

HEALTHY LIFESTYLE BEHAVIORS AND PERCEIVED PRENATAL STRESS IN OBESE PREGNANT WOMEN

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Received: 08.03.2022; **Accepted:** 22.07.2022; **Available Online Date:** 31.01.2023

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Cite this article as: Akgüneş-Dalkılıç A, Egeliöğlü-Cetişli N. Healthy Lifestyle Behaviors and Perceived Prenatal Stress in Obese Pregnant Women. J Basic Clin Health Sci 2023; 7: 186-195.

ABSTRACT

Purpose: The study was conducted to examine healthy lifestyle behaviors and perceived prenatal stress levels, affecting factors, and the relationship between healthy lifestyle behaviors and perceived prenatal stress levels in obese pregnant.

Material and Methods: This cross-sectional study was conducted with 159 primipara pregnant who were gestational week>37th, prepregnancy BMI>30 kg/m², and applied to the obstetrics clinic of a university hospital in Izmir between December 2020 and July 2021. Data were collected using the Individual Identification Form, the Prenatal Perceived Stress Scale, and the Healthy Lifestyle Behaviors II Scale. The data of the study were collected in the interview room of the polyclinic in approximately 30 minutes by the self-report method. Descriptive statistics, non-parametric tests, and Spearman correlation analysis were used in the analysis of the data.

Results: It was found that the Healthy Lifestyle Behaviors II Scale mean score of the obese pregnant was 107.4±14.7, PPSS mean total score was 3.4±0.8. It was found that as the age of obese pregnant women increased, the perceived prenatal stress levels decreased and HLB was more positive. It has been determined that the pregnant women who are high school graduates, have a good income, have a planned pregnancy and go to control during their pregnancy have lower prenatal stress levels and more positive health lifestyle behaviors. It was determined that there was a negative, significant and high correlation ($r = -0.715$; $p < 0.001$) between the mean total score of the Healthy Lifestyle Behaviors II Scale for obese pregnant and the mean scores of the Prenatal Perceived Stress Scale.

Conclusion: With a multidisciplinary team, care should be given to obese pregnant to gain healthy lifestyle behaviors and to avoid or manage stress.

Keywords: Maternal obesity, healthy lifestyle behaviors, prenatal stress

INTRODUCTION

The World Health Organization (WHO) defines obesity as "abnormal or excessive fat accumulation in the body to a degree that impairs health" (1). The prevalence of obesity which is seen as a risk factor for maternal and perinatal mortality and morbidity during pregnancy (2), ranges from 1.8% to 25.3%, as reported by the WHO (3,4). The Center for Disease Control (CDC) stated that the prevalence of obese pregnant reflects the obesity rate of women of

childbearing age and that 25% of women of childbearing age in the United States are overweight and 25% are obese (3,5). In our country, it was determined that 30.9% of women were overweight and 18.3% were obese according to the Body Mass Index (BMI) at the beginning of pregnancy (6). If an obese woman becomes pregnant, the incidence of complications such as abortion, gestational diabetes mellitus (GDM), and preeclampsia increases. Therefore, maternal obesity is considered

in the class of high-risk pregnancies and it is recommended that these pregnant should be followed more closely throughout their pregnancies (7,8). In high-risk pregnancies, pregnant have various health needs that must be met for pregnancy outcomes to be positive in terms of both maternal and infant health (9). For a pregnancy to result in a healthy mother and baby, it is essential to have healthy lifestyle behaviors (HLB). Through pregnancy, it is important to evaluate and change negative health behaviors and to provide support in this regard. It is important to detect and prevent negative psychosocial conditions as well as physiological changes during pregnancy, and to reduce their negative effects on maternal and child health (10,11). Stress is more common in pregnancies of women with a high BMI than in normal pregnancies, as maternal or fetal problems are more common. Awareness of stressors in obese pregnant and the use of appropriate stress coping methods can improve maternal and infant health. The fact that the pregnant woman exhibits HLB during her pregnancy and in the pre-pregnancy period and enjoys the process she experiences will positively affect the pregnancy and postpartum period. Proper nutrition, exercise, positive health behaviors, and protection of psychological health are components of HLB during pregnancy (12,13,14). Multiple health behavior changes during pregnancy are important in maximizing maternal and fetal health. This is important for preserving and improving HLB during pregnancy and reducing the perceived stress level before birth. However, there is no study in the literature examining healthy lifestyle behaviors and perceived prenatal stress levels in obese pregnant women. For this reason, the study aims to determine the HLB of obese pregnant, their perceived prenatal stress levels, their affecting factors of them, and the relationship between HLB and perceived prenatal stress levels.

