Cyprus Turkish Journal of Psychiatry & Psychology Vol.4 Issue.1
Doi:10.35365/ctjpp.22.1.02

**RESEARCH ARTICLE / ARAŞTIRMA YAZISI**

# Investigation of the Relationship between Muscle Dysmorphia Disorder, Orthorexia Nervosa, and Motivation in Male Individuals Engaged in Bodybuilding Sports

## Vücut geliştirme sporu ile uğraşan erkek bireylerde kas algısı bozukluğu, ortoreksiya nervoza ve sporda güdülenme arasındaki ilişkinin incelenmesi

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**Abstract:**

Bodybuilding is a sport that challenges the individual both physically and mentally. The fact that this sport demands significant investment to one's body can affect the perception of the body over time. Such investments can be shaped by physical activities as well as by diet. The main purpose of this study is to investigate the relationship between sports motivation, muscle perception disorder and orthorexia nervosa in male individuals engaged in bodybuilding. 200 male individuals actively engaged in bodybuilding in TRNC participated in the study. Sociodemographic information form, Sports Motivation Scale-II, Ortho-11 and Muscle Perception Disorder Inventory were applied to the individuals participating in the study. SPSS 26 program was used to analyze the data. Descriptive analyzes of demographic variables of individuals, lowest and highest scores, mean and standard deviations were included in the study. In the study, relationships between scale scores were determined by using Pearson correlation, comparisons t-test analysis method. The results show that individuals who are engaged in bodybuilding have higher intrinsic motivation rather than external motivation. Significant difference is observed between use of ergogenic supplements and muscle perception disorder. As muscle perception disorder increases orthorexia neurosis will also increase ($p<0.05$). Motivations of individuals who are engaged in bodybuilding should be examined and proper information should be given to trainers and students about both muscle perception disorder, orthorexia neurosis and the use of ergogenic supplements

**Keywords:** Bodybuilding, motivation in sports, muscle perception disorder, orthorexia nervosa.

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**Date of Received/Geliş Tarihi:** 05.10.2021, **Date of Revision/Düzeltme Tarihi:** 15.12.2021, **Date of Acceptance/Kabul Tarihi:** 23.02.2022, **Date of Online Publication/Çevirimiçi Yayın Tarihi:** 09.03.2022
**Citing/Referans Gösterimi:** Abraş, H., Erdağ, D. &, Buran, A. (2022). Investigation of the Relationship between Muscle Dysmorphia Disorder, Orthorexia Nervosa, and Motivation in Male Individuals Engaged in Bodybuilding Sports, *Cyprus Turkish Journal of Psychiatry & Psychology, 4(1): 13-22*

**Öz:**

Vücut geliştirme sporunun gerek fiziksel gerekse mental olarak bireyi zorlayan bir spor olduğu bilinmektedir. Kişinin bedenine yönelik önemli bir yatırımda bulunduğu bu spor türünde, zaman içerisinde kişinin bedenine yönelik algıları da değişebilmektedir. Bireyin bedenine yaptığı yatırımlar spor gibi fiziksel aktivitelerle olduğu gibi, beslenme düzeni ile de şekillenebilmektedir. Bu çalışmanın temel amacı, vücut geliştirme sporu ile uğraşan erkek bireylerde spora yönelik motivasyonları, kas algısı bozukluğu ve ortoreksiya nervozanın ilişkisini araştırmaktır. Çalışmaya KKTC'de bölgesinde aktif olarak vücut geliştirme sporu ile uğraşan 200 erkek birey katılmıştır. Araştırmaya katılan bireylere sosyodemografik bilgi formu, Sporda Güdülenme Ölçeği-II, Orto-11 ve Kas Algısı Bozukluğu Envanteri uygulanmıştır. Verilerin analizinde SPSS 26 programı kullanılmıştır. Araştırmada bireylerin demografik değişkenlerine ilişkin betimsel analizler, en düşük ve en yüksek puan ile ortalama ve standart sapmalarına yer verilmiştir. Araştırmada ölçek puanları arasındaki ilişkiler Pearson korelasyon, karşılaştırmalar t-test analiz yöntemi kullanılarak saptanmıştır. Araştırma sonuçlarına göre vücut geliştirme sporu ile uğraşan bireylerde içsel motivasyonun dışsal motivasyondan daha yüksek olduğu, ergojenik besin destek ürünü kullanımı ile kas algısı bozukluğu arasında anlamlı bir farklılık olduğu ve kas algısı bozukluğu arttıkça ortoreksiya nervozanın artacağı saptanmıştır ($p<0.05$). Bu sonuçlar doğrultusunda vücut geliştirme sporu ile uğraşan bireylerin spora yönelik motivasyonlarının incelenmesi gerektiği, Beden Eğitimi ve Spor Yüksekokullarında ve antrenörlük eğitimlerinde gerek kas algısı bozukluğu ve ortoreksiya nevroza gerekse ergojenik besin destek ürünlerine yönelik bilgilendirmelerin yapılması gerektiği düşünülmektedir

