

# Do the body weight perception and body mass index affect the participation of exercise?

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## Abstract

*Study aim:* In this study, it is aimed to find out the exercise preferences based on the Body Mass Index (BMI) and Body Weight Perception (BWP), and to determine the consistency between BMI and BWP calculated via the self-reporting method.

*Material and methods:* The study was conducted total of 297 volunteers, included 174 females ( $M_{age} = 27.19 \pm 9.94$  years) and 123 males ( $M_{age} = 26.08 \pm 10.15$  years), who were members of the physical activity center. The height and body weight values were obtained based on the self-reports. BWP was assessed by asking “how do you describe your weight?” As a statistical analysis, the Pearson chi-square test and Kappa statistics were used.

*Results:* It was determined that overweight/obese female preferred most the strength exercises, whereas, overweight/obese men, according to both methods, preferred the different kind of exercises ( $p < 0.05$ ). When the mutual consistency of the BWP and BMI methods was compared, “average” level conformity was found in female, and “weak” level conformity was found in male (Female:  $\kappa = 0.48$ ;  $p < 0.000$ ; Male:  $\kappa = 0.21$ ;  $p < 0.001$ ).

*Conclusion:* It could be said that the type and application protocol of the exercise has been related with the frequency and duration of the exercise for both of the methods. Besides, it could be said that there was a higher consistency among female participants at the level of participating to the exercise and they had similar exercise preference, frequency and duration.

**Key words:** Exercise preference – Gender – Physical activity

## Introduction

Perception is considered as one of the factors that have a significant role in tendency for the healthy life behaviors and that provide for the structuring of the human behavior. Body perception, whereas, is a multidimensional aspect that is the relation of the individuals with their perception on their own bodies [3, 9] and defined as the mental image of all the sensations belonging to the body [22]. Based on a different definition, it may also be defined as the picture of the body weight shaped in mind [5]. The most deterministic factor affecting the body perception is the increase or decrease in the body weight [1, 3]. An accurate identification by the individuals of their body weights is at the top of list primarily for a successful body weight management and for a healthy living style [27, 31]. In recent years, there are many factors, including mainly the marketing campaigns that changing the social norms, affected on the BWP [10]. For example, it is known that being underweight or imposed thin body appearance being shown as ideal on the media regarding the female plays

an important role on the changes in the body perception [19, 20].

BWP may show the differences based on gender and there are conflicting results related to the perception level of the individuals of their bodies [12]. In general, normal weight individuals may report their body weight higher than it should be and overweight/obese individuals may declare as lower [16]. In a research conducted on young individuals, it reported that the low BWP was more common in female [27], and they exaggerated adiposity compared to the male [5]. Moreover, in some studies on adolescents, it was determined to the inconsistencies and different findings between BWP and BMI methods [22, 24]. In another study findings also indicated that while giving declarations on height data, it was reported that girls had the tendency to report their heights taller and their body weights lower, and boys had the tendency to report both their height and body weights higher [23] and after the adolescence period, it was emphasized that the changes in the body perception increased [28].

To understand how BWP can affect to the health behaviors of female and male is important [19], especially

overweight/obese people perceiving themselves thinner than that they are may cause them to plan false exercises is emphasized [18]. In national level, “Body Weight Perception Research (2012)” conducted by the Ministry of Health in Turkey was acknowledged as one of the primary studies. The study conducted under the scope of fight against obesity reported that there were inconsistencies between BWP and BMI results, and this could lead to affect negatively the healthy living behaviors [30]. The tendency towards exercise is one of the leading requirements for the health living behavioral habits, in regard to this, BMI and BWP are accepted as important components to determine the tendency of exercise. In this respect, without take into account BMI, high or low BWP is related to some attitudes and behaviors, including fewer weight loss attempts, less or more activity, calorie restriction and unhealthy food consumption etc [8, 10, 11, 25]. Although the studies related to the effects of BWP on physical activity, is unclear [19], besides it was reported that BWP in daily life, could be effect on many of behaviors such as the participation of physical activity in different type, duration and frequency [22]. In this regard, the primary aim of this study is (i) to find out the exercise preferences according to type, duration and frequency based on the BMI and BWP, and (ii) to determine the consistency between BMI and BWP calculated via the self-reporting method.

