

Female sexual function and associated factors during pregnancy

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Abstract

Aim: The objective of this study was to assess the changes in female sexual function during pregnancy and to identify associated factors among Turkish population using a validated questionnaire. Furthermore, we aimed to examine Turkish pregnant women's beliefs regarding sexual activity and describe their source of information about sexuality during pregnancy.

Material and Methods: In this cross-sectional study, healthy heterosexual pregnant women who had been living with their partners within the last four weeks were asked to complete two self-administered questionnaires, one of which was Female Sexual Function Index (FSFI).

Results: A significant association was found between the decrease in intercourse frequency and trimesters, as a decline in frequency was reported by 58.3%, 66.1% and 76.5% of women in each trimester, respectively ($P = 0.01$). Only the trimester of gestation and employment status were independent factors associated with the decline in sexual intercourse frequency during pregnancy. When the overall FSFI score were compared according to each trimester of pregnancy, there were no statistical significant differences between the first and second trimesters ($P = 0.71$). The overall FSFI score in the third trimester was found to be significantly lower than the overall scores in the first two trimesters ($P < 0.001$ for both). In linear regression analysis, overall FSFI scores were adversely affected by only being in the last trimester. 38.7% of women and 36.2% of male partners worried that sexual intercourse may harm the pregnancy. Among the total sample, only 23.8% of women discussed sexuality with the medical staff.

Conclusion: The third trimester is the independent variable for both decreased sexual activity frequency and sexual function scores in pregnancy. Counseling about sexuality during pregnancy is not frequent in the clinical setting, but conversations about this topic should happen on a regular basis during prenatal care visits.

Key words: female sexual function index, intercourse, pregnancy, sexual activity, sexual function, sexuality.

Introduction

Pregnancy is a period in which physical and psychological changes in conjunction with cultural, social, religious factors may influence the sexual activities of couples. Sexual activity is reported to decrease throughout pregnancy,¹⁻⁴ and the prevalence of

reduced sexual interest and enjoyment in this period is over 60%.¹ While most of the studies revealed a progressive decline in sexual activity as gestation advances,^{2,3} the same frequency of sexual intercourse in the second trimester compared with the first trimester has also been reported in the literature.⁵ Furthermore, most of the data regarding the variables which are

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positively associated with sexual dysfunction during pregnancy, such as maternal age, parity, gestational age, body mass index and urinary incontinence have been insignificant or contradictory.⁶

Aside from the socio-demographic and obstetric variables, the concerns of couples about sexual activity and the lack of reliable source of information regarding sexuality during pregnancy may have influences on female sexual function. Several studies reported that 23.4–82.9% of women¹⁷ and 55–84.9% of men¹⁸ had concerns about causing some sort of obstetric complication. In the meta-analysis of 59 studies, von Sydow reported that 68% of women did not discuss sexual activities during pregnancy, while 27% of those who did, received restrictive advice, namely were prescribed a certain time of coital abstinence before birth.⁶

The objective of this study was to assess the changes in female sexual function during pregnancy and to identify associated factors among Turkish population using a validated questionnaire. Furthermore, we aimed to examine Turkish pregnant women's beliefs regarding sexual activity and describe their source of information about sexuality during pregnancy.

Material and Methods

Subjects and procedures

This cross-sectional study was conducted between October 2010 and April 2011 in the Outpatient Antenatal Clinic after the approval by the local ethics committee. Healthy heterosexual pregnant women who have been living with their partners within the last four weeks were included in this study. Women with any fetal-maternal complications such as antepartum bleeding, threatened abortion, placenta previa, preterm labor or premature rupture of membrane, and those who were advised to avoid coitus by a physician due to a medical condition were excluded. We also excluded the women who conceived by any ovulation induction method or assisted reproduction technique.

Study protocol was explained to and a written informed consent statement was obtained from all eligible volunteers prior to taking part in the study. All subjects were asked to complete the questionnaire form in a separate room with sufficient privacy. One of the authors was available to provide additional information when it was necessary.

