

Sexual Function and Activity in Pregnant Women

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Abstract

Objectives: To determine the impact of pregnancy on sexual function and activity. Factors associated with sexual dysfunction were also evaluated.

Methods: This cross-sectional descriptive study included Thai pregnant women of any gestational age who had prenatal care at Faculty of Medicine Vajira Hospital during September 2009 to October 2009. Sexual functions at pre-pregnancy period and during pregnancy were assessed by a self-administered questionnaire using the Thai version of the Female Sexual Function Index questionnaire (FSFI). Questions involving the couple's demographic data and socioeconomic status were also added to the questionnaire.

Results: Mean age of 237 patients included in the study was 27.5 ± 5.8 years. Mean FSFI scores in pre-pregnancy period was higher than the score during pregnancy: 23.4 ± 4.6 compared to 18.4 ± 8.0 . Using FSFI < 26.5 as a cut off score for sexual dysfunction, the prevalence of sexual dysfunction was 71.2% in pre-pregnancy and 87.7% in pregnancy periods. Comparing sexual function during pregnancy to pre-pregnancy, higher percentage of decreased FSFI scores was observed. The decreased scores were more frequently found as pregnancy progressed: 65.3%, 73.6% and 74.3% in first, second, and third trimester, respectively. High family income, women's worrisome and concern towards effect of sexual activity on pregnancy outcome were significantly associated with decreased FSFI score. Age > 25 years, higher education and late pregnancy were also associated with decreased FSFI score but without statistically significant.

Conclusion: Sexual function and sexual activity decreased significantly throughout pregnancy. Significant factors associated with sexual dysfunction were high family income, women's worrisome and concern towards effect of sexual activity on pregnancy outcome.

Keywords: Female Sexual Function Index (FSFI) questionnaire, sexual activity, sexual dysfunction, pregnant women

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บทคัดย่อ

พฤติกรรมและกิจกรรมทางเพศระหว่างการตั้งครรภ์

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ภาควิชาสูติศาสตร์-นรีเวชวิทยา คณะแพทยศาสตร์วชิรพยาบาล มหาวิทยาลัยกรุงเทพมหานคร

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วัตถุประสงค์: เพื่อศึกษาผลของการตั้งครรภ์กับปัจจัยต่าง ๆ ที่มีผลต่อการเปลี่ยนแปลงของพฤติกรรมและกิจกรรมทางเพศในสตรีตั้งครรภ์

วิธีดำเนินการวิจัย: การวิจัยนี้เป็นการวิจัยเชิงพรรณนาแบบตัดขวาง โดยทำการศึกษาในสตรีไทยตั้งครรภ์ทุกช่วงอายุครรภ์ที่มาฝากครรภ์ ณ คณะแพทยศาสตร์วชิรพยาบาลระหว่างเดือน กันยายน ถึง ตุลาคม พ.ศ. 2552 ประเมินพฤติกรรมทางเพศในช่วงก่อนการตั้งครรภ์ และในขณะที่ตั้งครรภ์โดยให้สตรีตั้งครรภ์ตอบแบบสอบถาม Female Sexual Function Index (FSFI) ฉบับภาษาไทยด้วยตนเอง รวมทั้งตอบคำถามเกี่ยวกับ ข้อมูลของสามี และเศรษฐกิจของครอบครัวด้วย