## Material and methods

### Participants

This is a cross-sectional study that was conducted total of 297 who Turkish citizens included 174 females ( $M_{age}$ :  $27.19 \pm 9.94$  years; height:  $164.36 \pm 0.6$  cm; body weight:  $64.63 \pm 15.1$  kg; BMI:  $23.91 \pm 5.4$  kg/m<sup>2</sup>) and 123 males ( $M_{age}$ :  $26.08 \pm 10.15$  years; height:  $176.35 \pm 0.64$  cm; weight:  $77.32 \pm 15.17$  kg; BMI:  $24.97 \pm 5.18$  kg/m<sup>2</sup>). The volunteers were members of the physical activity center that had a hugely complex structure, for healthy life (non-professional). The individuals are quited by a specialist individually. The participants were evaluated in six groups that divided as walking/running, swimming, pilates, CrossFit, resistance, and spinning activity considering their exercise preferences. The study was carried out in accordance with the Helsinki Declaration and prior to this study, ethics committee approval was obtained from the Hitit University Non-invasive Research Ethics Committee.

### Data collection

#### *Socio-demographic informations*

The socio-demographic informations were obtained by using a survey method that included marital status, smoking (the answer of “no”: it consist of the participants who

give up smoking and never non-smoking), education, general health perception, income perception.

#### *Physical activity measurements*

The obtained data were categorized according to WHO 2020 recommendations: the weekly physical activity duration and frequency recommended by WHO for a healthy life was taken as reference [32].

#### *Anthropometric measurements*

The height and body weight values were obtained based on the self-reports of the participants. BMI was calculated as body weight [kg] divided by body height in meters squared. Individuals with a BMI <18.5 were considered underweight, between 18.5 and 24.9 were considered normal weight, individuals with a BMI between 25.0 and 29.9 were considered overweight, and individuals with a BMI of  $\geq 30$  were considered obese [33]. The categories were collapsed into slightly/very overweight to adequately power the models (as overweight/obese).

#### *Body weight perception*

Weight perception was assessed by asking “how do you describe your weight?” Response options included: “underweight,” “normal weight,” “overweight,” and “obese”. The categories were collapsed into slightly/very overweight to adequately power the models (as overweight/obese) [25].

### Statistical analysis

The mean, standard deviation, frequency (f), and percent (%) values of the variables were given as descriptive statistics. The Pearson chi-square test was used to examine the relationship between categorical variables. The BMI and BWP conformity is assessed via kappa ( $\kappa$ ) statistics. The obtained  $\kappa$  values are interpreted via classifying for conformity as insignificant level 0.01–0.20, weak level 0.21–0.40, average level 0.41–0.60, good level 0.61–0.80, and very good level 0.81–1.00. All the statistical analyses were performed using the program IBM SPSS Statistics (version 25.0), and the significance level was set at 0.05 for all tests.

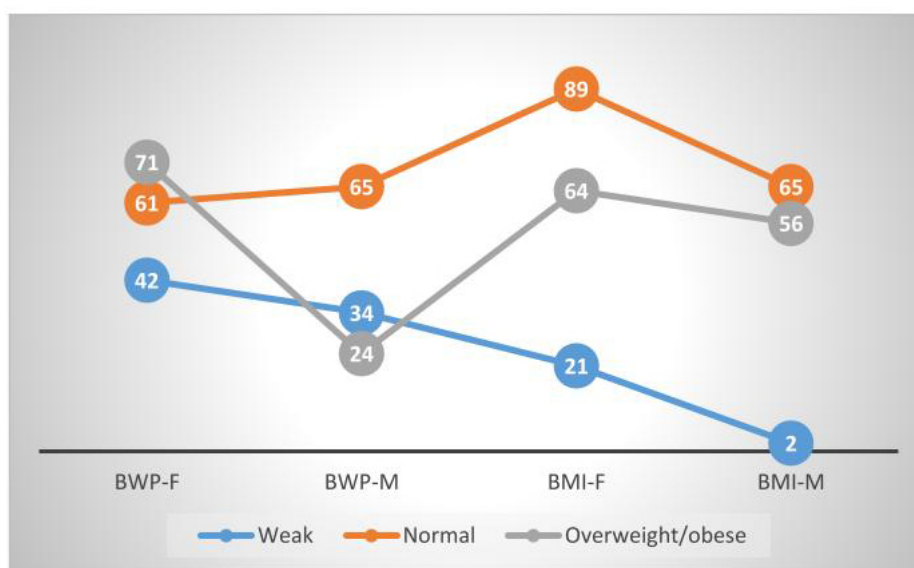
## Results

Table 1 presents the female and male participants’ socio-demographic characteristics.