Questionnaire

The self-administered questionnaire had two parts. The first part was designed to collect data about obstetric

history and socio-demographic characteristics which were age, education level, employment status, the duration of partnership, financial situation, smoking status and the gender of fetus. Also, the subjects were asked to report the person who took the sexual initiative (male, female or both partners) and the frequency of intercourse before pregnancy and within the last four weeks. In addition, they were asked to report their opinion regarding sexual activity during pregnancy as well as their partners' thoughts. Furthermore, the subjects were asked whether they required any information about sexual life in pregnancy and what type of information source they used for this purpose.

The second part of the questionnaire included the FSFI, which is a validated and reliable measure of female sexual function with 19 questions that assess various sexual domains including desire, arousal, lubrication, orgasm, satisfaction and pain.⁹ The score ranges from 0 to 5 for each question except for the items 1, 2, 15 and 16 in which score ranges from 1 to 5.⁹ The composite score is the sum of the responses to each question of a specific domain multiplied by a factor. The full-score range from 2 to 36 and a score ≤ 26.5 indicates the deficiency of female sexual function.¹⁰

Data analysis

As this was not a longitudinal study, we evaluated the decline in intercourse frequency in each trimester compared with prepregnancy frequency rather than comparing the number of times intercourse occurred in each trimester. Statistical analysis was carried out using Statistical Package for the Social Sciences version 15.0 (SPSS, Chicago, IL, USA). Student's *t*-test was used for comparisons for normally distributed variables, and the Mann-Whitney *U*-test was used for categorical variables. The one way ANOVA was used to compare means of more than two samples. Factors associated with the decrease in sexual activity were investigated using multiple logistic regressions to compute odds ratios (OR). The factors associated with overall FSFI score were investigated by multiple linear regression analysis. Differences were considered statistically significant at $P < 0.05$.

Results

A total of 400 eligible women were invited to participate and 363 completed the questionnaire with a response rate of 90.7%. Fifteen questionnaires were excluded due to incomplete data. A total of 348 women

were evaluated for the study. The distribution of the number of participants was 115 (33%) in the first trimester, 118 (33.9%) in the second and 115 (33%) in third trimester. The mean age of the women was 26.9 ± 4.8 years. Distributions of the socio-demographic features by trimester are summarized in Table 1.

Table 2 shows the sexual activity frequency of the participants before pregnancy and within the last four weeks by trimester. No significant difference was detected in the pre-pregnancy sexual intercourse frequency among the trimesters ($P = 0.23$). The frequency of sexual activity within the last four weeks was significantly associated with the trimester of the pregnancy ($P = 0.001$). A total of 67 (19.3%) women described no sexual activity within the last four weeks. The percentages of sexual avoidance were 12.2% (14/115) in the first trimester, 8.5% (10/118) in the second trimester and 37.4% (43/115) in the third trimester.

There was not a significant difference between the prevalence of sexual avoidance in the first and second trimesters ($P = 0.35$), whereas it was significantly higher in the third trimester in comparison to the first and second trimesters ($P < 0.001$ for both).

Table 3 shows the relationship between obstetric and socio-demographic variables, and the sexual activity frequency. In univariate analysis, the trimester of pregnancy and employment status were significantly associated with the decreased frequency of sexual activity ($P = 0.01$ and $P = 0.007$, respectively). All parameters that can be related with the decline in frequency were evaluated in multivariate analysis. The trimester of pregnancy and employment status remained as independent factors. Sexual activity frequency decreased significantly in the second and the third trimester of pregnancy compared with the first trimester (OR: 1.42; 95% CI: 1.03–9.72, $P = 0.03$ and OR: 2.67; 95% CI: 1.26–13.98; $P = 0.01$; respectively).

