Original article

Evaluation of relationship of intuitive eating and eating awareness with body mass index and anthropometric measurements in adults

Aliye Özören[1], Özlem Baran[2], Ayhan Dağ[3]

[1]Aliye Özören Nutrition and Diet Counseling, Lefkoşa, Turkish Republic of Northern Cyprus, [2,3]Department of Nutrition and Dietetics University of Lokman Hekim, Ankara, Turkey

Abstract. *Objective:* This study was conducted to assess effects of intuitive eating and eating awareness on body mass index (BMI) and anthropometric measurements (body weight and height) in adults. *Material and method:* This study was conducted with adult residents from Lefkoşa, North Cyprus Turkish Republic between September, 2020 and November, 2020. Overall, 386 subjects were recruited to the study, including 247 women and 139 men. The demographic characteristics were recorded using a data sheet and anthropometric measurements were performed in all subjects. The Intuitive Eating Scale-2 (IES-2) was used to assess level of intuitive eating behavior while the Eating Awareness Scale-30 (EAS-30) was used to assess eating awareness. *Findings:* It was found that there were significant, negative correlations between IES-2 scores and body weight and BMI in female subjects ($p<0.05$). It was also detected that there were significant, negative correlations between IES-2 scores and body weight and BMI in the whole study population ($p<0.05$). The IES-2 scores were found as 3.62±0.54 in underweight subjects, 3.55±0.42 in normal subjects, 3.39±0.44 in overweight subjects and 3.27±0.40 in obese subjects. In our subjects, the body weight and BMI were decreased by increasing IES-2 scores. It was found that there was a significant difference in IES-2 total scores across BMI classes ($p<0.05$). In general, it was detected that there were significant, negative correlations between EAS-30 and body weight and BMI in our subjects ($p<0.05$). The body weight and BMI were decreased by increasing EAS-30 scores. *Conclusion:* The increased intuitive eating and eating awareness are associated with low body mass index. It can be recommended to use intuitive eating and eating awareness approach to achieve or maintain ideal body weight.

Key words: Intuitive eating, eating awareness, body mass index

Introduction

The problems in eating behavior due to social, environmental and emotional effects have become a factor contributing increased body mass index (BMI) at community level, predisposing health issues such as eating disorders (1). Thus, researchers have focused on intuitive eating and eating behavior approaches as they believe that such approaches can be helpful in eating behavior disorders and obesity treatment (2).

Studies have shown that popular diets are ineffective in long-term (3) and that intuitive eating and eating awareness have regulatory effect on eating behaviors (2). Thus, in recent years, authors have emphasized importance of using ability of intuitive eating and eating behavior as an intervention technique in order to adopt healthy eating attitudes and behaviors (1).

The term "intuitive eating" was described as a non-dietary approach by two clinical dieticians, Evelyn Tribole and Elyse Resch, in 1995. Tribole and Resch have

build the approach as a bridge between non-traditional diet approach and typical public health approach including diet in achieving ideal body weight (4). Intuitive eating is defined as an eating pattern in which an individual perceives natural bodily signals of physical hunger, fullness and satiety and adapts these signals (4-6).

In a previous study, it was found that intuitive eating plays an effective role in lowering body mass index; in addition, it is effective in the recovery of impaired eating behaviors caused by unfavorable mental states such as depression and positively contributes self-esteem and body appreciation (7).

In a study on 343 university students, Smith and Hawks (8) suggested that higher level of intuitive eating was associated with low BMI. In a study including 2287 young adults, the relationship between body weight and food consumption and intuitive eating was investigated and it was observed that the subjects with highest intuitive eating score had lowest BMI value (9).

In a cohort study including 218 pregnant women (gestational age: 11-14 weeks), the relationship between gestational weight gain and intuitive eating was investigated and it was found that pregnant women feeding intuitively had lower body weight regardless of birth weight of the infants. Authors reported a significant correlation between intuitive eating and gestational weight gain (10).

The eating awareness is an approach that teaches and ensures eating behavior by recognizing how and why eating behavior occurs rather than what has eaten, internalizing hunger-satiety and recognizing emotions and thoughts, focusing on food to be consumed without being affected by environmental factors or judging food choices (11). It provides sustained changes in habitual eating behaviors (12).

