A Study on the Relationship between Mindful Eating, Eating Attitudes and Behaviors and Abdominal Obesity in Adult Women

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Abstract:-

Objective: This study aimed to determine the relationship between eating awareness, eating attitudes, eating behavior, and dietary habits with abdominal obesity among adult women residing in the Güzelyurt region.

Method: The research was conducted between January 2019 and May 2019 in the Güzelyurt district of the Turkish Republic of Northern Cyprus, involving a total of 350 adult individuals aged 25-59 years. Participants were selected using a random sampling method. Individual interviews were conducted to administer the eating awareness scale, eating attitude test, eating behavior scale, and record dietary consumption frequency forms. Additionally, certain demographic and anthropometric measurements were recorded.

Results: Participants aged between 25 and 35 years constituted 40.2% of the study sample. Among the participants, 67.4% were married, 27.1% were single, and 5.4% were widowed. Educational levels varied, with 15.7% having primary education or below, 15.14% having secondary education, 27.14% having high school education, and 42.0% having university-level education. A positive relationship (p<0.05) was observed between waist-to-hip ratio values and scores obtained from the Eating Attitude Test.

Conclusion: A negative linear relationship was found between participants' waist circumference and scores on the Eating Awareness Scale, and a positive linear relationship was identified between the Unhealthy Eating Behavior subscale scores from the Eating Attitude Test and Eating Behavior Scale. As participants' scores on the Eating Awareness Scale increased, waist circumference decreased, and as Unhealthy Eating Behavior subscale scores increased, waist circumference also increased. A negative linear relationship (p<0.05) was established between participants' hip circumference values and scores on the Eating Awareness Scale, as well as between the Unhealthy Eating Behavior subscale scores from the Eating Behavior Scale. Consequently, as participants' Eating Awareness Scale values increased, hip circumference decreased, and as Unhealthy Eating Behavior subscale scores increased, hip circumference also increased. A statistically significant positive relationship was observed between waist-to-hip ratio values and scores obtained from the Eating Attitude Test. As participants' scores on the Eating Attitude Test increased, waist-to-hip ratio values also increased.

I. INTRODUCTION

The body needs energy to function and be productive. This energy is achieved through adequate and balanced nutrition (Yücel, 2015). Adequate and balanced nutrition which is necessary for growth, development, tissue formation, and the continuation of crucial activities, is obtained by consuming the necessary nutrients in sufficient quantities and in a balanced manner during meals, (2,12). Individuals who do not practice adequate and balanced nutrition may encounter various health issues, with obesity being a primary concern. Obesity is a disease that refers to the accumulation of high levels of fat in the body due to the intake of high-energy foods and an increase in sedentary lifestyle. When the intake of energy is higher than the consumed, obesity occurs. It affects health, leads to the development of chronic diseases, has negative impacts on mortality, and requires treatment. (12). Genetic factors, easy access to foods with high energy, and sedentary lifestyles are factors leading to the progression of obesity (Köse, 2017). Researches conducted in the United States in 2009-2010 explored that 36% of obesity cases were among women and men, 17% involved young adolescents. By 2050, it is assumed that that 60% of obesity cases will be among males, 40% among females, and 25% among young adolescents. In 1997 and 1998, studies conducted in Turkey by Turkish Diabetes Epidemiology (TURDEP-I and TURDEP-II) indicated that obesity rates were then 32.9% for females and 13.2% for males whereas in 2010, these rates had increased to 44.2% for females and 27.3% for males, indicating Turkey's obesity prevalence as 32% (Köse, 2017). Debates on the interpretation of body fat only relying on waist circumference had started in 1990s. Knowing only the waist circumference measurement indicates abdominal fat accumulation and signifies overall health. Measuring waist circumference method is simple. Height is not taken into consideration. Waist circumference correlates with body mass index (BMI) and waist-to-hip ratio. Thus, it performs as a sign of central fat and overall body fat (Kaner, 2013). According to the World Health Organization's recommendation, waist circumference is obtained by measuring around the midpoint between the lower rib and the iliac bone. Hip circumference measurement is achieved by measuring the largest circumference of the hips whilst standing on the patient's side; the patient without any thick clothing on or objects that might prevent the measure or give incorrect results. (11).

