RESEARCH ARTICLE

Investigation of factors affecting postpartum maternal weight retention: A cross-sectional study

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Abstract

Objective: To examine weight retention and affecting factors among 12-18 months postpartum women.

Methods: The descriptive cross-sectional study was conducted from January 1 to June 30, 2012 at Gazikent 3rd Primary Health Care Centre, Izmir, Turkey, and comprised pregnant women registered with the centre in their 12-18 months postpartum phase. Data was collected using Mother Introduction Form and International Physical Activity Questionnaire-Short Form. SPSS 15 was used for data analysis.

Results: There were 239 women with a mean age of 30.81±4.59 years. Of the total, 182(76.2%) subjects had weight retention; 106(44.4%) having 0.5-5kg, and 49(20.6%) with 5.5-10 kg. Overall mean weight retention rate was 4.09±4.90kg (range: -9-27kg). Weight retention had significant correlations with chronic illness (p=0.037), having been educated about physical exercise during pregnancy (p=0.001), skipping meals (p=0.036), average pre-pregnancy weights (p=0.019), average pre-pregnancy body mass index (p=0.049), average weight gained during pregnancy (p=0.009), achieving weight gain during pregnancy as recommended by the Institute of Medicine guidelines (p=0.002), and mean physical activity score (p=0.006).

Conclusion: Women should be monitored for their body mass index and weight in the postpartum period and during pregnancy.

Keywords: Obesity, Postpartum period, Weight retention, Maternal weight, Postpartum weight, Risk factors. (JPMA 68: 1578; 2018)

Introduction

Obesity, described as a "global epidemic" by the World Health Organisation (WHO), is an important public health issue that concerns all societies and age groups. It is increasingly common and has social and psychological dimensions.[1] In Turkey, the prevalence of obesity is high among females. The results of the Turkey Demographic and Health Survey (TDHS), conducted in 2003, 2008 and 2013, showed the prevalence of obesity [i.e., body mass index [BMI] ≥ 30kg/m^2] in females aged 15-49 to be 22.7%, 23.9% and 27%, respectively.[2]

For women, being of childbearing age is a potential risk factor for the development of obesity.[3] Additionally, among this age group, excessive weight gain during pregnancy and weight retention for at least 6 months is also a risk factor for obesity.[4] Prior research indicates that postpartum weight retention (PPWR) in women is a global issue.[5-13] There are no Turkish studies investigating PPWR. It leads to breastfeeding complications, depression, stress and body image concerns, and also increases the risk of uterine prolapse, incontinence, obesity, cancer, apoplexy, hypertension, diabetes and coronary heart disease (CHD).[9] Obesity prevalence is higher in women in Turkey. Some traditional approaches in Turkish culture support gaining weight in pregnancy and the postpartum period. In traditional Turkish culture, the mother is commonly seen as the one who carries "two human beings" and therefore eats more, with friends and family encouraging a pregnant woman to eat everything. The puerperant woman eats more in order to have more milk and an excessive intake of carbohydrate-rich foods is encouraged. These incorrect practices make it more difficult to manage weight in

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pregnancy and in the postpartum period. In this context, health professionals play a key role in reducing these consequences of weight gain by promoting the maintenance of a healthy lifestyle. Health professionals should provide education on regular exercise and healthy nutrition with the aim of preventing obesity and its long-term consequences. This can be accomplished by focussing on controlling one's body weight starting from the pre-pregnancy period, gaining a suitable amount of weight during pregnancy, and controlling postpartum weight.[14]

The current study was planned to examine PPWR and affecting factors among mothers in the 12-18 month postpartum period.

Subjects and Methods

The descriptive cross-sectional study was conducted from January 1 to June 30, 2012 at Gazikent 3rd Primary Health Care Centre, Izmir, Turkey, and comprised pregnant women registered with the centre in their 12-18 months postpartum phase. The centre is operated by the Gaziemir Health Group Directorate. Random sampling was used for enrolment in the study. Power analysis was conducted to determine the sample size. With 1-β error probability, 80% power is considered sufficient.[15] Post hoc power was 91%.

Those included were mothers able to take the survey in Turkish, gave birth between the 37th and 42nd weeks, had healthy infants (e.g., without any anomalies and having a suitable weight and height for their age), were in 12-18 months of the postpartum period, knew their pre-pregnancy weight and the amount of weight they had gained during pregnancy, had sufficient communication skills, and agreed to participate in the study. Those who refused to participate were excluded.