Table 1 Demographic data and descriptive characteristics of the participants according to trimesters

	1st trimester <i>n</i> (%)	2nd trimester <i>n</i> (%)	3rd trimester <i>n</i> (%)	Overall <i>n</i> (%)
Number of participants	115 (33)	118 (33.9)	115 (33)	348 (100)
Age (mean \pm SD)	27.1 ± 4.9	27.4 ± 5.1	26.3 ± 4.5	26.9 ± 4.8
Parity				
Parous	48 (41.7)	69 (58.5)	51 (44.3)	168 (48.3)
Nullipar	67 (58.3)	49 (41.5)	64 (55.7)	180 (51.7)
Previous abortion				
Yes	21 (18.3)	8 (6.8)	12 (10.4)	41 (11.8)
No	94 (81.7)	110 (93.2)	103 (89.6)	307 (88.2)
Education level (years)				
<8	76 (76.1)	69 (59.1)	84 (73.1)	229 (65.7)
8–11	29 (25.2)	40 (34.2)	24 (20.9)	93 (26.8)
>11	10 (8.7)	9 (7.7)	7 (6.1)	26 (7.5)
Employment status				
Employed	23 (20)	23 (19.5)	25 (21.7)	71 (20.4)
Not employed	92 (80)	95 (80.5)	90 (78.3)	277 (79.6)
Family income				
Low	59 (50.9)	72 (60.3)	70 (60.9)	201 (57.4)
Moderate	55 (48.2)	41 (35.3)	42 (36.5)	138 (40.0)
High	1 (0.9)	5 (4.3)	3 (2.6)	9 (2.6)
Duration of partnership (years)				
<5	83 (72.2)	68 (57.6)	76 (65.2)	227 (65.2)
5–10	19 (16.5)	31 (26.3)	30 (26.1)	80 (23.0)
>10	13 (11.3)	19 (16.1)	9 (7.8)	41 (11.8)
Smoking status				
Non-smoker	95 (82.3)	110 (93)	98 (84.8)	303 (86.8)
Smoker	20 (17.7)	8 (7)	17 (15.2)	45 (13.2)
Gender of offspring				
Female	71 (62.2)	73 (62.2)	69 (60)	213 (61.3)
Male	44 (37.8)	45 (37.8)	46 (40)	135 (38.7)

Table 2 Sexual activity frequency before pregnancy and within the last four weeks according to trimesters

	1st trimester <i>n</i> (%)	2nd trimester <i>n</i> (%)	3rd trimester <i>n</i> (%)	<i>P</i> -value
Pre-pregnancy				0.23
Once a month	4 (3.5)	8 (6.8)	8 (7)	
Twice a month	11 (9.6)	5 (4.2)	8 (7)	
Once a week	24 (20.9)	22 (18.6)	31 (27)	
Twice a week	35 (30.4)	50 (42.4)	35 (30.4)	
≥3 a week	41 (35.7)	33 (28)	33 (28.7)	
Total	115 (100)	118 (100)	115 (100)	
During the last four weeks				0.001
None	14 (12.2)	10 (8.5)	43 (37.4)	
Once a month	8 (7)	15 (12.7)	14 (12.2)	
Twice a month	9 (7.8)	18 (15.3)	12 (10.4)	
Once a week	34 (29.6)	41 (34.7)	31 (27)	
Twice a week	41 (35.7)	27 (22.9)	12 (10.4)	
≥3 a week	9 (7.8)	7 (5.9)	3 (2.6)	
Total	115 (100)	118 (100)	115 (100)	

Table 3 Univariate and multivariate analysis for the different variables of sexual activity frequency

