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The relationship between healthcare professionals' mindful eating, eating attitudes, and body mass index

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Summary. *Purpose:* This observational research study was conducted to determine the relationship between healthcare professionals' eating attitudes, mindful eating, and body composition. *Methods:* Participants were 535 healthcare professionals, 325 (60%) working at Çorum (Turkey) Elitpark Hospital and 210 (40%) at Çorum Private Hospital. The participants filled a questionnaire with questions on demographic characteristics, body mass index (BMI), nutritional habits, Eating Attitudes Test, and Mindful Eating Scale. *Results:* The participants categorized as "other healthcare professionals" (28.6%) had the highest BMI value. The participants with impaired eating attitudes (92.2%) had high BMI values in general. The other healthcare professionals also constituted the occupational group with the highest impaired eating attitude score (66.9%). With regard to the magnitude of the relationship between mindful eating and BMI, obese and overweight people ranked first in terms of disinhibition, emotional eating, and interference. The lowest level of mindful eating was observed in the other healthcare professionals and auxiliary health personnel. Doctors were the occupational group with the highest level of mindful eating. The healthcare professionals with impaired eating attitudes had a statistically significantly higher average score on interference compared to those with normal eating attitude. *Conclusion:* The majority of the healthcare professionals participating in this study had high BMI values. Significant correlations were found among eating attitudes, mindful eating, and BMI. The other healthcare professionals and the auxiliary health personnel had the highest level of impaired eating attitudes and a low level of mindful eating. *Level of Evidence:* No level of evidence, basic science.

Key words: mindful eating; healthcare professionals; obesity; body mass index; eating attitude

Introduction

According to the World Health Organization (1), obesity is a health problem that has doubled over the last 35 years and causes many chronic diseases. Obesity occurs based on life-style changes as well as genetic factors (2).

It has been known for decades that eating behavior relates to body weight and body mass index (BMI), hence profoundly to obesity (3). Eating is a learned behavior (4). Eating behavior can be retaught to individuals, and thus, eating may become more sustainable by using verbal or visual instructions, by considering the process of change in conventional eating habits (5, 6).

A healthy and persistent practice of nutritional treatment can be ensured by having individuals gain mindful eating habits. Mindful eating means to stop, think and then take action whenever you feel hungry; it means being aware of what one eats; that is, it means to be aware of eating, not to eat as a reflex (7).

Although mindfulness has been associated with many health conditions (8), it plays a significant role especially in intrinsic and extrinsic factors such as ensuring portion control (9, 10), preventing emotional eating (8, 10, 11), and being able to stop excessive eating (12, 13) within the scope of mindful eating, as well as in the management of bodyweight.

It has been shown that the decrease in body weight is higher in individuals who are highly mindful and who have self-compassion, and additionally, there is a strong correlation between negative automated thoughts and bodyweight gain (14).

In a study on awareness and bodyweight management, it has been argued that improving mindfulness and self-compassion would be helpful in reducing bodyweight (14). They have been determined that mindfulness affects bodyweight loss independently and that bodyweight loss is positively correlated with mindfulness and self-compassion. They have been also found a strong negative correlation between automated thoughts and bodyweight loss. In the intervention section of the study, they have been offered training sessions on mindfulness and self-compassion, and observed that mindful eating has been improved at the end (14). In a similar study, the effect of mindfulness training on avoidance, impulsivity and bodyweight management was observed. Bodyweight and BMI values were shown to be reduced based on the training when pre and post assessments were compared (15). In another randomized controlled study, bodyweights and mindfulness of participants were compared after mindfulness training. At the end of the training, it was observed that the BMI value decreased and physical activity increased in the intervention group.

A relationship between food consumed by mindful eating — improved through mindful eating training — and bodyweight loss was reported (16). Although eating attitude is the basis of motor, cognitive, social and emotional development, it is regarded as a complex phenomenon that is regulated by environmental factors (17). It is the inclination of people that creates the feelings, thoughts and behaviors about eating and nutrition (18). Eating behavior is considered to vary depending on different emotions such as anxiety, joy, sadness, anger, depression, loneliness or happiness (19).

Eating behaviors are known to be responsible for all obese people being overweight (20). It has been considered that there is a relationship between anxiety levels and eating attitudes in obese people. Studies have shown that obese individuals eat significantly more food than normal-weight individuals when they face anxiety-causing situations (20-22). In a study, eating disorder was found in about 10% of all obese people (23).

