Investigating BMI, fatphobia and dietary habits of individuals going to the gym

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Abstract. *Study Objective:* The purpose of this study was to investigate BMI, fatphobia, and dietary habits of individuals going to the gyms. *Methods:* Samples of this study consisted of individuals who go to the gyms in Siirt province. The sample size consisted of 514 individuals (190 female, 324 male) who participated voluntarily in the study. A survey method was used as a data collection method in the study. To determining the fatphobia levels of participants, a 14 item scale developed by Scheltema and Robinson (2001) was conducted. Questions from the survey prepared by Ceylan (2017) were used for determining demographic attributes and dietary habits of participants. In the comparison of continuous data between two independent groups t-test was used and one way ANOVA test was used for comparison of continuous data between independent groups which are more than two. Scheffe test was used as a post-hoc analysis for determining the differences after the test Anova. Pearson correlation analysis was conducted between the continuous variables of the study. *Result:* As a result of the study, there was no significant relationship between BMI and fatphobia. However, when the differentiation status of BMI and fatphobia values according to their nutritional habits were observed, it was found that there was a significant difference in favor of those who exercise for weight loss ($p < 0.05$).

Key words: Sports, Body Mass Index(BMI), Fat Phobia, Diet, Dietary Habits.

Introductıon

As a result of the developments in technology, machines have taken the place of the labor force and for this reason, people were exposed to an immobilized and sedentary lifestyle. With increasing age, many people with these sedentary lifestyles have come down with several diseases (1). Furthermore, developing technology affects the dietary habits of people in a negative way (2,3). For this reason, changing dietary habits made people gain a lot of weight. Particularly in developed and developing countries, obesity-caused physical and social problems have become a social issue. Today, excessive weight or obesity is known as one of the most important health issues. While an individual who has to maintain his/her life struggling with problems in the presence of obesity, he/she is obliged to cope with the psychological attitudes which society exhibits (4). An individual categorized as "obese" by society with an excessive weight gain find him/herself in a guilt feeling and each abstracted from society feel him/herself unhappy and drop psycho-socially, communicationally, physically, and culturally behind (5). Obese individuals are usually exposed to discrimination in various places, in many countries (6,7).

There are many factors in the etiology of obesity. Malnutrition and overnutrition, consuming high-calory meals, sedentary life-style, personality, age, genetics, hormonal imbalance, and factors like environmental, physiological, psychological, biochemical, socio-cultural, neurologic exist in the etiology obesity (4,8). This negative attitude exhibited towards those who have much bodyweight or obese is defined as fatphobia (9) and also it means fearing from being overweight pathologically, feeling antipathy against being overweight, and disliking being overweight (4).

Therefore obese individuals will have to tackle fatphobia. Almost in every study, it can be seen that obesity is directly associated with physical activity and diets. Once again emphasized the relationship between nutrition and physical activity, saying that physical performance can be improved with a balanced diet and that it may be adversely affected by malnutrition (10).

On the other hand, the World Health Organization (WHO); recommends the use of Body Mass Index in weight classification (11). Body Mass Index is used as a method to explore weight-height balance, fatness, leanness, malnutrition (12). Body Mass Index is a value calculated by dividing body weight to height square (kg/m²) (13).

People feed themselves to supply the energy they need for their bodies and by taking all nutritional elements as body needs, i.e. if people spend all the energy they daily intake, and if energy taken is equal to energy spent there is no weight gain (14). Following that it is thought that people who regularly exercise spend the energy they took from their nutrition. Therefore, in this study, it was aimed to investigate BMI, fatphobia, and dietary habits of people who go to the gyms.

Material and Methods

Research Model

This research was a descriptive study aimed to reveal whether fatphobia and dietary habits change according to BMI, demographic characteristics of individuals who go to the gym in Siirt province. The research model was a causal-comparative model. The survey method is a general survey model mentioned in the literature and general survey model from case models. Also, it is a relational screening model among general survey models. Relational screening models aim to determine the presence of change or changing levels through correlation and comparison methods.

Participants

The research group consisted of 514 participants (190 female, 324 male) who go to the gym in Siirt province.

Data Collection

Fatphobia Scale and Dietary Habits questionnaire were used as data collection tools in research.

Dietary Habits Questionnaire

Nutrition questionnaire used in the research Dr. It was taken from the thesis titled "Determination of Nutritional Habits in Women Attending Sports Halls" prepared by Canan Ceylan (2017) (15). The questionnaire used contains 29 questions to determine the nutritional habits of the participants.