	Not changed <i>n</i> (%)	Univariate Decreased <i>n</i> (%)	<i>P</i> -value	OR	Multivariate %95 CI	<i>P</i> -value
Duration of partnership (years)			0.63			
<5	78 (67.8)	149 (63.9)		ref.		
5–10	26 (22.6)	54 (23.0)		0.31	0.07–1.38	0.12
>10	11 (9.6)	30 (12.9)		0.39	0.09–1.67	0.20
Parity			0.73			
Parous	57 (49.6)	111 (47.6)		ref.		
Nullipar	58 (50.4)	122 (52.4)		1.58	0.63–3.99	0.32
Previous abortion			0.36			
Yes	11 (9.6)	30 (12.9)		ref.		
No	104 (90.4)	203 (87.1)		0.82	0.23–2.86	0.76
Trimester			0.01			
1st	48 (41.7)	67 (28.8)		ref.		
2nd	40 (34.8)	78 (33.5)		1.42	1.03–9.72	0.03
3rd	27 (23.5)	88 (37.8)		2.67	1.26–13.98	0.01
Education level (years)			0.87			
<8	77 (64)	155 (66.5)		ref.		
8–11	33 (28.9)	60 (25.8)		0.91	0.46–2.31	0.65
>11	8 (7)	18 (7.7)		1.66	0.74–3.16	0.21
Employment status			0.007			
No	101 (87.8)	176 (75.5)		ref.		
Employee	14 (12.2)	57 (24.5)		0.25	0.08–0.79	0.01
Financial income			0.08			
Low	64 (54.9)	137 (58.6)		ref.		
Moderate	45 (39.8)	93 (40.1)		0.47	0.18–1.22	0.12
High	6 (5.3)	3 (1.3)		0.59	0.26–1.35	0.59
Gender of offspring			0.67			
Female	67 (58.8)	144 (62.1)		ref.		
Male	48 (41.2)	89 (37.9)		0.94	0.45–1.97	0.88

Table 4 Domain and total scores of all participants within the last four weeks (mean \pm SD)

	1st trimester (<i>n</i> = 115)	2nd trimester (<i>n</i> = 118)	3rd trimester (<i>n</i> = 115)	<i>P</i> -value
Desire	3.36 \pm 1.06	3.1 \pm 1.10	2.89 \pm 1.15	0.006
Arousal	3.26 \pm 1.54	3.19 \pm 1.46	2.13 \pm 1.85	<0.001
Lubrication	3.86 \pm 1.66	3.83 \pm 1.50	2.56 \pm 2.17	<0.001
Orgasm	3.66 \pm 1.68	3.61 \pm 1.60	2.51 \pm 2.10	<0.001
Satisfaction	4.09 \pm 1.59	4.03 \pm 1.53	3.00 \pm 1.95	<0.001
Pain	3.60 \pm 1.80	3.60 \pm 1.73	2.32 \pm 2.13	<0.001
Total	21.84 \pm 8.00	21.47 \pm 7.27	15.35 \pm 10.46	<0.001

Table 5 Obstetric and sociodemographic variables related with overall FSFI score according to linear regression analysis

Factor	Beta†	SE	<i>P</i> -value*
3rd trimester	-0.35	0.71	<0.0001
Having abortion	-0.008	2.45	0.91
Parous	0.10	1.86	0.25
<8 years education	-0.05	1.59	0.45
Employed	0.10	1.70	0.14
Low income	0.04	1.48	0.53
<5 years marriage	-0.08	1.83	0.37
Male fetus	-0.002	1.44	0.97
Women initiative	0.03	1.41	0.62

**P* < 0.05 was considered significant. †Standardized Beta. SE, standard error.

The domain and overall scores of the FSFI questionnaire according to the trimesters of pregnancy are shown in Table 4. A significant decrease in all domain scores and overall score were detected during pregnancy. When the scores were compared according to each trimester of pregnancy, there were no statistically significant differences in the overall FSFI score between the first and second trimester (21.84 \pm 8.00 and 21.47 \pm 7.27; *P* = 0.71). The overall FSFI score in the third trimester (15.35 \pm 10.46) was found to be significantly lower than the overall scores in the first and second trimesters (*P* < 0.001 for both). Table 5 shows obstetric and sociodemographic variables related overall FSFI score according to linear regression analysis. Overall FSFI scores were adversely affected by only being last trimester (-0.35, *P* < 0.0001).

When the total cohort was evaluated according to sexual initiative, 51.1% (178) of participants reported that both partners took the initiative for sexual intercourse, followed by male partners (45.7%, *n* = 159) and the women themselves (3.2%, *n* = 11) before pregnancy. During pregnancy this pattern changed as male partner

taking the initiative the most frequently (56%, *n* = 195), followed by both partners (41.1%, *n* = 143), and then the female partners (2.9%, *n* = 10). The proportion of sexual initiator was found to be significantly different between pre-pregnancy and pregnancy periods (*P* < 0.001) (data not shown in table).