Dunn et al. (13) reviewed interventional studies to assess effects of eating awareness on weight loss. They observed that the weight loss continued in 4 of 5 studies included while weight gain in only one study. Based on these studies, it may be helpful to include eating awareness approach into obesity management or to control body weight as a component or focus.

In a study examining the relationship between eating awareness and healthy eating behavior, it was found that eating awareness has a casual effect on healthy eating, ensures sufficient and balances nutrition by less energy intake and selection of healthier foods regardless of emotional and environmental factors, and has been found to aid healthy body weight loss (14).

Material and method

Study setting and sample selection

This study was conducted with adult residents from Lefkoşa, North Cyprus Turkish Republic between September, 2020 and November, 2020. Overall, 386 subjects were recruited to the study, including 247 women and 139 men. To calculate adequate sample size from study population, sampling from finite population was used. The number of samples to be selected was calculated as 382, We calculated sample size as 386 in a population of 59,382 at level of 95% confidence interval and alpha level of 5%. The study was approved by Ethics Committee of International Cyprus University (approval date: 11.01.2021, approval#100-425).

Study protocol and data collection

The study included volunteers. The questionnaire employed was developed based on literature search. The data were collected between September, 2020 and November, 2020. Due to the pandemic process, the surveys were submitted online by the researcher. All individuals involved in the study were informed and the Informed Consent Form was read and accepted online by participants.

The questionnaire included 3 parts. The first part included sociodemographic characteristics and anthropometric measurements (age, body weight, height etc.). The second part included 23-item Intuitive Eating Scale-2 (IES-2) to assess individuals' intuitive eating states and the third part included 30-item Eating Awareness Scale-30 to assess individuals' eating awareness (EAS-30).

Intuitive Eating Scale (IES-2)

The Intuitive Eating Scale (IES-2) was used to assess level of intuitive eating behavior of participants. The IES-2 includes 23 items with 4 subscales. The

scale is rated using 5-points Likert scale. The reverse scoring items included 1, 2, 3, 6, 7, 8 and 9. In the IES-2, higher scores indicate higher level of intuitive eating behavior. Turkish validity and reliability study was performed by Baş et al. (2017) and Bakıner et al. (2017) (15,16).

Eating Awareness Scale (EAS-30)

The EAS-30 was used to assess level of eating awareness in participants. The scale includes 30 items (in 7 subscales) rated using 5-points Likert scale (1, never; 2, rare; 3, sometimes; 4, often; 5, always). The Eating Awareness Scale has 7 sub-dimensions. The reverse scoring items included those other than 1, 7, 9, 11, 13, 15, 18, 24 and 27. (Reverse scoring: 1=5, 2=4, 3=3, 4=2, 5=1). In the EAS-30, higher scores include higher level of eating awareness. Turkish validity and reliability study was performed by Köse et al. (11).

Anthropometric measurements

The anthropometric measurements were performed by participants; thus, all participants were informed about how to perform these measurements.

The participants were instructed to perform body weight with no shoes and light clothing after defecation while height should be measured while the subject with feet attached is in the Frankfort plane (superior border of the external auditory meatus to the infraorbital rim) (17).

For each participant, body mass index was calculated by dividing body weight (kg) by square of height (m^2). The subjects were classified according to BMI using WHO classification for adults (18).

Statistical analysis

Data were analyzed using Statistical Package for Social Sciences (SPSS) version 25.0.

Frequency analysis was used to determine the distribution of subjects according to sociodemographic characteristics. Anthropometric measurements, IES-2 scores and EAS-30 scores are presented using descriptive statistic such as mean, standard deviation, minimum and maximum.

To determine statistics to be used in testing study hypothesis, the normal distribution of IES-2 and EAS-30 scores were initially assessed using Kolmogorov-Smirnov test and non-parametric tests were used due to skewed distribution. Mann-Whitney U test was used if independent variable included 2 categories while Kruskal-Wallis H test was used if independent variable included 3 or more categories. Spearman's test was used to evaluate correlations between anthropometric measurements, BMI and IES-2 and EAS-30 scores (19).

