

## Original Article

## Comparison of Women with Gestational Diabetes and Healthy Pregnant Women in Terms of Quality of Sex and Sexual Dysfunction

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### Abstract

**Objective:** This descriptive research is to compare women with gestational diabetes mellitus in their third trimester and healthy pregnant women in terms of quality of sex and sexual dysfunction.

**Method:** The data of this cross-sectional study were collected between September and December 2015. The study population consisted of the healthy women and women with gestational diabetes in two region in Turkey. The study included a total of 130 pregnant women. Data were collected face to face interview using the "The Descriptive Questionnaire" which included demographical characteristics and "Golombok-Rust Inventory of Sexual Satisfaction Female Questionnaire". The data obtained were assessed by SPSS 20 Program. The data were analyzed using arithmetic means, percentage distributions and min-max values as well as the Mann Whitney-U and Student t tests.

**Results:** The mean age of the women included in the study was  $30.58 \pm 3.82$  and their mean gestational week  $31.75 \pm 5.12$ . Most of the pregnant women had education at primary school level, were married, lived in provincial centers, had less income than expenses and had health insurance. Of the women with gestational diabetes, 44.6% had their blood sugar measured once a week. The differences between the mean scores of total satisfaction, and the mean touch, frequency, communication, satisfaction, avoidance and anorgasmia subscale scores of women with gestational diabetes and healthy pregnant women were statistically significant ( $p < 0.05$ ). When the total and subscale scores obtained by the pregnant women from the sexual satisfaction inventory were compared with respect to the 3<sup>rd</sup> trimester, their total, touch, vaginismus, frequency, satisfaction and anorgasmia scores were found to differ significantly from each other ( $p < 0.05$ ).

**Conclusion:** Sexual dysfunction was higher in healthy pregnant women in the 3<sup>rd</sup> trimester of their pregnancy compared to women with gestational diabetes. During their pregnancy, the knowledge and beliefs of women about sex should be assessed to provide proper nursing care and sexual counseling in line with their needs.

**Keywords:** Gestational Diabetes Mellitus, Nursing, Pregnancy, Sexual Dysfunction.

### Introduction

According to the World Health Organization healthy sex is not only the absence of sexual dysfunction but also the presence of full physical, emotional, mental and social well-being. Sexual function is an inevitable part of everyone's life and a mile stone with an obvious impact on quality of life (Serati et al., 2010). Some situations experienced by women in their lives may affect their sexual functions. Sexual dysfunction symptoms are quite often seen throughout pregnancy (Leite et al., 2009; Ribeiro

et al., 2014; Erol et al., 2007; Souza et al., 2013). Some studies have demonstrated that sexual dysfunction increases gradually in the gestational period, 80% of pregnant women in their 3<sup>rd</sup> trimester are affected and sexual satisfaction diminishes as birth approaches (Serati et al., 2010; Leite et al., 2009; Ribeiro et al., 2014; Fok, Chan, Yuen, 2005; Pauleta, Pereira, Graca, 2010; Chang, Chen, Lin, Yu, 2011). All stages of women's sexual response cycles including sexual drive, arousal and orgasm are at risk especially in the 3<sup>rd</sup> trimester of pregnancy (Serati et al., 2010;

Leite et al., 2009; Pauleta, Pereira, Graca, 2010). Besides physical, psychosocial, sociocultural, religious and relation-related concerns, myths or fears such as the baby would be harmed contribute to worsening of sexual functions (Serati et al., 2010; Ribeiro et al., 2014; Erol et al., 2007; Pauleta, Pereira, Graca, 2010; Shojaa, Joubari, Sanagoo, 2009; Khamis, Mustafa, Mohammed, Toson, 2007). Lack of knowledge about sexual activity in pregnancy may also contribute to sexual dysfunction (Uapusitanon, Choobon, 2004).