Table 6 shows the women and their partners who have concerns about sexual activity during pregnancy in each trimester. Totally, 38.8% (135/348) women worried that sexual intercourse may harm the pregnancy. The corresponding rate for male partners, as perceived by the women, was 36.2% (126/348). The concerns of the male partners were more prevalent in the first and third trimesters (first trimester 41.7%, second trimester 26.3%, third trimester 40.9%; *P* = 0.02), whereas there was no significant difference in women's concerns by trimester (41.7% first trimester, 31.4% second trimester, 43.5% third trimester; *P* = 0.12).

43.7% (152/348) of women declared that they needed to inquire on sexuality during pregnancy, and 60.5% (92/152) of these women managed to obtain information regarding this topic from various sources. The source of information was a physician in 79.2% (73/92), a midwife in 10.8% (10/92), the Internet in 8.6% (8/92) and a close relative in 1% (1/92) of these participants. Among the total sample, 23.8% (83/348) of women discussed sexuality with the medical staff, and all of these women asked whether sexual activity would harm the pregnancy and until which gestational age they could have sexual intercourse.

Discussion

In the present study we investigated the change in sexual intercourse frequency during pregnancy. We found a significant association between the decrease in intercourse frequency and trimesters, as a decline in

Table 6 Concerns of women and their partners as perceived by women by trimesters

	1st trimester <i>n</i> = 115 (%)	2nd trimester <i>n</i> = 118 (%)	3rd trimester <i>n</i> = 115 (%)	Total <i>n</i> (%)	<i>P</i> -value
Women	48 (41.7)	37 (31.4)	50 (43.5)	135 (38.8)	0.12
Male partner	48 (41.7)	31 (26.3)	47 (40.9)	126 (36.3)	0.02

frequency was reported by 58.3%, 66.1% and 76.5% of women in each trimester, respectively ($P = 0.01$). Our results are consistent with the studies, which showed a linear decrease in intercourse frequency throughout the pregnancy.^{2,3,8}

We also examined the changes in each FSFI domain score during pregnancy. There were no significant differences between the first two trimesters, whereas the scores declined sharply during the third trimester. Our findings are consistent with the study by Aslan *et al.* who used FSFI questionnaire for longitudinal evaluation of 40 women in terms of sexual function throughout the pregnancy.² Similarly, Gokyildiz and Beji, in the 63-question face-to-face interview with 150 women, found a significant increase in inability to experience orgasm and dyspareunia, and a decrease in satisfaction particularly during the third trimester.³ This seems to be the result of physical aches and obstacles which become overwhelming in the third trimester making traditional sexual acts more difficult and infrequent.¹¹ Also, it might be due to the increased doubts about the health of baby and anxiety about delivery in the last months of pregnancy.

The association between the socio-demographic variables and the sexual function during pregnancy has been controversial. Naldoni *et al.* reported a significant association between the FSFI scores and gestational age, urinary incontinence and excessive weight gain in the current pregnancy.¹² Al Bustan *et al.* in their research on 220 Kuwaiti Muslim women, found that younger age, multiparity, low-level of education and lesser duration of marriage affect sexuality positively.¹³ In another study on 298 Chinese women, multivariate analysis revealed significant correlation between the reduction in vaginal intercourse during pregnancy, and advanced maternal age, nulliparity and the third trimester.¹ While some studies reported a significant association between education and sexual dysfunction,^{8,14} others failed to find such a relationship.^{4,12} Chang *et al.* reported that women who were employed full-time had higher scores for overall sexual function and sexual intercourse in the second trimester of preg-

nancy.¹⁵ On the other hand, Bartellas *et al.* found the trimester of pregnancy to be the only variable independently associated with reduction of sexual activity.⁸ In the present study, different from the previous studies we found a significant association between the decreased intercourse frequency and employment status ($P = 0.007$) in addition to the trimester of pregnancy ($P = 0.01$). Employed women had significantly lower prevalence of sexual intercourse, which may be explained by the fatigue due to working. Furthermore, in contrast to the previous literature regarding the decreased intercourse frequency of the expectant mothers of sons,⁶ we failed to find a significant association between the gender of fetus and sexual function or sexual activity frequency.