**Anahtar Kelimeler:** Vücut geliştirme, Sporda motivasyon, kas algısı bozukluğu, ortoreksiya nevroza.

## Introduction

Bodybuilding is a sport branch based on a targeted program and aims an increase in muscle mass with equipment or bodyweight exercises (Alpar, 2011). The branch is mostly preferred by male individuals around the world as it expresses the ideal body structure for male individuals both socially and culturally. The individual's starting, increasing, maintaining, or quitting any physical activity depends on the individual's motivational status. According to the motivation type of the individuals doing sports, they exhibit behaviors that will change their diet and lifestyle (Gerrig & Zimbardo, 2014). In intrinsic motivation, the individual reflects a behavior as they enjoy it and are satisfied with the result. Intrinsically motivated individuals have a need for learning and success orientation. In extrinsic motivation, the individual exhibits the behavior in line with extrinsic factors. Extrinsically motivated individuals exhibits their behavior to achieve results. Instead of enjoying the behavior, the individual focuses on the benefits to be obtained as a result of the behavior (Yurt & Bozer, 2015).

Since bodybuilding sport has a lifestyle that requires serious discipline, some psychiatric disorders are observed in individuals interested in this sport over time (Andersen et al., 1995). Muscle dysmorphia is a psychiatric disorder that usually affects individuals who do bodybuilding sports and causes individuals to feel obsessed over seeing themselves as insufficient in terms of muscle mass. With the bodybuilding sport, which has increased in popularity in recent years, there has been a significant increase in the number of individuals who have muscle dysmorphia in direct proportion. Some symptoms observed in individuals with muscle dysmorphia are constantly observing their body in front of the mirror, excessively long exercise times, unconscious and compelling sports, high expenditures on ergogenic nutritional support products, and anabolic steroid use (Ozoglu and Hocaoglu, 2019). Since people with muscle dysmorphia think of themselves as weak, they usually try to cover their defective body parts by wearing long clothes. Individuals exhibiting such symptoms think their social and professional lives affect them because of the obsessions they experience, and they prefer to isolate themselves (Devrim & Bilgic, 2018).

A healthy diet plays a significant role in bodybuilding. Therefore, individuals become selective about food and adopt strict dietary rules and make it a lifestyle. However, this excessive effort on healthy eating turns into an obsession and a psychiatric disorder called orthorexia nervosa after a while (Dalmaz & Yurtdas, 2015). Orthorexia nervosa is a pathological obsession with consuming foods that are biologically pure and do not contain any traces of artificial substances, pesticides, and herbicides. Orthorexic individuals, unlike other nutritional disorders, are concerned with the content and quality of the food, not the quantity (Gezer and Kabaran, 2013). Orthorexic individuals are worried not only about the purity of the food, but also about the food preparation process, the cooking technique applied, the sterilization of the tools used, and they do not consume the foods they do not trust (Zamora et al., 2005). This situation causes nutritional deficiencies after a while and causes serious diseases such as bradycardia, hyponatremia, osteopenia, and metabolic acidosis observed in other eating disorders (Koven and Abry, 2015).