ผลการวิจัย: สตรีตั้งครรภ์ที่เข้าร่วมในการศึกษามีทั้งหมด 237 คน อายุเฉลี่ย 27.5 ± 5.8 ปี ค่าเฉลี่ยคะแนน FSFI ก่อนตั้งครรภ์ คือ 23.4 ± 4.6 คะแนน ซึ่งสูงกว่าค่าเฉลี่ยคะแนน FSFI ขณะตั้งครรภ์ซึ่งเท่ากับ 18.4 ± 8.0 คะแนน ความชุกของภาวะ sexual dysfunction ที่วินิจฉัยจากคะแนน FSFI ที่น้อยกว่า 26.5 ในสตรีก่อนและขณะตั้งครรภ์คือ ร้อยละ 71.2 และ 87.7 ตามลำดับ เมื่อศึกษาพฤติกรรมทางเพศขณะตั้งครรภ์เปรียบเทียบกับก่อนตั้งครรภ์ พบว่ามีสัดส่วนการลดลงของคะแนน FSFI มากกว่าก่อนตั้งครรภ์ ความชุกของสตรีที่มีคะแนน FSFI ลดลงในขณะตั้งครรภ์เทียบกับช่วงก่อนตั้งครรภ์คือร้อยละ 65.3, 73.6 และ 74.3 ในไตรมาสที่ 1, 2 และ 3 ตามลำดับ รายได้ครอบครัวที่สูง ความกังวล และความกลัวผลกระทบต่อตั้งครรภ์ที่อาจเกิดจากการมีเพศสัมพันธ์มีความสัมพันธ์กับการลดลงของคะแนน FSFI อย่างมีนัยสำคัญ ในขณะที่ อายุที่มากกว่า 25 ปี ระดับการศึกษาที่สูง และอายุครรภ์ที่มากขึ้นมีความสัมพันธ์กับคะแนน FSFI ที่ลดลง แต่ไม่มีนัยสำคัญทางสถิติ

สรุป: พฤติกรรมและกิจกรรมทางเพศมีการลดลงอย่างมีนัยสำคัญตลอดการตั้งครรภ์ เมื่อเทียบกับช่วงก่อนการตั้งครรภ์ โดยมีปัจจัยที่มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ คือ รายได้ครอบครัวที่สูง ความกังวลและความกลัวผลกระทบต่อตั้งครรภ์ที่อาจเกิดจากการมีเพศสัมพันธ์

Introduction

Pregnancy is one of the most delightful events in most women. However, many unfavourable physiologic changes including physical and psychological aspects can occur during pregnancy. One system which is usually affected by pregnancy is sexual function. Many studies

from the Western countries reported a decrease in sexual activities and sexual dysfunction in pregnant women.¹⁻³

In 2000, Bartellas et al¹ from Canada conducted a cross-sectional study in 141 pregnant women using self-administered questionnaires to evaluate women's sexuality and sexual activity during pregnancy. They found a reduction in sexual activity, sexual desire and vaginal

intercourse occurred in many women. The decrease was greater in extent as pregnancy progressed. Many of them were worried that sexual intercourse might harm their pregnancy.¹ Two other studies from Turkey were reported by Aslan et al² in 2005 and Erol et al³ in 2007. Aslan et al² conducted a prospective cohort study using self-administered FSFI questionnaire to assess sexual function during pregnancy in 40 pregnant women. They demonstrated that sexual functions of pregnant women were significantly decreased, and worsen as pregnancy progressed. The second study from Turkey by Erol et al³ performed a cross-sectional study in 589 women in all trimesters of pregnancy. Data from self-administered FSFI questionnaire in their study demonstrated lower sexual function scores in women in the third trimester of their pregnancies compared with those in the first or second trimesters.

Many factors were found to associate or predispose a woman to sexual dysfunction e.g. gestational age and worrisome about the effect of sexual activity to their health and fetus.¹ Knowing sexual attitude and the extent of sexual dysfunction affected by pregnancy status is certainly important, so education and prevention or minimization of dysfunction can be provided to the pregnant woman and her spouse.

In contrast to the Western world where a topic of sex is generally open for discussion, different culture or religious background in the Eastern countries render this issue to be unrevealed. This fact leads to limited data information from this part of the world. We aimed to evaluate the impact of pregnancy to sexual function of Thai pregnant women.

