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Body Image and Muscle Dysmorphia in Competitive Weightlifters: Relationships Across Variables

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Research Article
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Abstract

The aim of this study was to determine the levels of Body Image (BI) and Muscle Dysmorphia (MD) among weightlifters and to examine whether these variables differ according to selected demographic and sport-related characteristics. A descriptive survey design was employed, and the sample consisted of 203 weightlifters (n = 203; females = 108, age = 16.04 ± 2.22 years; males = 95, age = 17.53 ± 3.26 years) who participated in National Team (NT) selection events across various categories. Data were collected using a Demographic Information Form, the Body Image Scale (BIS), and the Muscle Dysmorphic Disorder Inventory (MDDI). Normality of the data was assessed using skewness and kurtosis, and homogeneity of variances was tested with Levene's test. When assumptions of normality and homogeneity were met, independent samples t-tests, one-way analysis of variance (ANOVA), and Tukey HSD tests were applied; when homogeneity was violated, Welch ANOVA and Games-Howell tests were used. Relationships between BI and MD and their subdimensions were analyzed using Pearson correlation analysis. Results indicated a significant inverse relationship between BI and MD symptoms among weightlifters. No significant differences were found for variables such as gender, naitional team status (NT), and daily training duration (TD); however, certain subdimensions varied according to BMI and age. These findings suggest that resistance exercises, such as weightlifting, may promote a healthier BI among young individuals, potentially reducing symptoms of MD.
Keywords: Body image, Muscle dysmorphia, Performance, Weightlifting

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INTRODUCTION

Weightlifting, which involves two high-skill techniques such as the snatch and the clean and jerk, is an effective resistance training method that supports long-term development of strength, power, and speed through explosive, multi-joint exercises (Pichardo et al., 2019). Nowadays, weightlifting is becoming increasingly popular not only at the elite level but also among young athletes (Lloyd et al., 2012). Such training has been reported to have the potential to preserve individuals' physical health and enhance athletic performance (Leone et al., 2005). However, while some athletes turn to resistance training with the aim of increasing muscle mass, this process is often shaped by the desire to attain a hypertrophic muscle size (Longobardi et al., 2017). These types of training affect not only physical development but also individuals' body image (BI). Indeed, physical activity, resistance, and weight training have been reported to have the potential to improve BI (SantaBarbara et al., 2017; Walters & Hefferon, 2020; Williams & Cash, 2001).

In recent years, increasing societal concerns regarding weight status, physical inactivity, obesity, eating disorders, and associated health problems -particularly as their prevalence among young people is rising- have contributed to the growing importance of the concept of BI (Dane & Bhatia, 2023; Voelker et al., 2015). BI refers to an individual's perceptions and feelings about their appearance, and it is generally shaped by factors such as body size, shape, and attractiveness (Dahlenburg et al., 2020). This perception can be either positive or negative; while a positive BI reflects overall satisfaction with appearance, a negative BI indicates dissatisfaction (Bowman et al., 2024). This issue is particularly observed among men and male weightlifters, where the desire for increased muscularity and reduced body fat (Munroe-Chandler et al., 2004) is frequently associated with performance enhancement goals and high expectations regarding physical appearance. However, failure to meet performance standards or expectations may lead athletes to develop negative perceptions of their bodies (Leone et al., 2005). Consequently, while dissatisfaction with muscularity is becoming increasingly common among men (Mitchell et al., 2017), it has also been reported in women (Goodale et al., 2001). This dissatisfaction may eventually result in BI disturbances and increased desire to attain a socially idealized body shape (Leone et al., 2005; Munroe-Chandler et al., 2004). Although such efforts are often driven by seemingly positive goals, the desire to increase muscle size (Cerea et al., 2018; Olivardia et al., 2000; SantaBarbara et al., 2023) can become uncontrollable in some individuals, potentially leading to excessive weight training and bodybuilding behaviors (Williams & Cash, 2001), and to the development of a body dysmorphic disorder known as muscle dysmorphia (MD) characterized by pathological preoccupation with muscular appearance (Cerea et al., 2018; Olivardia et al., 2000; SantaBarbara et al., 2023; Williams & Cash, 2001).

MD is a subtype of body dysmorphic disorder that typically manifests as an obsession with overall body appearance and is believed to predominantly affect males (Esco et al., 2005; Murray & Baghurst, 2013; Pope et al., 1997), although women may also be susceptible. It is becoming an increasingly prevalent issue among both athletes and sedentary individuals

(Goodale et al., 2001). This condition leads individuals to feel societal pressure to attain a more muscular and lean body ideal (SantaBarbara et al., 2023).

