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Can Obesity Prejudice be Reduced? Intervention Study to Reduce Obesity Prejudice in Nutrition and Dietetic Students

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ABSTRACT

Background: The obesity bias is defined as negative attitudes, beliefs, assumptions, and decisions towards individuals whose overweight or obese.

Objectives: To identify obesity biases, attitudes, behaviors and to determine the changes in these biases, attitudes, and behaviors expected to take place through educational interventions to be conducted.

Methods: The study was carried out with 57 volunteer female students studying in the Department of Nutrition and Dietetics at Başkent University. After determining the obesity bias levels of the students who participated in the study, which was conducted at 2-week intervals and consisted of 5 stages, two interventions that involved going on a diet for a certain time and watching video films that aimed to encourage the students to establish empathy for individuals with obesity were conducted.

Results: The mean pre-interventional GAMS-27 score of the students participating in the study was 76.98±9.74, and it decreased to 72.56±10.75 after the interventions. Although the mean scores obtained from the scale in both cases were in the range of bias-propensity, the difference between them was found to be significant ($p < 0.05$). While the mean scale score of the students who stated that they were not biased against obesity was 78.4±10.12 before the intervention, it was found to decrease to 73.7±11.77 after the intervention, and this decrease was determined to be statistically significant ($p < 0.05$).

Conclusions: Obesity bias is a phenomenon that is also seen among health students. This state can be reduced with various interventions, and thus the healthcare professionals who will serve in the future will have an awareness of the issue.

Keywords: obesity bias, discrimination, stigmatization, intervention

INTRODUCTION

Defined as an increase in body fat ratio by the World Health Organization, obesity has become a common public health problem worldwide today (1). It brings about some psychiatric and social problems as well as physical and metabolic disorders (2). However, the social problems caused by obesity have not been addressed adequately when compared to the physiological and psychological problems. Obesity needs to be also investigated socially because of the biased, discriminatory, and stigmatizing behaviors of the people in society against obesity. Especially in western societies, while the concept of thinness is appreciated, individuals with obesity are excluded, and they face various negative labeling (3,4). With this regard, 'obesity bias' shows up as a serious social problem (5).

In general, obesity bias is defined as negative attitudes, beliefs, assumptions, and decisions towards individuals with overweight or obesity about their weights (6,7). Humiliation, bias, and disrespectful attitudes towards individuals with obesity are extremely common. The society considers people with obesity not as innocent victims, but as architects of their own disorder, and thinks that they are personally responsible for their body weight problems due to laziness and overeating (8,9). Studies conducted on this issue report that discrimination and bias clearly exercised against these people show itself in three main areas including education, employment, and health (4-6).

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Negative attitudes towards individuals with obesity begin in the preschool period, and rejection by their peers may be the first challenge a child with obesity encounters in an educational setting. School-age children can see children with overweight or obesity as 'lazy, filthy, stupid, ugly, and unwanted playmates' (10-13). This may lead children to tend to eat more and cause many psychosocial problems during the following years of their life such as "low self-esteem, suicidal ideation, anxiety, and body dissatisfaction (11).

Studies show that obesity bias is also common in healthcare services (12-16). For example, a study reported that all women with a BMI above 30 were exposed to negative attitudes and behaviors by healthcare workers (17). Individuals with overweight and obesity cannot get the attention they deserve from primary healthcare workers, and this situation causes negative results in terms of the effectiveness of treatment (18). Raising awareness is the most important step to prevent or reduce the occurrence of obesity bias, especially in the health field. Reducing bias against individuals with obesity by means of various interventions to be conducted with students who are currently receiving health education as well as healthcare workers, trying to prevent negative attitudes towards individuals with obesity, and achieving a better understanding of individuals with obesity with the development of empathy skills will be an important step in the prevention of obesity.

Therefore, this study was carried out to identify bias, attitudes, and behaviors against obesity among nutrition and dietetic students and to determine differences in these biases, attitudes, and behaviors through educational interventions.

