Muscular Dysmorphia: An Investigation on its Prevalence and Profile Among Bodybuilding Enthusiasts

Dismorfia Muscular: Uma Investigação sobre sua Prevalência e Perfil em Adeptos da Musculação

Disforia Muscular: Una Investigación sobre su Prevalencia y Perfil entre Practicantes de Musculación

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Abstract

Introduction: Body image is a multidimensional and individual construct of self-perception of one's own body, often distorted by bodybuilding practitioners, leading to significant stress. Thus, this study aimed to identify self-image perception among bodybuilding practitioners, delineating the prevalence and profile of individuals at risk of muscular dysmorphia. Methodology: An exploratory study was conducted with bodybuilding practitioners who provided personal data and responded to the Muscle Appearance Satisfaction Scale questionnaire. Results: The results indicated that the majority of participants (63.75%; p = 0.01) reported satisfaction with their appearance. Furthermore, significant differences were observed between groups concerning age (f = 4.96; p = 0.03), number of training sessions per week (f = 6.07; p = 0.01), and subjective perception of effort (f = 4.19; p = 0.01). Discussion: Correlations were observed between muscular dysmorphia and age (ρ =-0.197; p = 0.01), suggesting an inverse relationship between age and vulnerability to dysmorphia, as well as with the number of training sessions per week (ρ = 0.320; p = 0.01) and subjective perception of effort (ρ = 0.255; p = 0.01). Conclusion: It is suggested that individuals at risk of dysmorphia tend to train more frequently and intensely, and are typically younger.

Keywords: body image, bodybuilding, mental health

Resumo

Introdução: A imagem corporal é uma construção multidimensional e individual da percepção do próprio corpo, e praticantes de musculação frequentemente a distorcem, gerando fonte de estresse. Assim, este estudo teve como objetivo identificar a percepção da autoimagem entre praticantes de musculação, traçando prevalência e perfil de indivíduos com risco de dismorfia muscular. Metodologia: Foi realizada uma pesquisa exploratória com praticantes de musculação, os quais forneceram dados pessoais e responderam ao questionário Muscle Appearance Satisfaction Scale. Resultado: Os resultados indicaram que a maioria dos participantes (63,75%; p = 0,01) relataram satisfação com sua aparência. Além disso, foram observadas diferenças significativas entre os grupos em relação à idade (f = 4,96; p = 0,03), número de sessões de treinamento por semana (f = 6,07; p = 0,01) e percepção subjetiva de esforço (f = 4,19; p = 0,01). Discussão: Observamos correlações entre dismorfia muscular e idade (ρ =-0,197; p = 0,01), indicando relação inversa entre idade e vulnerabilidade à dismorfia, bem como com o número de sessões de treinamento por semana (ρ = 0,320; p = 0,01) e percepção subjetiva de esforço (ρ = 0,255; p = 0,01). Conclusão: Sugerimos que indivíduos com risco de dismorfia tendem a treinar com maior frequência e intensidade, além de serem mais jovens.

Palavras-chave: autoimagem, musculação, saúde mental

Resumen

Introducción: La imagen corporal es una construcción multidimensional e individual de la percepción del propio cuerpo, a menudo distorsionada por los practicantes de musculación, lo que genera un estrés significativo. Por lo tanto, este estudio tuvo como objetivo identificar la percepción de la autoimagen entre practicantes de musculación, delineando la prevalencia y el perfil de personas en riesgo de dismorfia muscular. Metodología: Se llevó a cabo un estudio exploratorio con practicantes de musculación que proporcionaron datos personales y respondieron al cuestionario de Escala de Satisfacción con la Apariencia