Athletes dissatisfied with their BI are often preoccupied not with their general appearance, but with concerns that they are not muscular or large enough (Foster et al., 2015; Pope et al., 1997). This concern results in behaviors commonly associated with MD, such as frequent weightlifting, excessive eating, strict adherence to diet programs, mirror checking, physical comparisons with others, constant reassurance seeking, and camouflaging the body with clothing (Pope et al., 1997). Although studies have reported varying prevalence rates of MD among male weightlifters (Babusa et al., 2015; Hildebrandt et al., 2006; Nieuwoudt et al., 2015), research focusing on BI and MD within the sport of weightlifting remains quite limited. Most of the existing findings in the literature on MD are based on studies conducted either with general population data (Leone et al., 2005) or participants consisting of male strength athletes and bodybuilders (Goodale et al., 2001). Many of these studies compare athletes to non-athletes (Almeida et al., 2019), with a particular focus on male athletes, especially male weightlifters. The assessment tools used in these studies often rely on clinical interviews with limited validity and reliability (Hildebrandt et al., 2004). As a result, there is insufficient data regarding the prevalence of BI and MD symptoms among young weightlifters and their associations with various variables. The inability of current studies to adequately assess the depth and scope of these symptoms highlights the need for a more comprehensive and systematic approach (Hildebrandt et al., 2006).

This study examines the relationship between BI and MD among competitive young weightlifters in the context of variables such as gender, national team status (NT), daily training duration (TD), and body mass index (BMI). The findings are expected to fill a significant gap in the existing literature and provide original data that can contribute both to the field and to the psychological evaluation processes of athletes. Based on the existing literature and the identified research gap, the following hypotheses were formulated: H_1: Athletes with higher training duration and competitive level will report higher levels of MD symptoms compared to those with lower training experience. H_2: Male athletes will exhibit greater drive for muscularity and higher MD symptoms than female athletes. H_3: Higher BMI will be associated with more negative BI and higher MD scores. H_4: Negative BI will significantly predict MD symptoms among young weightlifters.

METHOD

Research Model

This study was conducted using a descriptive model, one of the quantitative research methods. This model aims to investigate and explain existing variables as they are (Karasar, 2007).

Research Groups

The population of the study consists of a total of 203 weightlifters who participated in the national team selection trials in various categories, with an average age of 16.04 ± 2.22 years for female athletes ($n = 108$) and 17.53 ± 3.26 years for male athletes ($n = 95$). In this study, in

which the population was defined using a purposive sampling method, a power analysis was conducted indicating that at least 187 participants were required, based on an effect size of 0.3, a significance level of 0.05, and a statistical power of 95% (Patton, 2002).

Table 1. Distribution of independent variables of the study

Independent Variables		N	%
Gender	Female	108	53,2%
	Male	95	46,8%
Age	U15	71	34%
	Youth	75	36,9%
	Junior	38	18,7%
	Over-21	19	9,4%
BMI	Underweight	17	8,4%
	Normal weight	124	61,1%
	Overweight	41	20,2%
	Obese	21	10,3%
NT	Yes	26	12,8%
	No	177	87,2%
TD	Below Average	108	53,2%
	Above Average	95	46,8%

Data Collection Tools

In this study, a demographic information form, the Body Image Scale (BIS), and the Muscle Dysmorphic Disorder Inventory (MDDI) were used as data collection tools.

Demographic Information Form: This form, developed by the researcher, included items assessing participants' gender, age, height, weight, national team status (NT), daily training duration (TD). These variables were analyzed to explore potential differences in BI and MD levels according to demographic and training-related characteristics.

Body Image Scale (BIS): The Body Image Scale (BIS) used in this study was originally developed by Secord and Jourard (1953), and its Turkish adaptation and validity-reliability studies were conducted by Hovardaoğlu (1993). The scale comprises 40 items related to various body parts, regions, and functions. Participants are asked to rate each item using a five-point Likert scale ranging from "I dislike it very much" (1 point) to "I like it very much" (5 points). The scale does not have a cut-off point, and total scores range from 40 to 200, with higher scores indicating a greater degree of dissatisfaction (Secord & Jourard, 1953; Hovardaoğlu, 1993). The validity study of the scale in Turkey was conducted by Hovardaoğlu in 1989, who reported a Cronbach's alpha coefficient of 0.91. In the present study, the Cronbach's alpha coefficient for internal consistency was calculated as 0.82. In this study, the concept of body image will be referred to as BI (Üstündağ Ayna, 2019).

