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Investigation of muscle appearance satisfaction in active sports individuals

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Abstract. The aim of this study is to examine the muscle appearance satisfaction levels of individuals who exercise regularly. In the study, the Muscle Appearance Satisfaction Scale developed by Mayville et al. (2002) and validity and reliability study conducted by Selvi and Bozo (2020) was used. In the study, independent t test was used for pairwise comparisons, ANOVA for multiple comparisons and Pearson correlation analysis test for correlations. When the research findings were examined, no significant difference was found in the gender factor ($p>0.05$), while the findings related to the department factor showed that individuals studying in the department of sports management differed significantly compared to individuals studying in the department of physical education and sports teaching. In addition, it was determined that the muscle appearance satisfaction levels of individuals who are members of the gym are higher and the muscle appearance satisfaction levels of individuals who use supplements are significantly different from those who do not use supplements ($p<0.05$). As a result, it was revealed that sports is a choice in terms of both physical and physiological health as well as ideal appearance. However, at this point, it is necessary to be careful not to create emotional states such as exercise addiction. When evaluated in terms of muscle appearance satisfaction, it is very important in creating a healthy society. It can be said that factors such as gym membership and supplement use can play an effective role in achieving physical appearance.

Introduction

The widespread recognition of the positive effects of sport on health is increasing participation in physical activity worldwide. Regular physical activity provides many physical, mental and social benefits to individuals. However, a state of well-being occurs in people. According to the World Health Organisation, the concept of health is defined as 'the state of complete physical, social and mental well-being'. For this reason, it can be said that regular exercise at regular intervals instead of a sedentary life works as a defence mechanism against many diseases such as cardiovascular diseases, diabetes, obesity, cancer and osteoporosis. However, it also has positive effects such as coping with problems, gaining more effective problem solving skills, decreasing anxiety level, having a wide social environment, communicating effectively, and ensuring that body muscles work effectively and regularly (Boz et al., 2023). Historically, research on physical appearance has generally focused on women, but recently, the development of men's thoughts about body perception has changed the focus of these studies (Pickett et al., 2005; González-Martí et al., 2012). Women and men vary in terms of ideal body appearance. While women's perception of ideal physical appearance is perceived as a thin body, men's ideal body perception is perceived as a thin but more muscular structure (Pope et al., 2000; Pickett et al., 2005; Raevuori et al., 2006; Nowell and Ricciardelli, 2008).

With the increasing interest of people in their bodies, muscle dysmorphia (Jin et al., 2015), which is mostly seen in adult women, has recently emerged as a psychological condition (Pope et al., 1993; Pope et al., 1997; Olivardia et al., 2000). Commonly, people have symptoms such as avoiding mirrors, basing personal values on muscle size, seeking reassurance, finding a reference related to muscle size, excessive weight training, camouflaging physique with loose clothing, and steroid use (Mayville et al., 2002).

In addition, adverts on social media have led to a change in people's perception of the ideal body. By imposing the thin body perception on society, it

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has also led to body dissatisfaction, especially in young and adult women (Levine and Murnen, 2009; Homan et al., 2012). Sociocultural pressures, the influence of social media, low self-esteem, body dissatisfaction and various health-related consequences of behaviours such as eating disorders constitute an important experimental field in terms of experimental studies on people (Benton and Karazsia., 2015).

As a result of all these, it is seen that the increase in people's body perception has positive effects as well as negative effects. However, despite the negative effects, the fact that people's body perception has increased ensures their regular participation in physical activity and opens a way for everyone in the society to interact from small to large. Active sports can lead to both positive and negative psychological consequences in individuals. However, negative emotional states such as exercise addiction may occur in people. For this reason, the satisfaction levels of individuals who exercise regularly regarding their muscles may differ according to the psychological state they are in. When the literature studies are examined, it is seen that there are many psychological conditions that affect people. Many of these factors are potential factors that can affect the level of muscle appearance satisfaction in individuals. This issue, which is very important for athletes, needs a wide research in the literature. As a result of this information, the aim of our research is to examine the muscle appearance satisfaction levels of individuals who exercise regularly.