Methods

The study was approved by the Ethics Committee for Researches Involving Human Subjects of Bangkok Metropolitan Administration. A cross-sectional descriptive study was performed at antenatal clinic, Faculty of

Medicine Vajira Hospital from September 2009 to October 2009. Inclusion criteria were: Thai pregnant women of all trimesters, well-literate in Thai, had no medical or obstetrical contraindication for sexual intercourse, i.e. cardiac diseases, premature rupture of membrane (PROM), placenta previa, and etc. All pregnant women during the study period were informed about the research project at the time of their antenatal visits by one of the female researchers. Women who agreed to participate were requested to sign consent forms before entering into the study. All participants were requested to complete the questionnaires by themselves in a private room located at antenatal clinic. The couple's demographic data, socioeconomic status, general health, sexual function including sexual intercourse position of the women themselves and their perception of their husbands' attitude toward sex were collected. The Thai language version of the Female Sexual Function Index questionnaire (FSFI)⁴ was used to collect data of pre-pregnancy and current sexual function during pregnancy. The original questionnaire in English language⁵ had been translated into Thai and was tested by Peeyananjarassri et al.⁴ The reliability coefficient of the Thai edition questionnaire was 0.9.⁴ Sexual function in this study was evaluated according to six domains. The questionnaire consisted of 19 questions: desire (two questions), arousal (four questions), lubrication (four questions), orgasm (three questions), satisfaction (three questions) and pain (three questions).^{4,5} Frequency of sexual intercourse and position during the act were also added to the questionnaire. Only two questions in desire domain and two questions in satisfaction domain were scored from 1 to 5 while the remaining 15 questions had a score ranging from 0 to 5. Each domain score was a sum of score in each question, multiplied by the domain factor as had been described in the study of Rosen et al.⁵ Therefore the total score ranged from 2 to 36. We used FSFI scores of less than 26.5 as a cut-off value for a woman to be at risk for sexual dysfunctions according to finding from previous studies.^{4,5}

SPSS (Statistical Package for Social Sciences) version 11.5 was used for statistical analysis. Demographic data and FSFI score were presented as mean \pm standard deviation (SD) and percentage. The mean FSFI scores during pre-pregnancy period and during pregnancy were compared by paired t-test. Mean FSFI score and score changes according to various factors were compared by unpaired t-test. A p-value of less than 0.05 was considered statistical significant.

Results

Two hundreds and thirty seven pregnant women met inclusion criteria and were enrolled into the study. Of these, 95 were in their first trimester of pregnancy, 72 were in second trimester, and 70 were in third trimester. Mean age of the women was 27.5 ± 5.8 years old while mean age of the husbands was 31.2 ± 4.1 years old. Most were Buddhist. Majority had family monthly income between 5,001–20,000 Baht. Approximately 1/3 of the women were primigravid. Detailed characteristics of pregnant women are presented in Table 1.

Regarding sexual function of the husbands according to the perception of 237 pregnant women, 220 reported no problems which disturbed sexual intercourse (92.8%). Thirteen reported no sexual desire (5.5%) and only four reported erectile dysfunction (1.7%).

Mean pre-pregnancy FSFI score was 23.4 ± 4.6 . These average score in the first, second and third trimester were 23.1 ± 4.4 , 23.5 ± 3.9 and 23.5 ± 4.2 , respectively. The prevalence of sexual dysfunction, based on FSFI scores less than 26.5, in pre-pregnancy period of the women was 71.2%. There was no difference of pre-pregnancy sexual dysfunction among pregnant women of any trimesters of pregnancy (data not shown).