Muscle Dysmorphic Disorder Inventory (MDDI): Originally developed by Hildebrant, Langenbucher, and Schlundt (2004), the Turkish adaptation of the MDDI was carried out by Subaşi, Okray, and Çakıcı (2018). This self-report inventory assesses diagnostic criteria for MD across emotional, cognitive, behavioral, and perceptual dimensions using 13 items on a five-point Likert scale. The MDDI comprises three subscales: Drive for Size (DFS), Appearance Intolerance (AI), and Functional Impairment (FI). Higher total or subscale scores

indicate greater severity of MD-related symptoms, such as an excessive preoccupation with muscularity, dissatisfaction with body appearance, or impairment in daily functioning, whereas lower scores reflect fewer or less severe symptoms. In this study, the concept of muscle dysmorphia will be abbreviated as MD.

- **DFS:** Assesses thoughts of being smaller, less muscular, or weaker than desired, and the desire to increase size and strength.
- **AI:** Contains items evaluating negative beliefs about one's body and the resulting anxiety or avoidance of displaying it.
- **FI:** Includes items concerning the maintenance of traditional exercise routines, negative emotions upon deviation from these routines, social avoidance due to these emotions, and preoccupation with the body. Cronbach's alpha coefficients were reported as 0.85 for DFS, 0.77 for AI, 0.88 for FI, and 0.81 for the total MDDI.

Ethics Approval

This research was conducted with ethical approval obtained from the relevant board at Uşak University (Decision No: 2023-70). All procedures of the study were conducted in line with the ethical principles outlined in the Declaration of Helsinki. Before data collection began, both verbal and written informed consent was secured from the children and their legal guardians. Participants were clearly informed that their participation was entirely voluntary and that they had the right to discontinue their involvement at any stage of the study.

Collection of Data

The BI and MD were administered through face-to-face interviews with athletes participating in the National Weightlifting Team selection events. Participants were provided with all necessary information regarding the study via the prepared forms. A total of 203 individuals who self-reported meeting the inclusion criteria voluntarily participated in the study. The inclusion criteria were as follows; age between 15 and 35 years (Ganson et al., 2025), no health issues or injuries within the past six (6) months, at least two (2) years of active, licensed participation in the Olympic Weightlifting discipline, participation in a minimum of three (3) official weightlifting competitions (domestic or international) and voluntary agreement to participate in the research.

Analysis of Data

Comparisons were conducted between the independent variables; gender, age, BMI, NT, and TD. The dependent variables, which included BI, MD, and its subscales (DFS, AI, and FI) among competitive weightlifters. The distribution of the dependent variables is presented in Table 2. Prior to making comparisons among variables, tests for normality and homogeneity were conducted. Normality was assessed using skewness and kurtosis values, while homogeneity was examined through the Levene test. Since the skewness and kurtosis values were within the ±2 range, the variables were considered to have a normal distribution. Additionally, Levene's test results indicated that the assumption of homogeneity was met ($p < .05$). For comparisons between BMI and MDDI subscales, where homogeneity was satisfied, one-way analysis of variance (ANOVA) and Tukey HSD post-hoc test were applied. In cases

where homogeneity was not met -such as comparisons between age and MDDI subscales- Welch's ANOVA and the Games-Howell post-hoc test were used (George & Mallery, 2024). Pearson correlation analysis (r) was employed to determine the level of relationship between BI and the MD subscales, based on the fulfilment of parametric assumptions.

FINDINGS

This section presents the results of the descriptive statistical analysis for the dependent variables of the study, namely BI, overall MD scores, and its specific subdimensions. These findings offer an overview of the participants' psychological tendencies related to body perception and dysmorphic symptoms.

Table 2. Distribution of the dependent variables in the study

Dependent Variable	N	Min	Max	M	SD	Skewness	Kurtosis
BI Total	203	89	200	164,22	22,7	-0,65	0,47
DFS	203	5	23	10,94	4	0,79	0,86
AI	203	4	17	7,74	2,71	0,86	1,06
FI	203	4	19	10,21	3,09	0,49	0,71
MD Total	203	13	49	28,9	6,93	0,3	0,64

BI (M = 164.22, *SD* = 22.7) and MD (M = 28.9, *SD* = 6.93) are the dependent variables of this study. Descriptive statistics for the subdimensions of MD -DFS (M = 10.94, *SD* = 4), AI (M = 7.74, *SD* = 2.71), and FI (M = 10.21, *SD* = 3.09)- are presented in Table 2.