Data was collected using the Mother Introduction Form, which identifies socio-demographic characteristics and other variables, and the International Physical Activity Questionnaire-Short Form (IPAQ-SF).[16] The forms were completed by the researcher during interviews with the mothers.

Before the data collection process, a pilot study was conducted with 10 participants who were not included in the study sample to evaluate comprehension of scales and forms and the time taken to complete the forms.

In the study, the Mother Introduction Form was used to determine the factors affecting PPWR. The form was generated in line with relevant literature.[9,13,17] It consisted of 42 questions relating to age, education level, employment status, social insurance, etc. Face validity of the questionnaire was obtained by consensus of five experts in the fields of gynaecology and obstetrics. Changes to the questionnaire were made according to the experts' suggestions.

The International Physical Activity Questionnaire was created to determine adult's levels of physical exercise. There are eight versions of IPAQ that consist of four short and four long forms.[16] This study used the last-seven-days short form which the participants could complete themselves.

IPAQ-SF provides information about the amount of time spent sitting, walking and undertaking moderate and vigorous activities. The total score of the short form is calculated by adding the duration (minutes) and frequencies (per days) of walking and moderate and vigorous activities.[16] The sitting score (sedentary behaviour level) is calculated separately. The criterion for the evaluation of all activities is the ability to perform each activity for at least 10 minutes in one session.[18] The score produced by these calculations is expressed as metabolic equivalent (MET)-min/week. One metabolic equivalent equals 3.5 ml oxygen consumption of the body per kg. For example, 1 MET is the energy used by the body when reading a book, speaking on the phone or sitting. The more the body works during the exercise, the higher the MET value will be. When doing the calculations for the IPAQ-SF, the values for minutes and days and the MET value (e.g., the times of resting oxygen consumption) are multiplied to produce the MET-min/week score.[18] The validity and reliability of IPAQ-SF was determined by an earlier study.[19]

Approval for the study was obtained from the Nursing Faculty's ethics committee. Permission was also obtained from the scientists who conducted the validity and reliability studies of the scales and from the Gaziemir Health Group Directorate. Informed verbal and written consents were also obtained from the subjects.

Weight gain during pregnancy was assessed using the Institute of Medicine (IOM) guidelines of 2009.[20]

Data was analysed using SPSS 15.0 for Windows (SPSS Inc., Chicago, IL, USA) and were evaluated using frequencies, percentages, means, standard deviations,

and median, all of which are descriptive statistical methods. Regarding the independent variables, Pearson chi-square test was used to compare qualitative data with PPWR. Mann-Whitney U test was used to compare quantitative data. In the comparison of two or more quantitative data, logistic regression was conducted to examine the correlation between dependent and independent variables. The study evaluated the hypothesis tests based on a significance level of α=0.05.

Results

Of the 350 women registered with the centre, 261(74.5%) were approached. Of them, 239(91.5%) completed the study. The sample had a mean age of 30.81±4.59 years, with 116(48.5%) in the 18-30 age group and 123(51.5%) aged 31 years or more. Overall, 121(50.6%) mothers had college or higher degrees; 150(62.8%) were not employed; 224(93.7%) had health insurance; all (100%) were married; and 224(93.7%) lived in nuclear families.

Of the total, 203(84.9%) mothers desired the pregnancy, 104(43.5%) said it was their first pregnancy, 126(52.7%) said it was their first delivery. Of the mothers who had previously delivered, 64(55.2%) had 1-5 years between their previous and last deliveries.

Overall, 172(72%) mothers had caesarean sections (CS) and 231(96.7%) nursed their infants. Of the mothers who nursed, 91(39.3%) had done so for 7-12 months, and 111(48.1%) for 13-18 months. Among the mothers, 210(87.9%) had infants whose birth weight was between 2501-3999 gr.

Besides, 55(23%) mother's smoked, with 22(40%) of them smoking 6-10 cigarettes a day; 192(80.3%) mothers said they did not use alcohol. Of the total, 31(13%) had a chronic disease, and 18(58.1%) of them had hypothyroidism.

Also, 157(65.7%) mothers reported skipping meals during their pregnancy, with 116(73.8%) of those skipping lunch, 34(21.7%) skipping breakfast, and 200(83.7%) skipping snacks. Of those who ate snacks, 98(49%) had two snacks, 40(16.7%) went on a diet during their pregnancy, and 35(14.6%) went on a diet after delivery.

