

## ORIGINAL RESEARCH ARTICLE

# Examining the effect of weight self-stigma on attitudes toward sexuality during pregnancy using structural equation modeling

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## Abstract

Obesity can cause psychiatric, medical, sexuality and relationship problems. Thus, this study aimed to examine the effect of weight self-stigma on attitudes toward sexuality during pregnancy using structural equation modeling. This cross-sectional study and correlational design was conducted and included 328 pregnant women pre-pregnancy body mass index greater than 30 kg/m<sup>2</sup>. The data were collected using a socio-demographic information form, the Weight Self-Stigma Questionnaire, and the Attitude Scale toward Sexuality during Pregnancy. Data were analyzed using descriptive statistics, correlation analysis, mean comparison tests, and structural equation modeling. The correlation matrices of all weight self-stigma and attitudes toward sexuality scale scores showed a significant correlation ( $p < 0.05$ ). According to the path coefficient for the effect of weight self-stigma on sexual attitudes, as the pregnant women stigmatized themselves more, their attitudes toward sexuality during pregnancy changed negatively ( $\beta < 0$ ). Weight self-stigma leads to negative attitudes toward sexuality during pregnancy in pregnant women. (*Afr J Reprod Health* 2023; 27 [9]: 87-95).

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**Keywords:** Pregnancy, sexuality, weight self-stigma

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## Résumé

L'obésité peut entraîner des problèmes psychiatriques, médicaux, sexuels et relationnels. Ainsi, cette étude visait à examiner l'effet de l'autostigmatisation liée au poids sur les attitudes à l'égard de la sexualité pendant la grossesse à l'aide d'une modélisation par équation structurelle. Cette étude transversale et de conception corrélationnelle a été menée et a inclus 328 femmes enceintes avec un indice de masse corporelle avant la grossesse supérieur à 30 kg/m<sup>2</sup>. Les données ont été collectées à l'aide d'un formulaire d'informations sociodémographiques, du questionnaire d'auto-stigmatisation lié au poids et de l'échelle d'attitude à l'égard de la sexualité pendant la grossesse. Les données ont été analysées à l'aide de statistiques descriptives, d'analyses de corrélation, de tests de comparaison moyenne et de modélisation d'équations structurelles. Les matrices de corrélation de tous les scores d'autostigmatisation liée au poids et d'attitudes à l'égard de la sexualité ont montré une corrélation significative ( $p < 0,05$ ). Selon le coefficient de cheminement de l'effet de l'autostigmatisation liée au poids sur les attitudes sexuelles, à mesure que les femmes enceintes se stigmatisent davantage, leurs attitudes à l'égard de la sexualité pendant la grossesse ont changé négativement ( $\beta < 0$ ). L'autostigmatisation liée au poids conduit à des attitudes négatives envers la sexualité pendant la grossesse chez les femmes enceintes. (*Afr J Reprod Health* 2023; 27 [9]: 87-95).

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**Mots-clés:** Grossesse, sexualité, auto-stigmatisation liée au poids

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## Introduction

Obesity, defined as a body mass index (BMI) of  $\geq 30$  kg/m<sup>2</sup> in individuals, is a widespread health problem that has become a global epidemic<sup>1</sup>. According to the Monitoring of Trends and Determinants in Cardiovascular Diseases (MONICA), a study conducted by the World Health Organization (WHO) in 26 countries over a period

of 12 years, the prevalence of obesity has increased by 10-30%<sup>2,3</sup>. The 2022 Europe obesity report by the WHO states that 60% of adults are either obese or overweight<sup>4</sup>. This high prevalence of obesity in the general population also indicates that the rate is high among women of childbearing age. In Turkey, the results of the Turkish Diabetes, Obesity and Hypertension Epidemiology-I (TURDEP-I) study (1998) reported the prevalence of obesity among

women as 30%<sup>2,5</sup>. However, the TURDEP-II study conducted 12 years later in 2010 found that the prevalence of obesity among women had increased to 44%<sup>2,6,7</sup>. According to the 2019 data from the Turkish Statistical Institute, 24.8% of women were obese and 30.4% were overweight<sup>8</sup>. The high rates of obesity among women highlight the importance of focusing on health issues related to obesity during pregnancy.