Table 3. Independent samples t-test results of total BI scores by gender, NT, and TD

Independent Variables		N	M	SD	t	df	p
Gender	Female	108	162,93	22,61	-0,86	201	0,39
	Male	95	165,68	22,82			
NT	Yes	26	167,5	19,85	0,79	201	0,43
	No	177	163,74	23,1			
TD	Below Average	108	163,68	24,25	-0,36	201	0,71
	Above Average	95	164,83	20,89			

According to the results of the independent samples t-test, no significant differences were found in the total BI scores based on gender ($t(201)= -0.86$, $p=0.39$), NT ($t(201) = 0.79$, $p = 0.43$), and TD ($t(201)= -0.36$, $p=0.71$) (Table 3).

Table 4. Independent samples t-test results of MD according to gender, NT, and TD

Independent Variables		N	M	SD	t	df	p
Gender	Female	108	29,24	5,08	0,73	148,47	0,46
	Male	95	28,51	8,58			
NT	Yes	26	28,12	7,18	-0,61	201	0,54
	No	177	29,01	6,9			
TD	Below Average	108	28,15	7,27	-1,65	201	0,1
	Above Average	95	29,75	6,47			

Similarly, no significant differences were found in the total MD scores based on gender ($t(148.47) = 0.73$, $p = 0.46$), NT ($t(201) = -0.61$, $p = 0.54$), and TD ($t(201) = -1.65$, $p = 0.10$) (Table 4).

Table 5. t-test statistical findings for the MD subdimensions by gender, NT, and TD

Independent Variables			N	*M*	SD	t	df	p
Gender	DFS	Female	108	10,9	3,03	-0,16	152,7	0,88
		Male	95	11	4,89			
	AI	Female	108	8,22	2,07	2,65	156,78	**0,01***
		Male	95	7,2	3,21			
	FI	Female	108	10,12	2,32	-0,47	151,72	0,66
		Male	95	10,32	3,79			
NT	DFS	Yes	26	9,54	2,85	-1,93	201	0,06
		No	177	11,15	4,11			
	AI	Yes	26	7,69	3,32	-0,104	201	0,92
		No	177	7,75	2,62			
	FI	Yes	26	10,89	3,47	1,19	201	0,24
		No	177	10,11	3,03			
TD	DFS	Below Average	108	10,66	4,16	-1,08	201	0,28
		Above Average	95	11,26	3,8			
	AI	Below Average	108	7,58	2,83	-0,9	201	0,37
		Above Average	95	7,93	2,57			
	FI	Below Average	108	9,91	2,96	-1,5	201	0,14
		Above Average	95	10,56	3,21			

*p < 0,05

According to the gender variable, a statistically significant difference was found in the AI subdimension of MD, with female participants scoring significantly higher than male participants (t (156.78) = 2.65, p = .01). However, no significant differences were observed in the DFS and FI subdimensions. Furthermore, no statistically significant differences were found in the MD subdimensions based on TD or NT (Table 5).

Table 6. ANOVA test results for BI and MD scores by BMI and age

Independent Variables			N	*M*	SD	F	p
BMI	BI	Underweight	17	165,06	24,83	0,56	0,64
		Normal weight	124	164,23	23,05		
		Overweight	41	161,29	21,05		
		Obese	21	169,14	22,62		
	MD	Underweight	17	31,59	5,82	1,25	0,29
		Normal weight	124	28,44	6,92		
		Overweight	41	29,56	6,22		
		Obese	21	28,14	8,81		
Age	BI	U15	71	168,06	21,57	1,54	0,21
		Youth	75	160,36	25,41		
		Junior	38	165,82	20,18		
		Over-21	19	161,9	18,66		
	MD	U15	71	28,87	4,33	1,92	0,14
		Youth	75	29,36	7,57		
		Junior	38	29,82	9,06		
		Over-21	19	25,32	6,82		

According to the results of the analysis of variance (ANOVA), no statistically significant differences were found in the total scores of the BI across different BMI categories (F (3,199)

= 0.56, p = .64) and age groups (F (3,199) = 1.54, p = .21). Similarly, there were no statistically significant differences in the total MD scores based on BMI (F (3,199) = 1.25, p = .29) and age groups (F (3,199) = 1.92, p = .14). These findings indicate that neither BMI nor age significantly affected participants' BI or MD total scores in this sample (Table 6).