A 75 gm oral glucose tolerance test is being performed to all women between gestational weeks 24 and 28 as a routine part of prenatal care. According to the criteria of the World Health Organization, those with a fasting blood sugar <126 mg/dL and a postprandial blood sugar <140 mg/dL 2 hours later continue to receive prenatal care in the low-risk group. Those who had one or two abnormal results are diagnosed with GDM and are assessed closely as a risky group until birth (ADAD, 2011; ACOG, 2017).

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance starting in pregnancy. It is one of the most frequent endocrine diseases in pregnancy and affects 1 to 14% of women depending on diagnostic criteria (ADAD, 2011; ACOG, 2017). The diabetes mellitus seen in pregnancy is a condition where carbohydrate intolerance develops during pregnancy. Researches have stated that many conditions may be associated with the diagnosis of GDM and developed hypotheses suggesting that increased stress of the mother in her perinatal period can affect her sex life (Perkins, Dunn, Jagasia, 2007). Both in Type 1 and Type 2 diabetes, there may normally be impairment in the vascular bed due to exposure to chronic hyperglycemia or sexual dysfunction in women associated with peripheral neuropathy. As a result of hyperglycemia, the level of serum prolactin rises and this changes neurotransmitters, which may potentially be associated with sexual dysfunction. However, this is not the case in GDM because a glucose intolerance of any degree occurs for the first time in pregnancy (ADAD, 2011). For this reason, women who normally have GDM are not expected to be at high risk for sexual dysfunction due to biological reasons, but occurrence of changes in hormone and neurotransmitter levels in GDM may result in accompanying metabolic changes (Ziaeirad, Vahdaninia, Montazeri, 2010;

Owiredu, Amidu, Alidu, Sarpong, Gyasi-Sarpong, 2011). The resulting metabolic changes in turn may lead to sexual dysfunction. For example, metabolic problems such as obesity can also have negative effects on sexual functions (Ribeiro et al., 2014). While some studies have reported that significant changes occur in sexual functions of women with GDM in their 3<sup>rd</sup> trimester, other studies have reported no changes (Souza et al., 2013; Ribeiro et al., 2011; Ribeiro, Nakamura, Scanavino, Torloni, Mattar, 2012). These questionable results indicate that there is a need for further studies with different populations. For this reason, the aim of this study is to compare women with gestational diabetes mellitus in their 3<sup>rd</sup> trimester to healthy pregnant women in terms of quality of sex and sexual dysfunction.

## Methods

### Study design

This descriptive and correlational study included healthy women and women with gestational diabetes who were being monitored between September and December 2015 at the department of obstetrics of two hospitals from the Mediterranean Region and one hospital from the Eastern Anatolia Region.

### Participants

The study population consisted of the entire healthy pregnant women and those with gestational diabetes in the said hospitals. Between the dates specified, the subjects who were willing to participate in the study were included. The sample size was calculated as 130 pregnant women using a power analysis with 5% error and 95% power of representing the population; thus, 130 pregnant women were included in the sample. In the post-hoc power analysis performed to determine the sufficiency of the sample size, the effect size turned out to be 1.96 and the power 0.99.

The study seeks answers to the following questions:

- What is the quality of sex in women with gestational diabetes and healthy pregnant women?
- Is there any sexual dysfunction in women with gestational diabetes and healthy pregnant women?

**The inclusion criteria:** The pregnant women were being aged between 18 and 40 years, the

gestational age being between weeks 28 and 40, having a partner for at least 6 months and currently living with them, being literate and being able to communicate.

**Exclusion criteria without work:** Women who were banned to have sexual relation due to an obstetric disease (e.g. placenta previa, early membrane rupture or preterm birth) and those who had a vaginal infection in the last one month were excluded from the study. Women who used antihypertensive drugs, who were hospitalized in the last 30 days, who used alcohol or narcotics and who had a history of a psychiatric illness were also excluded.