METHODS

This is an interventional study planned to identify the discriminatory attitudes and behaviors against individuals with obesity among 3rd-grade Nutrition and Dietetics students enrolled in the Faculty of Health Sciences at Baskent University and to reduce obesity bias by raising awareness. The study was approved by Baskent University Medical and Health Sciences Research Board and Ethics Committee (Project No: KA / 17-103 - Date:19 April 2017). The study was launched with 80 students who agreed to voluntarily participate in the study, but it went on with 57 students who participated in the program fully and completed the questionnaire forms completely. The study consisted of 5 stages with 2-week intervals. Students' names were not collected during data collection; instead, the students used code names in the questionnaires and combined the forms in each phase. The stages of the study are shown in Figure 1.

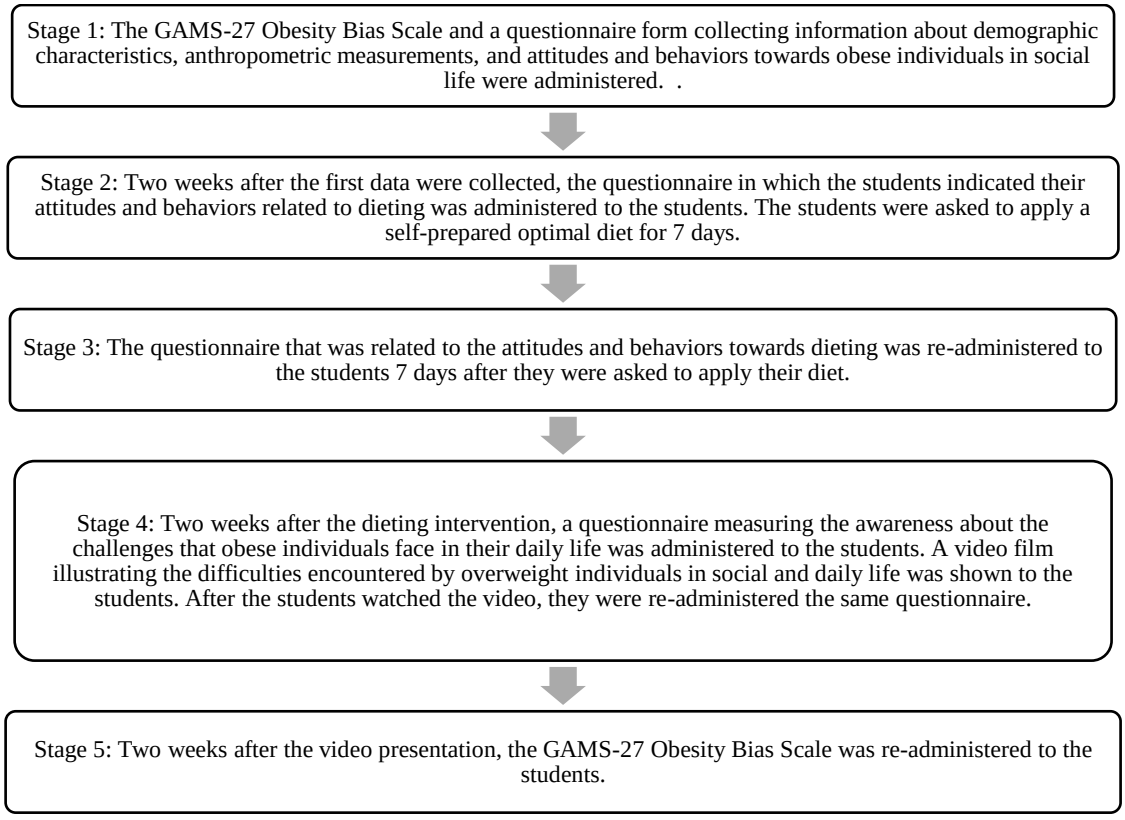

Figure 1. The stages of the study

The evaluation of the study findings indicated that there were some differences in the Obesity Bias Scale scores compared to the scores that students obtained from the questionnaires administered pre-interventionally.

