



The Relationship Between Mindful Eating and Nutritional Status in Pregnancy

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ABSTRACT

Mindful eating focuses on the individual's awareness of what, where, how to eat, the relationship with external factors, and no judgment on food. The aim of this study was determination of mindful eating during pregnancy. A questionnaire was applied to 145 individuals aged 20-45 years by face-to-face interview technique in a Women's Health Center in Ankara. In this questionnaire, there are questions regarding to demographic information and Mindful Eating Questionnaire. Also nutrition status was determined by 24-hour recall method. The mean age of the participants was 28.7±5.01 years and 47.5% of the participants were in their first pregnancy. The mean of MEQ score was 86.7±11.16. The mean MEQ score of the pregnant women in the first trimester was 86.9±11.05. There were positive and statistically significant correlations between energy, carbohydrate, protein, fat, vitamin E, thiamine, riboflavin, folate, potassium, calcium and zinc intake and MEQ ($p<0.05$). When the subscales were examined, only a statistically significant difference was found between the groups in terms of eating control subscale score. A negative and statistically significant relationship was found between the emotional eating, food control and focusing of the subscale of MEQ and pre-pregnancy body mass index. Additionally it was determined that the highest eating control sub-score of the MEQ was belong to the second trimester. There were significant relationship between pre-pregnancy body mass index and mindful eating sub-groups that emotional eating, eating control and focusing.

1. Introduction

The regular and balanced diet of the mother during pregnancy is an important factor for the metabolic development of the baby from the moment of pregnancy onset and the health of the child in future. Nutrition in pregnancy should protect the mother's health, be sufficient for the growth of the foetus, and provide energy and endurance to the mother during birth and lactation. Mother's nutrition during pregnancy has a great effect on both before and after the birth (Shahid et al. 2012). If a simple definition is made for mindful eating, it can be summarized as eating by focusing on the consumed food or drink. Before the detailed description of mindful eating, the concept of mindfulness should be addressed. Mindfulness is expressed as an awareness that includes giving the main unconditionally conscious attention to current moment (Bishop et al. 2004; Kabat-Zinn 2003).

Excessive energy intake is a controllable behavioural reason. Because the nutrient intake is realized without the concept of mindful, excessive food consumption can create a feeling of guilt. The concept of mindfulness can help "healthier nutrition" and facilitate body weight management (Jordan et al.2014). Framson, Kristal, Schenk, Littman, Zeliadt and

Benitez (2009) described "mindful eating" that can be used to describe a non-judgmental awareness of physical and emotional sensations while eating or in a food-related environment. It is being present with internal emotions, thoughts, and sensations as well as the external sensations associated with eating (Albers 2010). In a study mindful eating refers to "Rather than what is eaten realizing how and why eating behavior occurs, internalizing the concept of physical fasting-satiety and being aware of the effects of emotions and thoughts without being influenced by environmental factors, that without judging the food choices currently consumed eating with focus on nutrients"(Kose et al. 2016). Besides being associated with many health conditions, mindfulness plays an important role in the management of body weight by reducing excessive food consumption and food cravings within the limits of mindful eating, preventing emotional eating and providing individualized portion control (Beshara et al. 2013; Heatherton and Baumeister 1991; Alberts et al.2012).

Pregnancy is a process that includes social, psychological and physical changes that can be turning points for recovery or onset/relapse of eating behavior disorders (Watson et al. 2014). The aim of this study was; determination of the

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relationship between mindful eating and nutrients in pregnancy.

2. Material and Method

Study Participants and Data Collection

This study was carried out in 145 pregnant women who applied to a special Gynaecology and Obstetrics Centre in Ankara in January-June 2018. Before the study, the participants were informed about the research and the volunteer individuals who accepted to participate in the research were included in the study by signing the Informed Consent Form. Pregnant women with preeclampsia or gestational diabetes were excluded. This study was approved by the ethics committee of the institution.

A questionnaire consisting of 3 sections was applied to the individuals who participated in the study by face to face interview technique. The first part has some questions about determining the demographic information of individuals. In the second part, Mindful Eating Questionnaire (MEQ) was used. In the third section, nutritional status was determined by 24-hour recall method.