Material and Method

Purpose and Significance

The aim of the study was to examine the relationship between healthcare professionals' mindful eating, eating attitudes, and their body mass index. The hypothesis is that there is a positive relationship between healthcare professionals' emotional eating, eating attitudes and BMI; that is, as emotional eating increases, eating attitudes deteriorate and BMI increases. In the study planned with this aim, the results are thought to contribute to the literature as examples for new studies. Moreover, it is thought that the results will contribute to the presentation of the status of healthcare professionals, who have a large share in work life in the fight against obesity, and to their training.

Population and Sample

The sample of this study consisted of all 535 healthcare professionals at Corum Private Hospital and Corum Private Elitpark Hospital in Corum province. They were categorized into groups as follows: doctors, nurses, auxiliary health personnel (dietitians, physiotherapists, biologists, psychologists, pharmacists, anesthesia specialists, and technical staff working in laboratory and imaging services), administrative staff (managers, human resources staff, administrative employees) and other healthcare professionals (cleaning, security, food, technical, cafeteria and porter staff).

Data Collection Instruments

This is an observational research study. A questionnaire consisting of socio-demographic questions identifying the participants and their nutritional habits, the Mindful Eating Scale (MES), and the Eating Attitudes Test (EAT-26)were used to collect data.

Data Collection

The questionnaire was administered after receiving permission to conduct the study from the Bahcesehir University Scientific Research and Publication Ethics Committee dated February 13, 2019 (Docu-

mented No. 2019/02) Participation in the questionnaire was on voluntary basis and with informed consent. This study was conducted in accordance with the principles of the Declaration of Helsinki.

Data Analysis

The BMI values of the healthcare professionals were categorized according to the BMI classification of the World Health Organization, and each BMI value was calculated by dividing the body weight (kilograms) of the individual by the square of his or her height (meters) (24). The SPSS 21.0 for Windows software program was used to analyze the data. First, the data were tested for normality, and it was found that the data were normally distributed. Parametric tests were carried out as a result of the normal distribution of the data. The data obtained from the healthcare professionals were analyzed, and the results were presented in tables. Frequencies, percentages, averages, cross-tables and Chi-square analyses were prepared. The relationships between body mass indices (BMIs), mindful eating levels, and eating attitudes were analyzed according to the occupations of the healthcare professionals. The following parametric tests were carried out: t-tests, ANOVAs and post-hoc tests. The categorical data were analyzed through Chi-square analyses.

Results

The occupational distribution of healthcare professionals participating in this study was as follows: 13.3% of the participants were doctors, 38.7% were nurses, 24.5% were auxiliary health personnel (dietitians, physiotherapists, biologists, psychologists, pharmacists, anesthesia specialists, and technical staff working in laboratory and imaging services), 17% were administrative staff (managers, human resources staff, administrative employees) and 23.2% were other healthcare professionals (cleaning, security, food, technical, cafeteria and porter staff). In addition, the body mass indices (BMIs) of the healthcare professionals were calculated, and it was found that 2.8% were thin, 38.4% were normal, 44.1% were overweight, and 14.4% were obese (Table 1).

Table 1. Demographic information

Variables	n	%
Gender		
Female	323	60.4
Male	212	39.6
Total	535	100.0
Marital Status		
Married	269	50.3
Single	266	49.7
Occupation		
Doctor	71	13.3
Nurse	118	22.1
Auxiliary health personnel	131	24.5
Administrative staff	91	17.0
Other healthcare professionals	124	23.2
BMI		
Thin	15	2.8
Normal	207	38.7
Overweight	236	44.1
Obese	77	14.4
Total	535	100.0

When the distribution of body mass indices of the healthcare professionals was examined according to their occupations, a significant relationship was found between their body mass indices and occupational groups (^{2} = 41.288, p = .000 < .05). The occupational groups were as follows according to their BMI values in descending order: the other healthcare professionals (28.6%), auxiliary health personnel (26%), nurses (24.7%), administrative staff (14.3%) and doctors (6.5%) (Table 2).

There was a statistically significant difference between the eating attitudes and body mass indices (^{2} = 200.395, p = .000 < .05). The groups, who had the worst impaired eating attitudes, were the obese and overweight individuals with a high BMI level (Table 3). That is, there was a significant relationship between weight gain and eating attitudes. When the eating attitude was impaired, the BMI value increased, which affected the body composition.

