ORIGINAL RESEARCH

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Female Sexual Dysfunction During Pregnancy: A Case-Control Study

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ABSTRACT Objective: This prospective study aimed to explore sexual dysfunction during pregnancy by comparing sexual function and depression scores among high-risk pregnant women, healthy pregnant women, and healthy non-pregnant women of reproductive age. **Material and Methods:** Data were collected from 553 participants who provided complete responses using the sociodemographic and pregnancy history forms, the Female Sexual Function Index, and the Beck Depression Index. **Results:** Pregnant women, compared to non-pregnant individuals, exhibited significantly lower scores in desire, arousal, lubrication, orgasm, satisfaction, pain parameters, and total sexual function ($p<0.001$ for all parameters), with a significantly higher total Beck Depression score ($p=0.022$). High-risk pregnancies showed even lower scores in desire, arousal, lubrication, orgasm, satisfaction, pain parameters, and total sexual function ($p<0.001$ for all parameters), with a significantly higher total Beck Depression score ($p=0.003$) compared with healthy pregnant participants. Among the 3 groups, high-risk pregnant women had the highest prevalence of sexual dysfunction ($p<0.001$) and depression symptoms in the Beck Depression scores ($p=0.001$). The 3rd trimester was identified as the most vulnerable period for sexual dysfunction ($p<0.001$), while depression symptoms were most common in the 1st trimester ($p<0.001$). **Conclusion:** Pregnancy significantly increases the risk of sexual dysfunction and depression. Concurrent conditions such as hypertension, diabetes, and thyroid dysfunction intensify these challenges during pregnancy. Recognizing and addressing these factors are crucial to improving the overall well-being and quality of life of pregnant women.

Keywords: Pregnancy; female sexual dysfunction; depression; high-risk pregnant women

Sexual health is recognized as a vital component of overall well-being, encompassing physical, mental, and social dimensions. It is essential for individuals to have access to sexual knowledge and to engage in sexual relationships for pleasure and reproduction. Human sexuality, influenced by various factors, evolves throughout life, affecting communication, love, and quality of life. Sexual dysfunction, defined as the inability to achieve desired sexual relationships, is a significant concern.[1]

Female sexual function is shaped by physiological, psychological, and sociocultural factors and plays a crucial role in women's quality of life. Pregnancy, as a major life event, significantly affects sexual health, often leading to a decline in sexual activity due to anatomical, hormonal, and psychological changes. Studies indicate that sexual function tends to decrease as pregnancy progresses, particularly in the 3rd trimester, due to discomfort, fatigue, and concerns about fetal harm.[2]

Despite pregnancy being a transformative experience, sexuality during this period is often overlooked, with various factors influencing sexual interest and satisfaction. Misconceptions and concerns about harming the baby, along with cultural norms, can negatively impact sexuality during preg-

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nancy. However, restricting sexual activity during a healthy pregnancy is generally unnecessary.[3]

Sexuality during pregnancy remains a taboo topic in many societies, hindering open discussion and support for pregnant couples. While pregnancy is typically a positive experience, it can also lead to increased physical and mental stress. Additionally, the presence of additional illnesses during pregnancy poses a higher risk, necessitating increased medical intervention and impacting social relationships and responsibilities. While many studies have examined sexual function during pregnancy, sexual function in high-risk pregnancies has not been clearly investigated.[4]

Understanding the effects of pregnancy and additional illnesses on sexual life is crucial for identifying needs and expectations and improving healthcare quality. Given these gaps, this study aims to compare sexual function and depression scores among healthy pregnant women, high-risk pregnant women, and healthy non-pregnant women, shedding light on sexual dysfunction in high-risk pregnancies.

MATERIAL AND METHODS

This case-control study, conducted in accordance with the Declaration of Helsinki, assessed sexual dysfunction during pregnancy. The research protocol and procedures were reviewed and approved by the Ethics Committee of the Medical Faculty of the Mersin University (date: 08.02.2018, no: 2017-67). Written informed consent was obtained from all participants before participation in the study.

A total of 553 participants were included, comprising 211 healthy pregnant women (who are not diagnosed with any disease before or during pregnancy), 174 high-risk pregnant women (pregnant women with diseases such as diabetes, hypertension, thyroid dysfunction during pregnancy), and 168 non-pregnant women of reproductive age. The study focused on comparing the sexual function and depression scores among these groups.