Figure 1 presents to the results that belong to female and male were achieved as according to BMI and BWP respectively, for female, the ratio of the underweight ones: 12.1 % (n = 21), 24.1% (n = 42) respectively; the ratio of normal weight ones 51.1% (n = 89), 35.1% (n = 61) respectively; the ratio of overweight/obese ones: 36.7%

**Table 1.** Socio-demographic characteristics of the participants

Variables	Category	Female	Male	Total
		f (%)	f (%)	f (%)
Marital status	Married	55 (31.6)	31 (25.2)	86 (29.0)
	Single	119 (68.4)	92 (74.8)	211 (71.0)
Smoking	Yes	68 (39.1)	38 (30.9)	106 (35.7)
	No	106 (60.9)	85 (69.1)	191 (64.3)
Education	≤ High school	70 (40.2)	58 (47.2)	128 (43.1)
	≥ University	104 (59.8)	65 (52.8)	169 (56.9)
General health perception	Medium	62 (35.6)	27 (22.0)	89 (30.0)
	Good	82 (47.1)	59 (48.0)	141 (47.5)
	Very good	30 (17.2)	37 (30.1)	67 (22.6)
Income perception	Low	23 (13.2)	20 (16.3)	43 (14.5)
	Medium	106 (60.9)	66 (53.7)	172 (57.9)
	High	45 (25.8)	37 (30)	82 (27.6)



**Figure 1.** According to gender BWP and BMI categories

BWP-F: Body weight perception – Female; BWP-M: Body weight perception – Male; BMI-F: Body mass index – Female; BMI-M: Body mass index – Male.

(n = 64), 40.8% (n = 71) respectively. For male, the ratio of the underweight ones: 1.6 % (n = 2), 27.6% (n = 34) respectively; the ratio of normal weight ones: according to both BMI and BWP, is 52.8% (n = 65); the ratio of overweight/obese ones: 45.5% (n = 56), 19.5% (n = 24) respectively.

Table 2 presents to the BWP and BMI classification is compared, conformity at “average” level in female and at “low” level for male are seen (Female:  $\kappa = 0,48$ ;  $p < 0.000$ ; Male:  $\kappa = 0.21$ ;  $p < 0.001$ ). According to the BMI

classification, the results showed that only 9.8% of the female and 1.6% of the male that were underweight perceive themselves as underweight; 26.4% of the female and 30.1% of the male that were normal weight perceive themselves as normal weight; 30.5% of female and 17.9% of male that were overweight/obese perceive themselves as overweight/obese; and in total approximately 60% of the participants (n = 177) had consistent BMI and BWP values.

Table 3 presents to the exercises preferences based on BMI and BWP. According to BMI, walking/running:

**Table 2.** Body weight perception change relative to the body mass index

BWP	BMI					
	Underweight f (%)		Normal f (%)		Overweight/obese f (%)	
	Female	Male	Female	Male	Female	Male
Underweight	17 (9.8) <sup>a</sup>	2 (1.6) <sup>a</sup>	25 (14.4) <sup>b</sup>	26 (21.1) <sup>b</sup>	0 (0) <sup>b</sup>	6 (4.9) <sup>b</sup>
Normal	4 (2.3) <sup>b</sup>	0 (0) <sup>b</sup>	46 (26.4) <sup>a</sup>	37 (30.1) <sup>a</sup>	11 (6.3) <sup>b</sup>	28 (22.8) <sup>b</sup>
Overweight/obese	0 (0) <sup>b</sup>	0 (0) <sup>b</sup>	18 (10.3) <sup>b</sup>	2 (1.6) <sup>b</sup>	53 (30.5) <sup>a</sup>	22 (17.9) <sup>a</sup>
<sup>a</sup> Consistent						177 (59.5)
<sup>b</sup> Inconsistent						120 (40.5)

BMI: Body mass index; BWP: Body weight perceived; <sup>a</sup>: Body mass index; <sup>b</sup>: Body weight perception.