Results

It was found that, of the subjects, 64.0% were women and 36.0% were men; 57.09% were aged ≤30 years, 31.17% were aged 31-50 years and 11.74% were aged ≥51 years; 16.60% were graduated from secondary school, 66.80% were graduated from high school and 14.17% were graduated from university; 23.08% were civil servant, 36.84% were student and 23.89% were private sector employee (data not presented).

As shown in Table 1, it was found that mean body weight was 63.75±13.99 kg in female subjects and 80.49±14.93 kg in male subjects while mean height was 164.08±5.74 cm in female subjects and 177.77±6.21 cm in male subjects. Again, BMI was found as 23.64±4.79 kg/m^2 in female subjects and 25.38±4.07 kg/m^2 in male subjects.

In Table 2, when the BMI classifications of individuals according to gender was assessed, it was found that, of the female subjects included, 59.11% were normal while 19.43% were overweight and 12.5% were obese. Again, it was found that, of the male subjects included, 41.73% were normal while 46.04% were overweight and 9.35% were obese.

In Table 3, it was found that mean IES-2 score was 3.45±0.43 in female subjects and 3.53±0.47 in male subjects, indicating a significant difference ($p<0.05$).

When Table 4 was assessed, it was found that female and male subjects had lowest score in unconditional permission to eat subscale (3.18±0.58 and 3.31±0.64, respectively) while they had highest score in body-food choice congruence subscale (3.67±0.80 and 3.66±0.83, respectively).

Table 1. Distribution of subjects according to anthropometric measurements.

	Gender	n	$\bar{x} \pm s$	Min	Max	Z	p
Body weight (kg)	Female	247	63.75±13.99	41.00	120.00	-10.088	0.000**
	Male	139	80.49±14.93	40.00	140.00		
Height (cm)	Female	247	164.08±5.74	148.00	178.00	-14.463	0.000*
	Male	139	177.77±6.21	162.00	193.00		
BMI (kg/m^2)	Female	247	23.64±4.79	15.60	41.52	-4.758	0.000*
	Male	139	25.38±4.07	14.17	43.21		

*Z: Mann-Whitney U test, p<0.05

Table 2. Distribution of subjects according to BMI classes.

BMI Classes	Female (n=247)		Male (n=139)		Total (n=386)	
	s	%	s	%	s	%
Underweight	23	9.31	4	2.88	27	6.99
Normal	146	59.11	58	41.73	204	52.85
Overweight	48	19.43	64	46.04	112	29.02
Obese	30	12.15	13	9.35	43	11.14

Table 3. Mean total score, standard deviation and min-max values of Intuitive Eating Scale.

	n	$\bar{x} \pm s$	Min	Max	Z	p
Gender						
Female	247	3.45±0.43	1.92	4.54	-2.259	0.024*
Male	139	3.53±0.47	1.88	4.58		

*Z: Mann-Whitney U test, p<0.05

Table 4. Mean subscale score, standard deviation and min-max values of Intuitive Eating Scale.

Subscale	Gender	n	$\bar{x} \pm s$	Min	Max
Unconditional permission to eat	Female	247	3.18±0.58	1.67	4.83
	Male	139	3.31±0.64	1.83	4.67
	Total	386	3.23±0.60	1.67	4.83
Eating for physical rather than emotional reasons	Female	247	3.35±0.65	1.50	4.63
	Male	139	3.48±0.63	2.13	4.50
	Total	386	3.40±0.64	1.50	4.63
Reliance on hunger and satiety cues	Female	247	3.58±0.81	1.00	5.00
	Male	139	3.65±0.91	1.00	5.00
	Total	386	3.61±0.85	1.00	5.00
Body-food choice congruence	Female	247	3.67±0.80	1.00	5.00
	Male	139	3.66±0.83	1.00	5.00
	Total	386	3.67±0.81	1.00	5.00

As shown in Table 5, it was found that there were significant, negative correlations between IES-2 scores and body weight and BMI in female subjects (p<0.05). It was found that body weight and BMI values were decreased by increasing IES-2 scores in female subjects.

In whole study population, it was found that there were significant, negative correlations between IES-2 scores and body weight and BMI (p<0.05). It was also found that body weight/BMI values were decreased by increasing IES-2 scores.

