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The Relationship of Pregnant Women's Sexual Activity and Response with Spouses' Emotional Response to Pregnancy

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ABSTRACT

Background & aim: Women's emotional relationships with their spouses can be influenced by adverse sexual performance during pregnancy. A spouse's supportive behavior toward pregnancy and his emotional response play a pivotal role in maintaining his pregnant wife's mental well-being. This study aimed to investigate the relationship between pregnant women's sexual activity and response with spouses' emotional response to pregnancy.

Methods: In this cross-sectional study, cluster sampling was employed to select 265 pregnant women having a healthy singleton pregnancy within 16–24 weeks from January to Agust 2024. The Raj Sexual Activity and Response Questionnaire and the Kazemi Emotional Reaction to Pregnancy Questionnaire were used to collect data on a self-report basis. ANOVA, paired t-tests, Pearson correlation coefficients, and linear regression were utilized for data analysis in SPSS Statistics 22.

Results: Before pregnancy, 79.6% of women showed sexual activity and response at satisfactory to excellent levels. However, this figure declined to 40.4% after pregnancy, with mean scores for sexual activity and response falling from 63.86±19.51 pre-pregnancy to 44.88±14.31 post-pregnancy (P<0.001). Additionally, the mean emotional response to pregnancy score of the spouse was recorded as 52.35±21.31. There was a significant positive correlation between women's sexual activity and response and the spouses' emotional response to pregnancy (P=0.001, r=0.202).

Conclusion: The spouse's emotional response to pregnancy was positively associated with the pregnant women's sexual activity and response. The results can be used to develop a pregnancy counseling program to establish safe marital environments and relationships, helping pregnant women with psychological stress.

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Introduction

During pregnancy, male spouses' positive emotional response is considered highly valuable because it can mitigate women's anxiety and depression. In other words, a male spouse's emotional response to pregnancy reflects positive signs of fatherhood in support of pregnancy (1). Pregnancy is one of the most sensitive periods in a woman's life, having profound effects on her sexual activity and intercourse (2). While this period can bring joy to many women, the numerous physical and

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psychological changes caused by pregnancy can increase their vulnerability to various complications. As a result, women's overall physical, psychological, and social health, as well as their quality of life, may undergo significant changes (3).

Pregnant women's sexual response can be affected by multifarious factors: physiological, anatomical, and hormonal changes; cultural, social, ethnic, and religious factors; fear and anxiety related to sexual relationships during pregnancy; alterations in body image; and feelings of reduced physical attractiveness. All these factors can influence sexual relationships between spouses, ultimately disrupting the mental health of the family. Improving the quality of relationships and emotional support between couples can lower potential stress. Furthermore, a woman's positive attitude toward her spouse can significantly influence well-being during pregnancy (4). Declined sexual activity and failure to meet pregnant women's sexual needs may lead some men to seek extramarital affairs (5). Pregnant women's declined desire for emotional interaction is often interpreted as indifference (1), and their refusal to have sex with their spouses can lead to domestic violence or exacerbate existing violent dynamics (5). Men also profoundly influence women's access to economic resources, something which in turn affects their access to health services, nutritious food, and workload, thereby playing a major role in the health outcomes of both mothers and infants (6). Men's inadequate knowledge of health behaviors, as well as pregnant women's physiological and psychological needs and the challenges they frequently face during pregnancy, can hinder their ability to provide supportive care, even when they express an interest in reproductive health.

Men's involvement is essential for achieving the third Millennium Development Goals, especially those pertinent to women's empowerment and the improvement of maternal health (7). Men may face various challenges in fulfilling their paternal roles in the family, particularly when their wives are pregnant. Given the lack of information and not-so-comprehensive studies conducted on this subject, and the necessity of this study to help improve couples' relationships, we decided to conduct this study. Therefore, this study aimed to investigate the relationship between pregnant women's sexual activity and response with the spouses' emotional response to pregnancy.

Materials and Methods

In this cross-sectional study, cluster (multistage) sampling was employed to select 265 pregnant women who visited comprehensive health centers in Tehran, from January to Agust 2024.