Fatphobia

The Fatphobia scale was used to determine the fatphobia of participants. The fatphobia scale first developed by Robinson, Bacon, and O'Reilly in 1993 with 50 items. Bacon, Scheltema, and Robinson developed a 14 item short version of this scale in 2001. Turkish adaptation was done in 2005 by Koçak, Saraç and Hürmeriç. The scale was given as a list and consisted of 14 items to determine the fat people item rating and the items were made according to the fivefold rating system. Numbers close to "5" represent a high-fat phobic attitude, and numbers close to 1 represents low fatphobic attitudes. Assessment in the fatphobia scale is made by dividing the total score obtained from 14 items to 14.

Table 1. Classification of the Body Mass Index (kg/m²)

Lean	< 18,5
Normal	18,5-24,9
Overweight	25,0-29,9
Obese	≥ 30
Class 1	30,0 - 34,9
Class 2	35,0 - 39,9
Class 3 (morbid)	≥ 40

Reference: Ceylan, C. (2017) Master Thesis, Selcuk University

Statistical Analysis

The obtained data were analyzed by SPSS (Statistical Package for Social Sciences) for Windows 22.0 program. In this study, number, percent, mean and standard deviation were used for descriptive statistical methods. In the comparison of continuous data between two independent groups t-test was used and the One Way Anova test was used for comparison of continuous data between independent groups which are more than two. Scheffe test was used as a post-hoc analysis for determining the differences after the test Anova. Pearson correlation analysis was conducted between the continuous variables of the study.

Results

When we look at the age distribution of the participants, 269 (52.3%) are 21 and below, 245 (47.7%) are 22 and above. According to Body Mass Index values 31 (6,05%) of participants were lean, 296 (57,6%) were normal, 135 (26,3%) overweight, 40 (7,8%) Level 1 obese, 12 (2,3%) Level 2 obese. According to educational status, 15 (2,9%) of participants graduated from primary school, 76 (14,8%) graduated from high school, 308 (59,9%) bachelors, 115 (22,4%) graduated from graduate programs. According to monthly income 20 (3,9%) of participants earn 1000 Turkish Lira and below, 117 (22,8%) earn 1001-2000 Turkish Lira, 140 (27,2%) earn 2001-3000 TL, 237 (46,1%) earn 3001 TL and above. According to days in a weekly going to gym 181 (35,2%) participants went to the gym 1 day, 228 (44,4%) 2 days, 105 (20,4%) 3 days. According to membership duration to the gym were as 121 (23,5%) 0-2 month, 144 (28,0%) 3-5 months, 177 (34,4%) 6-7 months, 72 (14,0%) 8 months and above (Table 2).

Participants "body mass index" and "fat phobia" were determined as $\bar{x} = 24,27 \pm 5,02$ (Min = 15,57; Max = 72,00), $\bar{x} = 3,33 \pm 0,67$ (Min = 1,57; Max = 5,00), respectively (Table 3). When correlation analysis was investigated between BMI and fat phobia no relation was found (p>0,05, r=-0,018).

Table 2. Frequency and Percent Distributions Related to Demographic Properties of Participants

Groups	Frequency (f)	Percent (%)
Age		
21 and below	269	52,3
22 and above	245	47,7
Gender		
Female	190	37,0
Male	324	63,0
Body Mass Index		
Lean	31	6,0
Normal	296	57,6
Overweight	135	26,3
Level 1 Obese	40	7,8
Level 2 Obese	12	2,3
Educational Status		
Primary	15	2,9
High School	76	14,8
Bachelors/University	308	59,9
Graduate	115	22,4
Monthly Income		
1000 TL and below	20	3,9
1001-2000 TL	117	22,8
2001-3000 TL	140	27,2
3001 TL and above	237	46,1
How Many Days They Go to the Gym in a Week		
1 Day	181	35,2
2 Days	228	44,4
3 Days	105	20,4
Gym membership duration		
0-2 Month	121	23,5
3-5 Month	144	28,0
6-7 Month	177	34,4
8 Month and above	72	14,0

Table 3. Body Mass Index, Fat Phobia Levels, Mean and Correlation

	N	Mean	Sd	Min	Max	r	p
BMI	514	24,27	5,02	15,57	72,00		
Fat Phobia	514	3,33	0,67	1,57	5,00	-0,02	0,68

Table 4. Changing Status of BMI and Fat Phobia Values According to Dietary Habits

