;96:99-105.
 22. Bastianelli C, Farris M, Benagiano G. Use of the levonorgestrel-releasing intrauterine system, quality of life and sexuality. Experience in an Italian family planning center. *Contraception* 2011;84:402-8.
 23. Gorgen H, Api M, Akca A, Cetin A. Use of the levonorgestrel-IUS in the treatment of menorrhagia: assessment of quality of life in Turkish users. *Arch Gynecol Obstet* 2009;27:835-40.
 24. Casado-Espada NM, de Alarcon R, de la Iglesia-Larrad JI, Bote-Bonaecha B, Montejo AL. Hormonal contraceptives, female sexual dysfunction, and managing strategies: a review. *J Clin Med* 2019;8:908-10.
 25. Sakinci M, Ercan CM, Olgan S, Coksuer H, Karasahin KE, Kuru O, et al. Comparative analysis of copper intrauterine device impact on female sexual dysfunction subtypes. *Taiwanese J Obstet Gynecol* 2016;55:30-4.
 26. Elnashar AM, El-Dien Ibrahim M, El-Desoky MM, Ali OM, El-Sayd Mohamed Hassan M. Female sexual dysfunction in Lower Egypt. *BJOG* 2007;114:201-6.
 27. Valadares AL, Pinto-Neto AM, Conde DM, Sousa MH, Osis MJ, A. Paiva LC. Population-based study of dyspareunia in a cohort of middle-aged Brazilian women. *Menopause* 2008;15:1184-90.



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