A statistically significant difference was found when the eating attitudes were assessed according to occupations (^{2} = 18.661, p = .001 < .05). The group with the highest rate of impaired eating was the other healthcare professionals with 66.9%, who were fol-

Table 2. Body mass index distribution by occupation

BMI		Occupation[a]				
		Doctor	Nurse	Auxiliary health personnel	Administrative staff	Other healthcare professionals
Thin	n	3	8	1	2	1
	%	20.0	53.3	6.7	13.3	6.7
Normal	n	24	58	48	23	54
	%	11.6	28.0	23.2	11.1	26.1
Overweight	n	33	44	58	39	62
	%	14.0	18.6	24.6	16.5	26.3
Obese	n	5	19	20	11	22
	%	6.5	24.7	26.0	14.3	28.6
Total	n	71	118	124	91	131
	%	13.3	22.1	23.2	17.0	24.5

[a]Pearson Chi-Square Value = 41.288, p = .000.

Table 3. Comparison of Eating Attitudes by Body Mass Index

		Eating Attitude[a]		
BMI		Normal eating attitude	Impaired eating attitude	Total
Thin	n	15	0	15
	%	100.0	0	100.0
Normal	n	182	25	207
	%	87.9	12.1	100.0
Overweight	n	89	147	236
	%	37.7	62.3	100.0
Obese	n	6	71	77
	%	7.8	92.2	100.0
Total	n	292	243	535
	%	54.6	45.4	100.0

[a]Pearson Chi-Square Value = 200.395, p = .000.

Table 4. Comparison of Eating Attitudes by Occupation

		Eating Attitude[a]		
Occupation		Normal eating attitude	Impaired eating attitude	Total
Doctor	n	37	34	71
	%	52.1	47.9	100.0
Nurse	n	47	77	124
	%	37.9	62.1	100.0
Auxiliary health personnel	n	39	52	91
	%	42.9	57.1	100.0
Administrative staff	n	63	68	131
	%	48.1	51.9	100.0
Other healthcare professionals	n	39	79	118
	%	33.1	66.9	100.0

[a]Pearson Chi-Square Value = 18.661, p = .001.

lowed by nurses with 62.1%, auxiliary health personnel with 51.7%, administrative staff with 51.9%, and doctors with 47.9% (Table 3).

The "disinhibition" dimension of the Mindful Eating Scale had a statistically significant difference in terms of the body mass index (F = 255.18, p = .000 < .05). The averages of disinhibition of the overweight and obese healthcare professionals with a high body mass index were found to be higher than those of the thin and normal healthcare professionals with normal and low body mass indices (Table 5).

The "control of eating" dimension of the Mindful Eating Scale had a statistically significant difference in terms of the body mass index (F = 208.25, p = .000 < .05). The averages of the overweight and obese healthcare professionals with a high body mass index were found to be higher than those of the thin and normal healthcare professionals with normal and low body mass indices.

A statistically significant difference was found when the "emotional eating" dimension of the Mindful Eating Scale was examined with regard to the body mass index (F = 437.53, p = .000 < .05). The averages of emotional eating of the overweight and obese healthcare professionals with a high body mass index were found to be higher than those of the thin and

Table 5. Comparison of Mindful Eating Habits by Body Mass Index

		BMI					
Mindful Eating		**Thin**	**Normal**	**Overweight**	**Obese**	***F***	***p***
Disinhibition	M	2.41	2.86	4.60	5.20	255.18	.000
	SD	.92	.91	.94	.84		
Emotional Eating	M	2.1	2.66	4.38	5.22	208.25	.000
	SD	1.01	.94	.94	.85		
Control of Eating	M	5.01	4.80	2.35	1.75	437.53	.001
	SD	.81	.75	.89	.83		
Concentration	M	4.85	4.83	2.28	1.71	486.31	.000
	SD	1.08	.77	.83	.75		
Eating Discipline	M	5.34	5.07	2.17	1.61	769.69	.000
	SD	1.02	.71	.74	.66		
Mindfulness	M	5.12	5.02	2.22	1.64	668.93	.000
	SD	1.10	.72	.78	.65		
Interference	M	2.16	2.65	4.44	5.23	217.472	.000
	SD	1.01	.94	.94	.85		

normal healthcare professionals with normal and low body mass indices. A relationship was determined between concentration on eating and high BMI values. The averages of concentration on eating were found to be low among the individuals with high BMI values.