We asked by whom sexual intercourse was initiated because it is a manifestation of the desire to have sexual intercourse, and it can also be influenced during pregnancy.¹⁶ Aside from the desire, cultural characteristics, self-esteem and anatomic conditions may affect the sexual initiative. In a study on 440 Nigerian women, it was found that men took the initiative more frequently before and during pregnancy.¹⁷ However, more recent studies showed that while both partners usually initiated intercourse before pregnancy, the male partner was more likely to begin sexual activity during pregnancy,^{3,16} which was consistent with our findings. This discrepancy may be a result of decrease in sexual desire and interest during pregnancy.

In a survey of 298 Chinese pregnant women, the reported concerns about intercourse in pregnancy were mainly bleeding (78.4%), preterm labor (60.7%), infection (60.7%), rupture of membranes (54%) and fetal damage (71.8%).¹ However, bleeding and pain were experienced by less than 12% of the women surveyed.¹ Moreover, it has been shown that there is no evidence that abstaining from sexual intercourse avoids preterm birth.^{18,19} In this study, 38.7% (135/348) of women and 36.2% (126/348) of men worried that sexual intercourse may harm the pregnancy. Also, only 26.4% (92/348) of the participants inquired on sexuality during pregnancy, and medical staff were the major

source of information (90.2%, 83/92). Although this ratio was much higher than Chinese population which was reported as 9.4% by Fok *et al.*,¹ a total of just 23.8% of participants reported that they discussed this topic with their doctors. This shows that the discussion of female sexual function during pregnancy is infrequent in the clinical setting in Turkey.

Unfortunately, the importance of sexual function during pregnancy is disregarded in routine prenatal care visits. Sexual problems during pregnancy may have a negative effect on marital bonds and may inhibit the adaptation of women to this transient phase.² It is reported that if both partners were satisfied with their sexuality during pregnancy, they found their relationship better at four months postpartum and more stable 3 years later.⁶ Thus, obstetricians should be sensitive and competent enough to consider sexual function during pregnancy. A discussion of expected changes in sexuality should be routinely done by the health professional. In the absence of obstetric complications, such as bleeding, rupture of membranes, premature dilatation of cervix or heightened risk of premature labor, all couples should be reassured that sexual intercourse does not cause complication and be motivated to enjoy sexual activity during pregnancy. Furthermore, as face-to-face positions become more and more uncomfortable throughout the gestation, more comfortable positions such as side-by-side and on-all-fours position may be advised to couples to improve their sexual life.¹⁶

One of the limitations of this study is that it was not a prospective study and compared sexuality in pregnancy between different women and not in the same women over time. However, the sexual behavior of women in each trimester seems to be similar before pregnancy with an insignificant difference between the pre-pregnancy sexual activity frequencies ($P = 0.12$). In addition, we evaluated the change between prepregnancy and pregnancy frequencies for each woman to find out the influence of pregnancy on sexual activity. The other limitation was that the opinions and concerns of the male partners could not be asked directly to them but to the participant women, because the majority of men did not attend to hospital with their partners.

In conclusion, our results showed that sexual intercourse frequency was significantly associated with the trimester of pregnancy. Sexual function scores were significantly lower in the third trimester in comparison to the first two trimesters, and the third trimester was the independent variable for both decreased sexual

activity frequency and sexual function scores. None of the other socio-demographic or obstetric variables were significantly associated with decreased sexual function scores and sexual activity frequency, except for employment. Since counseling about sexuality during pregnancy is not frequent in the clinical setting, we emphasize the importance of sexuality in pregnancy and recommend that conversations about this topic should happen on a regular basis during prenatal care visits.

Disclosure

We declare that there is nothing to disclose.

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