In Table 6, when the score of unconditional permission to eat subscale in IES-2 was assessed according to BMI classes, it was lowest in overweight subjects (3.07±0.55) and highest in underweight

Table 5. Correlation between anthropometric measurements and Intuitive Eating Scale scores.

		Intuitive Eating Scale		
		Female (n=247)	**Male (n=139)**	**Total (n=386)**
Body weight (kg)	r	-0.228	-0.164	-0.132
	p	0.000*	0.054	0.009*
Height (cm)	r	0.071	-0.121	0.106
	p	0.265	0.154	0.038
BMI (kg/m2)	r	-0.291	-0.149	-0.220
	p	0.000*	0.081	0.000*

Table 6. Standard deviation and mean total score of Intuitive Eating Scale across BMI Classes.

	BMI	**n**	**$\bar{x} \pm s$**	**M**	**X^2**	**p**	**Difference**
Unconditional permission to eat	Underweight[1]	27	3.58±0.65	3.67	19.854	0.000*	1-3
	Normal[2]	204	3.29±0.58	3.17			1-4
	Overweight[3]	112	3.07±0.55	3.00			2-3
	Obese[4]	43	3.15±0.69	3.00			2-4
Eating for physical rather than emotional reasons	Underweight[1]	27	3.50±0.69	3.63	17.113	0.001*	1-3
	Normal[2]	204	3.47±0.62	3.63			1-4
	Overweight[3]	112	3.39±0.65	3.50			
	Obese[4]	43	3.03±0.59	3.00			
Reliance on hunger and satiety cues	Underweight	27	3.81±0.96	4.00	7.174	0.067	
	Normal	204	3.67±0.78	3.92			
	Overweight	112	3.53±0.90	3.75			
	Obese	43	3.36±0.89	3.33			
Body-food choice congruence	Underweight	27	3.59±1.00	3.67	4.083	0.253	
	Normal	204	3.75±0.74	4.00			
	Overweight	112	3.58±0.85	4.00			
	Obese	43	3.53±0.85	3.67			
Intuitive Eating Scale	Underweight[1]	27	3.62±0.54	3.54	21.150	0.000*	1-3
	Normal[2]	204	3.55±0.42	3.58			1-4
	Overweight[3]	112	3.39±0.44	3.47			
	Obese[4]	43	3.27±0.40	3.26			

Chi-square test (**X^2**), * p<0.05, M: Median,

individuals (3.58±0.65). When the score of eating for physical rather than emotional reasons subscale in IES-2 was assessed according to BMI classes, it was lowest in obese subjects (3.03±0.59) and highest in underweight individuals (3.50±0.69). It was found that, in IES-2, there were significant difference in unconditional permission to eat and eating for physical rather than emotional reasons subscores across BMI classes ($p<0.05$). In normal and underweight classes, unconditional permission to eat and eating for physical rather than emotional reasons subscores were higher than overweight and obese individuals. When total IES-2 score was assessed across BMI classes, it was found that mean total IES-2 score was 3.62±0.54 in underweight individuals, 3.55±0.42 in normal individuals, 3.39±0.44 in overweight individuals and 3.27±0.40 in obese individuals. A significant difference was found in total IES-2 scores across BMI classes ($p<0.05$). The total IES-2 score was higher in underweight individuals when compared to overweight and obese individuals.

When Table 7 was assessed, mean total EAS-30 score was 98.80±13.95 in female subjects and 97.69±14.85 in male subjects. It was found that there was no significant difference in EAS-30 scores between male and female subjects ($p>0.05$). Moreover it was found that female subjects had highest score in awareness subscale (16.35±2.89) and lowest score in interference subscale (6.85±1.72) while male subjects had highest score in emotional eating subscale (18.24±4.11) and lowest score in interference subscale (6.92±1.85) in EAS-30.

Table 7. Mean total score and subscale score, standard deviation and min-max values of Eating Awareness Scale.