Obesity Bias Scale

The GAMS-27 Obesity Bias Scale, which shows obesity bias status of individuals, was developed by Ercan et al (19) They also conducted the validity and reliability study of the scale. The scale consists of 27 items, and the items are graded on a 5-point Likert type scale. Each item is rated as "strongly agree", "agree", "neutral", "disagree", and "strongly disagree". Positive items (2, 4, 7, 10, 11, 14, 15, 17, 20, 22, 25, 27) are graded from 1 to 5 starting with “strongly agree” option, whereas negative items (1, 3, 5, 6, 8, 9, 12, 13, 16, 18, 19, 21, 23, 24, 26) are scored from 5 to 1 starting with "strongly agree" option. Minimum and maximum scores that can be obtained from this 27-item scale range between 27 and 135. Scores equal to 68 or less are interpreted as "unbiased", between 68.01 and 84.99 as "neutral/ prone to bias", and 85 and above as "biased". As the Obesity Bias Scale scores increase, biases, negative attitudes, and stigmatization behaviors of people towards individuals with obesity increase as well.

For the analysis of the data related to the categorical (qualitative) variables in the questionnaire, chi-square test, numbers, percentages, and mean and standard deviation values were used. Wilcoxon signed-rank test was used for data with no normal distribution. This test is a nonparametric equivalent of paired (dependent) sample t-test comparisons. Since the mean scores cannot be compared in this test, the data were created by giving the median and lower and upper values instead of the mean scores. SPSS Version 22.0 statistical software package was used for data analysis. The significance level was accepted as $p<0.05$ in all statistical tests. The reliability (internal consistency) coefficient (Cronbach’s Alpha) of the Obesity Bias Scale was found to be 0.846 according to the data collected from 57 participants. This coefficient was very close to the original value of the scale and showed that the scale had high reliability.

RESULTS

The mean age of the students was 21.44 ± 0.96 years and the mean BMI was 20.81 ± 2.01 kg/m2. Accordingly, the mean pre-interventional GAMS-27 score of the students was 76.98±9.74, and it decreased to 72.56±10.75 after the interventions. This difference was found to be statistically significant ($p <0.05$) (Table 1).

Table 1. Mean pre and post-interventional Obesity Bias Scale scores

GAMS-27 Scores $\overline{X}$ ±SS		
Pre-interventional	**Post-interventional**	**p[o]**
76.98±9.74	72.56±10.75	0.000

[o]Paired samples t-test was applied.

Table 2 shows the relationships between students' BMI classification and responses to various variables and their pre and post-interventional GAMS-27 scale scores. As is seen in the table, the median value of the scores of the students with normal BMI was found to decrease from 77 to 73. The pre and post-interventional scale scores of the students who identified themselves as “thin” fell from 74 to 70, and the scores of those who identified themselves as “normal” decreased to 74 from 77. The scores of the students who considered themselves as “overweight” fell from 81 to 72. While the pre-interventional score of those who were overweight in any period of their life was 78, it decreased to 73 post-interventionally. The score of the students who had never been overweight in any period of their life decreased to 72.5 from 75. The median scale score of the individuals who had family members with a history of overweight fell from 75 to 73, and the median value of those who did not have an overweight history among their family members fell from 77.5 to 72.5. Of the 57 students participating in the study, 49 (86%) stated that there were people with overweight (e.g. friends, neighbors) in their close circles. The median scale scores of these students were found to fall from 75 to 73. All these differences were found to be statistically significant ($p <0.05$) (Table 2).

Table 2. Relationships between students' BMI classification and responses to various variables and their pre and post-interventional GAMS-27 scale scores

			Pre-interventional GAMS-27			Post-interventional GAMS-27			
	S	**%**	**Median**	**Lower**	**Upper**	**Median**	**Lower**	**Upper**	**p[Y]**
BMI Classification									
≤18	4	7	71	67	90	61,5	50	75	0.144
18.0-24.9	51	89.5	77	61	105	73	48	106	0.001
25-29.9	2	3.5	74	70	78	74	67	81	-
Self-perception of body image									
Thin	8	14	74	66	90	70	50	75	0,049
Normal	42	73,7	77	61	104	74	49	105	0,014
Overweight	7	12,3	81	61	105	72	48	84	0,034
A period in your life when you were overweight									
Yes	37	64,9	78	61	105	73	48	106	0,005
No	20	35,1	75	66	102	72,5	50	92	0,013
Family members with a history of overweight									
Yes	35	61.4	75	61	105	73	48	106	0.009
No	22	38.6	77.5	63	87	72.5	49	92	0.008
Individuals with overweight in your circles									
Yes	49	86	75	61	105	73	48	106	0.000
No	8	14	80	69	87	72.5	66	92	0.207