**Table 3.** Distribution of weekly physical activity preferences relative to the BMI and BWP classifications in female and male

Exercise type	G	Underweight		Normal		Overweight		$\chi^2$ (p)	Female	Male
		Female f (%)	Male f (%)	Female f (%)	Male f (%)	Female f (%)	Male f (%)			
Walking/ Running	1	15 (11.7)	2 (2.7)	63 (49.2)	29 (38.7)	50 (39.1)	44 (58.7)	F = NS M = 15.878 (0.000)	128 (73.6)	75 (61.0)
	2	29 (22.7)	9 (12.0)	43 (33.6)	45 (60.0)	56 (43.8)	21 (21.8)	F = NS M = 25.969 (0.000)		
Swimming	1	12 (9.4)	2 (2.3)	69 (53.9)	53 (60.2)	47 (36.7)	33 (37.5)	F = NS M = 8.363 (0.015)	128 (73.6)	88 (71.5)
	2	28 (21.9)	30 (34.1)	47 (36.7)	43 (48.9)	53 (41.4)	15 (17.0)	F = NS M = 6.545 (0.038)		
Pilates	1	14 (14.6)	0 (0)	51 (53.1)	2 (33.3)	31 (48.4)	4 (66.7)	F = NS	96 (55.2)	6 (4.9)
	2	25 (26.0)	0 (0)	35 (36.5)	5 (83.3)	36 (37.5)	1 (16.7)	M = NS		
CrossFit	1	3 (10.7)	0 (0)	14 (50.0)	25 (65.8)	11 (39.3)	13 (34.2)	F = NS M = NS	28 (16.1)	38 (30.9)
	2	5 (17.9)	10 (26.3)	16 (57.1)	25 (65.8)	7 (25.0)	3 (7.9)	F = 7.231 (0.027) M = NS		
Strength	1	8 (12.7)	2 (1.9)	21 (33.3)	61 (59.2)	34 (54.0)	40 (38.8)	F = 14.092 (0.001) M = 11.498 (0.003)	63 (36.2)	103 (83.7)
	2	10 (15.9)	30 (29.1)	19 (30.2)	57 (55.3)	34 (54.0)	16 (15.5)	F = 7.665 (0.022) M = 6.388 (0.041)		
Spinning	1	20 (17.4)	2 (2.8)	59 (51.3)	44 (61.1)	36 (31.3)	26 (36.1)	F = 10.728 (0.005) M = 7.044 (0.030)	115 (66.1)	72 (58.5)
	2	36 (31.3)	23 (31.9)	39 (33.9)	32 (44.4)	40 (34.8)	17 (23.6)	F = 10.357 (0.006) M = NS		

G: Group; 1: Body Mass Index; 2: Body Weight Perception.

overweight/obese male (n = 44; 58.7%), swimming: normal weight male (n = 53; 60.2%), strength exercises: overweight/obese female (n = 34; 54.0%) and normal weight male (n = 61; 59.2%), spinning exercises: normal weight female (n = 59; 51.3%) and normal weight men (n = 44; 61.1%). According to BWP, walking and

swimming: normal male (n = 45; 60.0%; n = 43; 48.9%), CrossFit: normal weight female (n = 16; 57.1%), strength activities: overweight/obese female (n = 34; 54.0%) and normal weight male (n = 57; 55.3%), and spinning exercises: overweight/obese female (n = 40; 34.8%) prefer (p < 0.05).

**Table 4.** Distribution of weekly physical activity durations and frequencies relative to the BMI and BWP classifications