### Collection of data

In accordance with the Helsinki Declaration Principles and on the basis of voluntary participation principle, all pregnant women who met the inclusion criteria were informed about the study and its purpose and written and verbal consents were obtained from those who volunteered to take part in the study. The Descriptive Questionnaire and the Golombok-Rust Inventory of Sexual Satisfaction Female Questionnaire that were used for collecting data from pregnant women were given to them during their outpatient clinic consultations. To keep pregnant women from being under influence when answering the questions, a separate room outside the clinic was arranged and they were asked to read and complete the questionnaires on their own. The importance of the confidentiality of interviews was explained and no identity information was obtained from any of them. While pregnant women completed the questionnaires, the investigators waited outside the door of the room ready to take action in the case of a possible problem. The forms of the pregnant women who completed the questionnaires were placed in opaque envelopes in a way to be unreadable from outside to ensure the confidentiality of their answers. The interviews lasted between 30 and 45 minutes on the average.

### Data Collection Tools

The data were collected by the investigators using the pregnant women Descriptive Questionnaire that was prepared in line with the literature (Souza et al., 2013; Ribeiro et al., 2011; Ribeiro, Nakamura, Scanavino, Torloni, Mattar, 2012) and the Golombok-Rust Inventory of Sexual Satisfaction Female Questionnaire.

### Pregnant Women Descriptive Questionnaire:

Prepared by the investigators in line with the literature (Souza et al., 2013; Ribeiro et al., 2011; Ribeiro, Nakamura, Scanavino, Torloni, Mattar, 2012), the questionnaire consisted of questions on age, education, marital status, residence, employment status, income status, social security, exercising status, exercising frequency, body mass index, gestational week and smoking status. Additionally, women with GDM were also asked when they were diagnosed with diabetes, whether there was diabetes in their family, whether they had any other chronic disease besides diabetes and how often they measured their blood sugar.

### Golombok-Rust Inventory of Sexual Satisfaction Female Questionnaire:

The Golombok-Rust Inventory of Sexual Satisfaction (GRISS) was developed by Rust and Golombok in 1983. The validity and reliability study of the scale was performed by Tugrul, Oztan and Kabakcı (1993) in our country. It is a measurement tool assessing the quality of sexual relations and sexual dysfunction. The scale consists of 28 items and 7 subscales. The subscales are avoidance, satisfaction, communication, touch, frequency of relations, vaginismus and anorgasmia. The frequency of relations and communication subscales are questioned in 2 items each and the other subscales in 4 items each. The scale also includes 4 items outside these subscales but also about the quality of sexual relations. The items are answered on a Likert-type scale consisting of the choices “never”, “rarely”, “sometimes”, “mostly” and “always”. GRISS is scored as follows; “never: 0”, “rarely: 1”, “sometimes: 2”, “mostly: 3” and “always: 4”. Items 1, 2, 3, 4, 8, 9, 12, 13, 15, 16, 19, 20, 21 and 25 in the male version of GRISS and items 2, 4, 5, 8, 9, 10, 11, 15, 16, 17, 19, 21, 22, 25, 26, 27 and 28 in its female version are scored in the reverse order. Both the total score and the scores obtained from the subscales can be used when assessing the scale. Higher scores indicate impairment in sexual function and quality of relations (Tugrul, Oztan, Kabakcı, 1993). The reliability coefficient of the scale was found to be 0.87 in females in this study.

### Data Analysis

SPSS 20 program was used to statistically analyse the findings of the study. The statistical significance level was set at  $p < 0.05$  and the confidence interval at 95%. Arithmetic means,

percentage distributions and min-max values as well as Mann Whitney-U and Student-t tests were used for the statistical analysis of data. The histogram and bell-shaped curve method was used to determine normal distribution of data.

### Ethical Approval

Before starting the study, an ethical approval dated 24.08.2015 and numbered 8/1 was obtained from the Ethics Committee of Erzincan University and official permission for conducting the study from the hospitals where the study was to be performed. Participants included in the study were explained about the purpose of the study and who volunteered to work were included.

### Limitations of the study

The study population consists of only the department of obstetrics of two hospitals from the Mediterranean Region and one hospital from the Eastern Anatolia Region. Therefore these study results cannot be generalised.