Although there are separate studies of sports motivation types, muscle dysmorphia, and orthorexia nervosa according to different types of sports, no study has been seen in which these three concepts are examined together for individuals engaged in bodybuilding sports. In this context, the main purpose of this study is to investigate the motivations for sports, the relationship between muscle dysmorphia and orthorexia nervosa in male individuals engaged in bodybuilding sports. Considering all these, in

this study, it was aimed to examine the type of motivation in individuals engaged in bodybuilding sports. In addition, it was investigated whether there is a relationship between the use of ergogenic nutritional supplements and the time spent in sports and muscle dysmorphia and whether there is a relationship between muscle dysmorphia and orthorexia nervosa. Considering the absence of a study of this content in the literature and the aims of this research, it is significant in terms of shedding light on future research in the field of sports psychology.

## Methods

In the research, the relational survey method, which is one of the quantitative research methods was used. The research data were collected with a questionnaire form and the data were collected face-to-face by the researcher. Before starting the research, ethical permissions were obtained by the Yakın Dogu University Scientific Research Evaluation and Ethics Commission. Before starting the survey, the information form was read to the participants by the researcher, and after the informed consent was obtained, the survey was started. Volunteer male participants aged between 18 and 58 engaged in bodybuilding were included in the study.

### Population and Sample

The population of the research consists of male individuals who are registered in gyms in the TRNC and are actively engaged in bodybuilding. The sample group of the study consists of 200 male individuals.

### Data Collection Tools

#### Sociodemographic Information Form

It is a form created by the researcher, which includes 6 questions to determine the demographic characteristics of the individual who does sports (age, how long he has been involved in sports, how many hours he does sports a week, how many meals a day he eats, whether he uses any nutritional supplements, etc.).

#### Motivation Scale in Sports-II

It is a scale consisting of 18 items and 6 sub-dimensions developed by Pelletier et al. (2013), and its validity and reliability were tested by Ocal and Sakalli in 2018. The scale is a self-report scale to determine the motivation of the person doing sports. Cronbach Alpha values of the scale for each sub-dimension (Intrinsic Motivation, Assimilation, Identification, Introjection, Extrinsic Regulation, Amotivation, and the total scale) were found respectively as 0.72, 0.61, 0.81, 0.55, 0.73, 0,72 and 0.76.

#### Ortho-11

It is the shortened version of ORTO-15 developed by Bratman (2000) It was determined that the Cronbach alpha value of the scale, whose Turkish validity and reliability are prepared by Arusoglu et al. (2008) was 0.62. Answers that are thought to be distinctive for orthorexia are given "1" points and answers that show normal eating behavior tendency are given "4" points. Low scores indicate orthorexic tendency.

#### Muscle Dysmorphia Disorder Inventory (MDDI)

It was developed by Hildebrant et al. (2004) to measure the diagnostic criteria of muscle dysmorphia and the emotional, cognitive, behavioral and perceptual dimensions of body image disorder. The Turkish validity and reliability of the scale were made for male athletes (Subaşı, Okray, & Çakıcı, 2018). MDDI is a 13-item, five-point Likert-type self-report scale. It is known that the internal reliability scores of the MDDI are 0.84 for the functional impairment sub-dimension, 0.77 for the appearance intolerance sub-dimension, 0.76 for the body size desire sub-dimension, and 0.81 for the overall total internal consistency coefficient.

### Data Collection Process

The data of this study were collected from male individuals who were registered in gyms in TRNC between November and December 2019 and actively engaged in bodybuilding.

A total of 223 people were reached during the data collection process, and 211 people volunteered to participate in the research. Data collection tools were applied to 211 volunteers. Since 11 participants gave incomplete and/or incorrect answers to the data collection tools, their answers were not used in the data analysis process.

In this study, first of all, the literature related to the field was scanned, similar studies and scales were examined, expert opinions on the training method and the approval of the Yakin Dogu Ethics Committee were obtained in order to ensure the internal validity of the scale, and the form was rearranged in line with these opinions. In the study, after obtaining the necessary ethics committee approval, the data collection process was started. The data collection process was carried out for 8 weeks, and it took an average of 10 minutes to fill out each questionnaire. The data collected from the individuals are kept completely confidential according to the principles of confidentiality and the data is stored in the google drive account in the personal archive of the researcher.

