

Original Article

Assessment of the Diets and Weights of Primiparous and Multiparous Pregnant Women in the Last Trimester

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Introduction For a healthy and safe pregnancy, physiological requirements must be met, the storage levels in the body be kept in a balance, the baby must reach its potential weight and be born with adequate nutrients in its body.

Aim The dietary changes and weight conditions of primiparous and multiparous pregnant women were assessed.

Methodology This descriptive study was carried out at a maternity hospital located in Erzurum, Turkey. The study was conducted with 435 pregnant women in the final trimester of their pregnancy.

Results It was found that the rates of care received by the pregnant women before delivery were high; however, the rates at which they received information on diet during pregnancy were low and primiparous pregnant women made more changes in their diet than the multiparous pregnant women. It was found that the average daily consumption of meat and meat products by the pregnant women was at a significantly high level ($p<0.05$). It was found that the Body Mass Index and gravida (primiparous and multiparous pregnancy) did not have any effect on weight gain during pregnancy ($p>0.05$).

Conclusions It was found that primiparous pregnant women received more information on diet than multiparous pregnant women, made more changes in their diet and their BMI indexes during pregnancy were in the normal range. Pregnancy follow-up nutrition and weight control should be handled with a multidisciplinary approach.

Keywords Diet, Body Mass Index, Midwifery, Pregnancy, Weight Gain**Introduction**

For a healthy and safe pregnancy, physiological requirements must be met, the storage levels in the body be kept in a balance, the baby must reach its potential weight and be born with adequate nutrients in its body (Abubakari et al., 2015; Bookari et al., 2016; Fowles & Fowles 2008). For this reason, pregnancy increases dietary requirements (Dodd et al., 2010; Shub et al., 2013). Therefore, dietary habits from before pregnancy need to be reviewed during pregnancy (Fowles & Fowles 2008).

Under-nutrition or malnutrition during pregnancy negatively affects maternal and fetal health (Bookari, 2016; Dodd et al., 2010; Shub et al., 2013). Inadequate weight gain during pregnancy

may result in increased morbidity and mortality rates for the newborn, preterm birth, increased caesarean birth, preeclampsia, gestational diabetes and pregnancy induced hypertension (Ayensu, et al., 2016; Kabali et al., 2007; Nohr et al., 2008; Tennant et al., 2011).

Excessive weight gain during pregnancy also affects the maternal and fetal health negatively. Several complications may develop in obese women who become pregnant such as gestational diabetes mellitus (DM), urinary tract infections, inadequate weight gain during pregnancy, preeclampsia, infections, gestational hypertension, fetal follow-up difficulty, prolongation of labour, fetal macrosomia, fetal abnormalities, birth trauma, bleeding, respiratory failure, increased Caesarean birth, perinatal

deaths, postpartum anemia and pediatric obesity. Such complications are positively correlated with excessive weight gain. (Abenhaim, et al., 2007; Ayensu, et al., 2016; El- Gilany et al., 2010; Fowles & Fowles 2008; Kosa et al., 2011; Marshall et al., 2012; Meenakshi et al. 2012; Owens et al., 2010; Verma et al., 2012; Yazdani et al., 2012).

Since an unhealthy diet before and at the early phases of pregnancy negatively affects maternal and fetal health, it is a topics that needs careful attention in the context of prenatal services. Therefore, midwives and nurses have an important role to play by ensuring, monitoring and assessing healthy diet and providing training for a proper diet during pregnancy (Fowles & Fowles 2008; Bookari et al., 2016).

Nurses and midwives are the health care providers who are closest to the pregnant women and can watch them closely. Thus, they can gather important information about them such as dietary habits, lifestyles and physical symptoms. For this reason, nurses and midwives who offer prenatal services have rather high rates of early detections of deviations from healthy diets.

National and international studies have assessed obese, gestational diabetic and normal pregnant women for their weight gains, finding that there are health risks that may develop as a result of excessive weight gain. These studies did not adequately examine the diets and dietary changes of pregnant women.

This study was conducted to assess the diets and dietary changes of primiparous and multiparous pregnant women during pregnancy as well as their weight gain in comparison with their BMIs before pregnancy.

Methods

Design and Sample

This study was conducted as a descriptive study. The universe of the study was constituted by pregnant women in their final trimester, who visited to fetal non-stress test (NST) department of a maternity hospital in the city of Erzurum between July, 2013 and June, 2014.

According to the power analysis, the power was calculated as 0.99 for 435 mothers (215 primiparous and 220 multiparous) at a significance level of 0.05 and a confidence interval of 0.95.