Materials and Methods

In this study, comparison method from quantitative research methods and 'Muscle Appearance Satisfaction Scale' were used. The participant group was asked questions about gender, department, gym membership and supplement use. The population of the study consisted of students who regularly exercise at the Faculties of Sports Sciences, while the sample group consisted of a total of 228 people, 121 women and 107 men, who were selected from this population by convenience sampling method and who wanted to participate voluntarily in the study. Karagöz (2017) defined convenience sampling as 'the shortest way to obtain data quickly and cheaply'. Düzenli egzersiz yapmayan bireyler araştırmaya dahil edilmemiş ve araştırma olanakları açısından sınırlılık oluşturmaktadır.

Data Collection Tools

Demographic Information Form:

The demographic information form developed to collect data on the participants' gender, department, gym membership and supplement use was prepared by the researchers.

Muscle Appearance Satisfaction Scale (MASS):

MASS was developed by Mayville et al. (2002) for the evaluation of muscle dysmorphia symptoms. Turkish validity and reliability studies were carried out by Selvi and Bozo (2020). The scale is 5-point Likert-type and consists of 19 items and 5 sub-dimensions. These sub-dimensions are commitment to bodybuilding, dissatisfaction with muscles, physical injury, supplement use, and muscle examination. Items 1, 4 and 14 belonging to the sub-dimension of dissatisfaction with muscles are reverse coded.

Analysing the Data

'Statistical Package for Social Sciences' (SPSS) Version 22.0 statistical programme was used in the statistical analysis of the data obtained from the study. In the analysis of the normality test, parametric tests were applied since the kurtosis skewness values were in the range of ±2 (George and Mallery, 2010). Significance was accepted as $p<0.05$. Independent t test was used to compare the differences between two independent groups and One-Way ANOVA test was used to compare more than two independent groups. Pearson correlation test was used for correlation analysis tests.

Results

Table 1 shows the demographic information form for the participants. A total of 228 people, 121 women and 107 men, participated in the research. It is seen that 135 of the participants are members of a gym and 51 of them use supplements.

Table 2 shows the comparison results related to the gender factor of the MASS. When the obtained data were analysed, it was determined that there was no statistically significant difference regarding the gender factor.

Table 1. Demographic Information Form

		N	%
Gender	Female	121	53,1
	Male	107	46,9
Department	Physical Education and Sports Teaching	70	30,6
	Coaching Education	74	32,5
	Sport Management	56	24,6
	Recreation	28	12,3
Gym membership	Yes	135	59,2
	No	93	40,8
Supplement use	Yes	51	22,4
	No	177	77,6
	Total	228	100,0

Table 2. Analysis Results Related to Gender Factor

	Gender	N	x	Sd	t	p
Commitment to Bodybuilding	Female	121	14,85	2,50	1,466	,144
	Male	107	14,36	2,61		
Dissatisfaction with Muscles	Female	121	7,60	1,97	,318	,751
	Male	107	7,52	1,81		
Physical Injury	Female	121	8,40	2,84	-,060	,952
	Male	107	8,42	3,18		
Supplement Use	Female	121	9,82	3,20	,667	,506
	Male	107	9,54	3,03		
Analysing Muscles	Female	121	10,11	3,18	,914	,362
	Male	107	9,73	3,05		

Table 3. Multiple Comparison Results for Department Factor

	Department	N	x	Sd	F	p	Tukey
Commitment to Bodybuilding	A Physical Education and Sports Teaching	70	14,10	2,53	4,146	,007*	C>A
	B Coaching Education	74	14,66	2,02			
	C Sport Management	56	15,54	3,06			
	D Recreation	28	13,96	2,35			
Dissatisfaction with Muscles	A Physical Education and Sports Teaching	70	7,61	1,80	2,207	,088	
	B Coaching Education	74	7,31	1,70			
	C Sport Management	56	7,45	2,23			
	D Recreation	28	8,36	1,73			
Physical Injury	A Physical Education and Sports Teaching	70	8,01	3,13	3,617	,014*	C>D
	B Coaching Education	74	8,68	2,99			
	C Sport Management	56	9,18	2,84			
	D Recreation	28	7,14	2,51			
Supplement Use	A Physical Education and Sports Teaching	70	9,47	3,35	2,082	,103	
	B Coaching Education	74	9,24	2,69			
	C Sport Management	56	10,55	3,11			
	D Recreation	28	9,68	3,39			
Analysing Muscles	A Physical Education and Sports Teaching	70	9,49	3,07	2,210	,088	
	B Coaching Education	74	9,82	2,64			
	C Sport Management	56	10,82	3,80			
	D Recreation	28	9,54	2,66			