[Y]Wilcoxon signed-rank test

Table 3 shows students' obesity bias statements and the differences between their mean scale scores before and after the intervention. As shown in the table, the mean GAMS-27 scale score of 5 students (8.8%) who stated that they were biased against individuals with obesity was found to decrease from 76.4 ± 17.86 to 70.8 ± 8.34. While the mean pre-interventional scale score of 23 students who were neutral about obesity bias was 75.2 ± 6.85, it decreased to 71.4±10.06 after the intervention; however, these differences were not found statistically significant (p> 0.05). Besides, the mean pre-interventional scale scores of 29 students (50.9%) who stated they were not biased towards obesity was found to be 78.4 ± 10.12, whereas it decreased to 73.7 ± 11.77 after the intervention, and this difference was found statistically significant (p <0.05). While the mean scale score of students (19.3%) who stated that being obese was the worst thing a person could experience in life fell from 70.9 ± 6.39 to 66.5 ± 9.18, the mean scores of students who did not have any idea about this issue decreased from 75±6.67 to 70 ± 11.37, but these differences were not significant (p> 0.05). The mean score of the students who stated that being obese was a normal occurrence decreased from 78.8 ± 12.2 to 74.4 ± 10.64, and this decrease was found to be statistically significant (p <0.05).

Table 3. Students' bias statements towards obesity and the differences between pre and post-interventional scale scores

			GAMS-27 Scores		
	S	**%**	**Pre-interventional** $\overline{X}$ ±ss	**Post-interventional** $\overline{X}$ ±ss	**p[Y]**
Students' attitudes towards individuals with obesity					
Biased	5	8.8	76.4 ± 17.86	70.8 ± 8.34	0.223
Neutral	23	40.3	75.2 ± 6.85	71.4 ± 10.06	0.053
Unbiased	29	50.9	78.4 ± 10.12	73.7 ± 11.77	0.003
Being obese is the _____ thing that a person can experince in life.					
worst	11	19.3	70.9 ± 6.39	66.5 ± 9.18	0.306
normal	41	71.9	78.8 ± 12.20	74.4 ± 10.64	0.001
neutral	5	8.8	75 ± 6.67	70 ± 11.37	0.225

[Y]Wilcoxon signed-rank test

While 73.7% (42) of the students participating in the study stated that they might go on a diet for 7 days, 14% (8) said they wouldn't be able to do it, and 12.3% (7) stated that they did not have any idea about it. Only 12.3% (7) of the students were able to achieve it when they were asked to go on a 7-day long diet. The median scale score of the students who stated that they might go on a 7-day long diet was 75 before the intervention, and it was found to decrease to 73 after the intervention. The median scale score of the students who thought that they might not continue a diet for 7 days

decreased from 80.5 to 72.5, and these differences were found to be statistically significant (p <0.05). The reason why the students failed to continue the diet for 7 days was mostly due to social activities (22.2%) and lack of motivation (22.2%). The scale scores were observed to decrease in both groups post-interventionally (p <0.05) (Table 4).

When the students were asked about how they felt during the diet, the most frequent answers were "I can control my hunger" (23.0%), "my hunger level changes by activities" (18.8%), and "I feel hungrier than usual" (17.1%). The scale scores of the students who felt hungrier than usual were observed to not decrease significantly (p> 0.05). The students stated that the challenges they mostly encountered during the diet were missing the eating opportunities in social/friend environments (27%) and having difficulty in planning / preparing the menu in the diet (17.3%). There were decreases in post-interventional scale scores in both groups (p <0.05) (Table 4).