Using the probability-based simple random sampling method, the pregnant women selected from the universe and meeting the inclusion criteria for the study were enrolled in the study.

However, 50 pregnant women were withdrawn from the study since they did not know their weight before pregnancy.

Pregnant women who did not have risky pregnancies (preeclampsia, eclampsia, gestational diabetes, etc.), hyperemesis gravidarum, metabolic or chronic diseases, who knew their weight before pregnancy and did not have any communication problems were included in the study.

Participants

The average gestational weeks of the primiparous and multiparous pregnant women in the study (primiparous 36.08 ± 6.99 multiparous 36.18 ± 2.61) were close to one another. It was found that 18.1% of the primiparous pregnant women and 3.2% of the multiparous pregnant women were at or below the age of 19.

Of the primiparous pregnant women, 20% and 5.9% of multiparous women were university graduates. While 86% of primiparous pregnant women were housewives, this rate was 95.5% for multiparous pregnant women. It was identified that the majority of the primiparous (67.4%) and multiparous (68.7%) pregnant women had equal levels of income and expenses. Of them, 88.4% of the primiparous pregnant women and 95% of the multiparous pregnant women had social security coverage.

Care before delivery was provided for 93.5% of primiparous pregnant women and 98.2% of multiparous pregnant women. The pregnant women were similar in terms of employment, economic status, social security, family status and care before birth ($p>0.05$).

Data Collection

The data were obtained using the questionnaire prepared by the investigator after a review of the literature (Bookari et al 2016; Thompson et al., 2011; Shand 2011).

The questionnaire solicited information about the pregnant women's identifiers, obstetric histories, dietary habits during pregnancy and BMIs before birth.

The study data were obtained from face-to-face discussions conducted by the investigator with pregnant women in their final trimester, who visited the NST department between September, 2013 and February, 2014. After the questionnaires were completed, the heights and weights of pregnant women were measured. The data collection discussion with the pregnant women lasted between 10 and 15 minutes.

Ethical Considerations

Ethical approval was taken from Ethical Committee of the University and hospital administration was also informed about the study in written.

Data Analyses

The data were analyzed using SPSS 20.0 program. The chi-square test was used to determine the identifiers of the pregnant women, the percentage distributions and the knowledge and attitudes of primiparous and multiparous pregnant women about pregnancy and to compare their dietary changes during pregnancy.

The t-test was used to compare their average nutritional intake values. One-way ANOVA was used for assessing the BMI groups and average weights of the primiparous and multiparous pregnant women, and two-way ANOVA was used for assessing the gravida and BMI values as well as average weight gain during pregnancy.

Results

The levels at which primiparous pregnant women received information during their checkups and stated that diet during pregnancy affects the health of the baby and the mother were found higher than those of the multiparous pregnant women in the study ($p<0.05$). It was found that more than half of the primiparous and multiparous pregnant women had more than three meals per day. However, the difference between these groups was not significant ($p>0.05$) (Table 1).

In this study, 41.4% of the primiparous pregnant women and 35% of the multiparous pregnant women said that they made changes to their dietary habits. However, the difference between these groups was found to be insignificant ($p>0.05$). It was found that the pregnant women in both groups chose primarily to increase their intake of milk and dairy products, and secondarily to increase their consumption of

fruits and vegetables as well as their portion sizes. However, the difference between groups was found insignificant ($p>0.05$) (Table 2.).

This study found that the average daily portion amounts of milk and dairy products and fruits and vegetables group were in the normal range for primiparous and multiparous pregnant women, and that the difference between these groups was insignificant ($p>0.05$). The average daily consumption of meat and meat products portions were above normal for primiparous pregnant women, but not for multiparous pregnant women, and the difference between groups was significant ($p<0.05$). The daily water consumption of the pregnant women was inadequate, and there were no significant differences between the groups ($p>0.05$) (Table 3).

This study found that primiparous and multiparous pregnant women who were thin and had normal BMIs had normal values in weight gain, whereas the overweight, first and second degree obese pregnant women had high rates of average weight gain during pregnancy. While there were no significant differences between the average BMI and weight gain values of primiparous pregnant women ($p>0.05$), a significant difference was found for multiparous pregnant women ($p<0.05$). This difference was caused by thin pregnant women. No significant weight gain differences were found between BMI and Gravida (primiparous and multiparous pregnancies) ($p>0.05$) (Table 4).

Discussion

Here, this study's findings about the dietary status of primiparous and multiparous pregnant women in the final trimester and their weight gain during pregnancy are discussed in the light of related literature.