MATERIAL AND METHODS

Type Of The Study: This is a cross-sectional study.

The Sample Of Study

The population of the study consisted of obese pregnant who applied to the obstetrics clinic of a university hospital in Izmir between December 2020 and July 2021. The purposive sampling method, which is one of the non-probability sampling methods, was used in the sample selection of the study. It was

determined from the hospital records that 285 obese pregnant applied in the last six months. The smallest sample number was unknown by taking the prevalence of 50% (with 0.05 deviation and 95% confidence interval) and the sample size was calculated as 164, but 159 obese pregnant women who met the sample criteria were included in the sample. Pregnants who were primipara, gestational week >37th, prepregnancy BMI >30 kg/m², married, Turkish speaking, and wanted to participate in the study have accepted the study.

Variables Of The Study

The dependent variables of this study were the healthy lifestyle behaviors and the prenatal perceived stress levels of obese pregnant. The independent variables were the sociodemographic and pregnancy-related characteristics of the pregnant women.

Measures

The data of the study were collected using the Individual Identification Form, the Healthy Lifestyle Behaviors II Scale, and the Prenatal Perceived Stress Scale. Data were collected from pregnant by self-reporting method.

Individual Identification Form

The form, which was prepared by the researchers using the literature, consists of 12 questions questioning the sociodemographic (age, education, employment, income status, family type, etc.) and pregnancy-related characteristics (pre-pregnancy weight, weight gained during pregnancy, going for control during pregnancy and wanting pregnancy, etc.) of women.

Healthy Lifestyle Behaviors (HLB) II Scale

The scale was developed by Walker in 1987 and was revised in 1996. It consists of 52 items and six sub-dimensions (Health Responsibility, Physical Activity, Nutrition, Spiritual Development, Interpersonal Relations, and Stress Management) in a four-point Likert type. The lowest score that can be obtained from the scale is 52, the highest score is 208, and an increase in the score indicates that individuals develop positive HLB. The Turkish validity and reliability study was conducted by Bahar et al. in 2008 and the Cronbach alpha value was found to be 0.94 (15). The Cronbach's alpha value in this study was 0.89.

Table 1. Healthy Lifestyle Behaviors II and Prenatal Perceived Stress Scales mean scores of obese pregnant by sociodemographic characteristics

Variables	Mean±SD (min-max)	HLB II Scale Mean Score	PPSS Mean Score
Mean Age (Year)	24.6±4.5 (8-38)	r= 0.418 p< 0.001	r= -0.349 p< 0.001
	n(%)	Mean±SD	Mean± SD
Educational status			
No literate	8 (5.0)	95.0±17.4	4.1±0.9
Literate	15 (9.4)	91.3±19.0	4.4±0.5
Primary school	54 (34.0)	106.8±12.3	3.3±0.8
Secondary school	48 (30.2)	108.7±12.1	3.2±0.8
High school	34 (21.4)	115.6±11.5*	3.1±0.6*
KW		KW= 27.219	KW= 22.651
p		p< 0.001	p< 0.001
Employment status			
Employed	58 (36.5)	110.8±14.8	3.4±0.8
Unemployed	101 (63.5)	105.2±14.2	3.4±0.9
U		U= 2194.50	U= 2600.00
p		p= 0.009	p= 0.235
Perception of income status			
Good	36 (22.6)	115.5±11.1*	3.1±0.5*
Moderate	85 (53.5)	110.1±11.8	3.2±0.8
Bad	38 (23.9)	93.0±13.9	4.1±0.8
KW		KW= 43.070	KW= 26.901
p		p< 0.001	p< 0.001
Family type			
Nucleus	105 (66.0)	107.0±16.3	3.6±0.9
Wide	54 (34.0)	107.7±10.9	3.1±0.7
U		U= 2772.50	U= 1825.50
p		p= 0.820	p< 0.001
Social support			
Yes	120 (75.5)	109.4±13.5	3.3±0.8
No	39 (24.5)	100.5±16.2	3.7±1.0
U		U= 1548.50	U= 1895.00
p		p= 0.002	p= 0.072
Person receiving social support (n=120)			
Spouse	40 (33.3)	115.7±11.4*	3.1±0.6
Mother/Sister	64 (53.3)	106.5±14.1	3.4±0.8
Other family member	16 (13.4)	105.4±10.8	3.4±0.9
KW		KW= 14.712	KW= 0.685
p		p= 0.001	p= 0.710