Table 4. Relationship between the medians of the pre and post-interventional scale scores of the students according to their statements about continuing a diet for 7 days

			GAMS-27 Scores						
			Pre-interventional			Post-interventional			
	s	%	Median	Lower	Upper	Median	Lower	Upper	p[Y]
Can you maintain a 7-day long diet?									
Yes	42	73.7	75	61	105	73	49	92	0.003
No	8	14	80.5	61	104	72.5	48	106	0.0173
No idea	7	12.3	79	66	87	74	50	92	0.611
What are your reasons if you think you cannot maintain a 7-day long diet?*									
Hunger	14	19.5	78.5	62	104	72.5	61	106	0.054
Social activities	16	22.2	74.5	61	104	70	48	106	0.002
Stress/irritability	12	16.7	75.5	61	104	70	48	106	0.009
Planning meals	6	8.3	80	62	90	73	64	92	0.141
Lack of motivation /boredom	16	22.2	76.5	61	104	72	48	106	0.005
Low calorie /fatigue	8	11.1	72	62	104	72	61	106	0.944
I feel _____ during a diet.									
I starve.	3	2.5	79	74	84	72	68	92	1.000
I feel hungry constantly.	6	5	77.5	74	84	72,5	63	92	0.249
I will be pleased.	13	10.6	74	61	86	72	48	83	0.019
I feel I need to eat urgently and I feel hunger pains.	3	2.5	78	74	95	81	68	88	0.285
I can keep my hunger under control.	28	23	75	61	95	73	48	88	0.006
I don't feel too much hungry.	16	13.1	74	61	90	73	48	83	0.002
I feel hungrier than usual.	21	17.1	75	61	105	74	50	106	0.058
My hunger level changes by activities.	23	18.8	78	63	102	72	58	92	0.001
Hunger is unbearable and intolerable.	5	4.1	74	70	84	68	49	92	0.225
Dieting won't affect me.	4	3.3	76	71	86	74,5	67	76	0.141
What challenges you most during dieting?*									
Planning and preparing the menu in my diet	18	17.3	74	61	90	70	48	92	0.031
Missing the eating opportunities in social and friend environments	28	27	78.5	61	102	73.50	50	92	0.012
Feeling of hunger/ missing the pleasure of eating	18	17.3	78.5	66	104	73	50	106	0.150
Negative feelings	6	5.8	79.5	61	86	74	48	92	0.172
Difficulty in managing the portion control	13	12.4	80	61	105	74	70	92	0.039
Lack of energy	10	9.6	71.5	62	86	71	50	92	0.507
Thinking about the length of the diet	11	10.6	75	61	104	72	48	106	0.005

*Percentages by the number of responses
[Y]Wilcoxon signed-rank test

Table 5 shows the distribution of students' responses about individuals with obesity before and after the video intervention and the difference between the medians of the scale scores. As is shown in the table, 14% of the students marked the “I agree” option for the item “I always stare at individuals with obesity attentively”; 50.9% of them chose “I totally disagree” option for the item “a person with obesity looks ridiculous”, 49.1% chose “I disagree” option for the item “individuals with obesity do not encounter any difficulties in daily life”, 42.1% marked "I disagree" option for the item “I am disturbed by sharing the same environment with individuals with obesity”, 59.6% of the students marked “I disagree” option for the item “I consider changing my seat if a person with obesity sits next to me in a library or on a public transport”, and 43.9% responded with “I disagree” option for the item “the coughing, sneezing, and breathing behaviors of individuals with obesity are shamefully loud". A statistically significant decrease was observed in the scale scores of all groups post-interventionally ($p < 0.05$).

Moreover, 52.6% of the students responded as "I disagree" to the item “individuals with obesity always look ridiculous because of their clothes and appearances”, 59.6% of them agreed on the item that "individuals with obesity may encounter difficulties in meeting their personal needs and self-care such as toilet use", and 61.4% marked the “I agree” option for the item “my everyday life would be difficult if I were obese”. A statistically significant decrease was found in post-interventional scale scores in all groups ($p < 0.05$) (Table 5).