Nutritional Status: The data we obtained from the 24-hour recall section were first entered into the Nutrition Information System (BEBIS) program, and the amount of energy, protein, fat, carbohydrate, vitamin and mineral that they took from the foods they had consumed the day before was determined. Portion training was given to the participants in this study using the Meal and Food Catalogue (Rakıcıoğlu et al. 2012). The food consumption of the participants was taken using household scales (water glass, coffee cup, scoop, teaspoon, and tablespoon). The amount of energy and nutrients provided by each food was calculated using the BEBIS program.

Mindful Eating Questionnaire: Through this scale, which was developed by Framson, Kristal, Schenk, Littman, Zeliadt and Benitez (2009) with the original name MEQ, associations between eating behaviour, mindfulness and emotional state can be carefully investigated. Köse et al. (2016) adopted MEQ into Turkish. The items in the original scale are evaluated with a 4-point Likert scale (1: none/rarely, 2: sometimes, 3: frequently, 4: usually/always) and with Likert's effect factors of 28 questions are: disinhibition, mindfulness, external factors is the emotional response and distraction. The adapted new scale used 5-degree Likert rating (1: none, 2: rarely, 3: sometimes, 4: frequently, 5: always). In total there are 30 questions and 7 subscales. These subscales are Disinhibition, Emotional Eating, Eating Control, Focusing, Eating Discipline, Mindfulness and Interference.

Anthropometric Measurements: Pre-pregnancy weights, current weights and heights of the pregnant women participating the study were recorded. Pre-pregnancy Body Mass Index (BMI) was calculated by dividing the body weight before pregnancy by the square of the height of the body [body weight (kg) / height² (m)].

Statistical Analysis

The data obtained from the study were evaluated with SPSS (Statistical Package for Social Sciences) 17.0 program. Qualitative variables are given as number (N) and percentage (%). Quantitative variables obtained by measurement are shown by mean (\bar{x}) and standard deviation (SD) values. The appropriateness of the quantitative variables indicated by the

measurement with normal distribution was evaluated by "Kolmogorov-Smirnov" test. Pearson correlation test was used for the parameters which were normally distributed, and Spearman's rho correlation test was used for the parameters that did not show normal distribution. One-way ANOVA (analysis of variance) test and Kruskal-Wallis test were used for comparison between groups. $p < 0.05$ was considered as significant in all statistical analyses.

3. Results and Discussion

The distribution of demographic and gestational characteristics of the individuals participating in the study is given in Table 1. The mean age of the participants was 28.7 ± 5.01 years (minimum 20, maximum 43 years). 98.6% of the pregnant women are married and 56.6% have associate degree or bachelor's degree. 47.5% of the participants participated in this study in their first pregnancy. The number of live births performed by the individuals before their current pregnancies was 63% (43.4%) while the number of stillbirths was 35 (24.1%). 41.4% of the pregnant women participating in the study were in the first, 37.7% in the second and 26.9% in the third trimester. When asked about supplement intake during or before the pregnancy, 72.4% of the pregnant women participating in the study declared that they used the supplements. Among these supplements, folic acid (37.2%) was the most common (Table 1).

Table 1. Distribution of demographic and pregnancy characteristics of participants

		$\bar{x} \pm SD$	
Age (year)		28.7 ± 5.01	
		N	%
Marital status	Married	143	98.6
	Divorced/ Widow	2	1.4
Educational status	Illiterate	2	1.4
	Primary school graduate	7	4.8
	Elementary school	17	11.7
	High school graduate	37	25.5
	License / Associate degree	82	56.6
	Profession status	Housewife	68
Officer		31	21.4
Self-employment		30	20.7
Worker		8	5.5
	College student	8	5.5
	Live birth number	1	34
2		17	11.7
3 and more		12	8.3
Number of stillbirths	1	26	17.9
	2 and more	9	6.2
Trimester	First	60	41.4
	Second	46	37.7
	Third	39	26.9
Supplement use status	Yes	105	72.4
	No	40	27.6
Supplement type	Folic Acid	86	37.2
	Multivitamins	31	13.4
	Iron	26	11.3
	Calcium	25	10.8
	Vitamin D	24	10.4
	Zinc	14	6.1
	Vitamin B ₁₂	10	4.3
	Omega 3	9	3.9
Magnesium	6	2.6	