Demographic info	n	Body Mass Index	Fat Phobia
Dietary Style		Mean ± Sd	Mean ± Sd
Family	343	24,45 ± 5,44	3,35 ± 0,69
Diet Books	19	23,41 ± 5,04	3,35 ± 0,76
Visual and Written Media	81	24,32 ± 3,93	3,31 ± 0,56
Doctor and Dietitian	71	23,57 ± 3,90	3,27 ± 0,64
F =		0,78	0,32
p =		0,50	0,81
Morning Breakfast Preference		Mean ± Sd	Mean ± Sd
Tea, Cheese, Olive, Egg Etc.	425	24,32 ± 5,09	3,34 ± 0,69
Tea, Pastry, Toast, Bagel, etc.	39	25,02 ± 5,01	3,333 ± 0,55
Only Beverage	7	22,57 ± 3,09	3,265 ± 0,48
Cereal with Milk	32	23,87 ± 5,07	3,35 ± 0,56
Other	11	21,90 ± 2,50	2,96 ± 0,43
F =		1,08	0,91
p =		0,37	0,46
Regular Lunch Eating Status		Mean ± Sd	Mean ± Sd
Yes	228	23,90 ± 4,32	3,33 ± 0,70
No	286	24,56 ± 5,50	3,33 ± 0,64
t =		–1,48	0,02
p =		0,14	0,99
Lunch Preference		Mean ± Sd	Mean ± Sd
Meals Contrainin Red Meat	100	23,77 ± 4,12	3,29 ± 0,57
Table D'hote (Legume Family, Chickpea, Bean, Lentil)	220	24,42 ± 4,89	3,36 ± 0,70
Fast Food (Hamburger, Pizza, Döner Kebab Sandwich, Meatball Sandwich, etc.)	116	24,74 ± 6,16	3,313 ± 0,73
Fries, Sandwich, etc.	37	23,35 ± 4,76	3,409 ± 0,58
Salads	41	24,12 ± 4,34	3,303 ± 0,61
F =		0,88	0,32
p =		0,48	0,87
Dinner Preference		Mean ± Sd	Mean ± Sd
Meat (Boiled Beef, Saute, Grill, etc.)	310	24,62 ± 5,31	3,34 ± 0,63
Fast Food (Hamburger, Fries, Döner Kebab Sandwich, Meatball Sandwich, Bagel etc.)	29	23,93 ± 4,53	3,44 ± 0,86
Vegetable Dish	161	23,69 ± 4,61	3,31 ± 0,69
Pastry	14	23,89 ± 3,14	3,21 ± 0,63
F =		1,29	0,49
p =		0,28	0,69
Family Attitudes Towards Red Meat		Mean ± Sd	Mean ± Sd
Good	390	24,24 ± 5,25	3,36 ± 0,66
Less is Good	100	24,35 ± 4,35	3,24 ± 0,69
Must eat every day	24	24,36 ± 3,73	3,37 ± 0,71
F =		0,02	1,21
p =		0,98	0,30

View on Red Meat		Mean ± Sd	Mean ± Sd
Good	372	24,03 ± 4,16	3,35 ± 0,66
Less is good	125	25,01 ± 7,07	3,30 ± 0,68
Must eat every day	17	24,07 ± 3,68	3,09 ± 0,68
F =		1,80	1,44
p =		0,17	0,24
Daily Meat Consumption		Mean ± Sd	Mean ± Sd
25 Gr	187	24,15 ± 5,65	3,28 ± 0,69
50 Gr	155	24,23 ± 4,38	3,34 ± 0,66
100 Gr	113	24,46 ± 5,26	3,44 ± 0,67
100 Gr and above	59	24,38 ± 4,02	3,27 ± 0,53
F =		0,11	1,48
p =		0,96	0,22
Red Meat Consumption Whole Family		Mean ± Sd	Mean ± Sd
1-2 Kg	111	23,35 ± 4,29	3,34 ± 0,72
3-5 Kg	160	24,23 ± 4,36	3,29 ± 0,62
6-8 Kg	157	24,27 ± 5,08	3,39 ± 0,71
10 Kg and above	86	25,53 ± 6,51	3,29 ± 0,58
F =		3,09	0,72
p =		**0,03**	0,54
PostHoc=		4 > 1 ($p<0.05$)	
Number of Family Members		Mean ± Sd	Mean ± Sd
3	115	24,64 ± 4,66	3,32 ± 0,64
4	138	23,85 ± 4,00	3,36 ± 0,72
5	151	24,79 ± 6,44	3,38 ± 0,67
6 and above	110	23,68 ± 4,18	3,25 ± 0,61
F =		1,58	0,85
p =		0,19	0,47
Night Eating Habit		Mean ± Sd	Mean ± Sd
I often eat at night	77	25,13 ± 6,94	3,26 ± 0,67
Sometimes I eat at night	224	24,06 ± 4,28	3,39 ± 0,67
I don't eat at night	213	24,17 ± 4,90	3,30 ± 0,66
F =		1,37	1,48
p =		0,26	0,23
Daily Water Drunk Per Glass		Mean ± Sd	Mean ± Sd
1-5	126	24,32 ± 6,04	3,29 ± 0,64
6-10	254	23,99 ± 4,85	3,36 ± 0,67
10 above	134	24,74 ± 4,22	3,33 ± 0,69
F =		0,97	0,44
p =		0,38	0,65