The study population included all Iranian pregnant women who were experiencing their first or second pregnancies and were in normal gestational conditions during the second trimester. The inclusion criteria encompassed having an Iranian nationality, being older than 18 years, having maternal literacy, undergoing 16th and 24th weeks of pregnancy, experiencing a natural and healthy singleton pregnancy, and being in either the first or second pregnancy. Exclusion criteria from the study were multifetal pregnancy, third pregnancy and above, and pregnancy complications.

The sample size was estimated at a confidence level of 95% and a power of 90% to assume a correlation coefficient of at least 0.2 between pregnant women's sexual activity and the spouse's emotional reaction to pregnancy, which was deemed statistically significant. The value of r=0.2 was used as the effect size to determine the sample size. This value is considered a small effect size based on Cohen's classification. The purpose of adopting this value was to boost the power of the study.

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2}{w^2} + 3$$

$$w = \frac{1}{2}\ln\frac{1+r}{1-r}$$

$$n = \frac{(1/96+1.28)^2}{(0/2)^2} + 3 = 265$$

$$w = \frac{1}{2}\ln\frac{1+0/2}{1-0/2} = 0/2$$

After quantification through the appropriate formula, the sample size was determined to include 265 pregnant women.

To do the sampling, at first, the comprehensive health centers located in the northern and northwestern parts of Tehran were selected as classes, whereas their affiliated health centers were categorized as clusters. Based on the number of available health centers, a few clusters were selected randomly. Sampling was then performed on each cluster in accordance with the size of the population served by each center.

Data collection tools included the Sexual Activity and Response Questionnaire (Raj et al. 2009), the Emotional Reaction to Pregnancy Questionnaire (Kazemi et al. 2021), and a demographic information registration form. The demographic form covered different variables, *e.g.*, the respondent's age, the respondent's educational attainment, the spouse's age and educational attainment, the spouse's occupation, family income, housing status, the number of pregnancies, the number of births, and the number of abortions. The Sexual Activity and Response Questionnaire consisted of 26 items addressing various aspects of sexual activity, with responses categorized into ten domains: the frequency of sexual activities, sexual desire, sexual arousal, orgasm, women's sexual satisfaction, dyspareunia, initiation of sexual intercourse, women's sexual complications, men's sexual satisfaction, and men's sexual complications before and during pregnancy. Furthermore, items regarding men's sexual complications were also posed to women, incorporating their perspectives on their spouses. Cronbach's alpha was employed to determine the internal consistency and reliability of the data collection tool, whereas the split-half method was used to determine correlation. The tools were initially distributed to 20 pregnant mothers who met the inclusion criteria. This number was not the final sample size. In this study, Cronbach's alpha coefficient of the pregnant mother's sexual activity and response questionnaire was determined to be 0.718, whereas that of the spouse's emotional reaction to pregnancy questionnaire was reported to be 0.936.

The Emotional Reaction to Pregnancy Questionnaire consisted of 19 items rated on a five-point Likert scale (1 to 5), including three reversely scored items (items 11, 12, and 13). The response choices ranged from "completely disagree" (1) to "completely agree" (5). The total score for this questionnaire ranged from 19 to 95, with higher scores indicating a more positive reaction to pregnancy, which was perceived as more favorable by women. The reliability of this tool was confirmed with a Cronbach's alpha of 0.936.

To collect data, mothers who met the inclusion criteria and had previously submitted their information to the system were interviewed. After necessary coordination with the pregnant mothers and obtaining written consent, the questionnaire was filled using a self report method by mothers prior to their examinations in the waiting area, with an average completion time of ten minutes. In case participants required further clarifications, the researcher provided support and explanations during the interviews. After each questionnaire was filled, the researcher did a brief review and if any sections were incomplete, participants were encouraged to provide the missing data.

To analyze the relationship between pregnant women's sexual activity and response, as well as the spouses' emotional response to pregnancy, Pearson's correlation test was conducted. Independent t-tests, paired t-tests, linear regression, Tukey's test, and ANOVA were then used for data analysis in SPSS Statistics 22.