In Table 2, the total score of the MEQ and the subscale scores

were compared according to the trimesters. The mean MEQ score of the pregnant women participating in the study was 86.7 ± 11.16 . The mean MEQ score of the pregnant women in the first trimester was 86.9 ± 11.05 ; while the mean score of MEQ in the second trimester was 87.9 ± 10.89 and the mean score of the pregnant women in the third trimester was 85.0 ± 11.71 . When the subscales were analysed, a statistically significant difference was found between the groups in terms of eating control subscale score ($p < 0.05$). There was no significant difference between the groups in terms of Disinhibition, Emotional Eating, Eating Control, Focusing, Eating Discipline, Mindfulness and Interference subscales (Table 2).

Table 2. Comparison of the total score of the MEQ and the subscale scores of the MEQ

	I.Trimester	II. Trimester	III. Trimester	TOTAL	p
MEQ	86.9±11.05	87.9±10.89	85.0±11.71	86.7±11.16	0.496 ^a
Disinhibition	16.4±3.78	16.0±3.57	16.8±3.56	16.4±3.64	0.639 ^a
Emotional Eating	17.0±4.12	17.0±4.86	18.5±3.87	17.4±4.32	0.195 ^a
Eating Control	15.0±3.43	16.3±3.09	14.7±3.35	15.3±3.34	0.048 ^a
Focusing	15.4±2.52	15.6±2.52	16.2±1.67	15.7±2.33	0.276 ^a
Eating Discipline	13.6±2.98	13.5±3.31	13.1±2.97	13.4±3.07	0.707 ^a
Mindfulness	16.2±2.81	16.0±3.41	16.1±3.29	16.1±3.12	0.950 ^a
Interference	7.3±1.74	7.5±1.83	7.2±2.21	7.3±1.89	0.633 ^b

MEQ: Mindful Eating Questionnaire

* $p < 0.05$

a ANOVA (analysis of variance)

b Kruskal Wallis Test

The relationships between MEQ and energy, macro and micro nutrients are given in Table 3. There were positive and statistically significant correlations between MEQ and energy, carbohydrate, protein, fat, vitamin E, thiamine, riboflavin, foliate, potassium, calcium and zinc intake ($p < 0.05$).

There was no significant correlation between total score of MEQ and BMI values pre-pregnancy. In spite of this, a negative and statistically significant relationship was found between pre-pregnancy BMI and the emotional eating ($r = -0.247$), eating control ($r = -0.168$) and focusing ($r = -0.198$) (unshown data).

Mother's nutrition during pregnancy is important both for her own health and for the health of the foetus. The aim of nutrition during pregnancy is to meet both the physiological requirements of the mother and to provide an adequate and balanced diet in terms of the energy and nutrients necessary for the normal growth of the foetus. However, hormone-induced changes, the differentiation of plasma volume and renal functions make it difficult to determine the needs in this period (Uzdil and Özenoğlu 2015; Picciano 2002). There are some factors affecting healthy nutrition in pregnant women. These are physiological factors (body weight, nausea and vomiting), cognitive/perceptual factors (the level of knowledge of pregnancy nutrition, healthy eating perception during pregnancy, attitudes towards body weight increase in

pregnancy) and psychological factors (depression, stress and emotional eating) (Fowles et al. 2008). Women should be healthy during pregnancy and as a result healthy body weight increase should be observed. In this study, mindful eating in pregnant women was researched.