Lower than the pre-pregnancy FSFI, the mean overall FSFI score during pregnancy was only 18.4 ± 8.0 . Mean FSFI scores during pregnancy in all trimesters

were also significant lower comparing to pre-pregnancy scores (p-value < 0.001). The scores were 18.5 ± 8.4 , 19.2 ± 7.5 and 17.7 ± 8.3 in the first, second, and third trimester, respectively. The percentages of women with decreased FSFI increased as pregnancy progressed: 65.3%, 73.6% and 74.3% in first, second and third trimester respectively. The mean differences or a decrease of FSFI scores in each corresponding trimesters comparing to pre-pregnancy period were 4.6, 4.3 and 5.8 respectively. Using FSFI scores less than 26.5 to determine sexual dysfunction, the prevalence of this event during pregnancy was 87.7% (85.3%, 87.1% and 90.7% in first, second and third trimester, respectively). Comparison of FSFI scores in the pre-pregnancy period and during pregnancy are shown in Table 2. Along with the mean total score, all 6 domains of FSFI had a tendency to decrease in pregnancy period compared to pre-pregnancy period in all trimesters but did not reach statistical significance.

Of 237 pregnant women studied, 198 women still had sexual intercourse during pregnancy (83.5%). Despite a high maintenance of sexual intercourse activity, approximately one third to nearly one half reported that they were worried about this activity: 36.8%, 41.7% and 42.9% of women in first, second and third trimester respectively. More specifically, 73.7%, 73.6% and 82.9% of women in the respective trimesters concerned about harmful effects of sexual intercourse to pregnancy. Effect on their babies was the most concern among women who were in all trimesters especially in the third trimester, followed by infection and preterm labour in the first and second trimesters or the two in alternating order in the third trimester. Adverse effect on pregnant women themselves was the least concern in all trimesters.

Various factors of age, education, family income, gravida, trimester of gestation, worrisome, and concern of the women were evaluated for any possible association with decreased FSFI score during pregnancy (Table 3). Only higher family income, the women's worrisome and concern towards the effect of sexual activity on pregnancy outcome were significantly associated with decreased

Table 1 Demographic and clinical characteristics of pregnant women (n=237)

	1 st trimester (n=95)	2 nd trimester (n=72)	3 rd trimester (n=70)	All trimester (n=237)
	number (%)	number (%)	number (%)	number (%)
Age (years; mean \pm SD)	28.4 \pm 5.9	26.8 \pm 5.7	27.0 \pm 5.8	27.5 \pm 5.8
Religion				
Buddhism	92 (96.8%)	71 (98.6%)	68 (97.1%)	231 (97.5%)
Others	3 (3.2%)	1 (1.4%)	2 (2.9%)	6 (2.5%)
Occupation				
housewife	27 (28.4%)	12 (16.7%)	17 (24.3%)	56 (23.6%)
labor worker	27 (28.4%)	18 (25.0%)	13 (18.6%)	58 (24.5%)
business owner	30 (31.6%)	35 (48.6%)	32 (45.7%)	97 (40.9%)
government officer	10 (10.5%)	3 (4.2%)	3 (4.3%)	16 (6.8%)
others	1 (1.1%)	4 (5.5%)	5 (7.1%)	10 (4.2%)
Family income (Baht/month)				
\leq 5000	15 (15.8%)	4 (5.6%)	5 (7.1%)	24 (10.1%)
5001–10000	47 (49.5%)	28 (38.9%)	32 (45.7%)	107 (45.2%)
10001–20000	21 (22.1%)	24 (33.3%)	24 (34.3%)	69 (29.1%)
$>$ 20000	12 (12.6%)	16 (22.2%)	9 (12.9%)	37 (15.6%)
Education				
not educated	2 (2.1%)	2 (2.8%)	2 (2.9%)	6 (2.5%)
primary school	21 (22.1%)	8 (11.1%)	10 (14.3%)	39 (16.5%)
secondary school	53 (55.8%)	37 (51.4%)	40 (57.1%)	130 (54.9%)
bachelor degree or higher	19 (20.0%)	25 (34.7%)	18 (25.7%)	62 (26.1%)
Gravida				
1	22 (23.2%)	38 (52.8%)	23 (32.8%)	83 (35.0%)
2	39 (41.0%)	20 (27.8%)	27 (38.6%)	86 (36.3%)
$>$ 2	34 (35.8%)	14 (19.4%)	20 (28.6%)	68 (28.7%)

FSFI score. Age $>$ 25 years, higher education and late pregnancy in the third trimester had higher decreased FSFI score but without statistical significance.