When the mindful eating habits of the healthcare professionals were compared according to the occupational groups, "disinhibition" was found to differ statistically significantly depending on the occupational groups ($F = 24.16$, $p = .000 < .05$) (Table 6). Disinhibition was observed to be at the highest level among the other healthcare professionals and auxiliary health personnel, whereas it was at the lowest level in the doctor group.

Table 6. Comparison of Mindful Eating by Occupation

		Occupation						
Mindful Eating		Doctor	Nurse	Auxiliary health personnel	Administrative staff	Other healthcare professionals	*F*	*p*
Disinhibition	M	1.43	2.55	4.67	2.44	4.88	24.16	.000
	SD	.62	.74	.91	.90	.84		
Emotional Eating	M	1.78	2.95	5.10	2.4	5.20	23.66	.000
	SD	.98	.96	.97	.88	.94		
Control of Eating	M	5.13	2.46	2.2	4.45	1.8	28.36	.000
	SD	.81	.92	.96	.89	.92		
Concentration	M	5.1	3.21	2.3	4.49	1.65	26.48	.000
	SD	.93	.87	.96	.86	.79		
Eating Discipline	M	5.23	3.18	2.01	4.24	1.72	25.54	.000
	SD	.88	.90	.94	.89	.93		
Mindfulness	M	5.32	3.33	3.10	3.4	2.2	24.88	.000
	SD	.89	.77	.95	.98	.91		
Interference	M	1.87	3.20	5.4	2.5	5.6	27.61	.000
	SD	.68	.76	.84	.86	.98		

Table 7. Comparison of Mindful Eating Habits by Eating Attitude

Mindful Eating		Eating Attitude: Normal eating attitude	Eating Attitude: Impaired eating attitude	t	p
Disinhibition	M	3.3	5.21	-11.501	.000
	SD	1.19	1.21		
Emotional Eating	M	2.17	4.47	-12.372	.000
	SD	1.22	1.21		
Control of Eating	M	5.24	2.44	13.737	.000
	SD	1.08	1.20		
Concentration	M	4.02	2.30	14.265	.000
	SD	1.43	1.18		
Eating Discipline	M	5.15	2.32	14.903	.000
	SD	1.57	1.21		
Mindfulness	M	4.75	2.35	14.761	.000
	SD	1.53	1.21		
Interference	*M*	2.1	4.52	-12.812	.000
	SD	1.21	1.22		

When the mindful eating habits were assessed according to the eating attitudes, the healthcare professionals with impaired eating attitudes had a high average in terms of the disinhibition dimension, and they had a statistically significantly different score compared to that of the healthcare professionals with normal eating attitudes ($t = -11.501$, $p = .000 < .05$) (Table 7). Similarly, when the emotional eating habits were examined according to the eating attitudes, there was a statistically significant difference between the averages of those with normal eating attitudes and those with impaired eating attitudes ($t = -12.372$, $p = .000 < .05$). The healthcare professionals with impaired eating attitudes were found to have an emotional eating disorder.

The healthcare professionals with low scores on the dimensions of the Mindful Eating Scale, such as control of eating, concentration, eating discipline and mindfulness, were found to have impaired eating attitudes. The levels of mindful eating were found to be higher among the individuals with normal eating attitudes.

When the control of eating, concentration, eating discipline and mindfulness dimensions of the Mindful Eating Scale were examined according to the eating attitudes, these four dimensions also differed statistically significantly between the normal and impaired eating attitudes. The control of eating, concentration, eating discipline and mindfulness were found to be at poor levels among the individuals with impaired eating attitudes.

The healthcare professionals with impaired eating attitudes had a high average in terms of the "interference" dimension, and they were found to be statistically significantly different from those with normal eating attitudes ($t = -12.812$, $p = .000 < .05$). The individuals with impaired eating attitudes were found to eat more due to the influence of external factors and influences.

Discussion

In this study, when the healthcare professionals were examined according to their body compositions, it was found that the obese individuals with the highest BMI value were 14.4% of all healthcare professionals and the overweight individuals with a high BMI value were 41.1%. Similarly, Turner et al. (25) and Campos-Matos et al. (26) found that obese healthcare professionals with the highest BMI were 8% and 16.9% of all participants, and overweight professionals with a high BMI value were 31% and 38.4%, respectively. Healthcare professionals may have to consume fast food and skip meals due to patient examinations, patient care processes, and limited breaks for eating, as per their working conditions. This condition can lead to weight gain and may affect their body compositions.