Obesity can affect women hormonally, physically, psychologically, and socially. In addition to creating a predisposition for chronic diseases, obesity can cause several health problems such as depression, eating disorders, personality disorders, anxiety, negative body image, and sleep disorders<sup>9</sup>. When obesity and pregnancy, one of the important stages of a woman's life, are considered together, it can lead to negative outcomes for both the mother and fetus. Obesity can lead to several maternal risks such as gestational diabetes, hypertension, preeclampsia, and increased emergency cesarean delivery rates and fetal risks such as prematurity, stillbirth, congenital anomalies, and macrosomia<sup>10,11</sup>. Additionally, these risks can increase depending on the degree of obesity. In the literature, more than half of maternal deaths during pregnancy, childbirth, or the postpartum period occur in overweight or obese women<sup>11,12</sup>.

Obese individuals struggle not only with health issues caused by obesity but also with the social exclusion and discrimination often experienced within their social circles. This refers to the "stigma" toward obese individuals. Stigmatization is shaped by individual, cultural, or societal values, beliefs, and prejudices and causes individuals to be perceived differently from others and ultimately leads to their alienation. The stigmatizing attitudes, discourses, and thoughts directed at obese individuals by society lead to "self-stigmatization" as a result of internalization. This concept, which expresses individuals' self-alienation, is the result of referencing others or society in the process of understanding their existence. These attitudes, discourses, and thoughts can often include negative judgments such as inadequacy, laziness, worthlessness, and dangerousness<sup>13,14</sup>. Stigmatization can negatively affect the self-confidence and quality of life of obese individuals and also cause undesirable

consequences for their health such as depression<sup>15,16</sup>.

Sexual problems can be related to or stem from psychiatric, medical, and sometimes relationship problems. Obesity can affect all of these areas. Similarly, obesity can be associated with depression, poor body image, and low self-esteem, which also negatively affect sexual functions. Obesity can also negatively impact sexual relationships by reducing partner attractiveness<sup>17</sup>. Sexuality and obesity have an effect on each other<sup>13,18-21</sup>. In this context, Chen and Brown (2005) revealed that weight stigma emerges in sexual partner selection, especially for men who choose partners based on their weight<sup>19</sup>. This suggests that weight stigma can particularly affect women's sexual relationships. Indeed, Kaya (2019) has found that in obese women, self-devaluation reduces sexual desire, fear of labeling negatively affects orgasms, and weight self-stigmatization leads to sexual dysfunction<sup>13</sup>. In the literature, there are only studies about the "stigma of obesity and sexual function," "stigmatization of obese individuals by their social circles," and "sexual function during pregnancy"<sup>18-21</sup>. However, there is no study on the effect of weight self-stigma on attitudes toward sexuality in pregnant women. Therefore, this study examined the effect of weight self-stigma on attitudes toward sexuality in pregnancy.

## Methods

### Study design

This cross-sectional correlational study was conducted between January 12 and December 20, 2022, at the Women's Health and Birth Clinics of the Education and Research Hospital and the Health Application and Research Center in a city in the middle of the Black Sea region of Turkey. It complies with the guidelines strengthening the reporting of observational studies in epidemiology (STROBE)<sup>22</sup>.

### Research sample and participants

A power analysis was performed to determine the sample size of the study using the G\* Power program, and the estimated effect size was based on the results of a similar study conducted by Kaya

(2019) examining the relationship between sexual function and self-stigmatization in obese women<sup>13</sup>. The sample size of the study was calculated to include 328 pregnant women, considering the 0.180 correlation between sexual function and weight self-stigma in obese women in the study of Kaya (2019) and assuming a 95% confidence level (1- $\alpha$ ), 95% test power (1- $\beta$ ), and an effect size of  $p=0.180$ .