DISCUSSION

Obesity is a common health problem across the world, with an increasing incidence and associated physical, psychological, and social problems. In recent years, the social problems caused by obesity have been emphasized, and obesity bias has been identified as one of the leading problems. It is noteworthy that obesity bias levels of healthcare workers are high. Discriminatory attitudes of healthcare professionals towards individuals with obesity make obesity treatment inadequate, hinder the treatment process, and individuals with obesity even refuse to participate in the treatment because of the perceived bias (11,20,21).

It is extremely important to eliminate all kinds of discrimination to provide a full health service for the individuals in the society. Reducing this negative situation, which threatens the social identity of individuals with obesity especially among the healthcare workers, and arranging the curriculum through various policies to decrease obesity bias during university education are thought to be beneficial for future periods (22,23).

Table 5. The distribution of students' responses about individuals with obesity before and after the video intervention and the relationship between the medians of the scale score

		Pre-interventional GAMS-27 Score					Post-interventional GAMS-27 Score					
		S	%	Median	Lower	Upper	S	%	Median	Lower	Upper	p[Y]
I always stare at individuals with obesity attentively.	I totally agree.	-	-	-	-	-	2	3.5	-	-	-	-
	I agree.	8	14	72	67	81	13	22.8	62.5	49	74	0.021
	Neutral	19	33.3	77	61	87	14	24.6	73	61	92	0.286
	I disagree.	25	43.9	77	63	105	22	38.6	74	61	91	0.001
	I totally disagree.	5	8.8	79	61	104	6	10.5	89	48	106	0.893
A person with obesity looks ridiculous.	I totally agree.	-	-	-	-	-	-	-	-	-	-	-
	I agree.	1	1.8	90	90	90	2	3.5	75	75	75	-
	Neutral	2	3.5	74.5	74	75	6	10.5	71	67	75	-
	I disagree.	25	43.9	74	61	102	30	52.6	72	49	91	0.022
	I totally disagree.	29	50.9	78	61	105	19	33.3	73	48	106	0.010
Individuals with obesity do not encounter any difficulty in daily life.	I totally agree.	1	1.8	66	66	66	-	-	72	72	72	-
	I agree.	2	3.5	76	73	79	1	1.8	73,5	72	75	-
	Neutral	5	8.8	81	77	104	1	1.8	76	67	106	0.104
	I disagree.	28	49.1	78	61	105	19	33.3	74	61	92	0.018
	I totally disagree.	21	36.8	73	61	102	36	63.2	67	48	92	0.008
I am disturbed by sharing the same environment with individuals who have obesity.	I totally agree.	-	-	-	-	-	-	-	-	-	-	-
	I agree.	-	-	-	-	-	-	-	-	-	-	-
	Neutral	4	7	70.5	62	78	12	21.1	66	50	72	0.141
	I disagree.	24	42.1	73	61	102	30	52.6	66	48	92	0.002
	I totally disagree.	29	50.9	73	62	81	15	26.3	72	50	89	0.066
I consider changing my seat if a person with obesity sits next to me in a library or on a public transport.	I totally agree.	-	-	-	-	-	-	-	-	-	-	-
	I agree.	3	5.3	78	69	90	7	12.3	75	58	81	0.285
	Neutral	3	5.3	75	66	102	13	22.8	72	67	91	0.285
	I disagree.	34	59.6	74.5	61	105	29	50.9	72.5	48	84	0.002
	I totally disagree.	17	29.8	78	66	104	8	14	74	49	106	0.169
The coughing, sneezing, and breathing behaviors of individuals with obesity are shamefully loud.	I totally agree.	-	-	-	-	-	2	3.5	-	-	-	-
	I agree.	3	5.3	69	61	75	9	15.8	58	48	67	0.109
	Neutral	5	8.8	73	62	78	12	21.1	72	50	75	0.785
	I disagree.	25	43.9	78	61	90	27	47.4	74	49	92	0.018
	I totally disagree.	24	42.1	78,5	62	105	7	12.3	73.5	61	106	0.018

Table 5. The distribution of students' responses about individuals with obesity before and after the video intervention and the relationship between the medians of the scale score (continued)