Low mindfulness in eating is linked to healthy eating practices and achieving successful healthy weight loss (7). Mindfulness is associated with several health-related issues. Mindful eating involves inside and outside factors such as portion control, emotional eating, and prevention of overeating, which also contributes to weight management (4). Eating behaviors are not only driven by need but also shaped by traditions, causing imbalanced and unconscious eating habits, disruption while eating, lack of time for eating, and fast eating practices. Eating behaviors heighten depression whilst exhibiting evidence a positive relationship with anxiety disorders and obesity. It is known that emotional factors influence food and dietary choices (4). Mistakes made in dietary habits harm individual's life quality and lead to obesity. Improper nutrient proportions in meals, irregular meal timings, eating snacks with high-fat and high-carbohydrate, alcohol consumption, fast eating habit, the processes foods are exposed to, insufficient water drinking, and consuming inadequate pulp are incorrect eating behaviors that lead to obesity, along with genetic factors, (10). Urbanization along with economic progress have led to changes in lifestyles and diets in the rapidly evolving world. In order to reach the desired quality of life, education on raising awareness about nutrition and incorporating it into their lifestyle, should be provided to individuals. The aim of this study is to determine the eating mindfulness, eating attitude behaviors, dietary habits, and anthropometric measurements of adults living in the Lefke region of Northern Cyprus. The waist-to-hip ratio holds important significance when regarding the relationship between abdominal obesity and dietary habits.

A. Objective:

This study aims to establish the eating mindfulness, eating attitude behaviors, dietary habits, and anthropometric measurements of adult females aged 25-59 inhabiting in the Güzelyurt region of Northern Cyprus.

Method: Interviews were held individually with the administration of eating mindfulness scale, eating attitude test, and eating behaviour scale. Records of dietary consumption frequency forms were recorded.

In addition, some demographic characteristics and anthropometric measurements were identified. The data collected from participants were evaluated statistically using Statistical Package for Social Sciences (SPSS) version 25.0. While specifying the distributions on participants' socio-demographic characteristics, health status, smoking habits, walking habits, and sleep status, frequency analysis was used. Descriptive statistics to clarify the mean, standard deviation, minimum, and maximum values for anthropometric measurements, Eating Mindfulness Scale, Eating Attitude Test, and Eating Behavior Scale were presented. Kolmogorov-Smirnov test, QQ plot, skewness, and kurtosis values were used to examine normal distribution suitability for the Eating Mindfulness Scale, Eating Attitude Test, and Eating Behavior Scale scores according to participants' socio-demographic characteristics, health status, smoking habits, walking habits, and sleep status; because of the data demonstrating normal distribution, parametric test statistics were held.

While participants' socio-demographic characteristics, health status, smoking habits, walking habits, and sleep status among Eating Mindfulness Scale, Eating Attitude Test, and Eating Behavior Scale scores were compared;

Independent sample t-test for dichotomous independent variables, ANOVA for independent variables with three or more categories and Tukey's post-hoc test 23 were used. The relationship between participants' anthropometric measurements and scores on the Eating Mindfulness Scale, Eating Attitude Test, and Eating Behavior Scale was determined using the Pearson test.

B. Population and Sample:

The research was carried out in the Güzelyurt district of the Turkish Republic of Northern Cyprus between January 2019 and May 2019. The study was held to a total of 350 adult individuals aged 25-59 residing in the region. Participants were selected using a random sampling method.

II. DATA COLLECTION TOOLS

A. Anthropometric Measurements

➢ *Waist Circumference:*

The measurement was taken from the midpoint between the lowest rib bone and the iliac bone of individuals. For this purpose a non-stretchable measuring tape was used. According to the classification of the World Health Organization:
- For males: <94 cm
- For females: <80 cm (11).

➢ *Hip Circumference:*

Hip circumference measurement was done by taking the largest circumference of the hips whilst standing on individuals' side, the individuals without any thick clothing on or objects in pockets that could create thickness; thus, might affect accurate measurement (11).

➢ *Waist-to-Hip Ratio:*

To calculate the waist-to-hip ratio, the waist circumference value in centimeters is divided by the hip circumference value in centimeters.

➢ *Dietary Consumption Frequency Form:*

This method is commonly preferred to identify relationships between nutrition and disease risk. The form is used to determine the daily, weekly, or monthly quantity and frequency of consumption of foods or food groups. This form can be prepared in different formats based on food groups, specific foods, or the nature of the food (8).

➢ *Mindful Eating Questionnaire (MEQ-30):*

The Mindful Eating Questionnaire (MEQ) developed by Framson and colleagues in 2009, enables one to explore the relationships among eating behaviors, eating mindfulness, and emotional states. The original scale consists of items presented in a 4-point Likert scale and is evaluated as follows: (1: never/rarely, 2: sometimes, 3: often, 4: almost always/always). The 28-item Likert's impact factors: conditioned reflex loss, mindfulness, emotional responsiveness, external factors, and distraction of attention

(1). Validity and reliability studies were carried out by Köse and his colleagues, adapting the scale into Turkish as the Eating Mindfulness Scale (Köse et al., 2016).