The study included women who were diagnosed with intrauterine pregnancy, had a pre-pregnancy body mass index (BMI) greater than 30 kg/m<sup>2</sup>, were literate, had no psychiatric illness, mental disability, or communication problems, had not been restricted from sexual activity by their doctor, and agreed to participate in the study.

### Data collection tools

The data were collected using a socio-demographic information form, the Weight Self-Stigma Questionnaire, and the Attitude Scale toward Sexuality during Pregnancy.

**Socio-demographic information form;** this form was prepared by the researchers and includes questions about the women's age, health status, nutritional habits, socioeconomic level, employment status, educational level, height, and weight.

**Weight Self-Stigma Questionnaire (WSSQ);** the scale was developed by Lillis *et al.* (2010) and validated in Turkish by Sevincer *et al.* (2017)<sup>23,24</sup>. The scale is based on individuals' self-evaluation of their weight. This 5-point Likert-type scale consists of 12 items scored from "1=Strongly Disagree" to "5=Strongly Agree." The scale has two subscales: Self-devaluation (SD) and Fear of Enacted Stigma (FES). The total scale score ranges from 12 to 60, where a higher score indicates greater weight self-stigma. The original scale has a Cronbach's alpha coefficient of 0.83.<sup>24</sup> In this study, the Cronbach's alpha coefficient for the scale was 0.940.

**Attitude scale toward sexuality during pregnancy (ASTSDP);** the scale was developed by Yılmaz-Sezer and Şentürk-Erenel (2021) to determine the attitudes toward sexuality during pregnancy for pregnant women and men whose partners are pregnant<sup>25</sup>. This 5-point Likert-type scale consists of 34 items scored from "1= strongly disagree" to "5= strongly agree." The scale has three subscales: "AASIDP= Anxiety about Sexual Intercourse during Pregnancy," "DBVASDP=

Dysfunctional Beliefs and Values about Sexuality during Pregnancy," and "ASDP= Approving Sexuality during Pregnancy." The total scale score ranges between 34 and 170. A higher scale score indicates greater positive attitudes toward sexuality during pregnancy and vice versa. The cutoff point for the scale is 111.5, and those who score 111.5 or above are considered to have positive attitudes toward sexuality during pregnancy. The original scale has a Cronbach's alpha value of 0.902<sup>25</sup>. In this study, the Cronbach's alpha value of the scale was 0.958.

### Data collection

Pregnant women who met the study inclusion criteria were provided with necessary explanations regarding the purpose and importance of the research and their consent was obtained. Data were collected from pregnant women who visited the mentioned institutions after their height and pre-pregnancy weight were asked, and those who had a BMI of 30 or higher and met the inclusion criteria were included in the study. Subsequently, the forms were given to pregnant women in an envelope and collected in the same way in order to protect their privacy and obtain reliable data.

### Statistical analysis

Descriptive statistical analysis, correlation analysis, mean comparison tests, Cronbach's Alpha reliability analysis, and structural equation modeling (SEM) were used to analyze the data. In SEM, the diagonally weighted least squares (DWLS) estimator was used to construct a model appropriate for the ordinal data<sup>25</sup>. The normality of the scale scores was checked using Shapiro-Wilk's normality test. Because of the non-normality, the mean difference between two and more than two groups was assessed via the Mann-Whitney U and Kruskal-Wallis test, respectively. To examine the association among scale scores, Spearman correlation analysis was applied. All statistical results were obtained using R software<sup>27</sup>. SEM was performed using the lavaan package and it was plotted with the lavaanPlot package in R<sup>28,29</sup>.

