**Factors Affecting the Variation in Sexual Activity and Response Before and During Pregnancy**

**Running title: Sexual Activity and Response Before and During Pregnancy**

**Abstract**

Pregnancy is one of the most sensitive periods in women's lives during which, sexual activity are affected by the variations in the physical, hormonal, and mental conditions. The aim of this study was to investigate the factors affecting the variations in sexual response before and during pregnancy. This study is a cross-sectional one conducted in 2018 in X on pregnant women. The data were collected using the pregnancy sexual response inventory containing 26 questions in 10 domains. Then, the data were analyzed using the SPSS software and the descriptive and inferential tests. The mean of the total score of the subjects’ sexual response before and during pregnancy were 73.04±14.81 and 46.88±16.51, respectively. The variations in the total score of the subjects’ sexual response during pregnancy decreased by 26.16 points during pregnancy compared to pre-pregnancy. There was a positive correlation between the score of the variations in the subjects’ sexual response before and during pregnancy and the number of children. The couples’ higher level of education and lower number of children reduced the variations in the couples’ sexual response. Therefore, through encouraging couples to share the responsibilities of taking care of the children, and to pursue their education at higher levels, it is possible to enhance couples’ sexual health.

**Keyword:** sexual activity, sexual response, pregnancy, pre-pregnancy

**Introduction**

Sexual issues can be considered as important and normal aspects of each individual’s personal life and beyond mere sexual behavior. Sexual tendencies and behaviors are diverse and consist of several factors. As pregnancy is one of the factors leading to physical and psychological changes in women, it can be regarded as an important element in the emergence or intensification of sexual disorders (Jamali and Mosalanejad 2013) . Pregnancy is among the most sensitive periods in women’s lives during which, sexual activity and intercourse are affected by the changes in various physical, hormonal, social, cultural, and mental conditions (Johnson 2011, Sossah 2014).

During pregnancy, the sexual activity and tendencies of pregnant women and their spouses are unpredictable and may increase, decrease or remain unchanged (Babazadeh, Najmabadi, and Masomi 2013). Factors such as physiological, anatomical, and hormonal changes; cultural, social, ethnic, religious issues; fears and concerns about sexual intercourse during pregnancy; changes in pregnant women’s body image; and a sense of reduction in the physical attractiveness for their spouses can all negatively affect individuals’ sexual response and couples’ sexual intercourse; cause anxiety and lack of confidence in couples; and eventually, disturb the mental health of the family (Serati et al. 2010). Changes in the physical condition of pregnant women lead to changes in their sexual behaviors. During this period, women avoid some of their previous sexual behaviors (Johnson 2011, Sossah 2014). Besides, female sexual life during pregnancy can be affected by illnesses, gravidity, number of children, gestational age, beliefs, as well as emotional and physical changes (Demireloz Akyuz et al. 2018).

The normal sexual function of women includes sexual arousal, lubrication, orgasm, and satisfaction, leading to well-being and a favorable quality of life (AlessandRa PlácidO liMa leite et al. 2009).Variations and reduced sexual function during pregnancy not only affect women but also have a negative effect on their sex partners/spouses, leading to a low libido and thus affecting couples’ interactions (Johnson 2011, Pauleta, Pereira, and Graca 2010).

A healthy sexual condition during pregnancy is key to couples’ role as parents (Serati et al. 2010). Therefore, an essential component of pregnant women’s healthcare is the examination of sexual issues (Babazadeh, Najmabadi, and Masomi 2013).

Regarding the importance of couples’ sexual health during pregnancy, some studies focusing on sexual function and response during pregnancy have only examined female sexual response, activity, and function during pregnancy (Ninivaggio et al. 2017, Galazka et al. 2015, Aslan et al. 2008, Anzaku A. Stephen et al. 2016). While sexual intercourse involves both sexes, due to female physical and mental state during pregnancy, spouses have a decisive role in improving sexual health during this particular period. The aforementioned aim can possibly be achieved through examining couples’ sexual function, activity, and satisfaction; along with their variations before and during pregnancy; as well as the factors influencing them. Therefore, this study was conducted to investigate the factors affecting the variations in sexual response before and during pregnancy to help consolidate marital life through identifying and reinforcing those positively affecting sexual response.

**Materials and Methods**

The present study was a cross-sectional (descriptive-analytical) one. The research population consisted of the pregnant women living in X, northern Y. The total number of participants was 256, chosen from among pregnant women referred to the Prenatal Care Clinic, X Hospital, Y, between February 2018 and June 2018, via convenience sampling. The inclusion criteria were women with 20-36 weeks’ gestation, no physiopathological illnesses, no mental diseases, no marital problems and conflicts, and literacy. Given that the questionnaires were completed with the consent of the participants and by the individuals themselves, no questionnaire was excluded due to incomplete information and no one withdrew from the study.