	Gender	**n**	**$\bar{x}$ ± s**	**Min**	**Max**	**Z**	**p**
EAS-30 total score	Female	247	98.80±13.95	50.00	139.00	-0.257	0.797
	Male	139	97.69±14.85	57.00	144.00		
	Gender	**n**	**$\bar{x}$ ± s**	**Min**		**Max**	
Disinhibition	Female	247	15.47±4.02	5		25	
	Male	139	15.65±3.68	7		25	
	Total	386	15.53±3.90	5		25	
Emotional Eating	Female	247	16.01±4.33	6		25	
	Male	139	18.24±4.11	7		25	
	Total	386	16.81±4.38	6		25	
Eating Control	Female	247	14.32±3.24	4		20	
	Male	139	13.73±3.32	5		20	
	Total	386	14.11±3.28	4		20	
Mindfulness	Female	247	16.06±1.77	11		22	
	Male	139	16.17±1.85	9		22	
	Total	386	16.10±1.80	9		22	
Eating Discipline	Female	247	12.98±2.64	5		20	
	Male	139	12.99±2.78	5		20	
	Total	386	12.98±2.69	5		20	
Awareness	Female	247	16.35±2.89	7		24	
	Male	139	15.35±2.73	7		23	
	Total	386	15.99±2.87	7		24	
Interference	Female	247	6.85±1.72	2		10	
	Male	139	6.92±1.85	2		10	
	Total	386	6.87±1.77	2		10	

In Table 8, when correlations were assessed between anthropometric measurements and EAS-30 scores, it was found that there were significant, negative correlations between EAS-30 scores and body weight and BMI values in female subjects ($p<0.05$). The body weight and BMI were decreased by increasing IES-2 scores in female subjects.

There were no significant correlations between EAS-30 scores and body weight, height and BMI values in male subjects ($p>0.05$).

In whole study population, it was found that there were significant, negative correlations between IES-2 scores and body weight and BMI values ($p<0.05$). The body weight and BMI were decreased by increasing EAS-30 scores in whole study population.

As shown in Table 9, when scores in EAS-30 disinhibition subscale was assessed across BMI classes, it was found that the lowest scores were recorded in obese individuals (14.21±2.67) while highest score was recorded in individuals with normal weight (15.73±4.00).

Table 8. Relationship between anthropometric measurements and Eating Awareness Scale scores.

		Eating Awareness Scale		
		Female (n=24)	**Male (n=139)**	**Total (n=247)**
Body weight (kg)	r	-0.282	-0.149	-0.226
	p	0.000*	0.080	0.000*
Height (cm)	r	0.026	-0.078	-0.017
	p	0.684	0.363	0.738
BMI (kg/m^2)	r	-0.310	-0.137	-0.259
	p	0.000*	0.108	0.000*

*__r:__ Spearman's test, $p<0.05$

Table 9. Eating Awareness Scale scores according to BMI classes.

	BMI	**n**	$\bar{x} \pm s$	**M**	X^2	**p**	**Difference**
Disinhibition	Underweight[1]	27	15.37±4.18	15.00	7.901	0.048*	1-4
	Normal[2]	204	15.73±4.00	16.00			2-4
	Overweight[3]	112	15.72±3.98	16.00			3-4
	Obese[4]	43	14.21±2.67	14.00			
Emotional eating	Underweight[1]	27	16.59±4.22	18.00	12.583	0.006*	1-4
	Normal[2]	204	16.96±4.37	17.00			2-4
	Overweight[3]	112	17.42±4.20	18.00			3-4
	Obese[4]	43	14.67±4.51	14.00			
Eating control	Underweight	27	15.07±3.05	16.00	7.529	0.057	
	Normal	204	14.31±3.31	15.00			
	Overweight	112	13.87±3.14	14.00			
	Obese	43	13.19±3.45	13.00			
Mindfulness	Underweight	27	15.93±1.69	16.00	0.108	0.991	
	Normal	204	16.14±1.77	16.00			
	Overweight	112	16.14±1.80	16.00			
	Obese	43	15.91±2.04	16.00			

Table 9 (*Continued*)