Of the participants, 99(41.4%) obtained information during their pregnancy about nutrition and weight gain, and 42(17.6%) obtained information about physical exercise. Additionally, 167(69.9%) had support from their spouses, and 53(22.2%) had support from their families. Mean pre-pregnancy weight of the mothers was 60.88±9.65 kg, with an average height of 1.64±0.05 metres. Their mean BMI was 22.58±3.30. According to pre-pregnancy BMI classification, 17(7.1%) mothers had low weight, 179(74.9%) had normal weight, and 43(18%) were overweight or obese.

Of the mothers who gained 2-35kg during pregnancy, 102(42.7%) gained 8-14 kg, and 98(41%) gained 15-21kg with the average weight gain being 14.47±5.56kg. The average BMI during pregnancy was 27.97±3.26. According to the BMI classification, 42(17.6%) had normal weight, 137(57.3%) were overweight and 60(25.1%) were obese. Overall, 94(39.3%) mothers gained more than the recommended weight during their pregnancies, 87(36.4%) gained the recommended amount of weight, and 58(24.3%) gained less than recommended weight (Table-1).

The average postpartum weight was 64.98±10.27kg, and the average BMI was 24.11±3.57 (range: 15.43-36.73). Overall, 156(65.3%) had normal weight according to BMI classification, 57(23.8%) were overweight and 21(8.8%) were obese.

Of the total, 182(76.2%) mothers had PPWR (range: -9-27kg) (Table-2).

Overall median Physical Activity level of the mothers was 346.50 MET-minute/week (range: 0-8316), and the median value of their sitting period was 240 minute/day (range: 0-840).

There was no significant difference between mothers' PPWR and their age groups, education levels, employment status, income level perceptions, type of the families they lived in, smoking status, desiring the pregnancy, number of pregnancies, number of deliveries, perceptions of their weight during pregnancy, doing physical exercises during pregnancy, perceptions of themselves in physical terms during pregnancy, being educated during pregnancy about nutrition and gaining weight, going on a diet during pregnancy, type of delivery, or going on a diet after birth ($p>0.05$ each).

There was significant difference between mothers' PPWR and presence of chronic diseases, being educated during pregnancy about physical exercise, skipping meals, pre-pregnancy average weight, pre-pregnancy average BMI, average weight gained during pregnancy, achieving a weight gain during pregnancy in accordance with IOM guidelines, and the median of the total IPAQ-SF Physical Activity score ($p<0.05$ each).

The odds of PPWR were 3.570 (95% CI=1.384-9.204) times higher in mothers who had a chronic disease than those who did not. It was 4.839 (95% CI=2.073-11.294) times higher in mothers who were not educated during their pregnancy about physical exercise than those who were. And it was 2.924 (95% CI=1.326-6.447) times higher in the mothers who did not skip meals compared to those who did. An analysis of weight gain in accordance with IOM guidelines showed that the odds of PPWR was 4.009 (95% CI=1.711-9.396) times higher in mothers who gained weight in accordance with the guidelines compared to those who gained less than the level suggested. This odd was 5.351 (95% CI=2.206-12.978) times higher in those who gained more weight than that suggested by IOM guidelines compared to those who gained less (Table-3).

Table-1: The Distribution of Mothers by the Weight They Gained During Pregnancy and Gaining Appropriate Amounts of Weight According to IOM Guidelines.

Weight Gained During Pregnancy (kg)	**n**	**%**
1-7 kg	21	8.8
8 -14 kg	102	42.7
15-21 kg	98	41.0
22-28 kg	12	5.0
29-35 kg	6	2.5
Achieving IOM Criteria		
Suitable according to IOM	87	36.4
Higher than IOM	94	39.3
Lower than IOM	58	24.3
TOTAL	239	100.0

IOM: Institute of Medicine

Table-2: The Distribution of the Mothers by Their Weight Retention Rates and Weight Retention Statuses 12-18 Months Postpartum.

Weight Retention Status	**n**	**%**
Has retention	182	76.2
Does not have retention	57	23.8
Weight Retention (kg)		
-9 - -0.5 kg	32	13.3
0 kg	25	10.5
0.5-5 kg	106	44.4
5.5-10 kg	49	20.6
11-15 kg	21	8.8
16-27 kg	6	2.4
TOTAL	239	100.0

Table-3: The Logistic Regression Model of the Mothers' Weight Retention in the 12-18 Months of the Postpartum Period with Independent Variables.