The data collection tool was the Pregnancy Sexual Response Inventory (PSRI) and the demographic features. Designed by Rudge et al. in Brazil, the PSRI contains 26 questions about sexual activity and response in ten domains: the number of sexual intercourse, sexual desire, sexual arousal, orgasm, female sexual satisfaction, dyspareunia, sexual initiation, female sexual problems, male sexual satisfaction, and male sexual problems before and during pregnancy. The total score is calculated out of 100 points (Rudge et al. 2009): Scores below 25 indicate very bad sexual relations and activities; scores between 25 and 50 indicate bad sexual relations and activities; scores between 50 and 75 indicate good sexual relations and activities, and scores between 75 and 100 indicate excellent sexual relations and activities (Rudge et al. 2018). To ensure the validity and reliability of this questionnaire, after obtaining a written permission from the designer of the questionnaire, its English version was translated into Persian by 2 of the researchers whose native language was Persian and had sufficient proficiency in English. Then, the Persian version was reviewed and examined to ensure the accuracy of each item’s translation and finally, considering the comments and the proposed equivalents, a single Persian version of this instrument was developed. Then, the Persian version was back-translated into English by two translators (other than the initial ones) proficient in English and Persian and uninformed about the English version of the questionnaire, the research, and its stages. After examining and modifying the two back-translated English versions, a single English version was developed. Finally, this English version was sent to the designer of the original questionnaire in order to make sure that the translation corresponded to the original questionnaire. The designer verified the questionnaire and sent the scoring system of the questionnaire to the researcher. The questionnaire was assessed in terms of content, face, and construct validity. To do this, the Persian version of the questionnaire was given to twelve professors with enough expertise and experience in the field as well as ten pregnant women who were eligible for the study, and they were asked to examine the quality of the questionnaire with respect to criteria such as grammatical correctness, the appropriateness of words, clarity, the style of writing, and the spelling of words, and to provide the necessary feedback in order to let the researchers correct the formal and linguistic mistakes and resolve the ambiguities. Cronbach’s alpha coefficient and the test-retest method were used to ensure the reliability and internal consistency of the whole questionnaire (Taheri-Tanjani P and M. 2016). The reliability of the questionnaire was assessed using Cronbach’s alpha coefficient which equaled 0.81 for the questionnaires given to 30 pregnant women eligible for the study. The instrument can be considered reliable if the Cronbach’s alpha coefficient is equal to or greater than 0.7 (Plitcha SB and E. 2013). In order to examine the internal consistency and the repeatability, the test-retest method was used. It has been suggested that the interval between the two tests should be two weeks to one month (Plitcha SB and E. 2013). In this study, the questionnaire was given to the 30 pregnant women for the second time after 2 weeks and the obtained scores in these two tests were compared with one another using the intra-class correlation coefficient (ICC) which equaled 0.97. Intra-class correlation coefficient can be regarded as the most acceptable index for the consistency of tests (Plitcha SB and E. 2013).

**Data analysis:** The 16th version of the SPSS statistical software was used to analyze the data in this study. The statistical methods used in this study were descriptive and inferential. Descriptive statistics were used to describe the demographic data (calculating the central indices, frequency, and percentage). In this study, the significance level was set at 0.05.

**Ethical considerations:** All the steps taken in this study, including all the interactions with the human subjects, were in accordance with the ethical standards of Z University of Medical Sciences, the 1964 Helsinki Announcements and their later amendments, and general ethical standards. This study was approved by the ethics committee of Z University of Medical Sciences under the code (U) The study was conducted after obtaining permission from the designer of the original questionnaire, providing the necessary explanations and information to the participants and obtaining their written consent.

**Results**

The results of the data analysis indicate that the mean and the standard deviation of the age of the female subjects were 28.46 ± 5.12 years, with a minimum of 13 and a maximum of 42 years old. Pregnancy in the majority of the subjects (84.8%) was intended. The demographic features of the participants can be found in **Table 1**.

The mean and the standard deviation of the total score of the subjects’ sexual activity and response before and during pregnancy were 73.04 ± 14.81 and 46.88 ± 16.51, respectively. Variations in the total score of the subjects’ sexual activity and response during pregnancy showed a decrease of 26.16 points compared to pre-pregnancy. (**Table 2**)

Pearson’s statistical test indicated that there is no correlation between the score of the variations in the subjects’ sexual activity and response before and during pregnancy and the pregnant women’s age (p=0.289), the age of their spouses (p=0.248), the age difference (p=0.828), the duration of marriage (p=0.225), gravidity (p=0.386), gestational age (p=0.092), and the women’s occupation (p=0.295). However, there was a positive correlation between the score of the variations in the subjects’ sexual activity and response before and during pregnancy and the number of children [(p=0.022) (r=0.143)], and there was a negative correlation between the score of the variations in the subjects’ sexual activity and response before and during pregnancy and the pregnant women’s level of education [(p=0.005) (r=-0.174)] and also their spouses’ level of education [(p=0.039) (r=-0.129)].

