# Assessment of female sexual dysfunction during pregnancy with correlation to serum testosterone/estradiol ratio

**Original Article**

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## ABSTRACT

**Background:** Pregnancy is one of the important factors affecting the quality and quantity of marital intercourses. During pregnancy, women experience physiological, psychological, and social changes as well as significant changes in hormone levels. The cultural myths that pregnant women cannot lead a normal sexual life play an important role in this respect.
**Aim:** Evaluation of female sexual dysfunction during pregnancy and assessment of serum testosterone and estradiol with its correlation to the degree of sexual dysfunction.
**Patients and Methods:** This study was done as a prospective case-control study involving 60 pregnant women, divided into three groups based on their trimester (1st, 2nd, or 3rd). These women attended the outpatient clinic at Obstetrics and Gynecology Department, versus 40 non-pregnant married women as controls. An Arabic validated FSFI questionnaire (ArFSFI) assessing sexual function was given to all participants and scores were calculated. Blood samples were collected to measure testosterone and estradiol levels and calculate the testosterone/estradiol ratios.
**Results:** Arousal correlated negatively with total testosterone and estradiol in the first trimester, similar but less pronounced patterns were observed in later trimesters. The testosterone/estradiol ratio showed significant negative correlations with FSFI domains, especially in the first and third trimesters. Hormonal changes, along with female age, husband age, and duration of marriage, significantly affect sexual function during pregnancy.
**Conclusion:** Sexual function is significantly impaired in pregnant women compared to non-pregnant women, with notable declines in FSFI scores for desire, arousal, orgasm, and overall sexual function. The second trimester has a lesser impact on sexual function compared to the first and third trimesters. Evaluating sexual function in pregnant women should take these hormonal and demographic factors into consideration.

**Key Words:** Estradiol, female sexual dysfunction, FSFI scores, pregnancy, testosterone.

**Received:** 25 November 2024**, Accepted:** 31 December 2024

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**ISSN:** 2090-6048, 2025

## INTRODUCTION

Female sexual function is the ability to achieve sexual domains as arousal, lubrication, orgasm and satisfaction resulting in a better well-being with good quality of life. Sexual dysfunction is experienced during the stages of human sexual activity. In the United States (US) Psychiatric Association's classification, the latest edition of the DSM-5 Psychopathy Diagnostic Guide, Sexual Dysfunction is a heterogenous group of disorders that generally involve significant potential impairment in the ability of the individual to sexual response or sexual pleasure[1].

Female sexual disorders are classified in distinct categories, including; sexual dysfunction, gender dysphoria, paraphilic disorder, female orgasmic disorder, female sexual interest/arousal, genital pelvic pain/ penetration disorder[2].

Several risk factors affect the development of sexual dysfunction and sexual satisfaction of women, including mental health, sexual relations, female partner's sexual function, and factors related to personality, duration of familiarity with the sexual partner, infertility, medications, chronic diseases, pelvic surgery, cancers, pregnancy, and postpartum period[3].

*DOI: 10.21608/HA.2025.339297.1110*

The effect of female sexual dysfunction on their physical, social, psychological wellbeing has been proved[4]. A woman's life passes through many physiological changes likemenstruation, pregnancy and childbirth, breastfeeding, and menopause. These series of events are partially or totally reflected on their sexual lives.Consequences include reduced self-esteem, separation from their partners, and more seriously, may progress to committing crimes or becoming an addict[5].

The marital life of a pregnant woman can be extremely endangered regarding the quality and quantityof marital intercourses. This can be attributed to the modified physiological, psychological, and social behaviors as well as significant hormonal changes. The cultural myths that pregnant women cannot lead a normal sexual life play an important role in this respect[6].

Both estradiol and testosterone have been implicated, as steroid is critical for modulating women's sexual desire. In contrast, in all other female mammals only estradiol has been shown to be critical for female sexual motivation and behavior. Pharmaceutical companies have invested heavily in the development of androgen therapies for female sexual desire disorders, but today there are still no FDA approved androgen therapies for women. Nonetheless, testosterone is currently, and frequently, prescribed off-label for the treatment of low sexual desire in women, and the idea of testosterone as a cure-all for female sexual dysfunction remains popular[7].

## AIM OF THE STUDY

The aim of this study was the evaluation of female sexual dysfunction during pregnancy and assessment of serum testosterone and estradiol with its correlation to the degree of sexual dysfunction.