p<0.05 significant difference

*A Physical Education and Sports Teaching *B Coaching Education *C Sport Management *D Recreation

In Table 3, where the results of multiple comparisons related to the department of education of the participants are given, it was determined that there was a statistically significant difference in the sub-dimensions of commitment to bodybuilding and physical injury. In the sub-dimension of commitment to bodybuilding, it was determined that individuals studying in the sports management department differed statistically significantly from individuals studying in the teaching department. In the sub-dimension of physical injury, it was determined that individuals studying in the sports management department differed at a statistically significant level compared to individuals studying in the recreation department. It is seen that there

is no significant difference in the sub-dimensions of dissatisfaction with muscles, use of supplements and examination of muscles.

Table 4. Comparison Results Regarding the Factor of Gym Membership

	Gym membership	N	x	Sd	t	p
Commitment to Bodybuilding	Yes	135	14,96	2,37	2,523	,013*
	No	93	14,08	2,71		
Dissatisfaction with Muscles	Yes	135	7,19	1,76	-3,673	,000*
	No	93	8,11	1,96		
Physical Injury	Yes	135	8,73	3,02	2,081	,039*
	No	93	7,89	2,88		
Supplement Use	Yes	135	9,88	3,10	1,059	,291
	No	93	9,43	3,15		
Analysing Muscles	Yes	135	10,19	3,07	1,441	,151
	No	93	9,59	3,16		

*p<0.05 significant difference

In Table 4, where the results of the analyses related to the gym membership of the participants are shown, statistically significant differences were found in the sub-dimensions of commitment to bodybuilding, dissatisfaction with muscles and physical injury. In the sub-dimensions of commitment to bodybuilding and physical injury, it was determined that the average scores of individuals who were members of the gym were high. In the sub-dimension of dissatisfaction with the muscles, it was determined that the average scores of individuals who were not members of the gym were higher and they experienced higher dissatisfaction. No significant difference was found in the sub-dimensions of supplement use and muscle examination.

Table 5. Comparison Results on Supplement Use

	Supplement use	N	x	Sd	t	p
Commitment to Bodybuilding	Yes	51	15,46	2,61	2,473	,014*
	No	177	14,43	2,53		
Dissatisfaction with Muscles	Yes	51	6,88	1,70	-2,847	,005*
	No	177	7,74	1,91		
Physical Injury	Yes	51	9,77	2,76	3,507	,001*
	No	177	8,09	2,98		
Supplement Use	Yes	51	11,04	3,15	3,397	,001*
	No	177	9,35	3,03		
Analysing Muscles	Yes	51	11,13	3,23	3,060	,002*
	No	177	9,59	3,05		

*p<0.05 significant difference

Table 6. Muscle Appearance Satisfaction Scale Correlation Analysis

		1	2	3	4	5
1. Commitment to Bodybuilding	r	1				
	p					
2. Dissatisfaction with Muscles	r	-,303*	1			
	p	,000				
3. Physical Injury	r	,605*	-,311*	1		
	p	,000	,000			
4. Supplement Use	r	,690*	-,005	,560*	1	
	p	,000	,939	,000		
5. Analysing Muscles	r	,692*	-,141*	,634*	,760*	1
	p	,000	,033	,000	,000	

*p< 0.05 significant difference

Table 5 shows the comparison results related to supplement use. According to the data obtained, it was determined that individuals using supplements differed significantly in the sub-dimensions of commitment to bodybuilding, physical injury, supplement use and muscle examination. In the sub-dimension of dissatisfaction with muscles, it was determined that the dissatisfied scores of individuals who did

not use supplements were higher and showed a significant difference.