Results

The statistical sample included 265 pregnant women, with a mean age of 28.63±5.08 years old. The mean duration of marriage among the participants was 3.88±2.37 years. Most of the participants (54%) were homemakers, and 32.5% of them had secondary education. Additionally, 65.7% resided in rental housing. The mean age of their spouses was 32.95±4.19 years old. Furthermore, 41.5% of the spouses were involved in freelancing jobs, whereas 27.9% held high school diplomas, representing the highest frequency of educational attainment. Moreover, 47.9% of the spouses indicated an average income level. Notably, 50.6% of the mothers were experiencing their second

pregnancy, and the majority of them (81%) reported no history of abortion (Table 1).

In the examined cohort, 53.6% of the women reported a satisfactory level of sexual activity and response before pregnancy. However, after pregnancy, this figure declined to 51.7%, indicating a shift toward unfavorable sexual activity and response. This score was obtained from the sum of the scores pertinent to the number of sexual activities, sexual desire, sexual arousal, orgasm, female sexual satisfaction, dyspareunia, sexual initiator, female sexual problems, spouses' sexual satisfaction, and spouses' sexual problems. Moreover, a score below 25 indicates very undesirable sexual relationships and activity, whereas a score of 25–50 represents undesirable sexual relationships and activity. Furthermore, a score of 50–75 shows satisfactory sexual relationships and activity, whereas a score of 75–100 indicates excellent sexual relationships and activity.

Table 1. The frequency distribution of demographic characteristics of pregnant women

Variables	N (%)
Age (years)	
>25	61(23%)
25-29	83(31.3%)
30-34	76(28.7%)
≤35	45(17%)
Duration of marriage	
1-3	142(53.6%)
4-6	88(33.2%)
≤7	35(13.2%)
Occupation	
Housewife	143(54%)
Employed	122(46%)
Educational level	
Elementary	51(19.2%)
High school	86(32.5%)
Associate's degree	69(26%)
Bachelor's degree and higher	59(22.3%)
Type of residence	
Personal	91(34.3%)
Rental	174(65.7%)
Number of pregnancies	
1	131(49.4%)
2	134(50.6%)
Number of abortions	
0	215(81.1%)
1	50(18.9)

The pre-pregnancy mean score of sexual activity was 63.86±19.51, whereas the post-pregnancy mean score plummeted to 44.88±14.31. Based on the paired t-test results, the post-pregnancy mean score was significantly lower than that of the pre-pregnancy score (P<0.001) (Table 2).

The mean score of the spouses' emotional responses was determined to be 52.35±21.31.

Sexual activity and response during pregnancy had a positive, significant correlation with the spouse's emotional response (P=0.001). In other words, as the pregnant mother's sexual activity and response increased, the spouse's emotional response improved. Nevertheless, this correlation was observed at a weak level (r=0.202).

Table 2. The statistical distribution of pregnant women's sexual activity and response

Women's sexual activity and response	Before pregnancy N(%)	During pregnancy N(%)
Highly undesirable	2(0.8%)	21(7.9%)
Undesirable	52(19.6%)	137(51.7%)
Satisfactory	142(53.6%)	94(35.5)
Excellent	69(26%)	13(4.9%)
SD±Mean	19.51±63.86	14.31±44.88
MIN- MAX	20-100	15-83
Paired t-test result	P<0.001	

A positive correlation between sexual activity and the emotional responses of the spouse to pregnancy. Furthermore, an increase in the sexual activity and responsiveness of the pregnant women was reported to be associated with heightened emotional responses from the husband (P=0.001) (Figure 1).

The results also indicated that sexual activity and response after pregnancy had a positive, significant relationship with the mother's education (P=0.021) and the husband's education (P=0.038).

In particular, pairwise Tukey comparisons demonstrated that mothers with university degrees reported significantly higher mean scores in sexual activity and response than those with secondary education degrees (P=0.039) and high school diplomas (P=0.036). Similarly, the mean scores of sexual activity and responses in women whose husbands possessed university degrees were significantly greater than those

whose husbands had only secondary education degrees (P=0.036) (Table 3).