The study was conducted at the Department of Obstetrics and Gynecology, Mersin University Faculty of Medicine, between February 11 and September 11, 2018. Participants were recruited through face-to-face interviews with pregnant women and gynecology clinic visits for non-pregnant individuals. Inclusion criteria included literacy, adulthood between the ages of 18 and 43, being in the reproductive period, less than the 35th week of pregnancy, living with a partner, absence of sexual dysfunction history, absence of diagnosed organic psychiatric disorder and desired pregnancies.

Three forms were used for data collection: a sociodemographic information form, the Female Sexual Function Index (FSFI), and the Beck Depression Inventory (BDI). Sociodemographic characteristics were collected through interviews, while FSFI and BDI were self-administered. FSFI consists of 6 separate 33 headings: desire, arousal, lubrication, orgasm, satisfaction, and pain. Frequency of sexual desire or interest in questions 1 and 2 (score range, 1 to 5); frequency, level, certainty, and satisfaction in questions 3-6 (score range, 0-5); frequency, difficulty of lubrication in questions 7-10 (score range, 0-5); frequency, difficulty, and satisfaction of orgasm in questions 11-13 (score range, 0-5); satisfaction, degree of intimacy with partner, level of satisfaction during sexual intercourse and in overall sexual life in questions 14-16 (score range, 0/1-5); pain or discomfort (presence of pain during entry into the vagina, level of pain following entry into the vagina, during and following entry) in questions 17-19. The questions (score range, 0-5) are addressed and evaluated. The adjusted factor loadings were determined as 0.6 for desire; 0.3 for arousal and lubrication; 0.4 for orgasm, satisfaction, and pain. After multiplying the sub-dimension means with the factor loadings, the lowest score that can be obtained from the scale is 2 and the highest score is 36. A higher score means a better function.[5] BDI is a 21-item self-assessment scale that measures depressive symptoms and characteristic approaches. Each item includes 4 options scored from 0 to 3. A total of 21 items can score 0-63, and an increase in the total score indicates an increase in depressive symptoms. The cut-off score for the Turkish society is generally accepted as 17.[6,7]

Statistical analysis included the Shapiro-Wilk test for normality, summary statistics, Mann-Whitney U test for group comparisons, Kruskal-Wallis test for more than 2 groups, Dunn test for “post hoc” anal-

ysis, and Spearman correlation coefficient for assessing relationships between variables. A p value of <0.05 was considered statistically significant.

RESULTS

A total of 553 patients (385 pregnant and 168 non-pregnant) participated in the study. No statistically significant differences were found between the 2 groups in terms of age, education, spouse's education, employment status, and age at marriage (p=0.159, p=0.33, p=0.632, p=0.23, p=0.59, respectively) (Table 1).

In the pregnant group, significant differences were observed in sexual function score parameters compared to the non-pregnant group: desire (2.70±1.15 vs. 3.51±1.40), arousal (2.44±1.88 vs. 4.09±1.26), lubrication (2.85±2.25 vs. 4.75±1.30), orgasm (2.52±2.11 vs. 4.45±2.24), satisfaction (2.87±2.39 vs. 4.58±1.45), and pain (2.47±2.19 vs. 4.05±1.46) (p<0.001 for all parameters). Additionally, the total sexual function score was significantly lower in the pregnant group than in the non-pregnant group (15.87±10.90 vs. 25.44±7.10, p<0.001), while the total Beck Depression score was significantly higher in the pregnant group (12.13±7.93 vs. 10.92±8.44, p=0.022) (Table 2).

TABLE 1: Comparison of the sociodemographic and obstetric histories between the pregnant and non-pregnant groups.

Characteristic	Pregnant	Non-pregnant	p value
Age	28.98±5.35	29.73±7.35	0.159
BMI	27.61±5.53	24.76±4.28	0.002
Age at marriage	23.80±4.68	22.87±5.16	0.059
Number of live births	0.89±0.97	1.45±1.08	<0.001
Education level			
Elementary school	156 (40.5%)	77 (45.8%)	
High school	95 (24.7%)	43 (25.6%)	0.332
University and above	134 (34.8%)	48 (28.6%)	
Employment status			
Employed	133 (34.5%)	67 (39.9%)	0.230
Unemployed	252 (65.5%)	101 (60.1%)	
Spouse's education level			
Elementary school	121 (31.4%)	59 (35.1%)	
High school	118 (30.6%)	46 (27.4%)	0.632
University and above	146 (37.9%)	63 (37.5%)	