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Muscular (MASS). Resultados: Los resultados indicaron que la mayoría de los participantes (63,75%; p = 0,01) reportaron satisfacción con su apariencia. Además, se observaron diferencias significativas entre los grupos en relación con la edad (f = 4,96; p = 0,03), el número de sesiones de entrenamiento por semana (f = 6,07; p = 0,01) y la percepción subjetiva del esfuerzo (f = 4,19; p = 0,01). Discusión: Se observaron correlaciones entre la disforia muscular y la edad (ρ =-0,197; p = 0,01), sugiriendo una relación inversa entre la edad y la vulnerabilidad a la disforia, así como correlaciones positivas con el número de sesiones de entrenamiento por semana (ρ = 0,320; p = 0,01) y la percepción subjetiva del esfuerzo (ρ = 0,255; p = 0,01). Conclusión: Se sugiere que las personas en riesgo de dismorfia tienden a entrenar con mayor frecuencia e intensidad, y suelen ser más jóvenes.

Palabras clave: imagen corporal, musculación, salud mental

Introduction

Body image is a multidimensional construct that refers to an individual's perception of themselves and their own body (Dion et al., 2015; Godoy-Izquierdo et al., 2023). It is considered to be a complex psychological construct, with self-perception of body appearance mentally represented by various perceptions, such as emotions, thoughts, and associated behaviors (Spreckelsen et al., 2018). Thus, attending to this image is an important aspect of overall well-being, as distorted body image can lead to serious mental and physical health problems (Grogan, 2021).

It is known that regular physical exercise is a significant resource for health, positively impacting body physiology and directly contributing to improvements in morphological aspects related to body image, such as fat reduction and lean mass increase (Grgic et al., 2022). In this regard, bodybuilding emerges as a highly sought-after practice among the population, as one of its main outcomes is morphological responses that contribute to a better body image and, consequently, influence participants to have a positive self-perception of body image (Apovian, 2016).

It is important to clarify that, for the purposes of this study, the term “bodybuilding practitioners” refers to individuals who engage in regular resistance training for recreational, aesthetic, or health-related purposes. This does not include professional or competitive bodybuilders. Participants who engaged in bodybuilding for competitive purposes were explicitly excluded from the sample, as detailed in the Method section.

However, some individuals anchor themselves in the pursuit of greater societal acceptance with their self-image, turning it into an object of desire and relentless pursuit, triggering psychophysical conditions that directly influence quality of life (Mitchell et al., 2017). To achieve this, they dedicate enormous time and effort, such as engaging in extremely intense bodybuilding practices, radical diets, using anabolic substances, and experiencing extreme dissatisfaction with the results achieved, due to distortions in the perception of their body image, such as the development of muscles through bodybuilding, referred to as muscular dysmorphia (Soohinda et al., 2020).

According to Badenes-Ribera et al. (2019), muscular dysmorphia is directly associated with individuals who engage in bodybuilding excessively and obsessively, often resorting to the use of anabolic steroids, radical diets, and intense exercise. These individuals tend to obsessively pursue idealized muscularity and body definition, and although they may have acquired extremely positive morphological standards, they often do not recognize them due to distortions in their perception of body self-image (Hosseini & Padhy, 2023).

Thus, tracing the prevalence of muscular dysmorphia, as well as the profile of individuals presenting such conditions, among bodybuilding practitioners is of utmost importance to guide healthcare professionals in diagnosing and appropriately directing individuals with this condition. Therefore, the aim of the present study was to identify self-image perception among bodybuilding practitioners, delineating the prevalence and profile of individuals with muscular dysmorphia.

Method

Study Type and Population

This was a cross-sectional study, a descriptive research with an exploratory survey design (Thomas & Nelson, 2002), conducted using Google Forms from December 1, 2023, to January 31, 2024. To participate in the study, subjects had to be above 18 years of age and active practitioners of bodybuilding. Subjects engaged in bodybuilding for competitive purposes or who reported having any psychosocial disorder affecting cognitive ability and judgment were excluded from the sample.

It is important to clarify that, for the purposes of this study, the term “bodybuilding practitioners” refers to individuals who engage in regular resistance training for recreational, aesthetic, or health-related purposes. Individuals who practice bodybuilding with the intent of participating in competitions (i.e., competitive bodybuilding) were not included in the sample.