### Ethical considerations

Ethical approval was obtained from the Ondokuz Mayıs University clinical research ethics committee

(OMÜ KAEK 2021/640) and institutional permissions from the institutions where the data were collected. The principles of “Informed Consent Policy,” “Autonomy,” “Confidentiality,” “Protection of Confidentiality,” and “Anonymity and Privacy” were fulfilled during the study. This study has been conducted in accordance with the principles set forth in the Helsinki Declaration.

## Results

The mean age of the pregnant women in the study was  $29.17 \pm 5.29$  years. Their mean height was

$161.64 \pm 5.80$  cm. In addition, their pre-pregnancy weight and BMI were  $92.23 \pm 9.42$  and  $31.91 \pm 2.60$ , respectively. Table 1 shows the descriptive statistics and frequency analysis results for the characteristic variables. It has been found that 34.5% of pregnant women have had two pregnancies, 75.6% became willing to get pregnant, 82.6% did not work, 47% resided in a district, %50.9 had a high school diploma, 67.4% had income equal to expenses, %68.6 did not have a chronic illness, 36.3% had a balanced diet, %50.3 engaged in limited physical activity due to weight

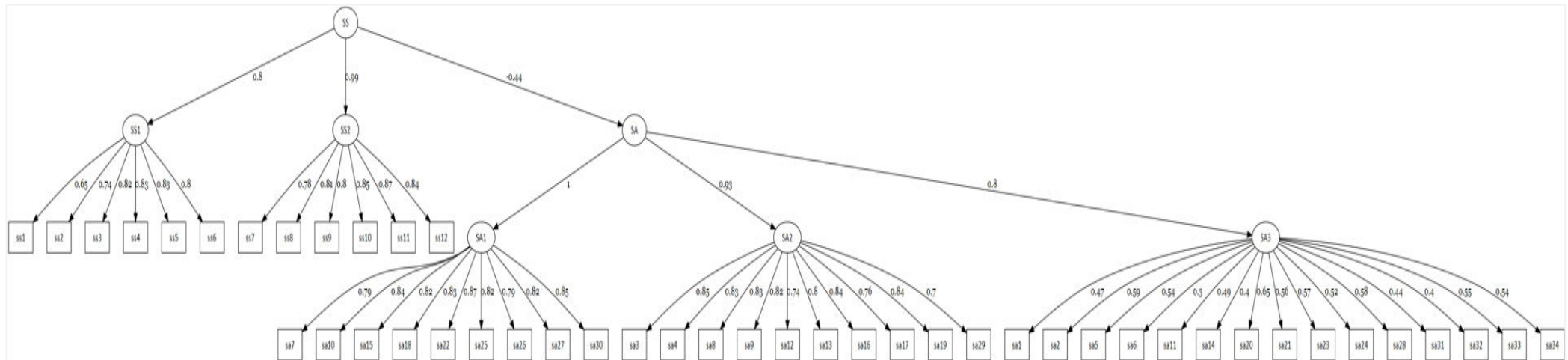
**Table 1:** Descriptive statistics and frequency analysis results

Variable	Group	n	%
Pregnancy number	1	97	29.6
	2	113	34.5
	3	71	21.6
	4	32	9.8
	5	10	3.0
	6	5	1.5
Willing to get pregnant	Yes	248	75.6
	No	80	24.4
Employment status	Working	57	17.4
	Not working	271	82.6
Residence	City center	142	43.3
	District	154	47.0
	Village	32	9.8
Education level	Elementary school	97	29.6
	High school	167	50.9
	Undergraduate and beyond	64	19.5
Income	Income less than expenses	66	20.1
	Income equal to expenses	221	67.4
	Income more than expenses	41	12.5
Chronic disease	Yes	103	31.4
	No	225	68.6
Type of chronic disease	Gestational diabetes	58	50.0
	Hypertension	29	25.0
	Other	29	25.0
Nutrition type	Mainly pastry and fried food	76	23.2
	Mainly fruit and vegetables	53	16.2
	White meat - red meat	44	13.4
	Grain-based	20	6.1
	Packaged food based	9	2.7
	Balanced	119	36.3
Activity limitation due to weight during pregnancy	Multiple options are marked	7	2.1
	Yes	163	49.7
Sexual problems due to weight	No	165	50.3
	Yes	147	44.8
	No	181	55.2