BMI: Body mass index

TABLE 2: Comparison of sexual function score parameters, Total Sexual Function score, and Total Beck Depression score between the pregnant and non-pregnant groups

Parameters of the Total Sexual Function score	Pregnant (n=385) X̄-SD	Non-pregnant (n=168) X̄-SD	p value
Desire	2.7023-1.15471	3.5107-1.40925	<0.001
Arousal	2.4452-1.88007	4.0911-1.26958	<0.001
Lubrication	2.8527-2.25376	4.7500-1.30113	<0.001
Orgasm	2.5247-2.11568	4.4524-2.24256	<0.001
Satisfaction	2.8717-2.39536	4.5857-1.45636	<0.001
Pain	2.4758-2.19385	4.0595-1.46472	<0.001
Total Sexual Function score	15.8725-10.90273	25.4494-7.10728	<0.001
Total Beck Depression score	12.1325-7.93237	10.9281-8.44156	0.022

SD: Standard deviation

TABLE 3: Identified conditions in pregnant women

		Number	Percentage (%)
Pregnancy-related disease	None	211	54.8
	Hypertension	59	15.3
	Diabetes	56	14.5
	Thyroid disorder	49	12.7
	Hypertension+diabetes	10	2.6
	Total	385	100.0

Among the pregnant individuals, 54.8% were healthy pregnant women, while 45.2% had risky pregnancies. Hypertension, diabetes, and thyroid dysfunction were the most common risk factors observed in the high-risk pregnancy group (Table 3).

In the high-risk pregnancy group, desire (2.49±1.03 vs. 2.87±1.21), arousal (1.97±1.73 vs. 2.83±1.91), lubrication (2.39±2.15 vs. 3.22±2.26), orgasm (2.10±2.04 vs. 2.86±2.11), satisfaction (2.28±2.29 vs. 3.35±2.36), and pain (1.99±2.06 vs. 2.87±2.22) scores were significantly lower compared to the healthy pregnant group (p<0.001 for all parameters). Similarly, the total sexual function score was significantly lower in the high-risk pregnant group (13.25±10.31 vs. 18.02±10.92, p<0.001), while the total Beck Depression score was significantly higher (13.27±8.13 vs. 11.18±7.65, p=0.003) (Table 4).

When comparing the 3 groups (high-risk pregnant, healthy pregnant, and non-pregnant), significant differences were found in all sexual function param-

TABLE 4: Comparison of the Sexual Function score parameters, Total Sexual Function score, and Total Beck Depression score between healthy and high-risk pregnant women

Parameters of the Total Sexual Function score	Healthy pregnant group (n=211) X̄-SD	High-risk pregnant group (n=174) X̄-SD	p value
Desire	2.8720-1.21942	2.4966-1.03772	<0.001
Arousal	2.8308-1.91288	1.9776-1.73286	<0.001
Lubrication	3.2275-2.26804	2.3983-2.15671	<0.001
Orgasm	2.8682-2.11586	2.1080-2.04511	<0.001
Satisfaction	3.3592-2.36974	2.2805-2.29731	<0.001
Pain	2.8701-2.22206	1.9977-2.06641	<0.001
Total Sexual Function score	18.0280-10.92630	13.2586-10.31475	<0.001
Total Beck Depression score	11.1896-7.65582	13.2759-8.13142	0.003

SD: Standard deviation

eters and total sexual function scores (p<0.001). The high-risk pregnancy group scored the lowest, while the non-pregnant group scored the highest. Similarly, the total Beck Depression score differed significantly among the 3 groups (p=0.001), with the high-risk pregnancy group having the highest score (Table 5).

The study divided the pregnancy period into 3 trimesters: the 1st trimester, from 0 to 14 weeks of gestation; the 2nd trimester, from 14.1 to 28 weeks; and the 3rd trimester, from 28.1 to 35 weeks. Pregnant women beyond 35 gestational weeks were not included. It was observed that 20.8% of the pregnant women were in the 1st trimester, 42.6% were in the 2nd trimester, and 36.6% were in the 3rd trimester.