		Pre-interventional GAMS-27 Score					Post-interventional GAMS-27 Score					
		S	**%**	**Median**	**Lower**	**Upper**	**S**	**%**	**Median**	**Lower**	**Upper**	**p[Y]**
Accessories such as car seats and seat belts are designed for everyone to use comfortably.	I totally agree.	1	1,8	69	69	69	1	1.8	58	58	58	-
	I agree.	8	14	77.5	62	86	4	7	73	61	92	0.575
	Neutral	21	36.8	74	61	105	3	5.3	73	61	92	0.159
	I disagree.	14	24.6	76.5	62	86	20	35.1	72.5	50	82	0.013
	I totally disagree.	13	22.8	79	61	104	29	50.9	74	48	106	0.021
Individuals with obesity always look ridiculous because of their clothes and appearances.	I totally agree.	-	-	-	-	-	-	-	-	-	-	-
	I agree.	-	-	-	-	-	1	1.8	-	-	-	-
	Neutral	1	1.8	66	66	66	1	1.8	72	72	72	-
	I disagree.	30	52.6	74.5	61	105	35	61.4	72	49	92	0.007
	I totally disagree.	26	45.6	78.5	61	104	20	35.1	73	48	106	0.007
Body mass index is an important factor in ergonomic designs.	I totally agree.	11	19.3	74	66	90	19	33.3	67	49	75	0.008
	I agree.	26	45.6	74.5	62	105	25	43.9	74	50	92	0.075
	Neutral	15	26.3	78	61	87	6	10.5	73	48	89	0.163
	I disagree.	4	7	87	78	104	2	3.5	80	72	106	0.141
	I totally disagree.	1	1.8	86	86	86	5	8.8	83	83	83	-
Individuals with obesity may encounter difficulties in meeting their personal needs and self-care such as toilet use.	I totally agree.	5	8.8	74	66	104	19	33.3	67	50	106	0.225
	I agree.	34	59.6	75	61	105	32	56.1	72	48	92	0.003
	Neutral	11	19.3	78	61	87	4	7	74	61	89	0.327
	I disagree.	6	10.5	78.5	63	95	1	1.8	74.5	65	88	0.092
	I totally disagree.	1	1.8	79	79	79	1	1.8	74	74	74	-
My everyday life would be difficult if I were obese.	I totally agree.	13	22.8	73	62	81	27	47.4	72	50	89	0.600
	I agree.	35	61.4	78	61	105	25	43.9	73	48	106	0.000
	Neutral	8	14	78.5	67	95	4	7	74.5	50	88	0.042
	I disagree.	-	-	-	-	-	-	-	-	-	-	-
	I totally disagree.	1	1.8	79	79	79	1	1.8	74	74	,	-

Obesity bias has been studied with different occupational groups. In a study conducted with fashion design students, 11 fashion design students were given lessons on obesity for 16 weeks and then they were asked to design swimsuits for large size women. At the end of the study, negative stereotypes of students against individuals with obesity were observed to decrease (24). In another study conducted with 305 students studying in the Faculty of Health Sciences and Fine Arts, students were found to be biased against individuals with obesity (25). A study conducted with the students of Faculty of Health Sciences and Faculty of Commerce found that 56.9% of the health students and 49.4% of the students of the Faculty of Commerce were found to be prone to bias. Generally, no significant differences have been found between the obesity bias levels of health students and non-health students.

In a study, which was carried out by Altınayak et al.[26] to determine the obesity bias of the 2nd, 3rd, and 4th-grade midwifery students towards pregnant women with obesity using the GAMS-27 Obesity Bias Scale, the mean scale score of the students was found to be 74.51±8.46. In another study by Sert et al. (94) conducted with midwifery and nursing students, the mean scale score of the students was determined to be 78.55±10.20. Using the same scale, Okumuşoğlu (27) found the mean scale score of university students from three different departments as 82.42±1.09. The mean scale score of the 3rd-year Nutrition and Dietetics students participating in this study was determined to be 76.9 ± 9.74, which indicated bias propensity. The present study showed similar results with other studies that used similar and different scales aiming to determine obesity bias.