### Data Analysis

SPSS 26 program was used to analyze the data. In the study, descriptive analyzes of the demographic variables of individuals, the lowest and highest scores, and mean and standard deviations were included. In the study, relationships between scales scores were detected by using Pearson correlation, comparisons were detected by using the t-test analysis method..

### Results

The youngest of the individuals participating in the study is 18 years old and the oldest is 58 years old, and the average age is 29.75. Looking at the years of the individuals participating in the research to engage in sports, it was seen that it was at least 1 and at most 26 years, and the participants were engaged in sports for an average of 7.40 years. When the weekly hours of doing sports of the participants are examined, it is seen that they are engaged in sports for at least 1 and at most 17 hours, and this time is 6.91 hours on average. It was determined that the individuals participating in the study ate at least 2 and at most 9 meals a day, with an average of 4.49 meals.

**Table 1.** Descriptive analyzes of the scale scores of the individuals participating in the research

| | n | Min | Max | X± sd |
|---|---|---|---|---|
| Ortho-11 | 200 | 14,00 | 41,00 | 24,28±5,09 |
| MDDI functional impairment | 200 | 5,00 | 35,00 | 17,96±7,20 |
| MDDI appearance intolerance | 200 | 3,00 | 19,00 | 7,40±4,13 |
| MDDI Drive for size | 200 | 5,00 | 35,00 | 14,50±7,50 |
| Intrinsic Motivation | 200 | 3,00 | 21,00 | 16,72±5,01 |
| Assimilation | 200 | 3,00 | 21,00 | 15,57±4,93 |
| Identification | 200 | 3,00 | 21,00 | 13,38±3,62 |
| Introjection | 200 | 3,00 | 21,00 | 15,28±4,60 |
| Extrinsic Regulation | 200 | 3,00 | 21,00 | 8,44±4,25 |
| Amotivation | 200 | 3,00 | 21,00 | 7,25±4,29 |

When Table 1 is examined, it is seen that the individuals participating in the research got the lowest 14, the highest 41, and the average 24.28 points from the ORTO scale. The individuals participating in the study got the lowest 5 points, the highest 35 points, the average 17.96 points from the MDDI functional impairment sub-dimension, the lowest 3 points from the MDDI appearance intolerance sub-dimension, the lowest 3, and the highest 19, average 7.40 points from the MDDI body size sub-dimension, the lowest 5 highest 35 points, the average of 14.50 points. When the sports motivation scale was examined, the lowest 3 and the highest 21 points were obtained in all dimensions; When the sub-dimensions are examined, it was seen that the individuals participating in the research got an average of 16,72, an average of 15.57 from the assimilation sub-dimension, 13.38 from identification sub-dimension, 15.28 from the introjection sub-dimension, 8.44 from the external regulation sub-dimension and an average of 7.25 from the non-motivation sub-dimension.

**Table 2**. Correlation table of demographic variables and scale dimensions of individuals participating in the research

| | | ORTHO-11 | MDDI functional impairment | MDDI appearance intolerance | MDDI Drive for size | Intrinsic Motivation | Assimilation | Identification | Introjection | Extrinsic Regulation | Amotivation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | R | -0,04 | -0,007 | -0,18 | -0,14 | 0,02 | -0,05 | -0,05 | 0,005 | -0,09 | -0,08 |
| | P | 0,48 | 0,92 | ,011* | ,036* | 0,74 | 0,45 | 0,44 | 0,94 | 0,16 | 0,24 |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Year of sports | R | -,16* | 0,10 | -0,19 | -0,12 | 0,10 | 0,19 | 0,06 | 0,16 | 0,18 | -0,06 |
| | P | 0,02 | 0,13 | ,007* | 0,07 | 0,12 | ,006* | 0,35 | ,019* | ,009* | 0,35 |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Weekly sports time | R | 0,06 | 0,11 | -0,008 | -0,09 | 0,13 | 0,16 | 0,07 | 0,13 | -0,06 | -0,14 |
| | P | 0,4 | 0,09 | 0,90 | 0,20 | 0,05 | 0,02* | 0,31 | 0,06 | 0,39 | ,042* |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Daily meal amount | R | -0,07 | 0,07 | 0,01 | -0,10 | 0,10 | 0,09 | 0,09 | 0,08 | 0,01 | 0,02 |
| | P | 0,28 | 0,28 | 0,89 | 0,14 | 0,15 | 0,20 | 0,18 | 0,22 | 0,87 | 0,68 |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |

p<0,05*

When Table 2 is examined, it has been observed that there is a low negative correlation between the age of the individuals participating in the study and the scores of MDDI appearance intolerance and MDDI body size desire. According to this, as the age of the individuals participating in the research increases, the points of MDDI appearance intolerance and MDDI body size desire decrease. It was observed there was a low negative correlation between the years spent in sports by the individuals participating in the research and their ORTO scores and MDDI appearance intolerance scores, also a low positive correlation between the Sports Motivation Scale assimilation, introjection, and extrinsic regulation sub-dimensions scores. According to this, as the years spent by the individuals participating in the research increase, the ORTO and MDDI appearance intolerance scores decrease, and the scores of the Sports Motivation Scale assimilation, introjection, and external regulation sub-dimensions increase. It was seen that there is a low positive correlation between the weekly hours of doing sports and the Sports Motivation Scale's assimilation sub-dimension and a low negative correlation with the amotivation sub-dimension of the individuals participating in the study. Accordingly, as the weekly hours of doing sports of the individuals participating in the research increase, their assimilation scores increase and their amotivation sub-dimension scores decrease. It was observed that there was no statistically significant relationship between the number of meals per day of the individuals participating in the study and the ORTO, MDDI, and Sports Motivation Scale sub-dimensions.

**Table 3.** Correlation table regarding the scale scores of the individuals participating in the research

| | | ORTHO-11 | MDDI functional impairment | MDDI appearance intolerance | MDDI Drive for size | Intrinsic Motivation | Assimilation | Identification | Introjection | Extrinsic Regulation | Amotivation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ORTHO-11 | r | 1 | | | | | | | | | |
| | p | | | | | | | | | | |
| | N | 200 | | | | | | | | | |
| MDDI functional impairment | r | -,27 | 1 | | | | | | | | |
| | p | 0,00* | | | | | | | | | |
| | N | 200 | 200 | | | | | | | | |
| MDDI appearance intolerance | r | 0,06 | ,340 | 1 | | | | | | | |
| | p | 0,34 | 0,00* | | | | | | | | |
| | N | 200 | 200 | 200 | | | | | | | |
| MDDI Drive for size | r | -0,02 | ,48 | ,41 | 1 | | | | | | |
| | p | 0,76 | 0,00* | 0,00* | | | | | | | |
| | N | 200 | 200 | 200 | 200 | | | | | | |
| Intrinsic Motivation | r | -0,07 | ,26 | -,14 | 0,10 | 1 | | | | | |
| | p | 0,30 | 0,00* | 0,04* | 0,15 | | | | | | |
| | N | 200 | 200 | 200 | 200 | 200 | | | | | |
| Assimilation | r | -,15 | ,38 | -0,10 | ,14 | ,79 | 1 | | | | |
| | p | 0,02* | 0,00* | 0,14 | 0,03* | 0,00* | | | | | |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | | | | |
| Identification | r | 0,009 | ,28 | 0,07 | ,19 | ,65 | ,69 | 1 | | | |
| | p | 0,90 | 0,00* | 0,27 | 0,005* | 0,00* | 0,00* | | | | |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | | | |
| Introjection | r | -,14 | ,37 | -0,02 | ,14 | ,70 | ,73 | ,71 | 1 | | |
| | p | 0,04* | 0,00* | 0,69 | 0,04* | 0,00* | 0,00* | 0,00* | | | |