➢ *Eating Attitude Test (EAT-40):*

This test assesses behaviors and attitudes in relation with food consumption, and specifies disorders in eating behaviors of individuals'. A direct proportional relationship between the total score and psychopathology levels was observed. The EAT-40 identifies habits and attitudes that are related to eating disorder behaviors at a clinical level. The test consists of 40 Likert-type items. Items 1, 18, 19, 23, 27, and 39 in the scale are scored inversely. The cutoff point is 30 points. This test was developed by Garner and Garfinkel. (4). Subsequently, Savaşır and Erol conducted validity and reliability studies and adapted it to Turkish (Savaşır and Erol, 1989). The scoring for the scale as normal and reverse are as the following: Items 18, 19, 23, 27, and 39 are inversely scored (Reverse Scoring: a=0, b=0, c=0, d=1, e=2, f=3), while the remaining questions are scored normally (Normal Scoring: a=3, b=2, c=1, d=0, e=0, f=0). As the score on the scale increases, eating attitudes become more disrupted. A score below 30 and 25 indicates a normal eating attitude, while a score of 30 or higher indicates a disrupted eating behavior. Individuals scoring 30 or higher on the eating attitude test are said to be at higher risk for eating disorders (4).

➢ *Eating Behavior Scale:*

Metric scale is used to create the Eating Behavior Scale . Responses on the metric scale are measured and scored on the response axis using a ruler, by placing a line on the response axis; For positive items the ruler is positioned starting from the left and for negative items the ruler is placed from the right. A 10 cm axis is provided for the response axis to allow respondents to estimate their behavior degrees more comfortably. 580 is the maximum score that can be obtained on the metric scale whereas the minimum score is 0. Initially the test which consisted of 79 statements, was reduced to 58 statements; after applying statistical processing 21 non-contributory statements were removed(6). The improved scale is considered to enable a detailed evaluation of adolescents' eating behaviors and nutritional knowledge. The benefits of the scale which are expected to be achieved include its low cost, easy applicability and analysis, the potential for more accurate comparisons with studies in the field, and its potential ease of application to other populations when needed (6).

In the recent studies it is pointed out that there is a need for such scale studies to achieve more detailed results, as the measurement tools used in recent studies have been unidirectional. The validity and reliability of the scale was established by Özdoğan (6).

III.   RESULTS

Table 1: Socio-Demographic Characteristics of Participants (n=350)

AGE	Number (n)	Percentage (%)
25-35 years	141	40.29
36-45 years	67	19.14
46-55 years	57	16.29
56-65 years	85	24.29

A. MARITAL STATUS

Married	236	67.43
Single	95	27.14
Divorced	19	5.43

B. EDUCATIONAL LEVEL

Primary school and below	55	15.71
Middle school	53	15.14
High school	95	27.14
Bachelor's/Master's	147	42.00

After analyzing Table 1, it is determined that 40.29% of participants are aged 25-35, 19.14% are aged 36-45, 16.29% are aged 46-55, and 24.29% are aged 56-65. In addition, 67.43% of participants are married, 27.14% are single, and 5.43% are divorced. In terms of educational levels, 15.71% completed primary school or below, 15.14% completed middle school, 27.14% completed high school, and 42.00% have received a bachelor's or master's degree.

Table 2: Participants' Health, Smoking Habits, Walking, and Sleep Status (n=350)

Diagnosed with a chronic disease	Number (n)	Percentage (%)
Yes	95	27.29
No	255	72.71

➤ *DISEASE (n=95)**
Hypertension	38	40.43
Cardiovascular Disease	25	27.14
Diabetes	22	26.43
Hormonal Disease	22	23.6

➤ *Continuous use of medication*
Yes	95	27.29
No	255	72.71

➤ *Smoking habits*
Smoker	62	17.71
Non-smoker	288	82.29

In table 2 the distribution of participants according to health, smoking habits, walking, and sleep status are presented. Upon examining Table 4.2, it is observed that 27.14% of participants have been diagnosed with a chronic disease. Among those diagnosed with chronic diseases, 40.0% have hypertension, 26.32% diabetes, 28.42% cardiovascular diseases, and 23.16% have hormonal diseases. In addition to all, 25.71% of participants regularly use medication, and 17.71% are smokers.