### Results

**Table 1** shows the basic characteristics of the pregnant women. Most of the pregnant women had education at primary school level, were married, lived in provincial centers, had less income than expenses and had health insurance (**Table 1**).

**Table 1. Demographic characteristics of pregnant women**

Demographic Characteristics		GDM		Healthy		Total	
		n	%	n	%	n	%
<b>Education</b>	Illiterate	-	-	1	1.5	1	0.8
	Primary School	47	72.3	25	38.5	72	55.4
	High School	9	13.8	19	29.2	28	21.5
	University	9	13.8	20	30.8	29	22.3
<b>Marital Status</b>	Single	1	1.5	-	-	1	0.8
	Married	64	98.5	65	100	129	99.2
<b>Residence</b>	Provincial Center	55	84.6	46	70.8	101	77.7
	District	8	12.3	12	18.5	20	15.4
	Village	2	3.1	7	10.8	9	6.9
<b>Employment</b>	Employed	54	83.1	32	49.2	86	66.2
	Unemployed	11	16.9	33	50.8	44	33.8
<b>Income Status</b>	Income less than expenses	48	73.8	41	63.1	89	68.5
	Income equal to expenses	17	26.2	18	27.7	35	26.9
	Income more than expenses	-	-	6	9.2	6	4.6
<b>Health Insurance</b>	Yes	61	93.8	53	81.5	114	87.7
	No	4	6.2	12	18.5	16	12.3
<b>Exercising</b>	Yes	35	53.8	41	63.1	76	58.5
	No	30	46.2	24	36.9	54	41.5
<b>Exercising Frequency</b>	At least 3 days a week for at least 30 minutes	5	14.3	2	4.8	7	9.1
	At least 3 days a week for 30 minutes	7	20.0	24	57.1	31	40.3
	At least 3 days a week for more than 30 minutes	4	11.4	8	19.0	12	15.6
	Once or twice a week for 15 minutes	19	54.3	8	19.0	27	35.1
<b>Smoking</b>	Yes	22	33.8	6	9.2	28	21.5
	No	43	66.2	59	90.8	102	78.5

**Table 2. Review of some characteristics of pregnant women**

Demographic Characteristics		GDM		Healthy		Total	
		n	%	n	%	n	%
Family History of Diabetes	Yes	32	49.2	12	18.5	44	33.8
	No	33	50.8	53	81.5	86	66.2
Disease Outside Diabetes	No	57	87.7	64	98.5	121	93.1
	Yes	8	12.3	1	1.5	9	6.9
	Hypertension	7	87.5	-	-	7	87.5
	Lung disease	1	12.5	-	-	1	12.5
	Once a week	29	44.6	-	-	29	44.6
Frequency of Measuring Blood Sugar	Twice a week	17	26.2	-	-	17	26.2
	Three times a week	5	7.7	-	-	5	7.7
	Everyday	4	6.2	-	-	4	6.2
	Twice a day	10	15.4	-	-	10	15.4
		Mean	SD	Mean	SD	Mean	SD
Age		31.68 (26-38)	3.23	29.48 (18-38)	4.06	30.58 (18-38)	3.82
Gestational week		32.14 (26-40)	3.96	31.35 (13-40)	6.08	31.75 (13-40)	5.12
Time of being diagnosed with diabetes		2.70 (1-7)	1.04	-	-	2.70 (1-7)	1.04

There are no family members with diabetes in 50.8% of gestational diabetic women and 81.5% of healthy pregnant women. There were no other chronic diseases in 87.7% of the women with gestational diabetes and in 98.5% of the healthy pregnant women. Of the women with gestational diabetes, 44.6% had their blood sugar measured once a week. The mean age of the women included in the study was  $30.58 \pm 3.82$  and their mean gestational week  $31.75 \pm 5.12$  (Table 2).

The differences between the mean total scores and the mean scores of touch, frequency, communication, satisfaction, avoidance and anorgasmia subscales the women with gestational diabetes and the healthy pregnant women obtained from the sexual satisfaction scale were statistically significant ( $p < 0.000$ ). With the exception of avoidance subscale, the healthy pregnant women had higher mean scores in all subscales. The difference between the mean scores of vaginismus subscale was statistically insignificant ( $p > 0.005$ , Table 3).