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | | |
| Extrinsic Regulation | r | 0,003 | ,20 | ,20 | ,18 | -0,07 | 0,13 | ,20 | ,18 | 1 | |
| | P | 0,96 | 0,003* | 0,004* | 0,009* | 0,30 | 0,06 | 0,003* | 0,009* | | |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | |
| Amotivation | r | ,14 | 0,03 | ,37 | ,18 | -,28 | -,23 | ,24 | -0,07 | ,37 | 1 |
| | P | 0,04* | 0,64 | 0,00* | 0,007* | 0,00* | 0,001* | 0,00* | 0,32 | 0,00* | |
| | N | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |

p<0,05*

It was observed that there is a positive low-level correlation between the functional impairment of MDDI and the sub-dimensions of intrinsic motivation, assimilation, identification, introjection, and extrinsic regulation of the individuals participating in the study. Accordingly, as the MDDI functional impairment scores increase, the scores of intrinsic motivation, assimilation, identification, introjection, and extrinsic regulation increase. It was observed that there is a low negative correlation between the MDDI appearance intolerance scores and ORTO and intrinsic motivation scores of the individuals participating in the study, and a low positive correlation between extrinsic regulation and amotivation scores. Accordingly, as MDDI appearance intolerance scores increase, orthorexia nervosa and intrinsic motivation scores decrease, and extrinsic regulation and amotivation scores increase. It was observed there is a low positive correlation between the MDDI body size desire scores of the individuals participating in the study and their assimilation, identification, introjection, extrinsic regulation and amotivation scores. Accordingly, as the MDDI body size desire scores increase, the scores for assimilation, identification, introjection, external regulation, and amotivation increase (Table 3).

**Table 4**. Comparison of the nutritional support usage status and the scale scores of the individuals participating in the research

| | Nutritional support | N | Mean±Sd | T | p |
|---|---|---|---|---|---|
| ORTHO-11 | Yes | 124 | 24,45±5,36 | ,61 | ,53 |
| | No | 76 | 24,00±4,65 | | |
| MDDI functional impairment | Yes | 124 | 18,60±7,63 | 1,61 | ,10 |
| | No | 76 | 16,92±6,33 | | |
| MDDI appearance intolerance | Yes | 124 | 6,91±3,72 | -2,14 | ,04* |
| | No | 76 | 8,19±4,64 | | |
| MDDI Drive for size | Yes | 124 | 14,56±7,81 | ,14 | ,88 |
| | No | 76 | 14,40±7,02 | | |
| Intrinsic Motivation | Yes | 124 | 17,33±4,60 | 2,24 | ,026* |
| | No | 76 | 15,71±5,50 | | |
| Assimilation | Yes | 124 | 16,13±4,81 | 2,07 | ,03* |
| | No | 76 | 14,65±5,01 | | |
| Identification | Yes | 124 | 13,54±3,52 | ,79 | ,42 |
| | No | 76 | 13,11±3,80 | | |
| Introjection | Yes | 124 | 15,76±4,48 | 1,89 | ,05 |
| | No | 76 | 14,50±4,72 | | |
| Extrinsic Regulation | Yes | 124 | 8,26±3,95 | -,75 | ,44 |
| | No | 76 | 8,73±4,71 | | |
| Amotivation | Yes | 124 | 6,73±3,86 | -2,19 | ,03* |
| | No | 76 | 8,09±4,83 | | |

p<0,05*

When the table is examined, it has been seen that there is a statistically significant difference between the MDDI appearance intolerance scores of the individuals participating in the research and their use of nutritional supplements. Individuals who do not use nutritional supplements have statistically higher MDDI appearance intolerance scores than those who do. When the table is examined, it is seen that there is a statistically significant difference between the scores of the internal motivation and assimilation sub-dimensions of the individuals who use nutritional supplements compared to those who do not. Accordingly, the intrinsic motivation and assimilation sub-dimension scores of individuals who use nutritional supplements are higher than those who do not use nutritional supplements. The amotivation scores of the individuals participating in the study who do not use nutritional supplements are statistically higher than those who use nutritional supplements (Table 4).