HLB II: Healthy Lifestyle Behaviors II Scale, PPSS: Prenatal Perceived Stress Scales, r: Spearman correlation analysis, KW: Kruskal Wallis test, U: Mann Whitney U test, *: The statistical difference is due to this group

Prenatal Perceived Stress Scale (PPSS)

It was developed by Razurel et al in Sweden, in 2013 to evaluate the factors that may be a source of stress in women expecting their first child and the perceived stress in the prenatal period with 36-39 gestational

weeks of pregnant expecting their first child. The five-point Likert-type scale consists of 12 items and three sub-dimensions (Medical and obstetric risks / fetal health, Psychosocial changes during pregnancy, and Birth expectation). By adding the item scores and

Table 2. Healthy Lifestyle Behaviors II and Prenatal Perceived Stress Scales mean scores of obese pregnant according to pregnancy-related characteristics

Variables	Mean±SD (min-max)	HLB II Scale Mean Score	PPSS Mean Score
BMI mean before pregnancy (kg/m ²)	31.23± 0.99 (30.02-36.5)	r= -0.128 p= 0.109	r= 0.011 p= 0.893
Mean weight gain through pregnancy (kg)	12.1± 3.1 (6-30)	r= 0.083 p= 0.296	r= -0.073 p= 0.362
	n (%)	Mean±SD	Mean± SD
Obesity classification			
Class I obese (30.00-30.99 kg/m ²)	156 (98.1)	107.1±14.8	3.4±0.8
Class II obese (35.00-39.99 kg/m ²)	3 (1.9)	113.6±4.1	2.8±0.6
Weight gain through pregnancy			
5-9 kg	31 (19.5)	108.0±16.9	3.6±0.8
>10 kg	128 (80.5)	107.1±14.1	3.3±0.8
U		U= 1921.00	U= 1667.00
p		p= 0. 784	p= 0.164
The planned state of pregnancy			
Planned	111 (69.8)	111.0±12.5	3.1±0.7
Unplanned	48 (30.2)	98.6±15.8	4.0±0.8
U		U= 1353.00	U= 1097.50
p		p< 0. 001	p< 0. 001
Status of going to pregnancy control			
Yes	141 (89.7)	109.0±13.0	3.3±0.8
No	18 (11.3)	93.4±19.4	4.3±0.6
U		U= 669.00	U= 490.50
p		p= 0. 001	p< 0. 001
The state of having health problems during pregnancy			
Yes	87 (54.7)	107.0±13.3	3.5±0.8
No	72 (45.3)	107.5±16.2	3.3±0.7
U		U= 2811.00	U= 2546.00
p		p= 0. 266	p= 0.041
Health problem during pregnancy (n=87)			
Gestational hypertension (GHT)	32 (36.8)	107.6±14.0	3.3±0.7
Gestational diabetes (GDM)	27 (31.1)	104.8±15.4	3.6±0.8
Abortion risk + GHT + GDM	19 (21.8)	109.9±15.0	3.4±0.7
Abortion risk	5 (5.7)	94.6±2.5	4.7±0.1
Oligohydramnios	4 (4.6)	117.7±8.4	2.5±0.4

HLB II: Healthy Lifestyle Behaviors II Scale, PPSS: Prenatal Perceived Stress Scales, U: Mann Whitney U test

dividing by the number of items, the score for the total and sub-dimensions of perceived prenatal stress is calculated. The score that can be obtained from the scale varies between 1 and 5. An increase in the score obtained from the scale indicates that the level of stress perceived by pregnant increases. The total Cronbach's alpha coefficient of the scale was found to be 0.75 by Razurel et al, and 0.70 by Atasever and

Sis Çelik, who conducted the Turkish validity and reliability study (16). It was found 0.72 in this study.

Data Collection

The study data were collected in an interview room in the outpatient clinic with pregnant who met the sampling criteria. Data was collected in approximately 30 minutes by self-reporting method using the questionnaire. The pregnant that participated in the

research was asked about her weight at the beginning of pregnancy and her reports were recorded. The same weighing device in the outpatient clinic was used to measure the weight of pregnant, and the measurements were made without shoes.