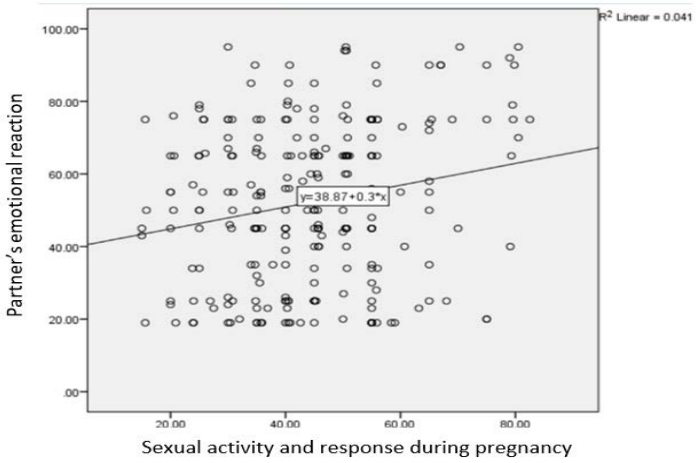

Figure 1. The linear regression diagram of the correlation between the pregnant mother's sexual activity and response and the spouse's emotional response to pregnancy

Table 3. The Mean of pregnant women's sexual activity and response after pregnancy according to their demographic characteristics

Variable	Frequency	Mean	SD	Test results
Age (years)				
>25	61	50.66	14.79	P=0.10 *r=-0.101
25-29	83	40.58	14.33	
30-34	76	43.86	13.7	
≤35	45	46.71	11.92	
Duration of marriage				
1-3	142	45.32	15.65	P=0.70 *r=-0.023
4-6	88	43.7	13.47	
≤7	35	46.05	10.29	
Occupation				
Housewife	143	44.4	14.62	**t=0.598 df=263
Employed	122	45.45	13.99	P=0.55
Educational level				
Elementary	51	46.25	14	***F=3.288 P=0.02
High school	86	42.91	15.54	
Associate's degree	69	42.53	13.48	
Bachelor's degree and higher	59	49.32	12.77	
Residence				
Personal	91	46.34	14.99	**t=1.201 df=263
Rental	174	44.12	13.93	P=0.23
Age of spouse				
≥30	63	47.01	16.02	*r=0.012 P=0.84
30-34	110	42.02	13.97	
≤35	92	46.85	13.01	
Occupation of spouse				
Unemployed	19	46.35	15.07	***F=0.917 P=0.43
Employee	65	42.73	11.79	
Out worker	71	44.36	10.03	
Self-employed	110	46.24	15.07	
Educational level of spouse				

Variable	Frequency	Mean	SD	Test results
Illiterate	30	47.87	13.02	
Elementary	44	43.28	14.5	
High school	59	41.46	14.92	***F=2.584 P=0.03
Associate's degree	74	44.17	14.07	
Bachelor's degree and higher	58	48.95	13.72	
Income				
Poor	109	45.05	14.83	
Moderate	127	43.66	13.41	***F=2.071 P=0.12
Well	29	49.61	15.65	
Number of pregnancies				
1	131	44.05	15.18	**t=0.938 df=263
2	134	45.7	13.43	P=0.34
Number of abortions				
0	215	44.27	14.31	**t=1.446 df=263
1	50	47.53	13.87	P=0.14

*Pearson correlation coefficient **Independent t-test ***Analysis of variance

Furthermore, the emotional reactions of spouses exhibited significant correlations with various factors, *e.g.*, the mother's occupational status (P<0.001), educational attainment (P<0.001), the place of residence (P=0.002), the spouse's age (P=0.007), his occupational status (P<0.001), his educational attainment (P<0.001), and his income level (P<0.001). The emotional responses of working husbands were observed to be more pronounced than those of housewives. The two-way Tukey comparisons indicated that mothers with university degrees had significantly higher mean scores than those with elementary education (P<0.001), high school education (P<0.001), and diplomas (P=0.022). Additionally, mothers with high school diplomas obtained significantly higher scores than those with secondary education (P=0.008).