Even though the rates at which primiparous pregnant women received information about diet from midwives and nurses were higher, this rate was less than half of the pregnant women in both groups (48.4% for primiparous and 37.7% for multiparous). Like this study, another study examining the knowledge and behaviors of pregnant women about pregnancy found that the information which pregnant women received about diet was inadequate (Fowles & Fowles, 2008; King, 2000; Won, 2009).

Table 1. Pregnant Women's Knowledge and Attitudes about Diet

Characteristics	Primiparous (215)	Multiparous (220)	Test and p
Received Information about Diet			
Yes	104	48.4	p=.025
No	111	51.6	$\chi^2=5.027$
Diet Affects Fetal Health and Weight			
Yes	153	71.2	
No	32	14.9	p=.022
I do not know	30	13.9	$\chi^2=7.678$
Diet Affects Maternal Health and Weight			
Yes	183	85.1	
No	17	7.9	p=.050
I do not know	15	7.0	$\chi^2=5.985$
Number of Meals			
Less than 3	19	8.8	p=.475
		35.4	$\chi^2=0.714$
3 meals	76	81	
More than 3	120	55.8	53.2

Table 2. Pregnant Women's Dietary Modifications during Pregnancy

Characteristics	Primiparous N(215)	%	Multiparous N(220)	%	Test and p
Presence of Modifications					
Yes	89	41.4	77	35	p=.170
No	126	58.6	143	65	$\chi^2=1.887$
Dietary of Modifications					
Abstaining from Harmful Food	7	7.9	6	7.8	
Larger Portion Sizes	14	15.7	12	15.6	
More Milk and Dairy Products	21	23.6	25	32.5	
More Fruits and Vegetables	20	22.5	12	15.6	
Less Fatty Food	9	10.1	4	5.2	p=.308
					$\chi^2=12.777$
More Nuts	1	1.1	3	3.9	
Less Legumes	4	4.5	3	3.9	
More Meat and Meat Products	8	9.0	2	2.6	
Less Sugar	1	1.1	4	5.2	
More Salty Food	1	1.1	2	2.6	
Less Tea	0	0	2	2.6	
More Sugar	3	3.4	2	2.6	

Table 3. Pregnant Women's Consumption of Daily Food Groups

Food Groups	X± SS	X± SS	Test and p	
Milk and Dairy Products*	3.89±1.87	3.90±1.71	t=-.066	p=.947
Fruit and Vegetables Group*	5.39±2.44	5.37±2.28	t=.067	p=.946
Meat and Meat Products*	3.71±2.06	4.56±2.45	t=-3.8	p=.001
Cereal Group*	8.60±4.89	8.97±4.83	t=-.809	p=.419
Sugars**	2.16±1.73	2.31±1.74	t=-.871	p=.384
Oils and Fats**	1.31±0.46	1.28±0.45	t=.679	p=.497
Water Intake***	6.91±4.26	6.81±4.11	t=.226	p=.821

*portion, **teaspoon, ***glass

Table 4. Average Weight Gain during Pregnancy by Gravida and BMI Group

	BMI Group	X± SS	Min-Max	Test and p
Primiparous	Thin	13.27±3.08	8-22	
	Normal	12.00±5.15	8-26	
	Overweight	10.80±5.00	0-24	F =1.476
	First Degree Obese	9.28±6.34	1-17	p=.211
	Second Degree Obese	-	-	
Multiparous	Thin	14.76±5.14	7-27	
	Normal	11.75±6.72	8-33	
	Overweight	10.50±6.60	-3-30	F=3.910
	First Degree Obese	8.37±5.54	-2-20	p=.004
	Second Degree Obese	6.33±1.54	5-7	
		F=.332	p= .856	

This situation suggests that pregnant women as well as the midwives and nurses do not sufficiently dwell on diet during their pregnancy checkups. Furthermore, the fact that the primiparous pregnant women had higher rates of receiving information about diet than the multiparous ones may have been due to their excitement about pregnancy, lack of experience and their higher levels of education. Most of the primiparous and multiparous pregnant women thought that diet during pregnancy affects the health of mother and child. However, this rate was higher for primiparous pregnant women. This rate being higher for primiparous pregnant women may have been due to the fact this was

their first experience, they had curiosity about fetal development and they therefore investigated it more. (Table 1).

According to the literature, the daily diet should be supplemented in accordance with the pregnancy's higher dietary needs (Bookari et al., 2016; King, 2000; Thompson et al., 2011). In our study, the pregnant women (41.4% primiparous and 35% multiparous) specified that they made changes to their diet during pregnancy. They increased the number of their meals, increased the intake of certain foods, while reducing others as the literature advises. The Turkish saying, "A pregnant woman has two lives, so she should eat

for two,” may also have led the pregnant women to change their diets.