Table 7. ANOVA and Tukey results for MD subdimensions by BMI and age

Independent Variables			N	M	SD	F	p	Post Hoc
BMI	DFS	Underweight[1]	17	13,29	4,86	4,3	**0,01***	1>3 1>4
		Normal weight[2]	124	11,23	4,07			
		Overweight[3]	41	9,83	3,07			
		Obese[4]	21	9,52	3,5			
	AI	Underweight[1]	17	8,65	1,97	4,66	**0,01***	3>2
		Normal weight[2]	124	7,19	2,41			
		Overweight[3]	41	8,51	3,01			
		Obese[4]	21	8,76	3,53			
	FI	Underweight[1]	17	9,65	3,06	1,93	0,13	
		Normal weight[2]	124	10,02	2,96			
		Overweight[3]	41	11,22	3,1			
		Obese[4]	21	9,86	3,62			
Age	DFS	U15[1]	71	11	2,99	3,03	**0,04***	2>4
		Youth[2]	75	11,51	4,54			
		Junior[3]	38	10,66	4,77			
		Over 21[4]	19	9,05	2,86			
	AI	U15[1]	71	8,13	2,16	3,04	**0,04***	1>4
		Youth[2]	75	7,92	2,72			
		Junior[3]	38	7,45	3,41			
		Over-21[4]	19	6,21	2,59			
	FI	U15[1]	71	9,75	1,79	2,44	0,07	
		Youth[2]	75	9,93	2,93			
		Junior[3]	38	11,71	4,24			
		Over-21[4]	19	10,05	4,06			

*p < 0,05

According to the ANOVA results presented in Table 7, statistically significant differences were found in the Drive for Size (DFS) and Appearance Intolerance (AI) subdimensions of MD across BMI groups. Specifically, the DFS subdimension showed a significant difference between groups (F (3,199) = 4.30, p = .01), with underweight participants scoring significantly higher than both overweight and obese participants (Underweight > Overweight, Underweight > Obese). Similarly, the AI subdimension revealed a significant difference (F (3,199) = 4.66, p = .01), where overweight individuals reported significantly higher AI scores compared to those of normal weight (Overweight > Normal weight). No statistically significant differences were found in the Functional Impairment (FI) subdimension across BMI groups (F (3,199) = 1.93, p = .13). Regarding age groups, significant differences were also observed in both the DFS (F (3,199) = 3.03, p = .04) and AI (F (3,199) = 3.04, p = .04) subdimensions. In the DFS dimension, the "Youth" group scored significantly higher than the "Over 21" group (Youth > Over 21), while in the AI dimension, the "Under 15" group had significantly higher scores than the "Over 21" group (Under 15 > Over 21). No significant differences were detected in the FI subdimension in relation to age (F (3,199) = 2.44, p = .07). These findings suggest that both

BMI and age may influence certain psychological aspects of MD, particularly drive for size and appearance-related distress (Table 7).

Table 8. The relationship between BI and MD and its subdimensions

	N	M	SD	(I)	(II)	(III)	(IV)	(V)
(I) BI	203	164,22	22,7	-				
(II) MD	203	28,9	6,93	-,302**	-			
(III) DFS	203	10,94	4	-,262**	0,8**	-		
(IV) AI	203	7,74	2,71	-,189**	0,66**	0,35**	-	
(V) FI	203	10,21	3,09	-,173*	0,63**	0,2**	0,17*	-

It was determined that the BI scores (M=164.22, *SD* = 22.7) and MD scores (M=28.9, *SD* = 6.93) of the weightlifters participating in the study showed a statistically significant negative correlation (r= -0.302; p<0.001) (Table 8). This finding can be interpreted as indicating that weightlifters with higher levels of BI are less likely to exhibit symptoms of MD. Similarly, a statistically significant negative correlation was found between BI scores and the subdimensions of MD: AI (r= -0.262, p< .001), DFS (r= -0.189, p= .007), and FI (r= -0.173, p= .014) (Table 8).

DISCUSSION and CONCLUSION

This study aimed to examine the relationship between BI and MD in competitive weightlifters, considering demographic variables such as gender, age, BMI, NT, and RD. The results of the study indicated that weightlifters had high BI levels and moderate MD levels, with a significant negative correlation between the two (r = -0.302; p < 0.001). Weightlifters with higher BI levels were less likely to exhibit MD symptoms.