The emotional responses of spouses were also reported to be greater among women residing in private homes than those living in rented accommodations. The two-way Tukey analysis revealed that mothers whose husbands were self-employed had significantly higher mean scores than those whose husbands were unemployed (P=0.001) or employed in other sectors (P=0.003). Moreover, the emotional responses of employed women's husbands were significantly higher than those of unemployed women's husbands (P=0.024). The mean scores of mothers whose husbands held university degrees were significantly higher than those of illiterate (P<0.001) mothers or mothers with elementary (P<0.001) or secondary education (P<0.001). Likewise, the mothers whose husbands had high school diplomas obtained significantly higher scores than those with secondary education whose husbands were illiterate (P=0.004) or had elementary education (P=0.013).

The Pearson correlation test further indicated a positive relationship between the spouse's age and his emotional responses. The two-way Tukey comparison showed that the mean scores of mothers in low-income categories were significantly lower than those in average (P=0.008) and higher income (P<0.001) categories. In the regression model, both the age (P=0.043) and the educational attainment of the spouse were considered significant predictors. Specifically, the emotional response of spouses with primary education was found to be 0.3 times lower than that of spouses with university education (Tables 4 and 5).

The average number of sexual activities, sexual desire, sexual arousal, orgasm, and sexual satisfaction of the spouses decreased during pregnancy. The average score of initiating sexual intercourse during pregnancy decreased, which indicates that sexual intercourse was started by force and compulsion without any desire or that the spouse usually initiated sexual intercourse, but before pregnancy, most sexual intercourse started spontaneously or with stimulation.

Table 4. The statistical values of spouses' emotional response to pregnancy according to the women's demographic characteristics

Variable	Frequency	Spouse's emotional response to pregnancy	Test results	P-Value
		Mean	SD	
Age (year)				
>25	61	48.51	23.49	
25-29	83	53.19	23.33	*r=0.108, P=0.078
30-34	76	51.61	18.96	
≤35	55	57.26	17.16	
Duration of marriage (year)				
1-3	142	51.32	22.48	P=0.169 r*=0.085
4-6	88	51.88	19.31	
≤7	35	57.71	20.92	
Occupation				
House wife	143	47.27	19.93	P< 0.001, **t=4.339 df=263
Employee	122	58.3	21.39	
Education				
Elementary	51	42.25	19.79	
High school	86	48.69	18.89	P< 0.001, ***F=12.516
Associate's degree	69	54.11	23.31	
Academic	59	64.35	17.53	
Type of residence				
Owned	91	57.86	21.83	P= 0.002, **t=3.097 df=263
Rental	174	49.46	20.49	
Spouse				
Age of wife				
≥30	63	46.66	22.97	P= 0.007, *r=0.164
30-34	110	52.19	20.76	
≤35	92	56.44	20.02	
Occupation				
Unemployed	19	38.42	19.98	
Employee	65	53.73	21.26	P< 0.001, ***F=7.221
Out worker	71	46.64	19.76	
Self-employed	110	57.62	20.19	
Education				
Illiterate	30	40.4	21.57	
Elementary	44	43.63	17.3	
High school	59	48.84	20.27	P< 0.001, ***F=11.184
Associate's degree	74	55.77	20.26	
Academic	58	64.36	19.65	
Income				
Poor	109	46.62	20.29	P< 0.001, ***F=9.212
Moderate	127	54.73	20.81	
Well	29	63.44	21.43	
Number of Pregnancy				
1	131	51.22	21.32	P=0.393 **t=0.855 df=263
2	134	53.46	21.3	
Number of Abortion				
0	215	51.54	20.65	P=0.202 **t=1.279
1	50	55.82	23.78	

Variable	Frequency	Spouse's emotional response to pregnancy	Test results	P-Value
		Mean	SD	
				df=263