**Table 5**. Comparison of the scale scores of the individuals participating in the research with other sports

| | Other sports | N | Mean±Sd | T | p |
|---|---|---|---|---|---|
| ORTHO-11 | Yes | 67 | 23,50±4,60 | -1,53 | ,12 |
| | No | 133 | 24,67±5,30 | | |
| MDDI functional impairment | Yes | 67 | 19,00±7,37 | 1,44 | ,15 |
| | No | 133 | 17,44±7,08 | | |
| MDDI appearance intolerance | Yes | 67 | 7,26±4,43 | -,33 | ,74 |
| | No | 133 | 7,47±3,99 | | |
| MDDI Drive for size | Yes | 67 | 14,22±7,45 | -,37 | ,70 |
| | No | 133 | 14,64±7,54 | | |
| Intrinsic Motivation | Yes | 67 | 16,88±5,14 | ,32 | ,74 |
| | No | 133 | 16,63±4,97 | | |
| Assimilation | Yes | 67 | 15,71±5,66 | ,28 | ,77 |
| | No | 133 | 15,50±4,54 | | |
| Identification | Yes | 67 | 12,83±3,71 | -1,51 | ,13 |
| | No | 133 | 13,65±3,56 | | |
| Introjection | Yes | 67 | 15,19±4,48 | -,19 | ,84 |
| | No | 133 | 15,33±4,68 | | |
| Extrinsic Regulation | Yes | 67 | 8,79±4,57 | ,81 | ,41 |
| | No | 133 | 8,27±4,09 | | |
| Amotivation | Yes | 67 | 7,08±4,37 | -,374 | ,709 |
| | No | 133 | 7,33±4,27 | | |

$p<0,05$*

When the table is examined, it has been observed that there is no statistically significant difference in the comparison of the scores of the individuals participating in the research according to the status of engaging in other sports (Table 5).

## Discussion

In this study, it was aimed to investigate the motivations for sports, muscle dysmorphia and the relationship between orthorexia nervosa in men who are engaged in bodybuilding sports. In this direction, it has been determined that intrinsic motivation is more intense than extrinsic motivation in the individuals participating in the research, that high intrinsic motivation causes functional impairment in these individuals, and may also be a trigger for the emergence of orthorexia nervosa.

It is stated that the internal motivation of the athletes who are engaged in individual sports or elite athletes is higher and that external motivation is effective at the beginning of the participation in sports, while internal motivation is effective in maintaining the sport (Ryan et al., 1997; Gould et al., 1985). These findings support the research results. The individual's orientation to individual sports rather than team sports will lead to a self-centered approach to internal motivation, and it will be seen as a normal situation for the person to do sports individually rather than as a group (Benar and Loghmani, 2014; Howard et al., 2018).

Muscle deficiency, one of the most prominent symptoms of muscle dysmorphia disorder, causes individuals to use ergogenic nutritional supplements, anabolic and androgenic steroids, and as a result, individuals experience serious health problems (Dhar et al., 2005). Individuals see this behavior as a remedy to increase their muscle mass and overlook the health problems they will experience (Devrim and Bilgic, 2018). Khorramabady (2017), in his research with bodybuilders, found that athletes who use ergogenic nutritional supplements have a higher muscle dysmorphia than those who do not. Skemp et al. (2013), on the other hand, found that male individuals have a higher risk of muscle dysmorphia and are more prone to use ergogenic nutritional supplements than females in their study with bodybuilders. Hitzeroth et al. (2001) concluded in their study with bodybuilders that individuals with muscle dysmorphia are more prone to anabolic and androgenic steroid use as well as using ergogenic nutritional supplements. Compte et al. (2015) found that individuals at risk of muscle dysmorphia are prone to low self-esteem, eating disorders, and the use of ergogenic nutritional supplements. In addition, another study, Garcia et al. (2010), found that there is a significant relationship between muscle dysmorphia and ergogenic nutritional support use status of male individuals who want to increase muscle mass. Accordingly, in support of this study, it was observed that muscle perception disorder and ergogenic nutritional support usage increased in a similar way. In another study conducted with university students, it was found individuals with muscle dysmorphia are extremely obsessed with their diets and tend to use ergogenic nutritional supplements (Bo et al., 2014). All these findings show that the use of ergogenic nutritional supplements, whether in bodybuilding sports or other types of sports, may cause muscle dysmorphia, which is a mental health disorder.