	BMI	n	$\bar{x} \pm s$	M	X^2	p	Difference
Eating Discipline	Underweight	27	12.74±3.15	13.00	0.469	0.926	
	Normal	204	12.90±2.58	13.00			
	Overweight	112	13.18±2.78	13.00			
	Obese	43	13.02±2.70	13.00			
Awareness	Underweight	27	16.07±3.16	15.00	5.648	0.130	
	Normal	204	16.17±2.88	16.00			
	Overweight	112	16.09±2.70	16.00			
	Obese	43	14.86±2.91	15.00			
Interference	Underweight	27	6.30±2.18	7.00	4.217	0.239	
	Normal	204	6.90±1.67	7.00			
	Overweight	112	7.07±1.74	7.00			
	Obese	43	6.58±1.97	7.00			
Eating Awareness Scale	Underweight[1]	27	98.07±13.47	101.00	12.026	0.007*	1-4
	Normal[2]	204	99.11±12.80	99.50			2-4
	Overweight[3]	112	99.49±13.40	98.50			3-4
	Obese[4]	43	92.44±12.09	90.00			

X^2:Kruskal-Wallis H testi, p<0.05

It was also found that there was significant difference in EAS-30 disinhibition subscale scores across BMI classes in the whole study population (p<0.05).

When EAS-30 emotional eating subscale was assessed across BMI classes, it was found that highest score was recorded in overweight individuals (17.42±4.20) while lowest score was recorded in obese individuals (14.67±4.51). It was also found that there was significant difference in EAS-30 emotional eating subscale scores across BMI classes in the whole study population (p<0.05).

When total EAS-30 score was assessed according to BMI classifications, it was found that mean total EAS-30 score was 99.11±12.80 in normal individuals and 92.44±12.09 in obese individuals. A significant difference was observed in total EAS-30 score across BMI classes in the whole study population (p<0.05). It was found that obese individuals had lower total EAS-30 scores than remaining BMI classes.

Discussion

Obesity prevalence has been increasing due to many reasons worldwide. Based on TNHS (Turkey Nutrition and Health Survey) 2017 report, the incidences of obesity and overweight were 23.8 and 42.0% in male subjects and 33.1 and 28.5% in female subjects, respectively (20). In TÜBER 2015, mean BMI values were reported as 27.3±5.21 kg/m^2 and 28.8±6.92 kg/m^2 in adult men and women, respectively (21).

In our study mean BMI was found as 25.38±4.07 kg/m^2 and 23.64±4.79 kg/m^2 in male and female subjects, respectively. It was also found that 52.85% of subjects were in normal BMI class. It was found that 9.35% and 46.04% of male subjects and 12.15% and 19.43% of female subjects were in obese and overweight BMI classes (Table 1 and Table 2). It was seen that there was a significant difference in BMI values according to gender, with higher BMI values in male subjects (p<0.05).

In a study on 315 subjects, mean BMI was found as 25.43±3.62 kg/m^2 in men and 24.43±5.21 kg/m^2 in women. It was reported that 48.4% of participants had normal BMI while 9.6% and 41.4% of male subjects and 11.4% and 27.2% of female subjects were obese and overweight, respectively (22). Authors found a significant difference in BMI according to gender (p=0.000) in agreement with our study. In both studies, gender-adjusted BMI values were comparable.

In our study, it was found that mean IES-2 score was 3.53 in male subjects and 3.45 in female subjects, indicating a significant difference ($p<0.05$). The mean IES-2 score was found to be significantly lower in female subjects when compared to male subjects (Table 3).

In a study on intuitive eating, it was found that, compared to female subjects, male subjects trusted their insight about nutrition much more (5). When another study conducted with university students was assessed, it was found that mean intuitive eating score was 3.59 in male students and 3.39 in female students (23).

In another study, a significant difference was found in intuitive eating score between male and female subjects ($p<0.001$), with higher level of intuitive eating in male subjects (24).

In a study including 532 adults, it was found that intuitive eating score was higher in men when compared to women (25). In our study, it was found that intuitive eating score was higher in male subjects than female subjects in agreement with literature.

We also found that there were significant, negative correlations between IES-2 score and body weight and BMI values in subjects included ($p<0.05$). The body weight and BMI values were decreased by increasing IES-2 scores (Table 5).

In studies on intuitive eating, it was found that there is a significant, negative correlation between intuitive eating and BMI, with a decrease in BMI values by increasing intuitive eating scale scores [26, 27]. In a review including 11 studies on correlations between intuitive eating and body weight/BMI, it was concluded that the individuals with higher level of intuitive eating have lower BMI when compared to those with lower level of intuitive eating. In the review, only one study reported contradictory results. In remaining studies, a negative correlation was detected between intuitive eating and body weight/BMI (28).