Gender	≤ 2 days / week Insufficiently active			≥ 3 days / week Meets activity recommendations			$\chi^2(p)$
	Body Weight Perceived						
	Underweight f (%)	Normal f (%)	Overweight f (%)	Underweight f (%)	Normal f (%)	Overweight f (%)	
Female	21 (50.0)	54 (88.5)	35 (49.3)	21 (50.0)	7 (11.5)	36 (50.7)	25.875 (0.000)
Male	13 (38.2)	46 (70.8)	14 (58.3)	21 (61.8)	19 (29.2)	10 (41.7)	9.806 (0.007)
Total	34 (44.7)	100 (79.4)	49 (51.6)	42 (55.3)	26 (20.6)	46 (48.4)	29.985 (0.000)
Body Mass Index							
Female	10 (47.6)	68 (76.4)	32 (50.0)	11 (52.4)	21 (23.6)	32 (50.0)	13.662 (0.001)
Male	2 (100.0)	32 (49.2)	39 (69.6)	0 (0)	33 (50.8)	17 (30.4)	6.588 (0.037)
Total	12 (52.2)	100 (64.9)	71 (59.2)	11 (47.8)	54 (35.1)	49 (40.8)	1.889 (0.389)
Gender	≤ 149 min / week			≥ 150 min / week			$\chi^2(p)$
	Body Weight Perceived						
	Underweight f (%)	Normal f (%)	Overweight f (%)	Underweight f (%)	Normal f (%)	Overweight f (%)	
Female	19 (45.2)	37 (60.7)	26 (36.6)	23 (54.8)	24 (39.3)	45 (63.4)	7.687 (0.021)
Male	8 (23.5)	18 (27.7)	8 (33.5)	26 (76.5)	47 (72.3)	16 (66.7)	0.676 (0.713)
Total	27 (35.5)	55 (43.7)	34 (35.8)	49 (64.5)	71 (56.3)	61 (64.2)	1.941 (0.379)
Body Mass Index							
Female	7 (33.3)	49 (55.1)	26 (40.6)	14 (66.7)	40 (44.9)	38 (59.4)	4.935 (0.085)
Male	2 (100.0)	11 (16.9)	21 (37.5)	0 (0)	54 (83.1)	35 (62.5)	11.690 (0.003)
Total	9 (39.1)	60 (39.0)	47 (39.2)	14 (60.9)	94 (61.0)	73 (60.8)	0.001 (0.999)

Table 4 presents to the distribution of weekly physical activity frequencies and durations relative to the BMI and BWP classifications. According to BWP, over 70% of the male and female (female: 88.5%; male: 70.8%) in normal weight category performed exercise  $\leq 2$  days ( $p < 0.05$ ). According to BMI 76.4% ( $n = 68$ ) of female and 49.2% ( $n = 32$ ) of male with normal weight category performed exercise  $\leq 2$  days ( $p < 0.05$ ). According to BMI 69.6% ( $n = 39$ ) of male in overweight/obese category performed exercises  $\leq 2$  days ( $p < 0.05$ ). According to both the classifications, it was seen that the female in overweight/obese category performed exercise  $\geq 3$  days is 50% (BWP:  $n = 36$ ; 50.7%; BMI:  $n = 32$ ; 50%) ( $p < 0.05$ ). Based on the weekly exercise durations, according to both the classifications, over 70% of male with normal weight were determined to be performing exercises for  $\geq 150$  min (BWP:  $n = 47$ ; 72.3%; BMI:  $n = 54$ ; 83.1%). Based on the weekly exercise durations, according to both the classifications 60.7% ( $n = 37$ ) of female in normal weight category who performed exercises  $\leq 2$  days were seen to perform the exercises for  $\leq 149$  min ( $p < 0.05$ ). According to both the classifications, when exercise frequency and duration were considered  $\geq 50\%$  of the female in overweight/obese category performed exercises  $\geq 3$  days and  $\geq 150$  min ( $p < 0.05$ ).

## Discussion

In this study the exercise preferences were examined regarding the type, duration and frequency based on BMI and BWP and through self-reporting method, the consistency between BMI and BWP was assessed. The participants, according to both the classifications, were categorized as underweight, normal and overweight/obese, and according to the aforementioned classifications, it was determined that there were the differences between the variables. These data based on self-reporting are among the frequently applied methods due to cost and facilitation [17]. In particular, the BMI method, calculated based on height and body weight, is a widely used method in determination of the healthy body weight or obesity in sedentary individuals [33].

In this regard, the study findings indicated that female in the normal weight category based on BMI classification, preferred spinning (51.3%), and according to BWP, preferred CrossFit exercises (57.1%). Besides, it was found that in both of the classifications, female performed the exercises 2 days or less ( $p < 0.05$ ). Based on weekly exercise durations, the study findings showed that the female performing exercise 2 days or less applied exercise

for 149 min or less based on BMI and BWP classifications, 51.1 % and 60.7 % ( $p < 0.05$ ) respectively (Tables 3, 4). In a study by Can et al. [7], it was reported that according to BMI classification, normal weight female participated to the exercises, including walking/running and strength as average 3 days in a week. However, the study findings indicated that normal weight female preferred more the exercises such as resistance, but not follow the WHO recommendations regarding the activity duration and frequency. The reason for this, it could be considered that the participants in the normal body weight category, preferred short and vigorous exercises types, because they aimed to expense more calories in a short time, and because of the reason, it would affect negatively on exercise duration and frequency. Besides, when it took into consideration the components that marital status due to being a female gender, child count and working life etc. conditions that affected physical activity, load more responsibilities to female may lead to affect the results.