**Discussion**

The results of this study indicated that the total score of the subjects’ sexual activity and response decreased during pregnancy compared to pre-pregnancy. Also, the scores of the number of sexual intercourse, sexual desire, sexual arousal, orgasm, female sexual satisfaction, dyspareunia, sexual initiation, female sexual problems, male sexual satisfaction, and male sexual problems decreased during pregnancy compared to pre-pregnancy.

In a 2018 study conducted in Portugal with the use of the Pregnancy Sexual Response Inventory (PSRI), Rudge et al. also found that the total score of the subjects’ sexual activity and response decreased during pregnancy compared to pre-pregnancy. They also found that the scores of all the domains, except for the dyspareunia, decreased during pregnancy compared to pre-pregnancy and that the mean of dyspareunia’s score during pregnancy was slightly less than the mean of its score before pregnancy (Rudge et al. 2018). In a review study on the sexual behaviors of pregnant women, Jawed-Wessel et al. found that there was a gradual decrease in the number of sexual intercourse from the first trimester of pregnancy to the third, and also a decrease in the number of sexual intercourse during pregnancy compared to pre-pregnancy (Jawed-Wessel and Sevick 2017). The results of another study showed that most of the pregnant women had sexual intercourse once to thrice a month during pregnancy while they had sexual intercourse once or twice a week before pregnancy. Furthermore, with the increase in the gestational age, a decrease was observed in the number of sexual intercourse, mainly due to the reduction of sexual desire (35.5%), physicians’ recommendation (29%) and the fear of injury to the fetus (29%). 54% of the subjects reported a decrease in sexual satisfaction during pregnancy compared to pre-pregnancy. One of the reasons for the reduction of sexual satisfaction was the decrease in women’s attractiveness (Staruch et al. 2016).

In another study, Corbacioglu et al. found that the number of women’s sexual intercourse decreased during pregnancy compared to pre-pregnancy. The decrease was more remarkable in the third trimester (76.5%). However, no significant relationship was observed between the number of sexual intercourse before pregnancy and during pregnancy. There was also a decrease in the scores in all the domains of sexual response during pregnancy compared to pre-pregnancy (Corbacioglu Esmer et al. 2013b). In another study conducted in Turkey, Yildiz et al. used the female sexual function index (FSFI) and found that the score of sexual function decreased during pregnancy compared to pre-pregnancy and that the highest decrease was in the third trimester (Yildiz 2015). The results of some other studies, just as the present study, indicated a reduction in sexual function during pregnancy compared to pre-pregnancy (Galazka et al. 2015, Aslan et al. 2008, Anzaku A. Stephen et al. 2016, Aydin et al. 2015, Lowenstein, Mustafa, and Burke 2013).

Some of the physiological and anatomical factors associated with pregnancy can reduce sexual activity in this period. Fatigue, backache, painful intercourse, infection (urinary tract infections, vaginitis), stress urinary incontinence, hemorrhoid, lightening of the fetus, the slackness of pubic symphysis and sacroiliac joints, nausea, and breast pain are among the effective factors in reducing sexual activity and desire (Johnson 2011).

The relationship between socio-demographic variables and sexual response and function during pregnancy and its change compared to pre-pregnancy is a controversial issue. In this study, there was no correlation between the score of the variations in the subjects’ sexual activity and response before and during pregnancy, and the age of the pregnant women, the age of their spouses, the age difference, the duration of marriage, gravidity, gestational age, and the women’s occupation. However, there was a positive correlation between the score of the variations in the subjects’ sexual activity and response before and during pregnancy and the number of children, and a negative correlation between the score of the variations in the subjects’ sexual activity and response before and during pregnancy and the pregnant women’s level of education as well as their spouses’ level of education.