Table 3. Healthy Lifestyle Behaviors II and Prenatal Perceived Stress Scales mean scores of obese pregnant

Scales	Mean±SD	Min-Max
HLB II Scale Mean Total Score	107.4±14.7	68-145
Health Responsibility	16.8±4.2	9-30
Physical Activity	11.0±3.0	8-27
Nutrition	18.5±3.7	11-29
Spiritual Development	21.7±4.3	11-34
Interpersonal Relations	21.3±4.2	11-31
Stress Management	17.7±3.4	9-31
PPSS Mean Total Score	3.4±0.8	1.9-4.7
Medical obstetric risks / fetal health	3.4±0.9	1.6-5.0
Psychosocial changes during pregnancy	3.2±1.0	1.8-4.8
Birth expectation	3.5±0.8	1.7-4.7

HLB II: Healthy Lifestyle Behaviors II Scale, PPSS: Prenatal Perceived Stress Scales

Statistical Analysis

The analysis of the study data was carried out in the Statistical Package for the Social Sciences (SPSS) 22.0 program. The sociodemographic and pregnancy-related characteristics of the pregnant included in the study were given as number and percentage distributions. Compliance analysis of the data with normal distribution was made with the Kolmogorov Smirnov test and nonparametric tests were used. The Mann-Whitney U test was used in the comparison of two groups, and the Kruskal-Wallis test was used in comparison of three or more groups. The relationship between the mean scores of the HBL II Scale and the PPSS Scale of pregnant women was analyzed by Spearman correlation analysis. p<0.05 was taken as the statistical significance level.

Ethics of the study

The data were collected by obtaining verbal and written consent from the Non-Interventional Clinical Research Ethics Committee (IRB Date: 26.09.2019, No:408), the institutions where the study will be conducted, and the individuals participating in the study.

RESULTS

The mean age of the pregnant was 24.6±4.5 years, 34% of them were primary school graduates, 63.5% of them were unemployed, and 53.5% of them defined their income level as moderate. 66% of the pregnant participating in the study have a nuclear family structure, 75.5% have a person who will support them socially when they need it, and 53.3% of those have a supporting person from their mother/sister (Table 1). 98.1% of pregnant were class I obese (BMI=30.0-30.9 kg/m²), mean BMI before pregnancy was 31.2±0.9 kg/m², mean weight gained during pregnancy was 12.1±3.1 kg, and 80.5% of pregnant gained >10 kg weight during pregnancy. 69.8% of the pregnant stated that their pregnancy was planned, 89.7% of them went to pregnancy controls during pregnancy and 54.7% of them stated that they had a pregnancy-related health problem. 36.8% of the pregnant who had health problems during their pregnancy stated that they had gestational hypertension and 31.1% had gestational diabetes (Table 2).

It was determined that the HLB II Scale mean total score of the pregnant was 107.4±14.7. It was determined that they got the lowest score in Physical Activity (11.0±3.0), Health Responsibility (16.8±4.2), Stress Management (17.7±3.4), and Nutrition (18.5±3.7) sub-dimensions among the HLB II Scale sub-dimensions. It was determined that the mean total score of the PPSS of the pregnant included in the study was 3.4±0.8, and the perceived stress level was the highest in the sub-dimension of birth expectancy (3.5±0.8) (Table 3).

It was determined that obese pregnant showed more positive HLB as their age increased (r= 0.418; p< 0.001) and their prenatal perceived stress levels was lower (r= -0.349; p< 0.001). It was found that pregnant with higher education levels showed more positive HLB compared to others, and those with higher income levels showed more positive HLB and their perceived stress levels were lower. In the posthoc analysis, it was determined that the difference was due to the pregnant women who were high school

graduates and had a good income level. In addition, the mean HLB II Scale scores of were employed pregnant were found to be statistically significantly higher than those who unemployed ($U= 2194.50$; $p= 0.009$), and those who had social support ($U= 1548.50$; $p= 0.002$), and those who received support from their spouses compared to from their mothers/sisters ($KW= 14.712$; $p= 0.001$). In the post hoc analysis, it was determined that the difference was caused by the women who received support from their spouses. It was determined that the mean scores of the PPSS were found to be statistically significantly lower in pregnant that have a wide family structure than those has a nuclear family structure ($U= 1825.50$; $p< 0.001$) (Table 1).