When the sexual satisfaction scale total and subscale scores of the women were compared with respect to the third trimester, the total,

touch, vaginismus, frequency, satisfaction and anorgasmia scores were found to significantly differ from each other ( $p < 0.05$ ). The mean total, touch, vaginismus, frequency, satisfaction and anorgasmia scores of the healthy pregnant women were higher. The communication score was higher in the women with gestational diabetes. The difference between the groups was insignificant for the avoidance subscale ( $p > 0.05$ , Table 3).

### Discussion

Pregnancy directly affects sexual lives of women. Hormones that are secreted at high levels during pregnancy may result in physical and mental changes, reduced libido and leaving sex aside in pregnant women (Sossah, 2014; Pauls, Occhino, Dryfhout, 2008). Studies have reported that sexual function gradually decreases reaching its lowest level in the third trimester (Leite et al., 2009; Erol et al., 2007; Pauleta, Pereira, Graca, 2010; Fok, Chan, Yuen, 2005; Ribeiro, Nakamura, Scanavino, Torloni, Mattar, 2012; Pauls, Occhino, Dryfhout, 2008; Bartellas, Crane, Daley, Bennett, Hutchens, 2000).

Souza et al. (2013) found in their study with 33 women with GDM and 55 low-risk pregnant women in their gestational weeks 20-25 that the sexual dysfunction rates were 67.5% and 38.5% respectively (Souza et al., 2013). However, they found no significant difference between the groups in terms of sexual drive, excitement, lubrication and pain. They also found in the same study that in the second trimester, the women with GDM had higher sexual function scores with lower incidence of sexual dysfunction than the low-risk pregnant women. Another study comparing the sexual functions of healthy adult pregnant women to women with GDM in their third trimester found that the prevalence of sexual dysfunction was higher in all women in the third trimester of pregnancy and there was no significant difference between the healthy women and the women with GDM (Ribeiro et al., 2011). In another study, the sexual functions of 44 pregnant women with GDM were compared to those of 43 healthy pregnant women in the same gestational week. The sexual functions of the pregnant women with GDM were not found to significantly differ from those of the healthy women in the same gestational week. It was stated that the most common problem experienced in both groups was diminished sexual drive and arousal and the area that received the highest score was satisfaction (Ribeiro, Nakamura, Scannavino, Torloni, Mattar, 2012). In their cross-sectional study, Tabande et al. (2016) also found no significant difference between pregnant women with and without gestational diabetes in terms of sexual satisfaction (Tabande, Behnampour, Mashah, Cherati, Alaei, 2016). In our study, the sexual functions of the pregnant women with GDM were significantly better than those of the healthy pregnant women in all subscales except the avoidance subscale, which meant that the sexual functions of the healthy pregnant women were poorer. The pregnant women with GDM were able to go for a check-up more often than the healthy pregnant women due to their monitoring of blood sugar. This may have been effective in both controlling GDM and adopting a healthy life style behavior and such behavior may have affected their sex life positively. Their sex lives may be better than those of healthy pregnant women. Diminished lubrication due to reduced libido, vaginal infections and increased vaginal ailments and diminished clitoral sensitivity due to peripheral neuropathy are thought to be the causes of sexual dysfunction in female patients

with diabetes mellitus (Ali, Hajeri, Khader, Shegem, Ajlouni, 2008 ). However, since GDM occurs only during pregnancy, it may not affect sexual function as much as chronic diabetes.