Previous Diet Status		**Mean ± Sd**	**Mean ± Sd**
Yes	258	24,53 ± 4,03	3,34 ± 0,65
No	256	24,00 ± 5,84	3,32 ± 0,68
t =		1,18	0,32
p =		0,24	0,75
Exercise Participation Status		**Mean ± Sd**	**Mean ± Sd**
I do exercise regularly	233	24,22 ± 4,83	3,32 ± 0,65
Sometimes I do Exercise	269	24,40 ± 5,25	3,34 ± 0,68
I never do exercise	12	22,18 ± 2,73	3,39 ± 0,66
F =		1,15	0,10
p =		0,32	0,91
Purpose of Doing Exercise		**Mean ± Sd**	**Mean ± Sd**
For Weight Gain	14	22,05 ± 2,96	3,35 ± 0,58
For Losing Weight	248	24,99 ± 4,84	3,34 ± 0,69
For Keeping it Fit	182	23,63 ± 5,45	3,33 ± 0,64
For Health Issues	37	24,38 ± 4,92	3,34 ± 0,64
Other	33	23,09 ± 3,78	3,23 ± 0,66
F =		3,24	0,20
p =		**0,01**	0,94
PostHoc =		2 > 1, 2 > 3, 2 > 5 ($p<0.05$)	
Regular Physical Activity Participation Status		**Mean ± Sd**	**Mean ± Sd**
Yes	325	24,22 ± 5,29	3,33 ± 0,66
No	189	24,33 ± 4,52	3,32 ± 0,67
t =		-0,23	0,18
p =		0,82	0,86
Physical Activity Frequency		**Mean ± Sd**	**Mean ± Sd**
Everyday	57	22,69 ± 3,37	3,26 ± 0,68
3-4 Days in A Week	117	24,27 ± 5,63	3,32 ± 0,66
2-3 Days in A Week	122	24,77 ± 5,81	3,37 ± 0,63
1-2 Days in A Week	29	24,75 ± 4,25	3,40 ± 0,76
F =		2,14	0,45
p =		0,10	0,72
Minimum 30 Min. in A Week Physical Activity Status		**Mean ± Sd**	**Mean ± Sd**
Yes	313	24,13 ± 5,34	3,30 ± 0,66
No	64	23,64 ± 3,81	3,37 ± 0,73
Sometimes	137	24,86 ± 4,72	3,38 ± 0,63
F =		1,57	0,88
p =		0,21	0,42
Reason For Going to The Gym		**Mean ± Sd**	**Mean ± Sd**
For Losing Weight and Maintaining My Weight	141	24,26 ± 4,15	3,38 ± 0,75
Other Reasons	373	24,26 ± 5,31	3,31 ± 0,63
t =		-0,02	1,15
p =		0,99	0,29

Seeing Him/Herself Very Fat Status		Mean ± Sd	Mean ± Sd
Yes	207	24,92 ± 4,23	3,34 ± 0,70
No	307	23,82 ± 5,44	3,32 ± 0,64
t =		2,44	0,40
p =		**0,02**	0,69
Desire For Losing Weight		Mean ± Sd	Mean ± Sd
Yes	361	24,67 ± 4,80	3,33 ± 0,68
No	153	23,31 ± 5,38	3,33 ± 0,61
t =		2,82	-0,11
p =		**0,01**	0,91
Diet Status Last One Month		Mean ± Sd	Mean ± Sd
Yes	207	24,72 ± 5,05	3,38 ± 0,69
No	307	23,95 ± 4,97	3,30 ± 0,64
t =		1,70	1,40
p =		0,09	0,16

BMI, fatphobia scores of participants were not statistically significant differences according to dietary style variable, morning breakfast preferences, dietary style, morning breakfast preference, regular lunch eating status, lunch preference, dinner preference, family attitudes towards red meat, view on red meat, daily meat consumption, number of family members, night eating habit, daily water drunk per glass, previous diet status, exercise participation status, regular physical activity participation status, physical activity frequency, minimum 30 min. in a week physical activity status, the reason for going to the gym, diet status last one month (p > 0.05).