*Pearson correlation coefficient **Independent t-test ***Analysis of variance

Table 5. Linear regression analysis of factors affecting spouses' emotional response to pregnancy

Variable	Coefficient	Standard coefficient	t	Significance level	Confidence interval	R^2
Spouse's age	0.614	0.121	2.034	0.043	(0.02,1.208)	
Occupation						
House wife	-0.562	-0.013	-0.17	0.865	(-7.06, 5.938)	
Employed				Ref		
Education						
Elementary	-5.345	-0.099	-0.826	0.41	(-18.089, 7.4)	
High school	-2.751	-0.061	-0.49	0.624	(-13.807, 8.305)	
Associate's degree	-4.298	-0.089	-1.006	0.315	(-12.714, 4.118)	
Academic				Ref		
Type of residence						
Owned	2.467	0.055	0.836	0.404	(-3.349, 8.284)	
Rental				Ref		
Income						
Poor	2.657	0.061	0.429	0.668	(-9.548, 14.862)	0.151
Moderate	-2.549	-0.06	-0.555	0.58	(-11.604, 6.505)	
Well				Ref		
Spouse's Occupation						
Employee	6.809	0.138	1.085	0.279	(-5.51, 19.169)	
Out worker	6.354	0.132	1.209	0.228	(-3.999, 16.707)	
Self-employed	9.689	0.25	1.582	0.115	(-2.377,21.755)	
Un employed				Ref		
Spouse's education						
Illiterate	-18.086	-0.27	-2.551	0.011	(-32.052, -4.12)	
Elementary	-17.131	-0.3	-2.688	0.008	-577.4) ,(-686.29	
High school	-13.452	-0.263	-2.382	0.018	(-29.686, -4.577)	
Associate's degree	-6.521	-0.138	-1.563	0.119	(-14.735, 1.694)	
Bachelor's degree and higher				**Ref**		

Table 6. The distribution of statistical values of the subscales of pregnant women's sexual activity and response questionnaire

Variable	Before Pregnancy		During Pregnancy	
Score	**Mean**	**SD**	**Mean**	**SD**
Frequency	63.77	34.93	45.80	27.20
Desire	67.35	41.74	41.96	31.66
Arousal	63.58	40.87	49.05	32.11
Orgasm	57.92	43.00	40.75	30.14
Intercourse start	95.47	20.83	53.39	33.25
Male sexual satisfaction	81.50	38.89	53.77	35.95
Dyspareunia	75.09	43.32	35.84	48.04
Female sexual difficulties	24.90	43.32	44.33	49.67
Male sexual difficulties	62.64	48.46	52.83	49.82
Females Satisfaction	46.34	33.02	31.23	29.06

The average dyspareunia score before pregnancy was 75.09, and during pregnancy, it was 35.84, which indicates an increase in the feeling of dyspareunia during pregnancy.

According to the spouses' sexual problems criterion score, spouses experience more sexual problems during pregnancy than women (Table 6).

Discussion

The purpose of this study was to investigate the relationship between pregnant women's sexual activity and response and the spouses' emotional response to pregnancy. Before pregnancy, sexual activity and response in more than half of the women (53.6%) were at a satisfactory level. However, around half of the women (51.7%) showed undesirable levels of sexual activity and response during pregnancy. According to the factors affecting sexual activity and response in women (*i.e.,* the number of sexual activities, sexual desire, sexual arousal, orgasm, and the sexual satisfaction of the spouses) decreased during pregnancy. Moreover, the average score of initiating sexual intercourse during pregnancy declined, a finding which indicates that sexual intercourse was started by force and compulsion and without any desire, or that the spouse usually took the lead in initiating sexual intercourse, whereas most sexual intercourse before pregnancy started spontaneously or with stimulation.

According to the male and female sexual difficulties scores, spouses experience more sexual difficulties during pregnancy than women. Comparing the data of dyspareunia indicated an increase in the feeling of dyspareunia during pregnancy.