Regarding pregnancy trimesters, significant differences were observed in sexual function scores among the 1st, 2nd, and 3rd trimesters (p=0.005 for desire, p=0.001 for lubrication, p<0.001 for other parameters). Further analysis revealed significant differences in desire scores between the 1st and 2nd trimesters, as well as between the 2nd and 3rd trimesters (p=0.034, p=0.017). Arousal scores also showed significant differences between the 1st and 3rd trimesters and between the 2nd and 3rd trimesters (p=0.012, p<0.001). Lubrication scores significantly varied between the 2nd and 3rd trimesters (p=0.001). Similar patterns were observed for the orgasm, satisfaction, and pain scores.

TABLE 5: Comparison of the Sexual Function score parameters, Total Sexual Function score, and Total Beck Depression score between healthy pregnant women, high-risk pregnant women, and non-pregnant women

Parameters of the Total Sexual Function score	Healthy pregnant group (n=211) X̄-SD	High-risk pregnant group (n=174) X̄-SD	Non-pregnant group (n=168) X̄-SD	p value
Desire	2.8720-1.21942	2.4966-1.03772	3.5107-1.40925	<0.001
Arousal	2.8308-1.91288	1.9776-1.73286	4.0911-1.26958	<0.001
Lubrication	3.2275-2.26804	2.3983-2.15671	4.7500-1.30113	<0.001
Orgasm	2.8682-2.11586	2.1080-2.04511	4.4524-2.24256	<0.001
Satisfaction	3.3592-2.36974	2.2805-2.29731	4.5857-1.45636	<0.001
Pain	2.8701-2.22206	1.9977 2.06641	4.0595-1.46472	<0.001
Total Sexual Function score	18.0280-10.92630	13.2586-10.31475	25.4494 7.10728	<0.001
Total Beck Depression score	11.1896-7.65582	13.2759-8.13142	10.9281-8.44156	0.001

SD: Standard deviation

TABLE 6: Comparison of sexual function indices and Beck Depression scores among the pregnancy trimesters

Parameters of the Total Sexual Function score	1st trimester pregnant group (n=80) X̄-SD	2nd trimester pregnant group (n=164) X̄-SD	3rd trimester pregnant group (n=141) X̄-SD	p value
Desire	2.4825-0.99094	2.9341-1.23628	2.5574-1.10086	0.005
Arousal	2.6325-1.75966	2.8098-1.90927	1.9149-1.80131	<0.001
Lubrication	2.7450-2.25062	3.3073-2.19750	2.3851-2.23217	0.001
Orgasm	2.6300-2.00230	2.9829-2.15946	1.9319-1.99483	<0.001
Satisfaction	3.0750-2.54626	3.3707-2.38114	2.1759-2.16220	<0.001
Pain	2.5750-2.27154	2.9463-2.18327	1.8723-2.02686	<0.001
Total Sexual Function score	16.1400-10.76317	18.3512-10.69075	12.8376-10.5398	<0.001
Total Beck Depression score	14.4500-8.52829	10.7317-7.21969	12.4468-8.08652	0.001

SD: Standard deviation

Total sexual function scores differed significantly among the trimesters (p<0.001). Specifically, the 2nd trimester exhibited the highest score, while the 3rd trimester had the lowest. Additionally, total Beck Depression scores also showed significant differences among the trimesters (p=0.001), with the 2nd trimester having the lowest score and the 1st trimester having the highest (Table 6).

DISCUSSION

This study reveals that during pregnancy, particularly in high-risk cases, sexual dysfunction and depressive symptoms significantly increase compared with non-pregnant women of reproductive age. Throughout pregnancy, a decrease in sexual desire, frequency of intercourse, orgasm, and satisfaction was observed, with the most prominent dysfunction occurring in the 3rd trimester.

Among the causes of reduced sexual desire during pregnancy are the stress and anxiety associated with the transition to parenthood, physical discomfort, and hormonal changes experienced by the expectant mother.[8] Compared to the pre-pregnancy period, a reduction in orgasmic sexual encounters during pregnancy has been observed due to factors such as stress and anxiety concerning the fetus experienced by both the pregnant woman and her partner, fear that orgasm may cause pain, discomfort resulting from engorgement caused by vasocongestion, increased breast sensitivity causing discomfort during intercourse and orgasm, and lactation occurring with orgasm in later stages of pregnancy.[9,10] In line with previous studies reporting that physiological, hormonal, and emotional changes during pregnancy lead to alterations in sexual function, our study found a decline in sexual desire, frequency of intercourse, orgasm, and satisfaction, with dysfunction most commonly seen in the 3rd trimester. The 3rd trimester yielded the lowest scores across most parameters, including lubrication, orgasm, and satisfaction, likely due to increased pelvic pressure, uterine contractions, and heightened anxiety regarding childbirth and fetal safety.[11-13]