Obese pregnant with planned pregnancies had a higher mean score on the HLB II Scale (111.0 ± 12.5 ; 98.6 ± 15.8) and a lower mean score on the PPSS (3.1 ± 0.7 ; 4.0 ± 0.8) compared to pregnant with a non-planned pregnancy. In the study, it was determined that there was a statistically significant difference in the mean total score of the PPSS according to the state of having health problems during pregnancy of the obese pregnant (3.5 ± 0.8 ; 3.3 ± 0.7). The prenatal perceived stress level of pregnant who have health problems was found to be higher ($U= 2546.00$; $p= 0.041$) (Table 2).

It was found that there was a negative, significant and high correlation ($r= -0.715$; $p< 0.001$) between the mean total score of the HLB II Scale and the PPSS of the pregnant. It was determined that the prenatal perceived stress level of obese pregnant, who showed positive HLB, was higher. In addition, it was determined that there was a significant negative correlation between all sub-dimensions of the HLB II Scale and all sub-dimensions of the PPSS ($p<0.001$) (Table 4).

DISCUSSION

This study was carried out to determine the HLB of obese pregnant, their perceived prenatal stress levels, and affecting factors. It was determined that the pregnant who participated in this study had low levels of developing positive HLB and had lower scores in physical activity, health responsibility, stress management, and nutrition sub-dimensions. In the literature, it was also reported that the rate of HLB in obese pregnant is low (17-22). A cross-sectional study was conducted by Jersey et al in 2017 to examine the facilitating and complicating factors of lifestyle and HLB (healthy diet, physical activity, and

weight gain) in healthy and overweight pregnant ($n=664$). In that study it was determined that the physical activity rates of overweight pregnant were low, their weight gain was higher during pregnancy, and therefore their self-efficacy was low when compared to healthy pregnant (17). In other studies conducted with obese pregnant, it was found that there were problems in physical activity and nutritional behaviors of obese pregnant. Individual, social and environmental factors affect food selection / physical activity behaviors in obese pregnant, gestational weight gain is high in obese pregnant, and this is one of the important obstacles to physical activity (18-21). In a qualitative study conducted by Fathnezhad-Kazemi and Hajian with 32 obese pregnant in Iran, it was stated that individual, social and environmental factors were effective in adopting health-promoting behaviors. It has been reported that the changes that occur during pregnancy, negative attitudes toward the social environment, economic difficulties, and inadequacy of family-social environment support were obstacles to adopting HLB in obese pregnant (22). In this study, it was concluded that those who have social support, especially those who receive support from their spouse, have an increase in positive HLB.

Health responsibility sub-dimension mean scores of obese pregnant were also low in the study. Low responsibility for health may cause obese pregnant to have health problems during pregnancy, 36.8% of the obese pregnant included in the study had gestational hypertension, 31.1% had gestational diabetes, 21.8% had gestational hypertension with abortion risk and gestational diabetes, and 80.5% of them had excessive weight gain during pregnancy. Assuring the responsibility of health to pregnant will be beneficial in terms of protecting and maintaining the health of both themselves and their babies. In the study of Petrella et al examining the effects of lifestyle changes on gestational weight gain and pregnancy outcomes in overweight and obese pregnant; a program including diet (overweight pregnant: 1700 kcal/day, obese pregnant: 1800 kcal/day) and physical activity (30 minutes/day, 3 times/week) was applied to pregnant. It was determined that the rates of gestational weight gain, GDM, gestational hypertension, and preterm birth were significantly lower in obese pregnant who participated in the program (23). Understanding the importance of behavior modification is one of the determinants of adopting health-related behaviors pregnant tend to

Table 4. Correlation between Healthy Lifestyle Behaviors II and Prenatal Perceived Stress Scales mean scores of obese pregnant