**Table 2:** Statistical results of the mean comparison tests for the scales

Characteristic	Group	AASIDP	DBVASDP	ASDP	Total ASTSDP	SD	FES	Total WSSQ
Willing to get pregnant	Yes	34 (17)	41 (18)	48.5 (14)	121 (44.25)	13.5 (12)	8 (11)	23 (22)
	No	31 (14)	42 (17.25)	49 (9.25)	116 (35.75)	14.5 (13)	8 (9.25)	23.5 (18.25)
Test statistic <sup>MW</sup>		1.713	1.005	1.309	0.142	1.476	0.120	1.036
p-value		0.087	0.315	0.191	0.887	0.140	0.904	0.300
Education level	Elementary school	27 <sup>c</sup> (13)	34 <sup>c</sup> (19)	46 <sup>b</sup> (9)	106 <sup>c</sup> (39)	16 <sup>a</sup> (12)	11 <sup>a</sup> (13)	28 <sup>a</sup> (22)
	High school	34 <sup>b</sup> (16)	42 <sup>b</sup> (17)	49 <sup>a</sup> (15)	121 <sup>b</sup> (40.5)	14 <sup>ab</sup> (12)	8 <sup>ab</sup> (10)	22 <sup>ab</sup> (21)
	Undergraduate and beyond	38.5 <sup>a</sup> (13)	46.5 <sup>a</sup> (10)	51.5 <sup>a</sup> (19.25)	137 <sup>a</sup> (44.25)	12 <sup>b</sup> (9.5)	7 <sup>b</sup> (6.5)	18 <sup>b</sup> (17.75)
Test statistic <sup>KW</sup>		34.009	37.820	28.098	39.356	10.596	7.972	11.288
p-value		<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>&lt;0.001</b>	<b>0.005</b>	<b>0.019</b>	<b>0.004</b>
Sexual difficulty during pregnancy	Yes	30 (15)	40 (18)	47 (7)	115 (38)	16 (9)	11 (11)	28 (20)
	No	36 (18)	42 (16)	50 (17)	131 (46)	12 (12)	7 (8.5)	20 (21)
Test statistic <sup>MW</sup>		3.924	2.666	2.550	1.761	3.578	3.240	3.707
p-value		<b>&lt;0.001</b>	<b>0.008</b>	<b>0.011</b>	<b>0.078</b>	<b>&lt;0.001</b>	<b>0.001</b>	<b>&lt;0.001</b>

MW: Mann-Whitney U test, KW: Kruskal-Wallis test. The descriptive statistics are given as Median (Interquartile range). Same letters represent non-significant difference.



**Figure 1:** Graphical representation of the structural equation model

**Table 3:** Correlation matrix for the self-stigma and attitude toward sexuality scales

	AASIDP	DBVASDP	ASDP	ASTSDP
SD	-0.304*	-0.283*	-0.295*	-0.324*
FES	-0.399*	-0.389*	-0.288*	-0.394*
Total WSSQ	-0.376*	-0.359*	-0.314*	-0.385*

\*p&lt;0.05

**Table 4:** Results of the path coefficients for SEM

Path	B	SZ( $\beta$ )	SE	z	p
WSSQ ->ASTSDP	-0.644	-0.441	0.029	-22.262	<0.001

 $\beta$ : Path coefficient, SZ( $\beta$ ): Standardized path coefficient, SE: Standard error