In contrast, the 2nd trimester-often referred to as the "honeymoon period" of pregnancy-showed a temporary improvement in sexual function due to adaptation to physical changes and stabilization of hormone levels.[14] In the 1st trimester, hormonal changes involving progesterone, prolactin, and estrogen contribute to nausea, breast tenderness, fatigue, and vaginal congestion, which negatively affect sexual health.[15-17] Moreover, widespread misconceptions-such as fear of harming the fetus through sexual activity-are particularly prominent during the 1st trimester and are cited as contributing to reduced libido and sexual activity.[18] This situation explains the observed increase in desire, orgasm, and overall satisfaction scores in the 2nd trimester compared with the 1st.

In our study, all FSFI parameters were lower, and depression scores were higher in the high-risk pregnancy group compared with the healthy preg-

nancies. In high-risk pregnancies, the physical, hormonal, and emotional changes inherently present in pregnancy are compounded by the psychological burden of a medical condition that must also be managed. Intense anxiety over the potential negative effects of the disease on the fetus, along with increased physical and psychological stress factors, intensifies sexual dysfunction.[19] In particular, medication use, restrictions in physical activity, and concerns about fetal health contribute to this condition.[20]

Regarding the BDI scores, the 2nd trimester group had the lowest, while the 1st trimester group had the highest mean scores ($p<0.001$). Possible explanations for this include lack of acceptance of the pregnancy, emotional ambivalence, physical discomforts, and unplanned pregnancy in the 1st trimester, while in the 3rd trimester, concerns about the health of both the baby and the mother, fear of childbirth, anxiety about possible complications during delivery, and worsening health conditions as pregnancy progresses play a significant role.[21,22] Furthermore, increasing levels of progesterone-especially in the 1st and 3rd trimesters-may explain the more frequent appearance of depressive symptoms in these stages.[23]

LIMITATIONS

A major strength of this study is the inclusion of a comparative analysis between healthy and high-risk pregnancies, providing a comprehensive perspective on the factors influencing sexual function. Additionally, the use of standardized scales for assessing sexual dysfunction and depression increases the reliability of the findings. However, certain limitations must be acknowledged. First, the study relied on self-reported data, which may introduce recall bias and subjective interpretation of sexual function. Second, the study population was limited to a specific geographic region, potentially limiting the generalizability of the findings to other populations with different cultural and socioeconomic characteristics. Given that individual factors play a crucial role in the identification and causes of sexual dysfunction, longitudinal studies are likely to provide more meaningful contributions to the literature compared with case-control designs.

CONCLUSION

In conclusion, sexual dysfunction and depressive symptoms are more common in pregnant women-particularly those with high-risk pregnancies-than in their non-pregnant counterparts. Sexual function appears to improve during the 2nd trimester but declines in the 3rd trimester. Addressing the emotional and physical health of pregnant women, dispelling misconceptions, and including sexual health in prenatal care may improve the quality of life and intimate relationships during pregnancy.

Source of Finance

During this study, no financial or spiritual support was received neither from any pharmaceutical company that has a direct connection with the research subject, nor from a company that provides or produces medical instruments and materials which may negatively affect the evaluation process of this study.

Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Kıvılcım Bektaş, Filiz Çayan;* ***Design:*** *Kıvılcım Bektaş, Filiz Çayan;* ***Control/Supervision:*** *Kıvılcım Bektaş, Onur Bektaş, Filiz Çayan;* ***Data Collection and/or Processing:*** *Kıvılcım Bektaş, Onur Bektaş;* ***Analysis and/or Interpretation:*** *Kıvılcım Bektaş, Onur Bektaş;* ***Literature Review:*** *Kıvılcım Bektaş, Filiz Çayan;* ***Writing the Article:*** *Kıvılcım Bektaş, Onur Bektaş, Filiz Çayan;* ***Critical Review:*** *Kıvılcım Bektaş, Filiz Çayan;* ***References and Fundings:*** *Kıvılcım Bektaş, Onur Bektaş, Filiz Çayan;* ***Materials:*** *Kıvılcım Bektaş, Onur Bektaş, Filiz Çayan.*

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