When the median of the pre and post-interventional scale scores were compared, the median scores were found to decrease in three groups including biased, prone to bias, and unbiased groups, but these decreases were observed to be statistically significant in students with no bias ($p < 0.05$). Various strategies have been developed to reduce the obesity bias of healthcare workers as in all other areas of society. Studies aiming to reduce obesity bias include interventions such as video presentations, drama, and dieting. Studies on this topic have reported a significant fall in weight bias as a result of interventions (28,29). For example, in the study of Pantenburg et al.(29)carried out with 671 Medical School students, the students were introduced to two female actresses aged 42, one of whom was obese and the other was normal weight. Then, the students were administered an obesity bias test. According to the results of this test, the biases of students with obesity were found to be significantly lower than those of the students with normal weight. In the study of Poustchi et al.(30)with medical students, the students watched a 17-minute long video on obesity bias in healthcare services. The stıdents were administered three scales before and after the video presentation, including the Beliefs About Obese Persons (BAOP) scale, which tests beliefs towards individuals with obesity, the Attitudes Toward Obese Persons (ATOP) scale, which determines attitudes towards individuals with obesity, and weight phobia scale. At the end of the intervention, students' belief that genetic and environmental factors, which are out of one's control, are more important, than factors such as diet and exercise, which require personal control, was found to increase significantly. Also, no significant decrease was observed in negative stereotypical attitudes towards individuals with obesity, whereas the mean bias scores decreased significantly.

In a study by Cotugna et al.(31); 40 dietetic students were asked to apply an energy-restricted diet for 7 days, and at the end of this period, 65% of the students were observed to complete the diet. The questionnaire administered to the students at the outset was readministered at the end of the study, and students' obesity bias was reported to decrease significantly compared to the pre-interventional results. At the end of the study, students stated that they realized maintaining a months-long diet and the feeling of hunger was highly difficult for individuals with obesity while they could not cope with a 7-day diet. Similarly, in this study, 73.7% of the students thought that they would be able to continue a diet for 7 days, while, at the end of 7 days, only 12.3% were able to complete it. Also, the difference between the mean scale scores was observed to decrease significantly.

While there are studies showing that individuals with obesity have a lower level of obesity bias compared to individuals with normal weight, there are also studies showing that individuals with obesity have more negative attitudes towards people carrying their own characteristics than individuals with normal weight. When the relationship between obesity bias of individuals according to their own body perception was examined, in the study of Altınayak et al.(26), 17.3% of the students identified themselves as thin, 59.6% as normal, and 23.1% as overweight, however, all the students in the study were observed to be prone to bias. In a study conducted by De Caroli et al.(32)with psychology students, 61.5% of the students evaluated themselves as thin, 23.1% as normal weight, and 15.4% as overweight. When the bias levels in these groups were compared, they were all determined to have bias-propensity, and no statistically significant difference was found between the groups.

Similar to other studies, the median scale scores of the students within a low BMI range were lower than those with higher BMI values. Students with high BMI can be thought to judge themselves even though they study in the field of nutrition and dietetics. Besides, the students in three groups, who identified themselves as thin, normal weight, and overweight were found to be prone to bias; however, the median and lower-upper values of the group who defined themselves as obese were found to be higher than those of the other groups. It is thought that how individuals perceive their own body does not affect obesity bias and negative attitudes towards individuals with obesity, but that bias can be reduced with interventions no matter how individuals perceive themselves.

Considering that weight bias starts from childhood and bullying is common among primary school children and adolescents, activities to be added to education programs to change this attitude will contribute to reducing obesity bias. Besides, educational staff who educate students on bias

should not give weight-based messages, they should draw student attention to the fact that health is more important than appearance, and they should receive education on preventing students from humiliating individuals with obesity. Particularly, having biased, negative, and stereotypical thoughts towards individuals with obesity will negatively affect the service process of the students who will provide health services in the future when working with patients with obesity in their professional lives. In this context, both theoretical and practical courses and contents that will be added to the curriculum during the university education process may be effective in reducing obesity bias.

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