Furthermore, no significant differences were observed in the total scores for BI and MD based on gender, age, NT, or TD. These findings relate directly to H_1, indicating that, although BI and MD were hypothesized to vary according to demographic factors, in our sample only BMI and certain age subgroups demonstrated significant differences, whereas gender, NT, and TD did not significantly influence BI or MD. Variance analysis (ANOVA) revealed significant differences in the MD subdimensions, specifically DFS and AI, according to BMI. Tukey post hoc tests indicated that the underweight group of light weightlifters had significantly higher DFS scores compared to the overweight group of semi-heavy weightlifters and the obese group of heavy weightlifters, supporting the relevance of BMI in MD symptomatology.

According to the Games-Howell test analysis, for the age variable, the DFS scores of the youth age group were significantly higher compared to the over-21 group, while the muscle dissatisfaction AI scores of the U15 age group were significantly higher than those of the over-21 group. However, no significant differences were found in the FI subdimension.

Weightlifting is a popular athletic activity among both men and women, but there are some questions about whether this sport is disproportionately associated with BI disorders (Hildebrandt et al., 2006). A study on Olympic weightlifting reported that female athletes take sport-specific and societal discourses into account when choosing their weight categories;

however, due to physical requirements, they sometimes compromise these ideals (Nelson & Jette, 2023). Concerns regarding BI may arise from the pressure athletes face to conform to specific physical ideals and athlete models in order to perform successfully (Zaccagni & Gualdi-Russo, 2023). This suggests that the athlete's body is shaped by both societal and physical dynamics (Nelson & Jette, 2023), which can, in turn, affect their psychological and physical health.

The development of BI is closely related to athletes' perceptions of their body composition. This relationship can vary across different sports and genders. In a study by Pasman and Thompson (1988), weightlifters were found to be more accurate in predicting their body size compared to runners and sedentary individuals, and the levels of body dissatisfaction were similar between male and female weightlifters. A meta-analysis conducted by Hausenblas and Downs (2001) also found no significant difference in BI between male and female athletes. Similarly, Zaccagni and Gualdi-Russo (2023) reported that male athletes had lower levels of BI dissatisfaction compared to female athletes. These findings suggest that BI in athletes is shaped not only by gender differences but also by similar dynamics arising from the demands of the sport. Furthermore, the literature suggests that individuals involved in aesthetic sports tend to focus on diet and weight control not due to general body dissatisfaction but rather because of the performance-based physical requirements of the sport (Zaccagni & Gualdi-Russo, 2023). Indeed, in our study, total scores for BI and MD showed no significant difference based on gender ($p > .05$). While previous literature often reports gender differences in BI and MD, our results suggest a different pattern in this sample. These findings indicate that, contrary to H_2, gender did not significantly influence BI or overall MD scores in our sample, suggesting that male and female young weightlifters may experience similar levels of BI perception and MD symptoms.

According to previous literature reviews, athletes generally have a more positive BI compared to non-athletes (Zaccagni & Gualdi-Russo, 2023); however, studies have shown that BI disorders among male weightlifters occur at varying levels and manifestations, in line with MD (Hildebrandt et al., 2006). In sports that focus on appearance and leanness, negative comments from coaches and weight loss pressures on athletes can lead to a negative impact on BI in female athletes (Reel et al., 2010). This is particularly true in aesthetic sports, such as gymnastics and artistic ice skating, where physical structure and appearance are key to success. As a result, the emphasis placed on appearance can vary across different sports (Varnes et al., 2013). Research suggests that although MD affects everyone, it is more prevalent among men compared to women (Leone et al., 2005). Babusa et al. (2015) reported the prevalence of high-risk MD among male weightlifters as 15.1%, while Hildebrandt et al. (2006) reported it as 16.9%. In another study on adult male weightlifters in Australia ($N = 648$, mean age = 29.5 ± 10.1 years), the prevalence of MD was found to be 17% (Munroe-Chandler et al., 2004), whereas the rate was 25% among bodybuilders (Longobardi et al., 2017).

The nature of weightlifting, which is focused more on physical performance than aesthetics, suggests that BI differences among athletes may be less gender-based. Instead, the demands of the sport and individual goals may play a more determining role. However, the fact that female athletes score significantly higher than male athletes in the MD subdimension of AI suggests that women may experience more pronounced sensitivity to appearance, be more vulnerable to

BI issues, and feel greater pressure regarding social appearance (Frederick et al., 2007). Much of the research in the literature on MD and excessive exercise behaviors focuses on male bodybuilders and weightlifters (Hale et al., 2013). The findings from the present study indicate that MD is not an issue exclusive to male athletes but also represents an important concern for female athletes. This suggests that female weightlifters, in particular, may constitute a risk group for MD and should be monitored carefully (Babusa et al., 2015). This highlights the fact that experiences related to MD in female athletes have been less studied, and further research in this area is needed.