Table 6 shows the results of the correlation analyses between the sub-dimensions of MASS. Accordingly;

There is a low level negative relationship between the sub-dimension of commitment to bodybuilding and the sub-dimension of dissatisfaction with muscles,

There is a moderate positive relationship between the sub-dimension of commitment to bodybuilding and the sub-dimensions of physical injury, supplement use and muscle examination,

There is a low level negative relationship between the sub-dimension of dissatisfaction with muscles and the sub-dimension of physical injury and examination of muscles,

There is a moderate positive relationship between the physical injury sub-dimension and the use of supplements and muscle examination sub-dimensions,

It can be said that there is a high level of positive relationship between the sub-dimension of supplement use and the sub-dimensions of examining muscles.

Discussion

Increasing participation in sports in the society may enable the emergence of a healthier generation. As a matter of fact, it is one of the benefits of sports that should not be ignored that innovative and healthy life-oriented thoughts can emerge with sports. With the increase in motivation to participate in sports, people turn towards their physical appearance as well as personal egos. However, the fact that physical appearance comes to mind as a muscular body, especially in men, has also revealed muscle appearance satisfaction. For this reason, our research aims to examine muscle appearance satisfaction in individuals who do regular sports.

When our research findings were examined, no significant difference was found in muscle appearance satisfaction levels between genders. Eraslan and Aydoğan (2016) examined the satisfaction levels of individuals who do sports in terms of gender factor and no significant difference was found. Köroğlu et al. (2023) did not find a significant difference in the body image levels of exercising individuals according to the gender factor in their study. In addition, in the study in which the body perceptions of the students of the faculty of sport sciences were examined, it was determined that there was no significant difference between genders (Güven and Solmaz, 2021).

Hacıbebekoğlu et al. (2023) examined the muscle appearance satisfaction of fitness centre members and found a significant difference between genders in favour of women. Boz et al. (2023), who examined the muscle appearance satisfaction of university students, found a significant difference between genders. It is seen that the average scores of male participants are higher in the total results of commitment to bodybuilding, physical injury, supplement use, muscle examination and muscle appearance satisfaction. In the sub-dimension of satisfaction with muscles, it is seen that the mean scores of women are higher than those of men. Cafri and Thompson (2004) found statistically significant differences between genders in favour of men in their study. In a study examining the body perceptions of men and women, it was found that the body appearance scores of male participants were higher than those of women (de Souto Barreto et al., 2011). In a study examining the body awareness of individuals engaged in bodybuilding sports, it was concluded that male participants differed significantly more than females in the sub-dimensions of physical injury and supplement use (Idgö, 2024).

Also Reboussin et al. (2000) found that factors such as body fat, body mass index and cardiovascular fitness accounted for 30% of the total variance in body appearance for men and 19% of the total variance for women. In the light of the information obtained from the literature, there are studies that are not similar to our study. This difference may be attributed to the fact that our sample group consists of men and women who exercise regularly, and as a result, both groups are quite satisfied with their physical appearance.

In Table 3, the results of the analyses related to the department in which the participants were studying revealed that the individuals studying in the sports management department showed a significant difference in the sub-dimension of commitment to bodybuilding compared to the individuals in the teaching department. In addition, in the sub-dimension of physical injury, it is seen that the average scores of the individuals studying in the sports management department are higher than the individuals studying in the recreation department.

In the study examining the body perception levels of the participants regarding the departments they studied, significant differences were found. It was determined that the average scores of individuals in the department of sports management and physical education and sports teaching department showed significant differences compared to students in the department of coaching education (Güven and Solmaz, 2022). In another study, Güven and Solmaz (2021) found a significant difference in the departments in which the participants studied. It was determined that coaching education students had higher body perception scores than physical education and sports teaching students.