during pregnancy, and 55.2% did not experience sexual problems due to weight. <sup>ND</sup> Numerical data are presented as Mean  $\pm$  Standard deviation. Table 2 reports the comparison results for three group variables. For the willingness to get pregnant status, there was no difference for any scale scores of the self-stigma and attitude toward sexuality scales ( $p>0.05$ ). In general, the level of positive attitude toward sexuality among women with at least a university education was significantly higher compared to those with only a primary school education ( $p<0.05$ ). This finding was opposite for the self-stigma levels. Additionally, the level of self-stigma among women with only primary school education was significantly higher compared to those with a university and higher education ( $p<0.05$ ). The self-stigma level of women who experienced difficulty moving during coitus was significantly higher compared to those who did not ( $p<0.05$ ). Also, the positive attitude toward sexuality of women experiencing sexual difficulties was significantly lower compared to those who did not experience sexual difficulties ( $p<0.05$ ).

Table 3 reports the correlation matrix of the scale scores. All the scale scores were significantly correlated with each other ( $p<0.05$ ). There was a negative relationship between the self-stigma and attitude toward sexuality scales. Also, the subscales of the self-stigma and attitude toward sexuality scales were negatively correlated with each other.

Figure 1 shows the SEM with a graph including all path coefficients for the measurement and latent model. The statistical validity of the SEM was evaluated via several goodness-of-fit indices. The incremental fit indices were CFI=0.947, AGFI=0.979, NNFI=0.944, and TLI=0.944, all of which were greater than 0.90. The ratio of chi-squared to degrees of freedom was 3.445

(CHISQ=3386.587, df=983), which was less than 5. Additionally, the RMSEA=0.086 value was lower than 0.10. Overall, the constructed SEM was considered appropriate based on the goodness-of-fit indices.

Table 4 reports the statistical results of the path coefficient showing the impact of self-stigma on the attitude toward sexuality. The path indicated that self-stigma had a significant direct effect on the attitude toward sexuality ( $p<0.05$ ). The increase in self-stigma reduced the positive attitude toward sexuality for obese pregnant women ( $\beta<0$ ).

## Discussion

This study was conducted to examine the effect of weight self-stigma on attitudes toward sexuality in pregnant women. There are limited studies on the subject in the literature. Therefore, the current findings were discussed in light of recent research findings.

Considering the average values of the attitude scale toward sexuality and education levels of pregnant women, those with higher education levels, especially those with a bachelor's degree or higher, exhibited more positive attitudes toward sexuality and had lower weight self-stigma. This result may be because as women's education levels increase, they judge themselves based on their appearance less. Indeed, one's self-esteem, which is defined as self-perception, feeling proud, valuable, and successful, is positively correlated with education level<sup>30</sup>. A study has reported that education level is an important variable for self-stigmatization level<sup>31</sup>. Furthermore, self-stigmatization and self-esteem are related to each other, whereby as self-stigmatization increases, self-esteem decreases<sup>32</sup>. Thus, an increased

education level may reduce weight self-stigma in pregnant women, as it is related to the development of self-esteem. This situation can also positively affect sexuality during pregnancy. On the other hand, pregnant women who have completed primary school education have negative attitudes toward sexuality during pregnancy and are also inclined to have weight self-stigma. This group's negative attitudes toward sexuality may be related to traditional patriarchal structures because those with lower education levels are more likely to adopt traditional roles and beliefs<sup>33</sup>. This group may have more conservative (sin, etc.) descriptions of sexuality during pregnancy or may consider that sexuality harms the fetus<sup>34,35</sup>.

Pregnant women who did not experience difficulty moving during coitus have more positive attitudes toward sexuality during pregnancy. It can be said that pregnant women who experience difficulty moving during coitus feel more stigmatized than those who did not. This finding may be related to negative attitudes toward their body image among pregnant women who do not feel attractive, or who believe that their partners do not find them attractive. Additionally, this finding may be due to the physiological and psychological burden of pregnancy. Pregnant women's negative perceptions of their body image during pregnancy are based on their pre-pregnancy beliefs and thoughts and are reinforced by rapid pregnancy weight gain. Other factors can contribute to negative attitudes toward sexuality among pregnant women. Both physical and hormonal changes specific to pregnancy as well as women's focus on adapting to the role of motherhood (especially in the third trimester) come to the fore in this context<sup>36</sup>.