Table 3: Descriptive Statistics of Participants' Anthropometric Measurements (n=350)

	N	$\bar{x}$	S	Min	Max
Waist Circumference (cm)	222	88.22	13.14	62.00	119.00
Hip Circumference (cm)	222	104.46	10.02	80.00	34.00
Waist-to-Hip Ratio	222	0.84	0.08	0.66	1.10

The study showed that the waist circumference was $\bar{x}$=88.22±13.14 cm, the hip circumference $\bar{x}$=104.46±10.02 cm, and the waist-to-hip ratio as $\bar{x}$=0.84±0.08.

Table 4: Correlations between Anthropometric Measurements of Participants and Scores on the Mindful Eating Scale, Eating Attitudes Test, and Eating Behavior Scale

		Mindful Eating Scale	Eating Attitudes Test	Healthy Eating Beh.	Unhealthy Eating Beh.
Waist Circumference (cm)	r	-0,171	0,140	0,021	0,147
	p	0,001*	0,009*	0,701	0,006*
Hip Circumference (cm)	r	-0,276	0,087	0,090	0,229
	p	0,000*	0,102	0,093	0,000*
Waist to hip ratio	r	-0,017	0,135	-0,057	0,002
	p	0,750	0,012*	0,290	0,972

The table presents the correlations among participants' anthropometric measurements and scores of the Mindful Eating Questionnaire, Eating Attitude Test, Waist-to-Hip Ratio and Eating Behavior Scale.

The study indicated a negative correlation between participants' waist circumference lengths and scores of the Mindful Eating Questionnaire, and a positive linear relationship between scores of the Eating Attitude Test and the Unhealthy Eating Behavior subscale in the Eating Behavior Scale ($p < 0.05$).

It was observed that as participants' scores on the Mindful Eating Questionnaire increase, waist circumference lengths decrease, and as scores of the Eating Attitude Test and the Unhealthy Eating Behavior subscale increase, waist circumference lengths increase. Additionally, a negative correlation between participants' hip circumference values and scores of the Mindful Eating Questionnaire, and a linear relationship between scores of the Unhealthy Eating Behavior subscale in the Eating Behavior Scale was seen. ($p < 0.05$).

In this case, as participants' scores on the Mindful Eating Questionnaire increase, hip circumference lengths decrease, and as scores of the Unhealthy Eating Behavior subscale increase, hip circumference lengths decrease. Moreover, a statistically significant positive relationship was found between participants' waist-to-hip ratio values and scores obtained from the Eating Attitude Test ($p < 0.05$). As participants' scores on the Eating Attitude Test increase, waist-to-hip ratios also increase.

IV. DISCUSSION

Among participants' age groups a statistically clear difference in scores were detected from the Eating Attitude Test was found ($p < 0.05$). Furthermore, a statistically significant relation between participants' age groups and scores was derived from the Healthy Eating Behavior subscale of the Eating Behavior Scale was identified ($p < 0.05$).

The cutoff point for the Eating Attitude Test is 30 points. A score above 30 on the Eating Attitude Test (EAT-40) is reported to signify a distorted eating attitude and a risk for eating disorders. The study involving students, determined that the scores on the Eating Attitude Test (EAT-40) was not statistically significant based on gender (p > 0.05). Likewise, no statistically notable difference was observed in this study between participants' gender and scores on the Mindful Eating Questionnaire (MEQ-30) (p > 0.05) (Köse, 2017).As a result, in this study, statistically significant difference in scores on the Mindful Eating Scale and the Eating Attitude Test based on participating individuals' gender was not observed(p>0.05).

Kaya et al., supported that a positive relationship was found between Body Mass Index (BMI) values and Eating Attitudes Test (EAT-40) scores (r=0.439, p=0.001) (Kaya et al., 2016). A clear connection was discovered between Body Mass Index (BMI) and the difference in Eating Attitudes Test scores (EAT-40) (p<0.05) (Köse, 2017). The Body Mass Index (BMI) data appointed an association with the difference in Eating Behavior Scale scores (p>0.05) (Özdoğan, 2013). On the other hand, the connection between participants' Body Mass Index (BMI) values and scores on the Mindful Eating Scale, Eating Attitudes Test, and Eating Behavior Scale was statistically insignificant here (p>0.05).Upon examining participants' educational levels in relation to Eating Attitudes Test (EAT-40) scores, it was detected that higher education levels were associated with lower Eating Attitudes Test scores (Kaya et al., 2016). In accordance with the current research, the educational levels of participants had a statistically significant impact on the scores derived from the Eating Attitudes Test, with individuals who had achieved undergraduate/graduate education, scoring lower on the Eating Attitudes Test compared to those with elementary education or no education (p<0.05).

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