	HLB II Scale Total Score Average	Health Responsibility	Physical Activity	Nutrition	Spiritual Development	Interpersonal Relations	Stress Management	PPSS Mean Total Score	Medical obstetric risks / fetal health	Psychosocial changes during pregnancy	Birth expectation
HLB II Scale Mean Total Score	r= 0.760 p< 0. 001	r= 0.625 p< 0. 001	r= 0.448 p< 0. 001	r= 0.723 p< 0. 001	r= 0.597 p< 0. 001	r= -0.642 p< 0. 001	r= -0.707 p< 0. 001	r= -0.642 p< 0. 001	r= -0.642 p< 0. 001		
Health Responsibility	r= 0.760 p< 0. 001	r= 0.515 p< 0. 001	r= 0.155 p= 0.051	r= 0.357 p< 0. 001	r= 0.470 p< 0. 001	r= -0.421 p< 0. 001	r= -0.543 p< 0. 001	r= -0.414 p< 0. 001	r= -0.421 p< 0. 001		
Physical Activity	r= 0.625 p< 0. 001	r= 0.515 p< 0. 001	r= 0.092 p= 0.248	r= 0.336 p< 0. 001	r= 0.473 p< 0. 001	r= -0.304 p< 0. 001	r= -0.395 p< 0. 001	r= -0.337 p< 0. 001	r= -0.304 p< 0. 001		
Nutrition	r= 0.448 p< 0. 001	r= 0.155 p= 0.051	r= 0.092 p= 0.248	r= 0.202 p= 0.011	r= 0.122 p= 0.126	r= -0.294 p< 0. 001	r= -0.322 p< 0. 001	r= -0.363 p< 0. 001	r= -0.294 p< 0. 001		
Spiritual Development	r= 0.723 p< 0. 001	r= 0.336 p< 0. 001	r= 0.202 p= 0.011	r= 0.379 p< 0. 001	r= 0.414 p< 0. 001	r= -0.530 p< 0. 001	r= -0.534 p< 0. 001	r= -0.427 p< 0. 001	r= -0.530 p< 0. 001		
Interpersonal Relations	r= 0.597 p< 0. 001	r= 0.386 p< 0. 001	r= 0.135 p= 0.090	r= 0.379 p< 0. 001	r= 0.114 p= 0.153	r= -0.481 p< 0. 001	r= -0.447 p< 0. 001	r= -0.374 p< 0. 001	r= -0.481 p< 0. 001		
Stress Management	r= 0.653 p< 0. 001	r= 0.473 p< 0. 001	r= 0.122 p= 0.126	r= 0.114 p= 0.153	r= 0.486 p< 0. 001	r= -0.378 p< 0. 001	r= -0.432 p< 0. 001	r= -0.544 p< 0. 001	r= -0.378 p< 0. 001		
PPSS Mean Total Score	r= -0.715 p< 0. 001	r= -0.498 p< 0. 001	r= -0.351 p< 0. 001	r= -0.535 p< 0. 001	r= -0.486 p< 0. 001	r= 0.924 p< 0. 001	r= 0.953 p< 0. 001	r= 0.912 p< 0. 001	r= 0.924 p< 0. 001		
Medical obstetric risks / fetal health	r= -0.642 p< 0. 001	r= -0.414 p< 0. 001	r= -0.363 p< 0. 001	r= -0.427 p< 0. 001	r= -0.544 p< 0. 001	r= 0.747 p< 0. 001	r= 0.799 p< 0. 001	r= 0.912 p< 0. 001	r= 0.747 p< 0. 001		
Psychosocial changes during pregnancy	r= -0.707 p< 0. 001	r= -0.395 p< 0. 001	r= -0.322 p< 0. 001	r= -0.534 p< 0. 001	r= -0.432 p< 0. 001	r= 0.845 p< 0. 001	r= 0.845 p< 0. 001	r= 0.799 p< 0. 001	r= 0.845 p< 0. 001		
Birth expectation	r= -0.642 p< 0. 001	r= -0.304 p< 0. 001	r= -0.294 p< 0. 001	r= -0.530 p< 0. 001	r= -0.378 p< 0. 001	r= 0.845 p< 0. 001	r= 0.845 p< 0. 001	r= 0.747 p< 0. 001	r= 0.845 p< 0. 001		

HLB II: Healthy Lifestyle Behaviors II Scale, PPSS: Prenatal Perceived Stress Scales, r: Spearman correlation analysis

turn their worries about the health of their babies into positive behaviors during pregnancy. Pregnancy can be a good time to take health precautions. Therefore, this opportunity should be used well in obese pregnant. In the planning and design of interventions, individual needs, personal expectations and social factors should be taken into account, barriers should be removed and the focus should be on empowering facilitators.