Study Design

All procedures of this study followed ethical norms stipulated according to Resolution 466/12, which regulates research involving human subjects. The study was approved by the Ethics Committee on Human Research of the Oswaldo Cruz Hospital Complex at the University of Pernambuco (CEP-HUOC/UPE), with approval number 3.696.219.

Participants received the form through social media channels (Instagram and Facebook groups and communities related to bodybuilding practitioners) via posts containing the link to the form, along with explanations about the study, inclusion criteria for participation, and information about the researchers.

The form used consisted of four distinct parts. In the first stage, participants were presented with the Informed Consent Form (ICF), along with the inclusion and exclusion criteria. Those who agreed to the ICF and met the established criteria were directed to the second stage of the research, while those who did not agree to the ICF or did not meet the criteria were directed to the conclusion of the form at this stage. To ensure the reliability of the collected data, each participant was authorized to respond to the form only once, which was controlled by the Google account login.

In the second stage of the form, data related to participants' personal history were collected, including age, gender, height, and current weight. The third stage aimed to obtain information about participants' training history, covering aspects such as time dedicated to training, weekly frequency, number of exercises performed (volume), and subjective perception of effort (intensity), obtained through the Borg scale (Borg, 2000). Finally, in the

fourth stage, the Muscle Appearance Satisfaction Scale (MASS) (Mayville et al., 2002; Silva Junior et al., 2008) was used to identify self-reported satisfaction with muscular appearance.

Collection Instruments

The MASS is a scale proposed by Mayville et al. (2002) and validated for the Brazilian population by Silva Junior et al. (2008), with the purpose of assessing the prevalence or incidence of muscular dysmorphia. It consists of 19 items, with statements about muscular appearance, where the individual indicates the degree to which each applies to them on a five-point scale, ranging from "no, never" (1) to "yes, always" (5). By summing the scores obtained from the responses, the MASS provides the following scoring interpretation: from 19 to 28 points, indicating total satisfaction with muscular appearance; from 29 to 47, satisfaction most of the time; from 48 to 66, satisfaction sometimes yes, sometimes no; from 67 to 85, dissatisfaction most of the time; and from 86 to 95 points, indicating total dissatisfaction with muscular appearance.

Data analysis

After the data collection through Google Forms was concluded, the data were exported to a spreadsheet using Microsoft Excel software. A detailed analysis was performed to verify the accuracy of the collected data, and participants were stratified into groups based on the classification of muscular dysmorphia determined by the MASS scale (Mayville et al., 2002; Silva Junior et al., 2008). Participants were classified into groups based on MASS score ranges to investigate whether other variables – such as age, training frequency, and training intensity – differed significantly across these levels of muscular appearance satisfaction. Subsequently, the database was transferred to the statistical software SPSS version 20.0 (IBM, USA) for descriptive statistical analysis. The data were initially subjected to the Kolmogorov-Smirnov normality test and Levene's test for equality of variances. Since the data did not follow a normal distribution, non-parametric statistical techniques were used.

Results were presented as means, standard deviations, and percentages for general sample characterization. To identify differences in personal and training variables among groups with different levels of muscular dysmorphia, the non-parametric Anova test was employed, followed by a Spearman correlation matrix to investigate possible correlations among the differences found. The significance level adopted was 5% ($p \leq 0.05$).

For all ANOVA tests performed, the independent variable was the classification based on the MASS score (grouping participants into four satisfaction levels), while the dependent variables were age, sex, training time, weekly training frequency, number of exercises, and perceived exertion. The purpose was to identify whether personal and training variables differed significantly among groups with different levels of muscular appearance satisfaction.