Regarding sexual intercourse position during each trimester of pregnancy, the most preferred position was missionary position in all trimesters: 55.7%, 49.4% and

41.9% in first, second and third trimester. The other two common approaches were rear entry in 20.1%, 23.3% and 25.7% followed by woman on top in 8.4%, 9.7% and 10.0%, in the respective order of pregnancy trimesters. No significant difference in sexual intercourse position among pregnant women in any trimester was found.

Table 2 FSFI score and FSFI domain score comparing between pre-pregnancy and during pregnancy in each trimester of pregnancy (n=237)

	FSFI Score (mean \pm SD)			
	pre-pregnancy	during pregnancy	decreased score	p-value*
First trimester (n=95)				
FSFI score	23.1 \pm 4.4	18.5 \pm 8.4	4.6 \pm 7.2	<0.001
FSFI domain score				
Desire	2.9 \pm 0.6	2.6 \pm 0.4	0.3 \pm 0.6	0.124
Arousal	3.2 \pm 1.1	2.6 \pm 0.7	0.6 \pm 0.4	0.093
Lubrication	4.1 \pm 1.3	3.1 \pm 1.5	1.0 \pm 1.4	0.081
Orgasm	3.9 \pm 1.9	2.9 \pm 1.7	1.0 \pm 1.1	0.072
Satisfaction	4.4 \pm 2.1	3.6 \pm 1.6	0.8 \pm 1.2	0.131
Pain	4.7 \pm 2.3	3.8 \pm 1.9	0.9 \pm 1.3	0.115
Second trimester (n=72)				
FSFI score	23.5 \pm 3.9	19.2 \pm 7.5	4.3 \pm 6.8	<0.001
FSFI domain score				
Desire	2.9 \pm 0.4	2.5 \pm 0.3	0.4 \pm 0.5	0.106
Arousal	3.4 \pm 1.2	2.7 \pm 0.8	0.7 \pm 0.6	0.125
Lubrication	4.3 \pm 1.5	3.4 \pm 1.8	1.0 \pm 1.6	0.098
Orgasm	3.9 \pm 1.7	2.9 \pm 1.5	1.0 \pm 0.9	0.082
Satisfaction	4.3 \pm 2.2	3.7 \pm 1.9	0.6 \pm 0.9	0.163
Pain	4.7 \pm 2.4	3.9 \pm 1.8	0.8 \pm 1.1	0.141
Third trimester (n=70)				
FSFI score	23.5 \pm 4.2	17.7 \pm 8.3	5.8 \pm 7.1	<0.001
FSFI domain score				
Desire	2.8 \pm 0.6	2.4 \pm 0.4	0.4 \pm 0.6	0.188
Arousal	3.3 \pm 1.1	2.3 \pm 1.0	1.0 \pm 1.2	0.113
Lubrication	4.4 \pm 1.4	3.2 \pm 1.6	1.2 \pm 1.5	0.141
Orgasm	4.0 \pm 2.1	2.7 \pm 1.4	1.3 \pm 1.6	0.076
Satisfaction	4.4 \pm 2.2	3.5 \pm 1.6	0.9 \pm 1.2	0.097
Pain	4.6 \pm 2.3	3.6 \pm 1.6	1.0 \pm 1.3	0.136

* p-value by unpaired t-test

Table 3 Association between various factors with pre-pregnancy, during pregnancy FSFI score and the change of FSFI score (n=237)