Sexual dysfunction is common in healthy pregnant women in the third trimester of their pregnancy (Serati et al., 2010; Leite et al., 2009; Pauleta, Pereira, Graca, 2010; Olusegun, Ireti, 2011; Kuljarusnont, Russameecharoen, Thitadilok, 2011; Wannokosit, Phupong, 2010; Rados, Vranes, Sunjic, 2014). The causes of sexual dysfunction in women include fear of harming the fetus, reduced libido and a self-image of being sexually weak (Serati et al., 2010; Olusegun, Ireti, 2011; Afrokoti, Shahhosseini, 2016). Men also reportedly choose to do without sex with the worry of harming the mother and the fetus (Serati et al., 2010; Olusegun, Ireti, 2011; Galazka, Drosdzol-Cop, Naworska, Czajkowska, Skrzpulec-Plinta, 2015). Moreover, signs in the last trimester of pregnancy such as fatigue, weakness, stomach problems, troublesome respiration, frequent urination, decreased mobility, and lactation as well as increased physical changes such as strong uterine contractions during orgasm also lead to decreased sexual drive (Millheiser, 2012). Iranian researchers have stated that the frequency of having sex decreases in pregnant women and the main reason for it is pain, nausea and fatigue during intercourse (Babazadeh, Najmabadi, Masomi, 2013). Due to the belief among Chinese people that the thoughts and acts that influence a woman's mind also have impact on the fetus, sexual relation is not allowed during pregnancy (Leite et al., 2009). In Pakistan and Kuwait, an apparent decrease has been observed in sexual activity during pregnancy and particularly in the last trimester (Escudero-Rivaset, Carretero, Cano, Cruz, Florida, 2013).

### Conclusion

In conclusion, the changes in role, identity and image during pregnancy can affect sex life (Leite et al., 2009). The rate of sexual dysfunction is higher in healthy pregnant women in their third trimester compared to women with gestational diabetes. During their pregnancy, the knowledge and beliefs of women about sex should be assessed to provide proper nursing care and sexual counseling in line with their needs and in addition to these the cultural relationships and practices of pregnant women should be evaluated. Through in-service trainings,

healthcare staff should be strengthened in their ability to evaluate cultural beliefs affecting sex and should be encouraged not to reflect their own beliefs and judgments in the care they give.

Nurses should start diagnosing from their first prenatal care onwards. Being an important part of holistic healthcare, sexual health counseling is among the responsibilities of a nurse. They should be able to ask pregnant women about sex-related information during anamneses and collect data on biopsychosocial variables affecting sex in pregnancy. Nurses should also evaluate intentions of couples in relation to pregnancy, their thoughts about sex in pregnancy and their knowledge on sex in pregnancy (Bartellas, Crane, Daley, Bennett, Hutchens, 2010; Wannokosit, Phupong, 2010; Afrokoti, Shahhosseini 2016). They should assess through nursing diagnoses conditions of pregnant women such as ineffective sexual patterns and sexual dysfunction and find the causes of these problems, should be able to plan interventions together with pregnant women to solve such problems and should absolutely assess the results of such interventions.

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**Table 3. Comparison of total and subscale scores of sexual satisfaction scale in pregnant women with GDM and healthy pregnant women**

Group	n	Touch		Vaginismus		Frequency		Communication		Satisfaction		Avoidance		Anorgasmia		Total	
		X <sup>e</sup>	SD <sup>b</sup>	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD	X	SD
GDM <sup>a</sup>	65	5.06	1.55	6.48	1.64	3.02	0.99	2.03	6.22	2.03	1.13	9.77	1.53	5.23	1.59	43.23	6.22
Healthy	65	9.97	2.36	6.80	2.68	3.69	0.95	5.42	9.66	5.42	2.05	3.34	2.15	10.12	2.17	59.14	9.66
Significance		U <sup>c</sup> = 215.500. p=0.000		U <sup>c</sup> =1715.500 p=0.062		t <sup>d</sup> = -3.972. p=0.000		t=-1.640. p=0.000		t= -2.876. p=0.000		t= 9.638. p=0.000		t=-14.672. p=0.000		U <sup>c</sup> =374.500. p=0.000	

GDM<sup>a</sup>: Gestational Diabetes Mellitus

SD<sup>b</sup>: Standard Deviation

U<sup>c</sup> : Mann Whitney U test

t<sup>d</sup>: Student t test

X<sup>e</sup>: Mean