Considering the correlation matrices of weight self-stigma and attitudes toward sexuality scales, there was a significant negative relationship between their total and subscale mean scores. Therefore, pregnant women devalue themselves and experience fear of stigmatization. This situation affects their attitudes toward sexuality. In this context, pre-pregnancy obesity problems and accelerated weight gain during pregnancy increase self-stigmatization, leading to negative attitudes toward sexuality. Attitudes and beliefs toward sexuality are also important. Bilgiç and Karahmet found that sexual beliefs during

pregnancy negatively affect sexuality<sup>34</sup>. In addition, negative myths about sexuality during pregnancy (such as fear of miscarriage) can also lead to negative attitudes toward sexuality among pregnant women<sup>35</sup>. The tendency of men to choose sexual partners based on weight can also affect pregnant women's attitudes toward sexuality, increasing their weight self-stigma by reinforcing their belief that they are not attractive during pregnancy<sup>19</sup>. A study on the relationship between sexual function and self-stigmatization in obese women found that the level of weight self-stigma is positively related to sexual dysfunction. The study also found a negative relationship between the level of self-devaluation and sexual desire, and between fear of labeling and orgasm<sup>13</sup>. Another issue that weight stigma can affect in pregnant women is the relationship between BMI and depression<sup>37,38</sup>. Depression is an important determinant in the context of female sexual problems, that is, obesity causes depression and negative attitudes toward sexuality<sup>39</sup>.

As a result, women experience anxiety toward sexual intercourse during pregnancy, have negative attitudes toward sexual intercourse during pregnancy, and do not approve of sexuality during pregnancy. There are studies in the literature showing that discrimination and stigmatization against obese individuals cause anger and low self-esteem in these individuals<sup>40,41</sup>. Similarly, Küçük *et al.* (2018) found that obesity causes a poor body image in women<sup>41</sup>. Another study found that the sexual functions of pregnant women are partially related to their body images. The study suggests that obesity has a negative effect on body image, and a negative body image negatively affects sexuality<sup>35</sup>. Furthermore, there are numerous studies in the literature showing that obese individuals are stigmatized, biased, and discriminated against because of their weight<sup>15,43</sup>. These findings in the literature indirectly support our research findings. Stigmatizing attitudes toward obese individuals legitimize discrimination and are internalized by these individuals over time, leading to self-stigmatization<sup>13,14</sup>. Thus, it is important to understand the process of individuals developing stigmatizing attitudes toward themselves.

## Conclusions

It should be noted that there are no findings in the literature on the effect of weight self-stigma on

attitudes toward sexuality in pregnant women or other population groups (women, men, adults, etc.). This situation reveals the unique value of the present study and indicates the need for additional research on the subject. These research findings provide an important contribution to the literature and provide evidence-based practices for practitioners. Because this subject is neglected in the evaluation of both health and well-being in obese pregnant women, it is important to make it more visible and define it as a problem for pregnant women. Thus, the professional practice requirements for these women can be clearly identified. For this, it is important to increase similar studies and involve various disciplines in the implementation process. It is thought that this study will be enlightening for interdisciplinary studies of healthcare professionals (such as midwives, social workers, psychologists, and psychiatrists) who work on pregnancy, women's issues, sexuality, stigmatization, and discrimination themes.

## Conflict of interest

The authors report there are no competing interests to declare.

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## Authors contribution

Design of the study: SÖA, BA  
 Acquisition of data: SÖA  
 Analysis and interpretation of data: SÖA, BA  
 Study supervision: SÖA, BA  
 Manuscript writing: SÖA, BA  
 Critical revisions for important intellectual content: SÖA, BA. All authors contributed to the article and approved the submission.

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