Consistent with the findings of this study, the results reported by Alizadeh *et al.* (2019) showed that the scores of the number of sexual activities, sexual desire, sexual arousal, orgasm, women's sexual satisfaction, dyspareunia, sex initiator, spouses' sexual satisfaction, and spouses' sexual problems were lower during pregnancy than before pregnancy (2). Similarly, a few other studies indicated a significant reduction in the number of sexual intercourses during pregnancy compared to before pregnancy (8-9) in the third trimester (10).

Several physiological and anatomical factors related to pregnancy, *e.g.*, fatigue, back pain, and mastalgia, the presence of the fetus in the pelvis, and painful intercourse, can affect the sexual activity and response in pregnant mothers. Other conditions, such as infections (*e.g.*, urinary tract infection, vaginitis, etc.), stress urinary incontinence, hemorrhoids, and nausea, can also affect sexual activity during pregnancy (11). The reduction in sexual activity can affect not only women but also their spouses and cause problems in their relationships.

The findings indicated a significant correlation between sexual activity and response after pregnancy, and the education level of the mothers and their spouses. In particular, mothers with university degrees manifested significantly higher mean scores on sexual activity and response than those with only high school diplomas or lower education. In addition, the women whose spouses had university degrees showed significantly higher mean scores on these domains than those whose spouses had secondary education. Alizadeh *et al.* (2019) reported a negative correlation between scores reflecting alterations in sexual activity and response before and during pregnancy and pregnant women's and their spouses' educational attainments (2). People with higher education tend to have access to more information about sexual activity and response, something which enables them to act more consciously in this area. Furthermore, Ziaei *et al.* (2014) reported that couples with higher education experienced greater economic stability and less economic concern, resulting in greater sexual and marital satisfaction (13), a finding which is consistent with the results of this study.

The mean score of the spouses' emotional response indicated a positive, significant correlation between sexual activity and response and the spouses' emotional response to pregnancy (P=0.001, r=0.202). Studies conducted on Iranian pregnant women's sexual function have shown that women in the past believed that sex during pregnancy would cause complications such as premature birth and that their sexual function would decrease as pregnancy progressed. However, medical science does not consider any restrictions on sex for healthy, uncomplicated, and normal pregnant women in a normal pregnancy. Sexual

activities during pregnancy are not only harmless but can also boost marital relationships. Reduced sexual function may have adverse effects on self-confidence and interpersonal relationships, causing stress in women and their spouses (13).

Other studies have also shown that there is a significant correlation between sexual dysfunction and emotional disorders, a finding that is in line with the results of this study. In general, they have confirmed that such changes can reduce anxiety in pregnant women and their spouses. Therefore, couples must be assured that sex does not often cause complications in pregnancy (13).

Pregnancy brings about vast changes in women's attitudes towards sexual relationships. During pregnancy, a husband's feelings for his wife become deeper, and his affection soars because now she is not only his wife but also the mother of his child (14). Multitudinous changes during pregnancy, *e.g.*, physiological (*e.g.*, weight gain), anatomical (*e.g.*, the presence of a fetus in the pelvic cavity), and hormonal changes (*e.g.*, estrogen, progesterone, and HCG) can have adverse effects on pregnant women's sexual response and the sexual relationship between couples, ultimately disrupting the mental health of the family (15). Experts also consider many emotional, psychological, and hormonal advantages in pregnancy. There are several reports of the reduced risk of certain cancers, like breast, ovarian, and endometrial, during pregnancy. The emotional response of the spouse was reported to be related to the occupation, maternal education, place of residence, his age, his occupation, his education, and his income. Therefore, this emotional response was higher in employed women with higher university education. It was also higher in women with private homes than in rented homes, and the average score obtained by mothers with self-employed spouses was higher than in unemployed and working spouses. It was also higher in women with employed spouses than in women with unemployed spouses.