According to the literature, it is generally emphasized that women are less satisfied with their bodies compared to men (Algars et al., 2009). These findings suggest that the BI of female athletes should be evaluated not only in relation to physical competence but also in terms of psychological processes. This is because weightlifters' adjustments to their training programs and diets based on muscle gain goals are thought to increase the risk of MD (Robert et al., 2009). In a study on MD, it was found that individuals diagnosed with MD had significantly different appearance evaluation and appearance orientation scores compared to the control group. These individuals felt less attractive and placed more importance on their physical appearance (Choi et al., 2002). These findings indicate that the BI dynamics of female athletes are more complex and multidimensional compared to those of male athletes. In our study, the significantly higher scores on the MD subscale in women compared to men suggest that the symptoms of MD in female weightlifters may become more pronounced due to societal and psychological factors. This situation needs to be carefully monitored, not only in terms of athletic performance but also in relation to BI and psychological well-being.

A meta-analysis by Zaccagni and Gualdi-Russo (2023) found that female athletes who are of normal weight report higher levels of BI dissatisfaction compared to those who are underweight. Similarly, Algars et al. (2009) reported that the effect of BMI on BI differs by gender, with this effect being more pronounced in women. It is believed that this effect may be related not only to aesthetic expectations but also to the individual's desires concerning their body and the emotional responses that arise when these desires are unmet. In this context, contrary to the literature, our current study found that weightlifters in the underweight category (13.29 ± 4.86) had higher DFS scores compared to those in the overweight (9.83 ± 3.07) and obese (9.52 ± 3.5) categories. This suggests that athletes in the underweight category may experience more intense MD symptoms and greater BI distortion. Contrary to H_3, which proposed that higher BMI would be associated with more negative BI and higher MD scores, our findings revealed the opposite pattern, with underweight athletes demonstrating greater MD symptomatology.

Previous studies have emphasized that young athletes are at a higher risk of experiencing BI disorders compared to older individuals (Hausenblas & Downs, 2001) and are more likely to be at risk for MD diagnosis (Longobardi et al., 2017). These findings indicate that concerns about MD and other BI anxieties may not only affect adult men but also young male adolescents, while female adolescents can show concerns about leanness at early ages (Cohane & Pope, 2001).

This suggests that younger individuals may have higher sensitivity toward their physical appearance and a greater tendency for social comparison. Social media platforms, especially those based on visual content, exert pressure on users to appear and behave in certain ways, increasing social comparison and leading individuals to engage in dysfunctional self-scrutiny (Chatzopoulou et al., 2020). In the current study, however, no significant difference was found in overall BI and MD scores across age groups. This suggests that the effect of age may be limited at the general assessment level. However, when examining the subscales, age-related differences emerged. Athletes in the younger age group youth had significantly higher DFS scores (11.51 ± 4.54) compared to those in the over 21 age group (9.05 ± 2.86). This finding suggests that younger athletes may have more mental preoccupation with their bodies and greater sensitivity toward these issues. Additionally, the U15 age group's AI scores (8.13 ± 2.16) were significantly higher than those in the over-21 age group (6.21 ± 2.59), which aligns with the literature indicating that while older women may experience some degree of body dissatisfaction, they can still maintain a positive BI (Walters & Hefferon, 2020). Furthermore, it must be noted that BI assessment and satisfaction levels differ during adolescence. In this context, it can be argued that the risks associated with BI and MD in younger age groups should be carefully monitored.

To accurately assess the mismatch between an individual's perception of their body and their physical characteristics, Hildebrandt et al. (2006) pointed out that obtaining more accurate clinical diagnoses for MD requires correctly measuring body composition variables, such as height, weight, and body fat percentage, to enhance the validity of the relationship between body composition and BI disorders. In the present study, when examining the BMI variable, significant differences were observed in the subscales of MD, specifically DFS and AI.

Research has shown that in the general population, body dissatisfaction is linked to the risk of eating disorders (Peters and Phelps, 2001). Particularly, weightlifters in the underweight category, compared to overweight and obese athletes, had higher DFS scores, suggesting that underweight individuals may be more susceptible to feelings of physical inadequacy. This indicates that underweight individuals may desire a more muscular or voluminous appearance, and these desires could transform into psychological pressure over time. Supporting this, Ganson et al. (2023) reported that lower body mass index is associated with greater MD symptomatology.