Factors	FSFI score (mean \pm SD)					
	pre-pregnancy	p-value	during Pregnancy	p-value	decreased score	p-value
Age		0.404		0.099		0.241
\leq 25 years (n=96)	23.8 \pm 4.4		19.5 \pm 7.4		4.3 \pm 7.5	
$>$ 25 years (n=141)	23.2 \pm 4.8		17.7 \pm 8.4		5.5 \pm 8.3	
Education		0.002		0.774		0.142
\leq primary school (n=45)	21.6 \pm 4.8		18.1 \pm 7.7		3.4 \pm 7.1	
\geq secondary school (n=192)	23.9 \pm 4.5		18.5 \pm 8.1		5.4 \pm 8.2	
Family Income (Baht/month)		0.101		0.003		<0.001
\leq 10000 (n=131)	23.0 \pm 4.3		19.8 \pm 7.2		3.2 \pm 6.6	
$>$ 10000 (n=106)	24.0 \pm 5.0		16.7 \pm 8.7		7.3 \pm 8.9	
Gravida		0.182		0.903		0.516
1 (n=83)	24.0 \pm 3.7		18.5 \pm 8.2		5.5 \pm 8.1	
$>$ 1 (n=154)	23.2 \pm 5.1		18.4 \pm 8.0		4.8 \pm 8.0	
Trimester		0.287		0.329		0.109
First and Second (n=167)	23.2 \pm 4.2		18.8 \pm 8.0		4.5 \pm 7.8	
Third (n=70)	23.9 \pm 5.6		17.6 \pm 8.2		6.3 \pm 8.2	
Women's worrisome		0.008		0.236		0.006
Yes (n=95)	24.4 \pm 3.8		17.7 \pm 8.9		6.7 \pm 8.7	
No (n=142)	22.8 \pm 5.0		19.0 \pm 7.4		3.8 \pm 7.3	
Women's concern towards effect of sexual activity on pregnancy outcome		0.025		0.199		0.009
Yes (n=181)	23.8 \pm 4.4		18.1 \pm 8.2		5.8 \pm 8.5	
No (n=56)	22.2 \pm 5.0		19.6 \pm 7.3		2.6 \pm 5.3	

* p-value by unpaired t-test

Concerning about information related to sexual intercourse during pregnancy, 72 pregnant women (30.4%) stated that she received information from family members, 71 (30.0%) from medical professionals and 66 women

(27.8%) had information from medias. Only 28 women (11.8%) had never had any information about sexual intercourse during pregnancy at all.

Discussion

Many couples throughout the world experience changes in sexual activity during pregnancy.^{1-4,6-11} More numbers of reports are from the West while there have been few studies about this topic in Thailand.^{4,7,9-11} Therefore, data from our own country is crucial for an optimal care for our women.

Concerning female sexual function assessment, diagnosis of sexual dysfunction is generally made by psychiatrists, based on the DSM-IV criteria which classified female sexual dysfunctions into 5 major categories: hypoactive sexual desire disorder (HASDD), sexual aversion disorder, female sexual arousal disorder (FSAD), female orgasmic disorder (FOD) and sexual pain disorders.¹² Many other questionnaires were also developed for assessing female sexual dysfunction. This may affect the prevalence of sexual dysfunction depending on the questionnaire used because this subject is complex and can be influenced by many factors.^{13,14} The most frequently quoted report from the USA found the prevalence of female sexual dysfunction in the general population was up to 43%.¹⁵ Data from other studies revealed 31% to 68% prevalences.¹⁶⁻¹⁸ A few studies from Thailand also used FSFI (a Thai translated version) to assess sexual function in non-pregnant^{4,9} or pregnant women.^{10,11} Focusing to the two studies involving pregnant women, Kerdarunsuksri and Manusirivithaya¹⁰ in 2010 performed a cross-sectional study to evaluate the attitudes and sexual function in 347 Thai pregnant women who were consent to complete FSFI questionnaire of sexual function assessment. They found the mean total FSFI score was 15.5 and 93.4% of these pregnant women had sexual dysfunction using FSFI score less than 26.5 as a criteria. Only 11.2% had positive attitudes and admitted that they still found sex as a pleasurable activity. Nearly half (47%) concerned that having sex during pregnancy may be harmful to the fetus. Furthermore, 71.2% reported that decreasing sexual desire throughout pregnancy was not a matter. The other study in 2011 by Kuljarasont et