## PATIENTS AND METHODS

This study was done as a prospective case-control study, comprising 60 consecutive pregnant females (patient group) divided into three groups (1st, 2nd, and 3rdtrimesters, respectively) who attended the outpatient clinic of Obstetrics and Gynecology Department, versus 40 non-pregnant married females (control group). The patient group included pregnant females with an age range from 18 to 40 years who had at least one year of a stable marital relationship. Patients with chronic debilitating diseases, pre-existing sexual disorders, physical deformities affecting self-esteem, psychiatric disorders or use of psychotic drugs, and male partners with sexual disorders were excluded from the study.

Informed consent was obtained from the enrolled subjects in the study with clear detailed information about risks, benefits, and the right of withdrawal from the study at any time with no penalty. Ethical approval was obtained from the ethical committee of the faculty of medicine. Institutional Review Board approval reference is (IRB:MS.23.02.2299).

Detailed History was taken from all participants includingpersonal, present, past, family, and sexual history. General Examination withmeasurement of weight, height, and BMI were done. An Arabic validated Female Sexual Function Index questionnaire (ArFSFI) assessing sexual function in 6 domains: desire, arousal, lubrication, orgasm, satisfaction, and pain was given to all participants[8]. Each domain scored from 0 to 6, with total scores ranging from 2 to 36. Blood samples were collected from 8 to 10 AM to measure testosterone and estradiol levels, and calculate the testosterone/estradiol ratio. Samples were analyzed with Electro-chemiluminescence analyzer using Roche Cobas e 411 manufactured by Hitachi High-Technologies Corporation, Tokyo. Japan.

Collected DATA were analyzed using SPSS (statistical package for social sciences) version 22. Quantitative data were tested for normality by Shapiro-Wilk test then described as mean and standard deviation for normally distributed data and median and range for non-normally distributed. The appropriate statistical tests were applied according to data type with Chi-Square for categorical variable and Spearman or Pearson correlation to correlate continuous variables.

## RESULTS

Regarding sociodemograpic data, there was no statistically significant difference between pregnant and non-pregnant groups except for BMI which was higher ($p$ =0.043) in the pregnant group (data not shown). There was significant difference between both groups regarding estradiol, total testosterone serum levels and testosterone/ estradiol ratio that were higher in the pregnant group (Table 1).

**Table 1:** Estradiol, Total Testosterone serum levels andtestosterone/estradiol ratio of the studied groups:

| | Pregnant group (N=60) | Non-Pregnant group (N=40) | Mann Whitney/ X2 | *P* |
|---|---|---|---|---|
| Estradiol (pg/ml) Mean ±SD | 7696.2±1773.6 | 110.5±76.6 | 2.392 | 0.013* |
| Total Testosterone (ng/ml) Mean ±SD | 54.69±0.55 | 20.29±0.37 | 2.287 | 0.027* |
| testosterone/estradiol ratio Mean ±SD | 43.67 ± 32.75 | 3.67 ± 1.75 | 2.343 | 0.011* |

* ($P$ value < 0.05) significant.

After the questionnaire was given, the mean total FSFI scoring was significantly higher in the non-pregnant group, ($p$ = 0.033). Regarding the sub items of FSFI; the mean of all sub items of FSFI was lower in pregnant than non-pregnant group; with orgasm showing statistically significant lower difference in pregnant than in non-pregnant women (Table 2); frequency of intercourse also showed a high statistically significant difference ($p$ =0.001) in favor of non-pregnant women (Table 3), considering that the cut-off for female sexual dysfunction equals 26.55[9]. Through the three trimesters, desire, arousal and total score domains showed a statistically significant difference ($p$ =0.001, $p$ =0.005, $p$ =0.023 respectively). The mean of total score of FSFI was significantly lower in the third trimester (20.55±3.66) followed by the first (22.66±3.85) and finally the second trimester (25.96±2.52), meanwhile the means of orgasm, satisfaction, and pain domains showed no statistically significant difference through the three trimisters (Table 4).