On the other hand, BMI of the participants, in the scores of fatphobia; As a family, in the consumption of RED meat; BMI scores of the participants differ significantly as a family of red meat consumption variable (F = 3,09; p = 0.03 < 0.05). The reason for the difference is that the BMI scores of those who consume red meat as a family of 10 kg and above are higher than the BMI scores of those who consume red meat as a family as 1-2 kg (p < 0.05). The scores of the participants did not differ significantly according to the red meat consumption variable as a family (p > 0.05).

BMI scores of the participants differ significantly according to the purpose of sports (F = 3,24; p = 0.01 < 0.05). The reason for the difference is that the BMI scores of those who aim to lose weight are higher than the BMI scores of those who aim to lose weight (p < 0.05). Besides, the purpose of doing sports is to keep my BMI scores for those who lose weight and maintaining my fitness form and other ones are higher than the BMI (p < 0.05).

BMI scores of the participants differ significantly according to the variable of finding themselves overweight. BMI scores ($\bar{x}$ = 24,92) of those who found themselves overweight were found higher than BMI scores ($\bar{x}$ = 23,82) of those who did not find themselves overweight (t = 2,44; p = 0.015 < 0.05).

BMI scores of the participants differ significantly according to the desire to lose weight variable. BMI scores (= 24,67) of those who want to lose weight were higher than those who did not want to lose weight ($\bar{x}$ = 23,31) (t = 2,82; p = 0.005 < 0.05).

Discussion and Conclusion

When looking at the results of this study, it can be seen that there is no relation between BMI and fatphobia. Besides when changing status of values of BMI, fatphobia according to dietary habits; while there was no statistically significant difference in dietary style, morning breakfast preference, regular lunch, and dinner eating, family individual number, eating at night habit, water amount took a day, previous diet status, exercise

participation status, frequency of regular physical activity, the reason of going to the gym and desire for losing weight variables (p>0.05), there were statistically significant differences in 10 kg and above meat consumption of all family and those who do exercise for losing weight (p<0.05). It is possible to discuss these findings in two ways. First is the status of individuals who had low BMI which fatphobia levels of lean individuals were high, this may show that lean individuals may have negative attitudes towards fat people. The second one is the status of individuals who had high BMI having low or high fatphobia levels; in this case, fat individuals may have negative attitudes towards both lean and other fat individuals. In either case, mentioned, the characteristics of these individuals will play an important role. When viewed from this aspect BMI was expected to associate with fatphobia. Negative attitudes towards overweight people create a discussion platform almost in the country in the world (4). Although an association determined in literature parallel with that in this study having seen no association between BMI and fatphobia can be suggested as a contradicting result to other research in literature. It is possible to say that this situation may arise from the socio-economic and socio-cultural status of the sample and population. Today, it is a fact that sedentary individuals have a higher BMI, in other words, they become overweight and obese. However in this study participants distributed as 6.0% lean, 57% normal, 26.3% overweight, and 10.1% obese. Therefore it can be suggested that because there were a lot of normal individuals in research can be shown as a cause of not being able to find such an association. As mentioned above, when we look at BMI, fatphobia, and dietary habits of participants, there were statistically significant differences in red meat consumption in all families and doing exercise variables. When we look at these dietary habits of participants they show protein-based diet habits and this shows that they intend to lose weight. Also, determining a significant difference in who had the desire to lose weight in doing exercise purpose variable supports this idea. When we look at literature; Harrisi Sandoval and Cortese (1998) they found that participants had negative attitudes towards both individuals who had mid-level weight and their weight levels (16). Besides, Poon and Tarrant

(2009) in their study, the attitudes of student nurses and serving nurses towards individuals who had been taking obesity treatment were examined. According to this research reveals a mid-level fatphobia, and nurses were seen to have neutral attitudes towards obese individuals (17). On the other hand, Chambliss, Finley and Blair (2004) made a research on attitudes of students working in the exercise field towards overweight individuals. And their study revealed that determined that these participants had very negative attitudes towards overweight individuals (18).Consequently, as can be seen, fatphobia levels of individuals or social groups or having negative attitudes towards overweight people show the difference. That means their attitudes may change. However in this study, as can be understood from research; finding, and literature, individuals who had the idea of losing weight had significant differences in their fatphobia levels. There were no significant differences with other variables in the study. Also, there was no significant relationship between BMI, fatphobia, and dietary habits.

Conflicts of interest: The authors declare that there is no conflict of interest in this manuscript.

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