This study identified the main dietary modification by pregnant women as increasing their consumption of milk and dairy products, followed by increasing their consumption of fruits and vegetables as well as their number of meals. During pregnancy, an additional 6 grams per day of protein is needed, and it is recommended that this need be met with food of animal origin such as meat, milk and dairy products, eggs, chicken and fish (Thompson et al., 2011).

Other studies of this topic have also reported that some women change their diets in pregnancy to eat foods they consider “better to eat,” such as fruits and vegetables, and to limit salty snacks (Fowles & Gabrielson, 2005; Fowles et al., 2005; Rifas-Shiman et al., 2006). The fact that the consumption of meat and meat products was not in the first ranks is attributed to the fact that meat and meat products already have a predominant place in the cuisine of this region (Table 2).

It is very important to have adequate intakes from every food group in pregnancy. Pregnant women need to consume 3 portions of meat and meat products per day (Thompson et al., 2011). According to the study, the other food groups were consumed at normal levels, whereas more than 3 portions per day of meat and meat products were consumed by both groups with even higher rates among multiparous pregnant women. The fact that the average daily meat consumption was high may have stemmed from the fact that the culinary tradition of Eastern Turkey is based on meat, and vegetables do not play a large role in this region's cuisine. Furthermore, the fact that this rate was higher among multiparous pregnant women may be due to the fact that meat and meat products are the primary sustenance for other children in the household. (Table 3).

Generally speaking, water consumption is ignored. Water consumption is as important as vitamins and minerals for a healthy pregnancy (Thompson et al., 2011). Pregnant women need to drink approximately 8-10 glasses of water per day (Shub et al., 2013). This study found that the water intake of pregnant women was inadequate. This finding shows that the pregnant women were not aware that water intake is as important as food consumption. Additionally, the high

levels of tea consumption in the culture of the region where the study was carried out reduce water intake. As a diuretic, tea does not contribute to meeting the increased water needs of pregnant women. However, water consumption has several benefits in pregnancy in addition to reducing the increased risk of urinary tract infection. Supporting our findings, another similar study found that 70% of pregnant women consumed less than 8 glasses of water per day (Olson, 2008).

It is recommended that calorie requirements during pregnancy be met with carbohydrates, and it is accepted that maternal caloric intake is adequate if maternal weight gain and fetal development are normal. Sugar consumption during pregnancy should not be on a daily basis, but occasional (Taskin, 2012). On the other hand, the pregnant women in our study consumed 2 teaspoons of sugar per day on average. In Turkey, tea is consumed with sugar. The high level of tea intake might have increased sugar consumption. (Table 3).

Weight gain during pregnancy may vary among women due to a variety of factors: weight before pregnancy, age, parity, ethnic origin, socioeconomic status and physical activity (Abubakari et al., 2015; Fowles & Fowles 2008). This study found that the average weight gain of primiparous and multiparous pregnant women who were thin and had normal BMIs were at normal values, whereas overweight, first and second degree obese pregnant women gained more weight during pregnancy. A foreign study related to healthy weight gain during pregnancy reported that excessive weight gain was more common than inadequate weight gain among pregnant women, supporting this finding (Fowles & Fowles, 2008) and several studies that evaluated the diets of pregnant women have yielded similar findings about weight gain during pregnancy (Catalano et al., 2014; Derbyshire et al., 2006; Fowles& Fowles 2008). Furthermore, the Turkish dietary habit of consuming lots of meat and meat products, potatoes and bread in may have also played a role. While there were no significant differences in terms of the BMIs and average weight gains of primiparous pregnant women ($p>0.05$), there was a significant difference in multiparous pregnant women ($p<0.05$), which may have resulted from the residual weight of multiparous pregnant women from their earlier pregnancies. (Table 4).

Conclusion

This study found that the knowledge of pregnant women about diet during pregnancy and the dietary modifications they made during pregnancy were inadequate and ineffective. It was determined that the pregnant women with high BMI values gained more weight than the required range. Since diet during pregnancy is of the utmost importance for maternal and fetal health, this should be stressed during the checkups of pregnant women. Midwives should dedicate ample time to monitor the dietary issues of pregnant women. For this reason, the midwives and nurses who conduct these checkups have an important tasks to fulfill. Weight control and diet should be emphasized especially to pregnant women who start their pregnancy with high BMIs. Since diet during pregnancy involves many disciplines, this matter also requires a multidisciplinary healthcare approach.

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