**Table 2:** FSFI total and sub-items level distribution between cases and controls

| | Pregnant group N=60 Mean ±SD | Non Pregnant group N=40 Mean ±SD | *t* | *P* |
|---|---|---|---|---|
| FSFI | 22.42±4.21 | 27.76±4.85 | 2.195 | 0.033* |
| Desire | 3.15±0.84 | 3.97±0.93 | -1.643 | 0.107 |
| Arousal | 3.08±0.97 | 3.59±1.01 | -1.792 | 0.079 |
| Lubrication | 4.83±0.72 | 4.99±1.19 | -1.841 | 0.072 |
| Orgasm | 3.46±1.19 | 4.263±1.0 | -2.140 | 0.042* |
| Satisfaction | 3.82±1.27 | 4.2±1.31 | -0.847 | 0.401 |
| Pain | 3.77±0.37 | 3.69±0.26 | 0.808 | 0.423 |

**P* value (<0.05) significant.

**Table 3:** Frequency of intercourse differences between pregnant and non-pregnant groups

| | Pregnant group N=60 Mean ±SD | Non Pregnant group N=40 Mean ±SD | *t* | *P* |
|---|---|---|---|---|
| | Intercourse frequency (month) n (%) | | | |
| 1 – 5 | 40 (67) | 5 (12.5) | 2.140 | .0.001* |
| 6 – 10 | 20 (33) | 25 (62.5) | | |
| >10 | 0 | 10 (25) | | |
| Total | 60 (100) | 20 (100) | | |

**P* value (<0.05) significant.

**Table 4:** Female sexual dysfunction distribution in pregnant cases according to gestational age

| | 1st trimester N=20 | 2nd trimester N=20 | 3rd trimester N=20 | *t* | *P* |
|---|---|---|---|---|---|
| FSFI | 22.66±3.85 | 25.96±2.52 | 20.55±3.66 | 2.723 | 0.023* |
| Desire | 3.22±0.72 | 3.88±0.32 | 2.19±0.71 | 1.643 | 0.001* |
| Arousal | 3.13±0.58 | 3.79±0.15 | 2.49±0.84 | 1.792 | 0.005* |
| Lubrication | 4.12±0.40 | 4.87±0.59 | 4.28±0.47 | 1.841 | 0.27 |
| Orgasm | 3.87±0.89 | 4.43±0.41 | 3.19±0.99 | 2.140 | 0.07 |
| Satisfaction | 4.26±1.12 | 4.96±1.05 | 3.89±0.76 | 0.847 | 0.49 |
| Pain | 3.36±1.19 | 4.67±1.42 | 4.39±1.12 | 0.808 | 0.08 |

In pregnant women, the arousal domain of the FSFI showed a significant negative correlation with total serum testosterone, whereas this correlation was not significant in non-pregnant women. Serum estradiol negatively correlated with the arousal, desire, orgasm, and total FSFI scores in pregnant women. The testosterone/estradiol ratio negatively correlated with all FSFI domains in both pregnant and non-pregnant women (Table 5). There were a statistically significant negative correlations between female age and satisfaction, and between husband age and orgasm, satisfaction and total score. Also, there were a statistically significant negative correlations between duration of marriage and both orgasm and satisfaction, and between parity and satisfaction (Table 6). There was a non-statistically significant correlation between sexual dysfunction and residence. Regarding educational level, female sexual dysfunction was lower in females with university degree but higher in read and write level. However, proportions of other educational levels were similar. Regarding work conditions, female sexual dysfunction was higher in employed subjects (Table 6).