In a study on adults (aged 19-45 years) residing in Ankara province, a negative correlation was found between BMI and intuitive eating scores (29). In another study on 136 adults, a moderate, negative correlation was found between overall intuitive eating score and BMI (30).

In our study, it was found that BMI was decreased by increasing intuitive eating score in agreement with literature. Again, it was found that there was significant difference unconditional permission to eat and eating for physical rather than emotional reasons scores across BMI classes ($p<0.05$). It was also seen that unconditional permission to eat and eating for physical rather than emotional reasons scores were higher in underweight and normal subjects when compared to overweight and obese subjects (Table 6).

In a study about intuitive eating in Portuguese population, it was found that there was a significant, in overall score and sub-scores of IES-2 across BMI classes and that there was a negative correlation between BMI and overall score and sub-scores of IES-2 (31).

According to Swiss Food Panel questionnaire including 5238 individuals, although a moderate, negative correlation was detected between BMI and overall Intuitive Eating Scale scores, It was found that three subscales of IES-2 (unconditional permission to eat, eating for physical rather than emotional reasons and reliance, on hunger and satiety cues) were negatively correlated to BMI (32).

In NutriNet-Sante study investigation relationship between intuitive eating and body weight, it was found that there was a negative correlation between intuitive eating and body weight/BMI. In addition, a negative correlation was detected between body weight/BMI and there sub-dimensions of intuitive eating including unconditional permission to eat, eating for physical rather than emotional reasons and reliance, on hunger and satiety cues (27).

In previous studies, it was found that there was a negative correlation between BMI and overall score and subscale scores of IES-2. In agreement with literature, it was found that there was a negative correlation between BMI and IES-2 total score in our study; however, our results regarding subscale scores are not completely comparable with literature.

In our study, it was found that there was no significant difference in EAS-30 scores according to gender ($p>0.5$) (Table 7). In a study by Köse et al., no significant difference was found in EAS-30 scores between male and female subjects with a mean age of 21.29±1.77 years (33). Based on both studies, there was no significant difference in EAS-30 scores according to gender, with comparable results in both genders.

In the study, it was found that there were significant, negative correlations between EAS-30 scores and body weight and BMI ($p<0.05$). The body weight and BMI were decreased by increasing EAS-30 score (Table 8). It was found that, according BKI classification, the difference between EAS-30 scores and disinhibition and emotional eating subscale scores were significant. It was found that obese individuals had lower EAS-30 total, disinhibition subscale and emotional eating subscale scores than remaining BMI classes (Table 9).

In a study on 94 adults, it was found that there was a slightly significant, negative correlation between eating awareness score and body weight and BMI ($p=0.006$) (34).

In a study by Framson et al., it was reported that there was a negative correlation between BMI and eating awareness, with a decrease in eating awareness score by increasing BMI (35).

In another study, it was reported that there were significant, negative correlations between BMI and disinhibition and emotional eating subscale scores of Eating Awareness Scale. Disinhibition and emotional eating subscale scores were decreased by increasing BMI. Authors also reported that there was no significant correlation between BMI and awareness, interference and mindfulness sub-factors (36).

In another study on 216 Mexicans (123 women, 93 men) aged 18-30 years, it was observed that there was a significant, negative correlation between BMI and eating awareness (37). The results from the studies are similar.

Conclusion

In conclusion, it was found that there is a significant difference in Eating Awareness Scale total score across BMI classes ($p<0.05$). It was also found that obese individuals had lower total scores in Eating Awareness Scale. In general, significant, negative correlations were detected between Eating Awareness Scale scores and body weight and BMI ($p<0.05$). The body weight and BMI were decreased by increasing Eating Awareness Scale scores.

Limitations of The Study: The limitation of the study is the online application of the surveys due to the pandemic process.

Conflict of Interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

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Correspondence:
Ayhan Dağ, PhD
Lokman Hekim University Faculty of Health Sciences Department of Nutrition and Dietetic
Postcode:06510
Çankaya, Ankara, Turkey
Phone: (0312) 203 9500 Ext. 64100
E-mail: ayhan.dag@lokmanhekim.edu.tr