According to BMI classification, the results of the present study showed that male in who normal weight category preferred more the combined exercise including strength, swimming, spinning (59.2%; 60.2%; 61.1% respectively) than the single type exercise. Furthermore, according to the weekly exercise frequency and durations, the study findings indicated that approximately half of the male (49.2%) participated the exercise for 2 days and less, however, 83.1% of them performed to the exercise for 150 minute and more ( $p < 0.05$ ) (Tables 3, 4). According to BWP classification, it was seen that the male who were normal weight also preferred the combined exercises including (walking, swimming, spinning) exercises (60.0%; 48.9%; 55.3% respectively). In addition, our findings related to exercise frequency and duration show that 70.8 % of male ( $p < 0.05$ ) participate 2 days in a week, and the duration of exercise in a week was 150 min and more (72.3%) ( $p > 0.05$ ). In this regard, according to both classifications, the results indicate that the male who normal weight category perform to the exercises in similar type, frequency and durations, but despite they participate to the exercise for 2 days and less, approximately 78% of them perform exercise for 150 min and more (Tables 3, 4). In literatures studies, Sirirassamee et al. [28] reported that male individuals who performed rigorous physical activities for more than 60 min in a day, had higher participation ratios in rigorous exercises in order to strengthen their muscles. Besides, because of the fact that males often associate their muscle mass with health, they prefer to look more masculine [19]. Arslan et. al. [2] stated that combined training was more efficient for not only increasing lean mass, but also for reducing total body fat and fat percentage. According to the present study in both classifications, our findings

suggest that although males participate to the exercise 2 days and less in a week, the total exercise duration is 150 min and more in a week, for that reason, the frequency may be compensated by increasing weekly duration.

The present study findings show that according to both classifications, female that are overweight/obese category prefer strength exercises (54.0%), and also, according to BWP classification prefer spinning exercises more (34.8%). In addition, the regard to exercise frequency and duration in a week, it is seen that female participate in the exercise 3 days and 150 min and more based on both classifications (Table 3, 4). Duncan et al. [10] reported that the false body weight perception among adults in the overweight/obese category was related to less exercise participation. In another study conducted by Kuan et al. [16], it was stated that female perceiving themselves as overweight had a higher tendency for behaviors like exercising. However, in this study results, overweight/obese individuals that participated in the exercises which providing more energy expenditure and increasing basal metabolic rate, in the desired level regarding frequency and duration, would be preferred via aiming body mass loss and to achieve more physical fitness.

The study findings according to BMI classification indicated that male overweight/obese preferred aerobic exercises such as walking, running (58.7%), and as weekly exercise frequency and duration, they participated 2 days and less (69.6%) and performed exercise 150 min and more (62.5%) ( $p < 0.05$ ). According to the BWP classification, the results showed that mostly (23.6%) spinning exercise was preferred ( $p > 0.05$ ), in addition, 58.3% of them participated in the exercises 2 days and less, 66.7% of them also performed the exercise weekly 150 min or more ( $p > 0.05$ ) (Table 3, 4). The results of the present study are conflicting with those reported. Öztürk Haney & Öztürk Çelik [24] reported that there was no relation between the BMI and physical activity participation level. Soyuer et al. [29] stated that as BMI increased the participation level to physical activity also decreased. Rasheed [26] presented that 15.8% of the overweight/obese individuals participated in exercises weekly  $\leq 2$  days, and also the ratio of participated for  $\geq 3$  days was 17.5%. Can et al. [7] reported that according to BMI classification overweight male participated in walking/running (35.3%) and strength (48.6%) exercises on an average of 3 days a week. Based on self-reporting, in a study conducted with adolescents, according to BMI, the ratio of the ones meeting the PA recommendations is 25.3% and it is 27.4% according to BWP [14]. In regard to the results of these studies, in overweight/obese male, the exercise preferences based on BMI and BWP mostly change, however, they are considered to participate in the exercises at similar levels regarding the frequency and duration. Besides, there are several

factors including age, gender, physical fitness level, etc. that affect participation in physical activity [6]. In this context, considering that male experiencing hardship in finding enough time for exercise due to conditions such as work-life, occupation, etc. it may be suggested that they are trying to compensate for the frequency by more time spending on one session.