**Table 5:** Correlation between FSFI domains and hormonal profile in pregnant and non-pregnant women

| Hormone | Group | | FSFI domains | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Desire | Arousal | Lubrication | Orgasm | Satisfaction | Pain | Total |
| Total Testosterone | 1st trimester | *r* | -0.34 | -0.49 | -0.30 | -0.29 | -0.18 | 0.04 | -0.34 |
| | | *p* | 0.14 | 0.026* | 0.19 | 0.20 | 0.42 | 0.85 | 0.14 |
| | 2nd trimester | *r* | -0.110 | -0.196 | -0.202 | -0.010 | 0.065 | -0.121 | -0.103 |
| | | *p* | 0.64 | 0.40 | 0.39 | 0.96 | 0.78 | 0.61 | 0.66 |
| | 3rd trimester | *r* | 0.212 | -0.256 | -0.122 | 0.228 | 0.325 | 0.322 | 0.220 |
| | | *p* | 0.49 | 0.52 | 0.62 | 0.32 | 0.21 | 0.26 | 0.27 |
| | non-pregnant | *r* | -0.117 | -0.191 | -0.282 | -0.019 | 0.068 | -0.127 | -0.103 |
| | | *p* | 0.65 | 0.30 | 0.38 | 0.97 | 0.75 | 0.62 | 0.66 |
| Estradiol | 1st trimester | *r* | -0.72 | -0.72 | 0.07 | -0.57 | -0.28 | 0.06 | -0.54 |
| | | *p* | 0.001* | 0.001* | 0.061 | 0.008* | 0.23 | 0.79 | 0.014* |
| | 2nd trimester | *r* | 0.203 | -0.156 | -0.121 | 0.218 | 0.365 | 0.323 | 0.210 |
| | | *p* | 0.39 | 0.51 | 0.61 | 0.35 | 0.11 | 0.16 | 0.37 |
| | 3rd trimester | *r* | -0.35 | -0.48 | 0.34 | -0.28 | -0.17 | 0.05 | -0.34 |
| | | *p* | 0.13 | 0.025* | 0.18 | 0.22 | 0.43 | 0.86 | 0.14 |
| | non-pregnant | *r* | 0.253 | -0.176 | -0.127 | 0.217 | 0.355 | 0.326 | 0.260 |
| | | *p* | 0.59 | 0.81 | 0.66 | 0.36 | 0.16 | 0.13 | 0.37 |
| Testosterone/estradiol ratio | 1st trimester | *r* | -0.12 | -0.25 | 0.09 | -0.77 | -0.81 | 0.05 | -0.59 |
| | | *p* | 0.001* | 0.001* | 0.91 | 0.04* | 0.29 | 0.59 | 0.018* |
| | 2nd trimester | *r* | 0.199 | -0.198 | -0.211 | 0.311 | 0.344 | 0.311 | 0.191 |
| | | *p* | 0.38 | 0.57 | 0.69 | 0.39 | 0.19 | 0.36 | 0.47 |
| | 3rd trimester | *r* | -0.73 | -0.72 | 0.06 | -0.59 | -0.29 | 0.07 | -0.55 |
| | | *p* | 0.001* | 0.001* | 0.63 | 0.008* | 0.27 | 0.78 | 0.013* |
| | non-pregnant | *r* | 0.293 | -0.176 | -0.181 | 0.214 | 0.325 | 0.329 | -0.220 |
| | | *p* | 0.49 | 0.61 | 0.69 | 0.38 | 0.10 | 0.13 | 0.07* |

*r*: Pearson coefficient *Statistically significant at $p \leq 0.05$

**Table 6:** Correlation between FSFI domains and demographic data in studied groups

| Variable | | | FSFI domains | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Desire | Arousal | Lubrication | Orgams | Satisfaction | Pain | Total |
| Age | | r | -0.23 | -0.29 | -0.02 | -0.38 | -0.63 | 0.03 | -0.35 |
| | | p | 0.29 | 0.37 | 0.92 | 0.07 | 0.004* | 0.74 | 0.12 |
| Husband Age | | r | -0.25 | -0.29 | -0.19 | -0.51 | -0.57 | -0.15 | -0.42 |
| | | p | 0.40 | 0.37 | 0.59 | 0.01* | 0.005* | 0.48 | 0.05* |
| Marriage Duration | | r | -0.19 | -0.44 | -0.12 | -0.47 | -0.70 | 0.13 | -0.34 |
| | | p | 0.49 | 0.19 | 0.56 | 0.03* | 0.001* | 0.92 | 0.06 |
| Parity | | r | -0.26 | -0.33 | 0.05 | -0.38 | -0.58 | -0.16 | -0.39 |
| | | p | 0.39 | 0.22 | 0.70 | 0.11 | 0.005* | 0.46 | 0.06 |
| Residence | Urban | r | 0.97 | 0.69 | 0.38 | 0.59 | 0.28 | 0.24 | 0.54 |
| | | p | 0.65 | 0.326 | 0.49 | 0.60 | 0.32 | 0.75 | 0.44 |
| | Rural | r | 0.90 | 0.196 | 0.702 | 0. 70 | 0.095 | 0.221 | 0.503 |
| | | p | 0.74 | 0.40 | 0.79 | 0.46 | 0.88 | 0.71 | 0.76 |
| Education | Read and write | r | 0.62 | 0.60 | 0.547 | 0.58 | 0.38 | 0.03 | 0.44 |
| | | p | 0.01* | 0. 03* | 0.51 | 0.018* | 0.29 | 0.69 | 0.014* |
| | Secondary | r | 0.243 | 0.196 | 0.245 | 0.276 | 0.375 | 0.463 | 0.39 |
| | | p | 0.38 | 0.81 | 0.84 | 0.95 | 0.271 | 0.37 | 0.79 |
| | University | r | -0.15 | -0.34 | -0.15 | -0.27 | -0.20 | 0.16 | 0.34 |
| | | p | 0.46 | 0.14 | 0.52 | 0.02* | 0.01* | 0.82 | 0.05* |
| Employment | Yes | r | 0.69 | 0.74 | 0.18 | 0.87 | 0.98 | 0.43 | 0.84 |
| | | p | 0.59 | 0.59 | 0.52 | 0.05* | 0.04* | 0.92 | 0.05 |
| | No | r | 0.19 | 0.44 | 0.12 | 0.47 | 0.70 | 0.13 | 0.34 |
| | | p | 0.49 | 0.19 | 0.56 | 0.23 | 0.06 | 0.82 | 0.06 |