Table 3. Correlations between MEQ and energy, macro and micro nutrients

	MEQ	
	r	p
Energy (kcal)	0.283	0.001 ^{a*}
Carbohydrate (g)	0.175	0.035 ^{a*}
Protein (g)	0.218	0.008 ^{a*}
Fat (g)	0.240	0.004 ^{b*}
Cholesterol (mg)	0.095	0.258 ^a
Fibre (g)	0.162	0.051 ^b
Vitamin A ($\mu\text{g}/\text{RE}$)	0.008	0.924 ^b
Vitamin E (mg)	0.187	0.024 ^{a*}
Thiamin (mg)	0.187	0.024 ^{b*}
Riboflavin (mg)	0.307	0.000 ^{a*}
Niacin (mg)	0.146	0.081 ^a
Folate (mcg)	0.221	0.007 ^{b*}
Vitamin C (mg)	0.029	0.727 ^b
Vitamin B6 (g)	0.146	0.081 ^b
Potassium (mg)	0.186	0.025 ^{a*}
Calcium (mg)	0.267	0.001 ^{a*}
Magnesium (mg)	0.137	0.101 ^a
Phosphorus (mg)	0.139	0.960 ^a
Iron (mg)	0.146	0.080 ^a
Zinc (mg)	0.224	0.007 ^{a*}

MEQ: Mindful Eating Questionnaire

* $p < 0.05$

a Pearson correlation

b Spearman's rho

In a study by Framson, Kristal, Schenk, Littman, Zeliadt and Benitez (2009), as the BMI increases, the MEQ score decreases. In another study, increased mindful as the BMI decreased was reported (Grinnell et al. 2011). In another study, a negative correlation was found between BMI and MEQ scores (Moor et al. 2013). Beshara, Hutchinson and Wilson (2013) found a negative correlation in their study between MEQ scores and body weight, as well as negative correlation with emotional eating and disinhibition factors. In this study, parallel to the literature, a negative relationship was found between pre-pregnancy BMI and emotional eating, eating control and focusing which are sub-factors of the MEQ scale.

An inadequate diet in energy affects the pregnancy negatively and the lack of adequate intake of vitamins and minerals in women's diet during pregnancy can pose a risk to the health of the foetus. In a study, daily energy intake of pregnant women was found to be below the recommended level (Bulut et al. 2007). The intake of vitamin A, C vitamins, riboflavin and phosphorus for women was higher than recommended, while vitamin D, folic acid, iron, zinc, calcium and magnesium intake were found to be lower than recommended. In this study, it was found that there were statistically significant relationships between MEQ and the micronutrients taken by

the pregnant women such as vitamin E, thiamine, riboflavin, foliate, potassium, calcium and zinc. As the MEQ score increased, an increase was observed in the intake of these nutrients. Mindful diet is recommended to reduce excess consumption during pregnancy and to improve eating containing higher energy (Hutchinson et al. 2017). Increasing attention to eating behaviour, internalizing the consumed food and reducing the sensitivity to thoughts and emotions during food consumption can help people make healthier food choices (Baer et al. 2005; Konttinen et al. 2009). In this study the subscale scores of the MEQ were compared according to the trimesters, and the highest eating control subscale scores of the participants were found to belong to the second trimester. The second trimester of pregnancy is the period when she adapts to his changes, solves the problems he encounters in the first trimester, and is mentally balanced. therefore, it is assumed that they are more sensitive about eating control.

The most important limitation of this study to evaluate the quality of attention given to eating experience during pregnancy is restriction of the number of samples. Another limitation of the study is that biochemical measurements were not included. However, there are very few studies related with mindful eating in pregnant women. Mindful-based approaches can reduce over-nutrition, manage wrong eating behaviours and emotional irregularities, and lead to internalization of change (Youngwanichsetha et al. 2014; Kristeller et al. 2014). Kristeller, Wolever and Sheets (2014) found in their study that in individuals with binge eating disorder, symptoms of binge eating disorders have improved with the mindful-based eating education. In a study conducted on pregnant women, it was determined that those who exhibit eating behavior in response to negative emotions such as stress and sadness prefer foods

4. Conclusion

Mindful eating focuses on the individual's awareness of what, where, how to eat, the relationship with external factors, and the lack of judgment on food while the eating action takes place. For fulfilling the requirements of both mother and baby during pregnancy and to protect general health, conscious nutrition is recommended. In subsequent studies, it is very important to evaluate the mindful eating of target groups using MEQ. The subject of mindful eating should be examined in different groups and intervention studies involving mindful-based education should be planned.

Conflict of Interest: The authors declare no potential competing of interests.

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