In literature, the studies conducted on BMI and BWP consistency reported different findings that were found among genders, indicated that female perceived themselves as fatter, male also thinner [4, 28]. The consistency between the methods is emphasized as an important factor affecting healthy life behaviors such as exercising. In this regard, the results of the study present, according to the categorical classification, the female and male are underweight based on BMI and BWP respectively, female are at a ratio of 12.1%, and 24.1%, and male are at 1.6% and 27.6%. In considered the study results for both genders, it could be said that the individuals identified themselves in an underweight category at a high ratio according to BWP. However, the rates of the results indicate that male consider themselves as thin at higher ratios than female according to BWP (Figure 1). The results in consistency of underweight category between both methods show that only 9.8% of the female and 1.6% of the male are actually underweight category (Table 2). Another results of the study in female related normal weight category according to BMI and BWP respectively are seen as 51.1% and 35.1%, but for male in the normal weight category, the same ratios (52.8%) that are seen in both methods is remarkable. According to the consistency results for in female and male respectively between the methods are found 26.4% and 30.1% (Table 2). The female's ratios identified themselves as overweight/obese according to BMI and BWP respectively are seen 36.7% and 40.8%, male also in this category are 45.5% and 19.5%. The findings indicate that according to both methods while the ratios are close with each other in obese female but in male having the differences between the ratios approximately more than 50%. Based on these findings, it could be said that male's tendency to see themselves as overweight is lower. The consistency results that belong to this category in female and male show respectively 30.5% and 17.9%. In line with these findings, approximately 60% of the participants in all categories, have given consistent responses (in female "average" and in male "weak" level of conformity;  $p < 0.001$ ) (Table 2). In literature studies conducted on the consistency between the BMI and BWP, Badrin et al. [3] reported that the consistency (accurate) is at a level of 54.2% in participants that given responses between BWP and actual measured BMI. Koçyiğit et al. [15] reported that the consistency between the BMI and BWP classification was at "good" level in

male and at "average" level in female (respectively  $\kappa = 0.61$ ,  $p = 0.024$ ,  $\kappa = 0.53$ ,  $p = 0.014$ ). In a study "Body Weight Perception Research" conducted in Turkey by Ministry of Health in 2012 [30] found the consistency at the measured BMI and BWP classification was reported to be "weak" in both genders, and that one of every two individuals did not perceive their body weight accurately. In addition, they stated that the education level was an important factor on given the responses as accurate because as the education level increased the people with accurate responses increased in BWP. Dorsey et al. [9] reported that the factors including to be male gender and low education level are important components to the perceiving false bodyweight probability was higher; another study conducted by Alwan et al. [1] stated that the perceiving false bodyweight probability was related to the different social-economic conditions that consist of education, occupation, income, etc. and to be female gender and overweight. There was another opinion that presented the age increased progressively was an independent factor from gender, especially changed bodyweight perception of individuals [15, 21]. In a study conducted with adolescents, it was stated that the probability for both genders to perceive themselves as overweight/obese was high [13]. In another study, the results reported that male were in the tendency to estimate their body weights higher, female's tendency also lower [25]. The limitations of the present study are that education level for approximately 57% being at university or higher level (female: 59.8%; male: 52.8%), general health perception being at "good" level with approximately 48%, and also, participants being individuals performing regular exercise may be considered to have affected the results (Table 1). Besides, other limitations, this study was used subjective two methods and without objective method.

## Conclusion

In conclusion, the study findings provide evidence that exercise type and application protocol could have an effect on exercise frequency and duration. Additionally, in the consistency findings based on both methods, it could say that the consistency was being higher among female who at exercise participation level, having similar exercise preference, frequency, and duration. In addition, it is considered that giving exercise recommendations only based on self-reporting methods may be misleading on exercise behaviors, and thus exercise recommendations should be given after objective measurements and calculations are made.

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