*r*: coefficient of correlation *: Statistically significant at $p \leq 0.05$

## DISCUSSION

Pregnancy is one of the important factors affecting the female sexual life. During pregnancy, women experience physiological, psychological, and social changes as well as significant changes in hormone levels. Female sexual function is affected during pregnancy, with a significant change in all female sexual Function Index domains, especially in the first and third trimesters. Hormonal changes are important biological factors which affect sexual function during pregnancy, leading to biological changes like nausea, fatigue that affect sexual desire and arousal in women. Sex hormone steroids, including androgens and estradiol, increase with normal pregnancy[6]. Several studies have shown that desire, excitement, and orgasm during pregnancy are changing and adapting to pregnancy, while dyspareunia increases with increasing gestational age[1].

The aim of this study was the evaluation of female sexual dysfunction during pregnancy and assessment of serum testosterone and estradiol with its correlation to the degree of sexual dysfunction. This study was pursued as a prospective case-control study, comprising 60 consecutive pregnant females (patient group) divided into three groups (based on the three trimesters) who attended the outpatient clinic of Obstetrics and Gynecology Department, versus 40 non-pregnant married females as a control group.

As regard serum testosterone and estradiolthe current study showed a statistically significant increase in both serum testosterone and estradiol in pregnant women compared to non-pregnant women ($p$ <0.001). In accordance with our findings, Mostafa *et al.*, (2021)[10], found thata statistically significant increase in both serum testosterone and estradiol in pregnant women compared to non-pregnant women ($p$ <0.001). Schock *et al.*, (2016), reported that throughout pregnancy, there is increment in both serum testosterone and estradiol[11].

Regarding FSFI total and sub-items level distribution between cases and controls, our study demonstrated significant decrease of desire, arousal, orgasm, and total score domains in pregnant females when compared to non-pregnant females, and the lowest score was related to sexual arousal (3.08±0.973 vs. 3.59±1.01 $p$ =0.079). A similar

finding was reported by Mostafa *et al.*, (2021)[10], as there was a significant decrease of desire, arousal, orgasm, and total score domains in pregnant females when compared to non-pregnant females. Ahmed and his colleagues (2014), found that all sexual function domains were significantly reduced (average 22.5±3.7) when compared to the pre-pregnancy period, and that the sexual arousal was significantly decreased during pregnancy (3.2±0.9) when compared with pre-pregnancy period (4.7±0.7)[12].

As regard female sexual dysfunction distribution in pregnant cases according to gestational age; our findings showed that through the three trimesters, desire, arousal and total score domains showed a statistically significant difference ($p$ =0.001, $p$ =0.005, $p$ =0.023 respectively). The mean of total score of FSFI was significantly lower in the third trimester (20.55±3.66), followed by the first (22.66±3.85) and finally the second trimester (25.96±2.52), meanwhile the means of lubrication, orgasm, satisfaction, and pain domains showed no statistically significant difference through the three trimisters ($p$ >0.05). In agreement with our findings, a cross-sectional study conducted on 300 healthy heterosexual pregnant Egyptian women and aimed to evaluate FSD through the three pregnancy trimesters, the incidence of FSD demonstrated significant alterations throughout pregnancy, being 68% in the 1st trimester, decreasing in the 2nd trimester to 51% and increasing to 72% in the 3rd trimester ($p$ <0.05)[13].