In their study with male university students, Duran et al. (2020) concluded that individuals with muscle dysmorphia have an orthorexic tendency. Carraro et al. (2014) concluded that individuals with muscle dysmorphia may have a tendency not only to orthorexia nervosa, but also to all other eating disorders. Gorrasi et al. (2019) found a significant relationship between muscle dysmorphia and orthorexia nervosa in their study with university students. They also concluded that these individuals are at risk of other eating disorders. As a result of the literature review, there are not enough studies on muscle dysmorphia disorder and orthorexia nervosa, but there are studies on muscle dysmorphia and eating disorders. Mitchell et al. (2017) stated that there is a significant relationship between muscle dysmorphia and eating disorders in their study with male bodybuilders. Devrim et al. (2018) concluded in their study that individuals with eating disorders tend to experience body dissatisfaction and muscle dysmorphia. Giardino and Procidano (2012), in their research with individuals who go to the gym, concluded that individuals with muscle dysmorphia, regardless of gender and culture, show an orthorexic tendency. Goodale et al. (2001) stated that there is a significant relationship between muscle dysmorphia and orthorexia nervosa in their study with university students. All these results showed that muscle perception disorder can cause another mental disorder, orthorexia nervosa, and individuals who are particularly prone to muscle dysmorphia, who are engaged in bodybuilding sports, may also constitute a risk group for orthorexia nervosa, which is related to nutrition.

**Conclusion**

This research was conducted on men who are members of gyms in TRNC and who are engaged in bodybuilding. When the research results are examined; it has been determined that the individuals engaged in bodybuilding sports in the TRNC have higher intrinsic motivation than extrinsic motivation. It has been observed that the probability of muscle dysmorphia is higher in individuals engaged in bodybuilding in the TRNC, who use ergogenic nutritional supplements compared to individuals who do not. According to the results of the research, muscle dysmorphia does not increase as the time spent in sports increases. However, as the years spent in sports increase, it is seen that muscle dysmorphia increases. It has been observed that as muscle dysmorphia increases, orthorexia nervosa increases in individuals engaged in bodybuilding sports in the TRNC.

**Suggestions**

Considering the results of the research, it is thought that the trainers of these individuals can increase their motivation with internal motivation techniques instead of external motivation in order to ensure that individuals engaged in bodybuilding sports continue their sports. In addition, by measuring the sports motivations of individuals who have just started bodybuilding, it will be possible to gain motivations that can increase the continuity of these individuals towards sports.Considering that bodybuilding sports may be associated with both muscle dysmorphia and orthorexia nervosa, it is thought that not only sports science experts but also mental health experts should work in sports complexes. In addition, it is foreseen that the psychological problems that may arise related to bodybuilding can be brought under control with psychoeducational programs to be given to both athletes and coaches.

It is thought that it is necessary to inform about muscle dysmorphia and orthorexia nervosa and ergogenic nutritional support products in Physical Education and Sports Schools and coaching training. In addition, training on athlete nutrition and sports psychology in these institutions will enable them to have information about both athlete motivations and other mental health disorders that can be seen frequently in athletes.Since such mental health disorders are increasing day by day in gyms, sports psychologists should also be present in gyms, and mental health assessments should be made in addition to medical assessments in new memberships.

Considering the ergogenic nutritional supplements in the research results are associated with muscle dysmorphia, it is thought the sale and use of these products should be supervised. It is thought the sale and use of these products should be supervised by a committee that includes both health professionals and expert dietitians. Since this research was conducted only on individuals engaged in male bodybuilding, this study cannot be generalized to individuals engaged in female bodybuilding sports. It is thought new information can be added to the literature by making similar studies on both other sports and women.

## Declarations

**Ethics Approval and Consent to Participate**
Informed consent was obtained from all participants who agreed to participate in the study. YDÜ/SB/2018/137 (Yakın Doğu Üniversitesi, Sosyal Bilimler) numbered ethics committee approved taken from the Near East University Institute of Social Sciences in 06/04/2018.

**Consent for Publication**
Not applicable.

**Availability of Data and Materials**

Data sets used and / or analyzed during the study can be obtained from the relevant author upon appropriate request.

**Competing Interests**
The author declares that no competing interests in this manuscript.

**Funding**
Not applicable.
**Authors' Contributions**
HA and AB analyzed and interpreted the data and HA, DE contributed to the writing of the article. All authors have read and approved the final version of the article.

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