Variables	**Level**	**Expβ (odds ratio)**	**95%CI**	**p-value**
Presence of any chronic diseases	1.Yes 2.No	3.570	1.384-9.204	0.008
Having been educated about physical exercise in pregnancy	1.Yes 2.No	4.839	2.073-11.294	0.000
Skipping meals	1.Yes 2.No	2.924	1.326-6.447	0.008
Gaining weight during pregnancy in accordance with IOM guidelines	1. Suitable 2. Higher 3.Lower	4.009 5.351	1.711-9.396 2.206-12.978	0.000 0.000

CI: Confidence interval

Discussion

In this study, the average PPWR was 64.98±10.27kg. Approximately two-thirds of the mothers were of a healthy weight, and approximately one-quarter were classified as overweight. In addition, the median of mothers' PPWR showed that approximately three-quarters of the mothers experienced weight retention. Of these, approximately two-fifths retained 0.5-5 kg, and approximately one-fifth retained 5.5-10 kg. In Turkey, women are monitored during pregnancy regarding their weight. However, their PPWR is not monitored, and patients are not provided with weight management programmes. There are no Turkish studies investigating PPWR. A few studies found that the average weight retention in the 12-month postpartum period was between 0.6 and 2.5 kg.[5-7] Similarly, a study determined that the average weight retention in 12 months postpartum was 1.51±5.95kg and that approximately 25% women retained 4.55kg or more.[8] Another study found that weight retention in the first year postpartum was 58%, which is lower than the results of this study.[10] A study found that 46% of African-American women and 25% of Caucasian women retained 9 kg and more in 10-18 months of the postpartum period.[9] Studies have identified that 20% mothers in the 12-month postpartum period retain 5 kg or more.[11-13] The results of this study support existing research.

In this study, PPWR was affected by the presence of chronic diseases, being educated about physical exercise during pregnancy, skipping meals, average pre-pregnancy weight and BMI, average amount of weight gained during pregnancy and whether this was in accordance with IOM guidelines, and total PA score. Many international organisations, including WHO, have been leading the fight against obesity by developing various programmes on changing nutritional habits, establishing a nutritious and balanced diet, and adopting an active lifestyle. Many countries have various strategies to communicate these important points of intervention.[21] In Turkey, the struggle

with obesity is included in various national health policy publications. In terms of protective health and family health services, these programmes mainly aim at popularising activities to prevent obesity, primarily among high-risk groups like infants, children, pregnant and breastfeeding women, elderly people, disabled people, and those who give up smoking. Education is an important factor in the prevention of obesity, but there are gaps in practice, as indicated by the study findings. In this context, it is important that health professionals provide education on physical exercise and balanced nutrition to minimise the risk for obesity, as well as the long-term adverse health outcomes associated with obesity.[14]

According to literature, excessive weight gain before pregnancy is one of the factors of PPWR.[22,23] One study found that women with a BMI of 26 or higher before pregnancy showed an increased rate of weight retention in the first year postpartum.[22] Another factor for PPWR is excessive weight gain during pregnancy.[9,17,24] This study found that the mothers who gained15.10±5.67kg on average during pregnancy had higher weight retention in the 12-18 months of the postpartum period compared to those who retained less. A study reported that the average weight retention in the sixth month of the postpartum period was 14.06±4.36 and determined a significant difference between weight retention and the amount of weight gained during pregnancy.[13] One study determined that mothers who gained 17.3-25.5kg during their pregnancy had an average of 0.8±4.5 weight retention in the 12th month of their postpartum period. Another factor for PPWR is the amount of weight gained in accordance with IOM guidelines.[25] A study, conducted to examine the correlation between BMI and postpartum maternal weight, determined that women who gained more weight than suggested by IOM guidelines had a higher risk of postpartum weight retention.[26] These results are consistent with the results of the current study, which indicate that the IOM guidelines are effective in controlling postpartum weight gain.

This study was performed in a single city in the western part of Turkey. Izmir is a region inhabited by people migrating from different regions of Turkey. This is a limitation of the study. However, we believe that the sample size was sufficient to detect differences in the targeted population.

Based on the findings, the study suggests that health professionals who serve women, including pregnant women, should provide education programmes to increase awareness about weight gain and weight control during pregnancy, postpartum weight control, and the global epidemic of obesity. The inadequacies in the Turkish Healthy Nutrition and Active Life Programme must be addressed.[27]

In addition, health professionals should offer programmes for pregnant women to maintain a healthy BMI, monitor their weight in the postpartum period, and learn health promoting behaviours to reduce weight retention.

Conclusion

Women should be monitored for their BMI and weight in the postpartum period and during pregnancy. They should also be provided with programmes by health professionals that focus on healthy and balanced nutrition and increasing physical activity for the purpose of reducing weight retention.

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