In accord also with our findings, Mostafa *et al.*, (2021) found that the FSD total score was highest in third trimester followed by first trimester and then the second trimester ($p$ =0.023). The 2nd trimester was the least affected which may be attributed to being the most emotionally stable period of gestation, where pregnancy seems to be clearly established, with a diminished fear of fetal loss and reduction of early symptoms of pregnancy such as fatigue, nausea, and vomiting[10].

Concerning the correlation between FSFI domains and hormonal profile in the current work, in pregnant women, the arousal domain of the FSFI showed a significant negative correlation with total serum testosterone, whereas this correlation was not significant in non-pregnant women. Serum estradiol negatively correlated with the arousal, desire, orgasm, and total FSFI scores in pregnant women. The testosterone/estradiol ratio negatively correlated with all FSFI domains in both pregnant and non-pregnant women.

Mostafa *et al.*, (2021)[10] agreed with these findings, they reported a negative impact of hormonal changes on sexual function in pregnant women. , a negative correlation between total testosterone level and arousal in pregnant women. They reported a negative correlation between estradiol and some sexual function domains in pregnant women as well. Moreover, they found that non-pregnant females showed no correlation between total testosterone level and sexual function domains.

In disagreement with our findings, Erol and his colleagues (2007)[14] , found no relationship between diminished sexual function and serum total androgen in pregnant women. Also, Stuckey (2008)[15], reviewed the influence of sex hormones on the sexual function during pregnancy and mentioned that if it is hormone-related, the most likely explanation of lower sexual desire towards the end of pregnancy is the high progestin level, rather than decreased androgen levels. This contrast may be due to the increased incidence of sexual dysfunction in Egyptian females due to psychological factors and misconceptions regarding harmful effects of sexual intercourse during pregnancy such as abortion and preterm labor.

Regarding correlation between FSFI domains and other demographic data, our results showed that the educational level of the participants was inversely correlated with the incidence of sexual problems, Females who had low educational level showed a statistically significant correlation with reduced score of FSFI domains (desire, orgasm and satisfaction).

In accordance also with our results, Safarineja, (2006) in a survey in Iran revealed that women with a low level of education had a 1.3 and 1.5 times greater risk of FSD than women with university educations, better educated women pay more attention to sexual consciousness and property rights and are more able to express their desire and dissatisfaction[16]. In Egypt, this may be attributed to the fact that low educated women have more life stressors, bad financial conditions and less quality life style[17]. In accord also with our results, Sarıibrahimand Köleli (2019)evaluated the prevalence and predictors of sexual dysfunction among 1,749 women. They reported that sexual dysfunction was associated with various demographic characteristics, including age and education. Those women who were college graduates had lesser degrees of low sexual desire, problems achieving orgasm, sexual pain, and sexual anxiety when compared to the women who did not graduate from high school[18].

Our results revealed that female sexual dysfunction was higher in employed subjects. These results agreed with Addis *et al.*, (2006) who stated that women who are frequently tired, depressed, or irritable are less likely to desire sexual activity as sexual function rely on both physical and mental health, and normal sexual activity are more common in healthier women[19].

While results came in disagreement with Smith *et al.*, (2017), who found that women whose work is much heavier are physically less likely to have difficulties with sexual activity, and physical exertion may be protective from sexual dysfunction problems or that both physical work and sexual activity are more common in women who are healthier overall[20]. In our opinion,

several cultural, environmental and dietary factors could contribute to the discrepancies between these findings.

## CONCLUSION

Sexual function is significantly impaired in pregnant women compared to non-pregnant women, with notable declines in FSFI scores for desire, arousal, orgasm, and overall sexual function. The second trimester has a lesser impact on sexual function compared to the first and third trimesters. Hormonal changes, along with female age, husband age, and duration of marriage, significantly affect sexual function during pregnancy. Evaluating sexual function in pregnant women should take these hormonal and demographic factors into account.

## CONFLICT OF INTEREST

There is no conflict of interest.