The results of the study conducted by Aydin et al. indicated that the number of pregnancies and children had an adverse effect on sexual function in pregnancy: Sexual dysfunction during pregnancy can be associated with the increase in the number of pregnancies and children. But the women’s age, the number of abortions, and the level of education in pregnant and non-pregnant women had no statistically significant relationship with sexual function. Furthermore, the employed pregnant and non-pregnant women, as well as women with a higher income, showed less sexual dysfunction (Aydin et al. 2015). Based on the results of the study conducted by Eryilmaz et al., the number of children negatively affects the number of sexual intercourse. Additionally, for women with higher levels of education, the number of sexual intercourse decreased during pregnancy compared with pre-pregnancy (Eryilmaz, Ege, and Zincir 2004). Contrary to the results of the studies discussed, the results of some studies showed that gravidity and number of children had no effect on the domains relating to pregnant women’s sexual response (Anzaku A. Stephen et al. 2016, Hanafy, Srour, and Mostafa 2014). Based on the results of this study and some of the mentioned studies on the positive correlation between the number of children and the variations in sexual response and dysfunction, it is possible to effectively increase the couples’ sexual function and satisfaction by encouraging them to appropriately plan for childbearing and to share the responsibilities of taking care of the children.

Anzaku et al. found that age affected pregnant women’s orgasm, but had no effect on their sexual desire, arousal, and satisfaction (Anzaku A. Stephen et al. 2016). The results of another study conducted in Turkey demonstrated that the pregnant women’s age did not affect their sexual behavior and response (Eryilmaz, Ege, and Zincir 2004). However, the results of some studies indicate that pregnant women’s age adversely affects sexual function during pregnancy (Güleroğlu and Beşer 2014, Basson 2005).

Pregnant women’s level of education affects their sexual function during pregnancy (Güleroğlu and Beşer 2014). The results of the present study indicate that for men and women with higher level of education, less variation can be detected in sexual response during pregnancy compared to pre-pregnancy. Similarly, the results of a study conducted in Egypt showed that women with lower levels of education were more likely to experience sexual dysfunction during pregnancy (Hanafy, Srour, and Mostafa 2014). Nevertheless, the results of another study demonstrated that women’s higher level of education negatively affected their sexual satisfaction; however, it did not have an effect on other sexual domains (Anzaku A. Stephen et al. 2016).

It has been proven that people with a higher level of education have less sexual problems. It may be argued that the level of education, as one of the factors associated with personality, influences behavior (Schomerus et al. 2013). Therefore, it seems that educated women are more interested in finding solutions to prevent sexual dysfunction during pregnancy.

In the present study, no relationship was found between the women’s occupation and the variations in sexual response before and during pregnancy. Chang et al. reported that full-time female employees had higher scores in sexual function and intercourse in the second trimester of pregnancy (Chang et al. 2011). However, the results of another study showed that the employed pregnant women had less sexual intercourse and that there was a negatively significant relationship between employment and sexual intercourse, which may be due to work-related fatigue (Corbacioglu Esmer et al. 2013a).

The results of another study conducted in Iran demonstrated that factors such as higher age, lower level of education, unintended pregnancy, and longer interval between marriage and pregnancy made women more prone to sexual dysfunction during pregnancy (Abouzari-Gazafroodi et al. 2015).

The discrepancies in the findings of the studies concerned with the examination of the effects of demographic factors on pregnant women’s sexual response can be attributed to the diversity of research designs; the diversity of the cultures to which the female subjects belong; the effects of social, cultural, and psychological factors as well as couples’ relationship on the sexual relations of pregnant women in different communities.

One of the strengths of this study is the use of a localized version of PSRI in a specific period of time in order to measure sexual response before and during pregnancy. Contrary to other questionnaires used in previous studies (e.g. Female Sexual Function Index), this questionnaire is a specialized instrument for examining couples’ sexual activity and response during and before pregnancy. It can be used by healthcare providers for assessing pregnant women’s sexual activity, response, and satisfaction and determining whether it’s necessary to refer them to a sexologist or not. Furthermore, using its scores in different domains, healthcare providers can plan and implement strategic and health programs in order to improve pregnant women’s sexual health. Being cross-sectional and being restricted to a specific geographical area are among the limitations of this study. It is suggested that more studies be conducted in different geographical areas with different cultures.

**Conclusion**

The results of the study indicated that sexual activity and response decreased during pregnancy compared to pre-pregnancy. Besides, demographic factors, with the exception of the couples’ education and the number of children, did not affect these variations in sexual activity and response. The number of children had a positive correlation with the variations in sexual response before and during pregnancy. The couples’ education had a negative correlation with the variations in sexual response before and during pregnancy. Thus, fewer children and a higher level of education can decrease the variations in the couples’ sexual response. Therefore, by encouraging couples to appropriately plan for childbearing, to share the responsibilities of taking care of the children, and to pursue their education at higher levels, along with providing valid sexual information for couples before and during pregnancy by healthcare providers and empowering women to maintain and improve their sexual health, it is possible to enhance couples’ sexual health and subsequently, to strengthen the family.

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**Conflict of interest**

The authors report no conflicts of interest.

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