al.¹¹ performed a cross-sectional study to investigate the prevalence of sexual dysfunction in 260 third trimester pregnant women. The authors found lower FSFI scores in pregnancy with a 90.8% prevalence of sexual dysfunction using FSFI score cut off level < 26.5.¹¹

Our study also used translated FSFI questionnaire as a tool to assess sexual function. With the same cut off value of FSFI as previous studies, our study demonstrated high prevalence of sexual dysfunction in Thai pregnant women: 71.2% at pre-pregnancy period and 87.7% during pregnancy. A significant decrease in sexual activity and function throughout pregnancy period was observed. The detrimental effect of pregnancy to sexual function was directly related to gestational age. As pregnancy advanced, more severe sexual dysfunction was observed. This was also found in two previous studies.^{1,6} Bartellas et al.¹ found a progressive reduction in sexual activity, vaginal intercourse and sexual desire in many women as pregnancy advanced. Fok et al.⁶ also found degree of sexual function and activity decreased most in the third trimester and lesser in the second and first trimesters in respective order. They also reported a fear of adverse effects from sexual intercourse as the reason of decreased sexual desire and enjoyment.⁶

Factors significantly associated with decrease FSFI score during pregnancy in our study were higher family income, women's worrisome and concern towards effect of sexual activity on pregnancy outcome. A concern of woman about adverse effects of intercourse on pregnancy was also found in previous study by Bartellas et al.¹ who reported a worry as the main reason for sexual dysfunction. This resulted in a decrease in sexual activity as pregnancy progressed.¹ Other studies found maternal age⁶ and late gestational age in the third trimester¹⁻³ as significant associated factors with sexual dysfunction. Our study also found the association of these factors with decreased FSFI score. However, the association did not reach statistically significant. We do not know whether this was due to a difference in cultural background or a small sample population in our study.

Regarding sexual position during pregnancy, Senkumwong et al⁷ in 2006 reported that the preferred sexual position in pregnancy was a missionary position. However, the sexual position had changed to rear position when pregnancy progressed to late second and third trimester. The same result was found on the study of Shojaa et al⁸ in 2008 which concluded that sexual position changed during pregnancy from basic missionary position to rear position when pregnancy advanced. These results were different from our study that we found no significant difference in sexual intercourse position among the three trimesters. Nearly half of our women preferred missionary position while only one fourth preferred rear entry position. Some proposed that a rear position might incur less discomfort to pregnant women over missionary position when pregnancy advanced and might have less effect on pregnancy.

Focusing on sources of knowledge about sexuality during pregnancy, common sources of data were from family members and medical professionals (approximately 30% each). This was similar or higher than other previous studies which reported that only 9%⁶ to 29%¹ of women discussed about sexual activity during pregnancy with their doctors. Their studies also explored in detail and found that approximately half of these women brought up the topic themselves^{1,6} while 34% were reluctant to do so.⁶

Since we found higher family income, women's worrisome and concern towards effect of sexual activity on pregnancy outcome were the main factors associated with sexual dysfunction. These reflect that knowledge and psychological perception of pregnant women. Medical or paramedical personnel who involve in prenatal care service should recognize these problems and educate the physiologic changes of pregnancy including the sexual activity to the couples to reassure that sexual intercourse in low risk pregnancy is safe.

In conclusion, sexual activity and sexual function decreased in pregnant woman compared to her pre-pregnancy status. Sexual deterioration significantly

decreased throughout pregnancy. Factors significantly associated with decrease sexual activity or impaired sexual function were higher family income, women's worrisome and concern towards effect of sexual activity on pregnancy outcome.