Table 4 shows the results of the analyses related to the participants' gym membership. According to this, it was determined that the average scores of individuals who were members of the gym were high in the sub-dimensions of commitment to bodybuilding, dissatisfaction with muscles and physical injury. Köroğlu et al. (2023) found significant differences in the results of their analyses on the frequency of coming to the gym. They found that individuals who came 5 days or more showed a significant difference compared to individuals who came 1 day. Boz et al. (2023) included the results of analyses related to the reasons for fitness of the participants in their study. Accordingly, in the sub-dimension of satisfaction with the muscles, it was concluded that the participants did fitness in order to achieve sportive success. In the use of supplements and total results, it was concluded that the reason for the participants to do fitness was to look muscular. As a result, it can be said that individuals who do fitness for the purpose of achieving sportive success more professionally have higher levels of satisfaction with muscles. In the light of the information obtained, when this study is associated with our research, the higher muscle appearance satisfaction of individuals who are members of the gym may reveal that individuals who are members of the gym are in expectation in terms of sportive success and physical development.

In order to increase muscle volume in individuals who exercise, it is especially necessary to take the necessary macronutrients into the body. If the nutrients taken into the body daily are insufficient, it will be very important to eliminate this deficiency with the use of supplements. The results of the analysis of the participants' supplement use in our study are given in Table 5. According to the results obtained, significant results were obtained in favour of individuals using supplements. Ünal (2022) examined the age, height, body weight and body mass indexes of individuals using ergogenic support products in his study and did not find a significant difference in these factors for the use of ergogenic support products. In addition, there was no significant difference in the results of self-identification of individuals using ergogenic support products at amateur and professional level. Babusa et al. (2012) stated that the sub-dimension of substance use is related to various factors in the model created in their study. It is seen that this sub-dimension is in a relational model with factors such as age, body mass index (BMI), self-esteem, drive for thinness, years of exercise, use of food supplements, and steroid use.

The results of the correlation analysis of muscle appearance satisfaction are given in Table 6. In the data obtained, it was determined that there were significant relationships between the sub-dimensions of the muscle appearance satisfaction scale. Boz et al. (2023) found that there were significant relationships between the sub-dimensions of the muscle appearance satisfaction scale in their study. In the study examining the muscle appearance satisfaction levels of Mexican men, it was determined that there was a significant relationship between the sub-dimensions of MASS (Escoto Ponce de León et al., 2018).

In the literature studies related to the research topic, sufficient resources could not be reached. For this reason, considering the deficiencies related to the research results, it is thought that the findings we have obtained will provide very important contributions.

Conclusion

As a result, it is seen that physical appearance today is a muscular fit structure for men and a thin and weak structure for women. Recently, with the influence of social media, people's body perceptions have gradually increased. Indeed, the increase in personal self-care levels has raised an awareness in people. Especially giving importance to physical appearance is at the forefront of this personal awareness. Sports have emerged in terms of both physical and physiological health as well as ideal appearance. However, at this point, it is necessary to pay attention not to create emotional states such as exercise addiction. When evaluated in terms of muscle appearance satisfaction, it is very important for the creation of a healthy society. In addition, being a member of a

gym can offer relaxation and satisfaction in the time left over from busy work life. Regular exercise, especially for individuals working at a desk, is very important to get away from work stress. Psychological readiness is essential for individuals competing at a professional level to resist the psychological pressure on the field. One of the ways to strengthen psychological readiness is the use of appropriate food supplements. As a matter of fact, proper nutrition and appropriate food supplements ensure physical well-being. In order to increase muscle appearance satisfaction in professional athletes, proper sports guidance and psychosocial support should be provided by their coaches. The application of the correct sports guidance for the conscious use of appropriate food supplements within the support to be provided is a very important key to success. For this reason, it is essential that the athlete's satisfaction with both muscle appearance and psychological well-being are high.

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Conflict of interest

The authors declare that there is no conflict of interest regarding this article.

Ethics approval and consent to participate

The study was approved by the local ethics committee (Protocol number 143, 30.12.2024, Ethics Committee of Selcuk University, Faculty of Sports Science, Konya, Turkey) in accordance with the Declaration of Helsinki. Before the assessment, every participant received the same detailed information about the procedure.

Authors' Contribution

Study Design: BFT, YB
Data Collection: BFT, YB
Statistical Analysis: BFT, YB
Manuscript Preparation: BFT, YB
Funding Acquisition: BFT, YB

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