## REFERENCES


1. Alizadeh, S., Riazi, H., Alavi-Majd, H., and Ozgoli, G. Prevalence of female sexual dysfunction during pregnancy in Eastern Mediterranean Regional Office (EMRO) countries: A systematic review and meta-analysis. The Journal of Maternal-Fetal and Neonatal Medicine, 2022; 35: 6654-62.
2. Laan E, Both S. Sexual desire and arousal disorders in women. Adv Psychosom Med. 2011;31:16-34.
3. Shahraki, Z., Tanha, F. D., and Ghajarzadeh, M. Depression, sexual dysfunction, and sexual quality of life in women with infertility. BMC Women's Health,2018; 18: 1-4.
4. Banaei, M., Zahrani, S. T., Pormehr-Yabandeh, A., Ozgoli, G., Azad, M. Investigating the impact of counseling based on the PLISSIT model on sexual intimacy and satisfaction in breastfeeding women. International Journal of Pharmaceutical Research and Allied Sciences, 2016; 5(4):36-50.
5. Anbaran Z. K., Baghdari N., Pourshirazi M., Karimi F. Z., Rezvanifard M., Mazlom S.R. Postpartum sexual function in women and infant feeding methods. J Pak Med Assoc. 2015;65(3):248-52.
6. Hajnasiri, H., Moafi, F., Nami, M., and Safaralinez had, A. Sexual dysfunction and its related factors among pregnant women referred to health centers in Qazvin, Iran. Social Health and Behavior, 2020; 3: 27-34.
7. Cappelletti, M., and Wallen, K. Increasing women's sexual desire: The comparative effectiveness of estrogens and androgens. Hormones and Behavior, 2016; 78: 178-93.
8. Anis, T., Gheit, S., Saied, H., and Kherbash, S. Arabic translation of the Female Sexual Function Index and validation in an Egyptian population. J Sex Med. 2011;8(12):3370-8.
9. Lou WJ, Chen B, Zhu L, Han SM, Xu T, Lang JH, Zhang L. Prevalence and Factors Associated with Female Sexual Dysfunction in Beijing, China. Chin Med J (Engl). 2017;130(12):1389-94.
10. Mostafa, R., Elfatah, R., Khalil, O. and Saad, H. Sexual function and related endocrinological and psychological aspects in pregnancy: A controlled study. Suez Canal University Medical Journal, 2021; 24(2), 144-54.
11. Schock H., Zeleniuch-Jacquotte A., Lundin E., Grankvist K., Lakso H. Å., Idahl A., Lehtinen M., Surcel H. M., et al.,Hormone concentrations throughout uncomplicated pregnancies: a longitudinal study.BMC Pregnancy Childbirth.2016;16(1):146-56.
12. Ahmed, M., Madny, E., and Sayed, A. Prevalence of female sexual dysfunction during pregnancy among Egyptian women. J ObstetGynaecol Res. 2014;40(4):1023-9.
13. Hanafy, S., Srour, N., and Mostafa, T. Female sexual dysfunction across the three pregnancy trimesters: An Egyptian study. Sex Health. 2014;11(3):240-3.
14. Erol B., Sanli O., Korkmaz D., Seyhan A., Akman T., and Kadioglu A. A cross-sectional study of female sexual function and dysfunction during pregnancy. J Sex Med. 2007;4(5):1381-7.
15. Stuckey B.G. Female sexual function and dysfunction in the reproductive years: the influence of endogenous and exogenous sex hormones.J Sex Med. 2008;5(10):2282-90.
16. Safarinejad MR. Female sexual dysfunction in a population-based study in Iran: prevalence and associated risk factors. Int J Impot Res. 2006;18(4):382-95.
17. Arafa, A., Elbahrawe, R, Shawky, S., Mostafa, A., Solima, S., El-Houfey, A., Abbas, A. Risk factors associated with female sexual dysfunction among married women in Upper Egypt; a cross sectional study. Int J Community Med Public Health. 2018;5(2):449-53.
18. Sarıibrahim A.B. and Köleli, I. A cross-sectional study of female sexual dysfunction among Turkish pregnant and nonpregnant women: Correlation with hormone profile. The Eur ResJ, 2019; 5(2): 258-67.

19. Addis I. B., Van Den Eeden S. K., Wassel-Fyr C. L., Vittinghoff E., Brown J. S., Thom D. H.Reproductive Risk Factors for Incontinence Study at Kaiser Study Group. Sexual activity and function in middle-aged and older women. Obstet Gynecol. 2006;107(4):755-64.

20. Smith R. L., Gallicchio L., and Flaws J. A.Factors Affecting Sexual Activity in Midlife Women: : Results from the Midlife Health Study. J Womens Health (Larchmt). 2017;26(2):103-8