In this study, when the occupational groups were assessed according to the body compositions, the group of healthcare professionals with the highest level of body composition was found to be the other healthcare professionals, followed by the auxiliary health personnel, nurses, and administrative staff. The group, which had the lowest BMI value, was found to be the doctors. Similarly, in the study of Turner et al. on healthcare professionals, the highest BMI values were found among the auxiliary health personnel and nurses, while the lowest one was among the doctors (25). Similarly, in their study on healthcare professionals, Kyle et al. (27) found that other healthcare professionals had the highest BMI values, followed by nurses and auxiliary health personnel. Due to the intensity of being on call

and patient monitoring, other healthcare professionals and nurses may have insufficient time to eat; they can be sleepless for being on call, and they may have to eat or snack during this process, which can affect weight gain and consequently their body compositions.

In this study, impaired eating attitudes were found to be high among individuals with high BMI levels. Similarly, research shows impaired eating attitudes of individuals with high BMI levels are high (28, 29). Correspondingly, a relationship has been identified between impaired eating attitudes and BMI in studies in the literature, and BMI values of individuals with impaired eating levels have been found to be high (30, 31). Individuals with impaired eating attitudes may tend to eat inadequately, unstably and excessively, which can consequently lead to weight gains.

In this study, the occupational group with the highest level of impaired eating attitude was found to be the other healthcare professionals, followed by the nurses, auxiliary health personnel, administrative staff, and doctors. Similarly, in the study of Ho et al. (32) on healthcare professionals, doctors have been found as an occupational group with the lowest impaired eating attitudes. This finding may be explained by the fact that other healthcare professionals have limited time to eat or have limited access to food because of the operational processes of hospitals such as food service, toilet cleaning, and security, or that they skip their meal with snacks.

In this study, a relationship was found between high BMI values and disinhibition. The mean of disinhibition of the obese and overweight individuals with high BMI value was found to be higher than that of the thin and normal individuals with normal and low BMI values. Similarly, disinhibition has been found to be associated with high BMI values in studies in the literature (33-35).

In this study, a relationship was found between the control of eating and BMI, and the control of eating averages of the overweight and obese healthcare professionals with a high body mass index were found to be higher than those of the thin and normal healthcare professionals with normal and low body mass indices. Likewise, a relationship has been determined between impulsive eating and high BMI values in studies in the literature (15, 36, 37).

In this study, a relationship was found between the emotional eating and high BMI values. The averages of emotional eating of the overweight and obese healthcare professionals with a high body mass index were found to be higher than those of the thin and normal healthcare professionals with normal and low body mass indices. Similarly, a relationship has been determined between emotional eating and high BMI values in studies in the literature (12, 14, 38).

In this study, a relationship was determined between concentration and high BMI values. The averages of concentration on eating were found to be low among the individuals with high BMI values. Similarly, a relationship has been determined between concentration on eating and high BMI values in studies in the literature (5, 11, 39).

In this study, when the mindful eating habits were assessed according to the eating attitudes, the healthcare professionals with impaired eating attitudes had a high average in terms of the disinhibition dimension, and they had a statistically significantly different score compared to that of the healthcare professionals with normal eating attitudes. Similarly, when the emotional eating habits were examined according to the eating attitudes, there was a statistically significant difference between the averages of those with normal eating attitudes and those with impaired eating attitudes. The healthcare professionals with impaired eating attitudes were found to have an emotional eating disorder. The healthcare professionals with low dimension scores of the Mindful Eating Scale, such as control of eating, concentration, eating discipline and mindfulness, were found to have impaired eating attitudes. The levels of mindful eating were found to be higher among the individuals with normal eating attitudes.

In this study, when the control of eating, concentration, eating discipline and mindfulness dimensions were examined according to the eating attitudes, these four sub-factors differed statistically significantly between the normal and impaired eating attitudes. The control of eating, concentration, eating discipline and mindfulness were found to be at poor levels among the individuals with impaired eating attitudes.

In this study, the healthcare professionals with impaired eating attitudes had a high average in terms of the “interference” dimension, and they were found

to be significantly different from those with normal eating attitudes. The individuals with impaired eating attitudes were found to eat more due to the influence of external factors and influences.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported by the author.

Ethical approval

"All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Bahcesehir University Scientific Research and Publication Ethics Committee, dated February 13, 2019 and numbered 2019/02) and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards."

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