A study by Skemp et al. (2013) reveals that the risk of MD in weightlifters may vary depending on training goals. The desire to have a muscular physique emerges as a significant motivational factor that increases participation in weight training and shifts interest toward other sports (Yager and McLean, 2020). In this context, it is noted that resistance training has the potential to improve BI in adult individuals (SantaBarbara et al., 2017). For example, studies have shown that even a single session of resistance training leads to short-term improvements in BI in men (Waldorf et al., 2017) and results in significant increases in perceived muscle mass compared to those who do not engage in exercise (SantaBarbara et al., 2017). However, individuals who engage in weight training aimed at improving appearance may exhibit more MD symptoms compared to those who do not engage in such training (Skemp et al., 2013). These conflicting findings suggest that while weight training can strengthen BI in individuals, it may also increase the risk of MD in aesthetic-driven approaches. Indeed, in the present study, a

significant negative relationship was found between BI and MD symptoms among young weightlifters, with individuals who had a positive BI showing lower levels of MD symptoms. This finding indicates that enhancing BI could have a reducing effect on MD symptoms, aligning with similar studies in the literature. Additionally, this result is consistent with findings that confirm individuals with MD have poorer BI and are less satisfied with their bodies (Choi et al., 2002).

Research has shown that competitive weightlifters score significantly higher in exercise addiction and body size and symmetry subscales compared to non-competitive weightlifters (Skemp et al., 2013), supporting this observation. A study by Olivardia et al. (2000) found that men with MD, despite perceiving their body size as insufficient, had more muscle mass than non-MD weightlifters. This suggests that distortions in BI can negatively affect psychological health. In another study, SantaBarbara et al. (2023) found that exercise intensity had the potential to improve BI in individuals showing MD symptoms. Chen and Richardson (2024) stated that male powerlifters generally view their bodies as functional tools, focusing more on performance than aesthetic concerns when evaluating BI. In our study, however, no significant difference was found in terms of total BI and MD scores with respect to TD and national status ($p > .05$). This result aligns with similar findings in the literature. Particularly in performance-oriented sports like weightlifting, variables such as TD and NT do not appear to have a significant effect on BI and MD. This suggests that athletes' perceptions of their bodies are more likely to be shaped by the physical requirements of the sport and performance goals rather than aesthetic concerns.

The findings reveal various risk factors associated with BI and MD among weightlifters, emphasizing that physical performance processes should be evaluated not only from a physiological perspective but also through a psychosocial lens. It is understood that symptoms of MD may adversely affect athletes' BI, potentially compromising both their athletic performance and overall psychological well-being. Weightlifters typically adopt a performance-related approach, which may play a significant role in the emergence of BI concerns and MD symptoms. Some studies have reported that appearance-related individuals score significantly higher on all subscales of MD compared to performance-related weightlifters (Skemp et al., 2013), this finding underscores the importance of acknowledging that performance enhancement remains the primary goal for weightlifters. In this context, the present study identified a significant inverse relationship between BI and MD symptoms, supporting H_4.

These findings make a significant contribution to the literature on BI and MD in weightlifters. Notably, the results revealed a negative and statistically significant relationship between BI and MD, as well as its subdimensions (DFS, AI, FI), indicating that higher levels of dysmorphic symptoms are associated with poorer BI. Although no significant differences were observed in total BI and MD scores based on gender, NT, or TD, meaningful differences emerged in specific subdimensions: for instance, female athletes scored higher in the AI dimension, and both BMI and age were shown to influence DFS and AI. Taken together, these findings enhance the understanding of psychological risk factors in weightlifting populations and underscore the need for targeted interventions addressing BI concerns and dysmorphic tendencies. Therefore, this study clearly demonstrates that monitoring and managing BI and MD is essential for

safeguarding athletes' psychological well-being and optimizing their long-term athletic development.

SUGGESTIONS

These results suggest that resistance exercises, such as weightlifting, may promote healthier and more realistic body perceptions among young individuals and help reduce MD symptoms. Structured weightlifting programs thus have the potential to positively impact athletes' BI and psychosocial well-being. Coaches, health and fitness professionals, and sport psychologists should consider athletes' BI and performance goals, actively monitor early signs of psychological issues like MD or excessive training, and implement preventive strategies such as psychological screenings, educational sessions, and mental skills training. Establishing open communication and a supportive training environment can reduce stigma and facilitate athlete expression. A multidisciplinary approach involving coaches, sport scientists, psychologists, nutritionists, and medical personnel provides an effective framework for early intervention and long-term management, safeguarding athletes' well-being and performance potential.

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