As reported by Kazemi *et al.* (2021), the average score on the emotional response of the spouse was 23.8 in the women sampled. The observed difference can be attributed to the lower educational levels of the participants, as most of them had only secondary education or lower, and only 19.1% had higher education. There was also a significant relationship between a spouse's age and their emotional response. As the spouse's age increased, his emotional response also increased. Perhaps as they age, the increase in intellectual growth and awareness that occurs following the acquisition of knowledge improves the manner of communication and enhances the skill of being a spouse (1).

The results of the pairwise Tukey comparison indicated that the average score obtained by mothers with poor income was significantly lower than in those with average and good levels of income. Apparently, these people are more prepared for the arrival of a new person to the family, a finding which was consistent with the results reported by Kazemi *et al.* (2021). Earning income leads to financial independence, freedom, and a sense of usefulness, which can result in life satisfaction (17). Therefore, high income is related to the spouse's emotional reaction to pregnancy. Daroneh *et al.* (2017) reported that an individual's job was an asset indicator and had the greatest relationship with the quality of women's marital life. With the improvement of the family's economic status, women's levels of sexual satisfaction increase. The couples who have a good economic status have higher sexual satisfaction due to the reduction of mental problems caused by economic problems. Financial problems can affect a couple's emotional and behavioral states and cause marital conflicts (17).

The father's emotional response during pregnancy can indicate the formation of paternal identity and support for the pregnancy, subsequently affecting the mother's mental health (4).

Understanding the interplay between pregnant women's sexual activity and spouses' emotional responses during pregnancy can facilitate the development of counseling programs for expectant mothers within the healthcare system, thereby fostering a supportive marital environment and enhancing healthy relationships as they navigate psychological pressures. Clinical practice, education, research, and management can all

benefit from the research findings that revealed a relationship between sexual activity and emotional responses after pregnancy. Given that this study had not been conducted before in Iran and had a suitable study population, its results can be used to improve couples' relationships and serve the family.

Considering the limitations of this research, such as temporal constraints and its cross-sectional design, future studies are recommended to employ a longitudinal and multicenter approach. They should also analyze the issue in three distinct phases: before, during, and after pregnancy. This methodological framework can lead to a more comprehensive analysis of changes occurring throughout these critical periods. Since the questionnaire on the emotional response of the spouse to pregnancy and the Sexual Activity and Response Questionnaire were completed by pregnant mothers in this study and previous studies, the items related to men in these questionnaires should be completed by spouses in future studies to achieve more accurate results. In addition, illiterate and poorly educated people did not participate in our study. Therefore, this group should be included in interviews in future studies to address their needs.

Conclusion

The research findings suggested a positive correlation between pregnant women's sexual activity and the emotional responses of spouses to pregnancy. Furthermore, an increase in pregnant woman's sexual activity and responsiveness was reported to be associated with heightened emotional responses to pregnancy from the husband. Understanding the interplay between pregnant woman's sexual activity and responsiveness, and the emotional response of spouses during pregnancy can facilitate the development of counseling programs for expectant mothers within the healthcare system. Such programs may foster a supportive marital environment by boosting healthy relational dynamics between couples, thereby assisting pregnant women in handling psychological stress and contributing to family cohesion.

Declerations

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Conflicts of interest

The authors declared no conflicts of interest.

Ethical considerations

The participants were briefed on the research objectives and procedures, and they were assured that their personal information would be kept confidential. They were then asked to express their written informed consent**.**

Code of Ethics

After obtaining necessary permission from the Ethics Committee of Iran University of Medical Sciences with Ethics code: (IRIUMS.REC.1402.891), the study was conducted in the designated health centers.

Use of Artificial Intelligence (AI)

Artificial Intelligence was not used in creation of this article.

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Authors' contribution

MKh, ESS and contributed to developing the initial idea of the study. FT did the data collection. ShH was responsible for the statistical analysis of the data. FT was responsible for the initial writing and preparation of the first draft of the article, submission, and revision of the article. All authors finally revised and approved the manuscript and accepted to be accountable for its accuracy and integrity. Farnaz Talebinejad (MSc)[1], Masoomeh Kheirkhah (PhD)[2*], Elahe Sadeghi Sahebzad (PhD)[3], Shima Haghani (MSc)[4]

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