It was found that the prenatal perceived stress level of obese pregnant included in the study was high. The study examining the perceived stress level in obese pregnant has not been found in the literature, and the findings were compared with the results of the research conducted with risky pregnant. This was the limitation of the study. In the study by Sarmasti et al, in which the perceived stress and perceived social support levels of pregnant with preeclampsia and healthy pregnant were examined, it was determined that the perceived stress level was higher in pregnant with preeclampsia (24). In the study of Baran et al in Turkey in 2020 to compare the perceived stress level of normal and risky pregnant, it was found that stress was higher in risky pregnant than in normal pregnant (25). Similarly, in the study by Gumusdas et al in 2014 in which they compared the psychosocial health of pregnant with and without risk, it was found that risky pregnant had higher levels of anxiety and stress (11). In the study conducted by Yılmaz and Şahin in 2019, it was determined that pregnant with risky pregnancies had a higher level of physical and social changes related to pregnancy, concerns about the baby, labor, and health status (26). Pregnancy is a stressful and complex process, even without any health problems. Since obesity is defined as a high-risk pregnancy, this situation is quite evident in obese pregnant. While risky pregnancy generates stress in pregnant, excessive stress and anxiety of the mother may also negatively affect pregnancy outcomes (27). In obese pregnant, physical and psychological changes that occur during pregnancy, maternal-fetal health problems caused by obesity, and fears about labor are factors that increase stress. In addition, in obese pregnant included in the study, age, education level, income status, and family type affect the perceived stress level before birth, those with planned pregnancy versus unplanned; pregnant who went to their controls during pregnancy, and those who did not; It was determined that those who did not experience any health problems during pregnancy had a lower perceived prenatal stress

level than those who did. In a study by Bogaerts et al. in which depression and anxiety levels were compared in obese and normal BMI pregnant, it was reported that low education levels increased psychosocial problems in mothers in both groups during pregnancy (28). Similarly, in the study conducted by Ozcetin and Erkan with high-risk pregnant, anxiety and stress scores were found to be lower in pregnant with good education levels, regular pregnancy follow-up, and working (29).

It was found that there was a negative, significant, and high-level correlation between the mean total scores of the HLB II Scale and the PPSS of the pregnant participated in this study. It has been determined that obese pregnant who show positive HLB had a decreased prenatal stress level. A pregnant woman under stress cannot develop HLB, and so the woman may exhibit behaviors that have negative effects on pregnancy, such as inadequate and unbalanced nutrition, smoking, and alcohol use during pregnancy. In the study by Stark and Brinkley, in which they examined the health protective behaviors and perceived stress level of high-risk pregnant, it was concluded that the stress level perceived before birth decreased in pregnant who showed positive HLB, similar to the results of this study (30). In the study conducted by Malakouti et al. to determine the correlation between health-protective behaviors and perceived stress levels in pregnant with preeclampsia (n=182), it was determined that there was a negative significant correlation between the total mean score of the HLB II Scale and the PPSS (31). It was thought that the implementation of HLB such as physical activity, nutrition, and stress management by pregnant would contribute to keeping obesity under control, as well as contributing to the mother's quality of life, recovery, and lactation process in the postpartum period. It was thought that the HLB of the pregnant would improve both maternal and fetal-neonatal health and prevent the pregnant from experiencing stress related to their own and their baby's health.

This study has some limitations. First, the BMI before pregnancy was accepted according to the reports of pregnant women. Secondly, since the study was conducted with a very limited group and obese pregnant women using the non-probability sampling method who applied for health services, there is a limitation regarding its generalizability.

CONCLUSION

According to the findings obtained from the study, it was determined that the level of developing positive HLB in obese pregnant was low, they experienced a high level of stress before birth and the level of prenatal perceived stress decreased in obese pregnant who showed positive HLB. With a multidisciplinary team, training and consultancy services should be provided to obese pregnant on appropriate weight gain, nutrition, health problems that may arise during pregnancy, and HLB. The economic and social burden of maternal obesity in health systems should be emphasized and awareness should be created among all health professionals. In addition, it is recommended that pregnant women with risky pregnancies (adolescent or advanced age pregnant women, gestational diabetes, gestational hypertension, etc.) be evaluated in terms of negative HLB and high stress level.

Acknowledgement: We would like to thank our pregnant women who participated and supported our work.

Author contribution: AA, NEC: Conception, design, literature review, data collection, data processing, writing, critical review. AA, NEC: Design, data analysis. AA: Data collection. AA, NEC: Literature review and interpretation, editing.

Conflict of interests: No conflict of interest was declared by the authors.

Ethical approval: This study was approved by Izmir Katip Celebi University Noninvasive Ethics Committee (IRB No:26.09.2019/408).

Funding: The authors declared that this study has received no financial support.

Peer-review: Externally peer-reviewed.

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