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References

1. Bartellas E, Crane JM, Daley M, Bennett KA, Hutchens D. Sexuality and sexual activity in pregnancy. *BJOG* 2000; 107: 964-8.
2. Aslan G, Aslan D, Kizilyar A, Ispahi C, Esen A. A prospective analysis of sexual functions during pregnancy. *Int J Impot Res* 2005; 17: 154-7.
3. Erol B, Sanli O, Korkmaz D, Seyhan A, Akman T, Kadioglu A. A cross-sectional study of female sexual function and dysfunction during pregnancy. *J Sex Med* 2007; 4: 1381-7.
4. Peeyananjarassri K, Liabsuetrakul T, Soonthornpun K, Choobun T, Manopsilp P. Sexual functioning in postmenopausal women not taking hormone therapy in the Gynecological and Menopause Clinic, Songklanagarind Hospital measured by Female Sexual Function Index questionnaire. *J Med Assoc Thai* 2008; 91: 625-32.
5. Rosen R, Brown C, Heiman J, Leiblum S, Meston C, Shabsigh R, et al. The female sexual function index (FSFI): a multidimensional self-report instrument for the assessment of female sexual function. *J Sex Marital Ther* 2000; 26: 191-208.

6. Fok WY, Chan LY, Yuen PM. Sexual behavior and activity in Chinese pregnant women. *Acta Obstet Gynecol Scand* 2005; 84: 934-8.
7. Senkumwong N, Chaovisitsaree S, Rugpao S, Chandrawongse W, Yanunto S. The changes of sexuality in Thai women during pregnancy. *J Med Assoc Thai* 2006; 89 Suppl 4: 124-9.
8. Shojaa M, Jouybari L, Sanagoo A. The sexual activity during pregnancy among a group of Iranian women. *Arch Gynecol Obstet* 2009; 279: 353-6.
9. Oranratanaphan S, Taneepanichskul S. A double blind randomized control trial, comparing effect of drospirenone and gestodene to sexual desire and libido. *J Med Assoc Thai* 2006; 89 (Suppl 4): S17-22.
10. Kerdarunsuksri A, Manusirivithaya S. Attitudes and Sexual Function in Thai Pregnant Women. *J Med Assoc Thai* 2010; 93: 265-71.
11. Kuljarusnont S, Russameecharoen K, Thitadilok W. Prevalence of sexual dysfunction in Thai pregnant women. *Thai J Obstet Gynaecol* 2011; 19: 172-80.
12. American Psychiatric Association. Diagnostic and statistical manual for mental disorders. 4th edition. Text version (DSM-IV-TR). Washington DC: American Psychiatric Association; 2000. p. 482-510.
13. Basson R, Berman J, Burnett A, Derogatis L, Ferguson D, Fourcroy J, et al. Report of the international consensus development conference on female sexual dysfunction: definitions and classifications. *J Urol* 2000; 163: 888-93.
14. Basson R. Women's sexual dysfunction: revised and expanded definitions. *CMAJ* 2005; 172: 1327-33.
15. Laumann EO, Paik A, Rosen RC. Sexual dysfunction in the United States: prevalence and predictors. *JAMA* 1999; 281: 537-44.
16. Lau JT, Kim JH, Tsui HY. Prevalence of male and female sexual problems, perceptions related to sex and association with quality of life in a Chinese population: a population-based study. *Int J Impot Res* 2005; 17: 494-505.
17. Safarinejad MR. Female sexual dysfunction in a population-based study in Iran: prevalence and associated risk factors. *Int J Impot Res* 2006; 18: 382-95.
18. Elnashar AM, El-Dien Ibrahim M, El-Desoky MM, Ali OM, El-Sayd Mohamed Hassan M. Female sexual dysfunction in lower Egypt. *BJOG* 2007; 114: 201-6.