Results

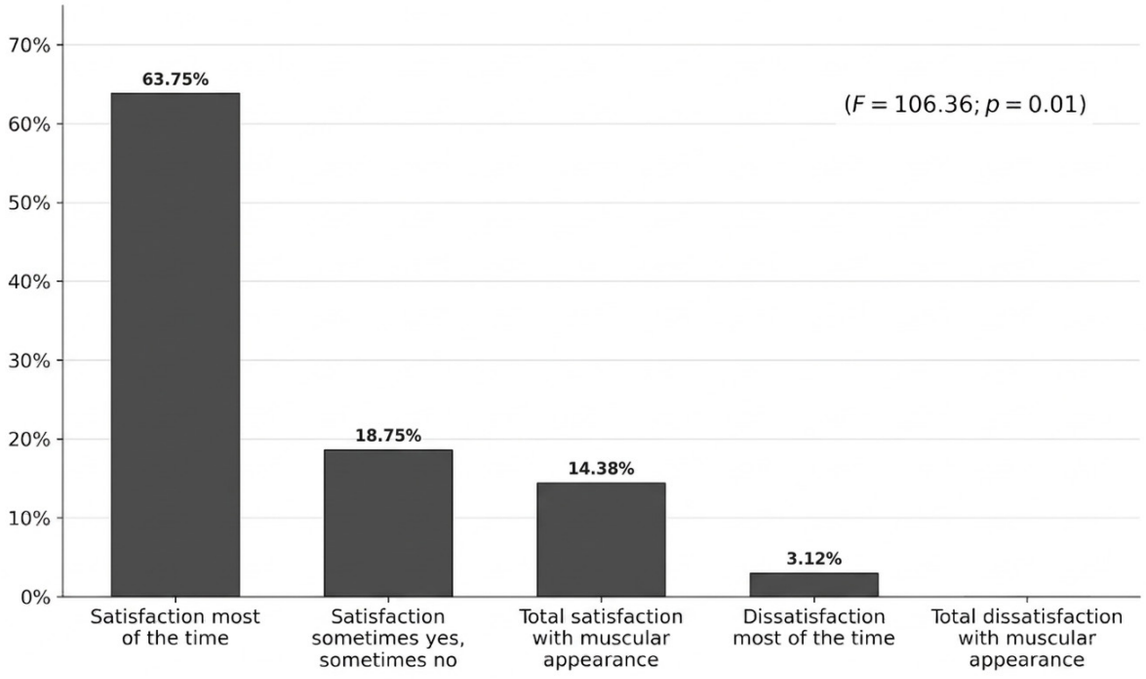
The study included 160 individuals, with a mean age of 25.66 ± 8.12 years, body mass of 73.95 ± 16.55 kg, and height of 168.56 ± 9.60 cm. The majority were female (51.25%), with a mean age of 25.96 ± 9.06 years, body mass of 66.85 ± 16.65 kg, and height of 162.15 ± 7.24 cm. The males (48.75%) had a mean age of 25.35 ± 7.05 years, body mass of 81.41 ±

12.83 kg, and height of 175.29 ± 6.74 cm. No statistically significant differences were found between sexes regarding age, body mass, or height ($p > 0.05$).

Regarding the risk of muscular dysmorphia, the self-image reported through the results obtained by the MASS showed a significant difference ($f = 106.36$; $p = 0.01$) among groups, with the majority (63.75%) reporting satisfaction most of the time; 18.75% reported satisfaction sometimes yes, sometimes no; 14.38% reported total satisfaction with muscular appearance; 3.12% reported dissatisfaction most of the time; and none indicated total dissatisfaction with muscular appearance (Figure 1).

Figure 1

Subjects' Responses (n = 160) Regarding the Risk of Muscle Dysmorphia, Classified According to the Proposal in the MASS (Mayville et al., 2002)



To explore potential differences in personal and training variables among participants with varying levels of muscular appearance satisfaction, participants were grouped based on their MASS scores. This allowed for comparisons of characteristics such as age, training frequency, and subjective effort across these groups.

Grouping personal and training history variables according to the muscle dysmorphia risk classification reported by the subjects, significant differences were observed among the groups in age ($f = 4.96$; $p = 0.03$), number of training sessions per day ($f = 6.07$; $p = 0.01$), and subjective perception of effort ($f = 4.19$; $p = 0.01$). Regarding age, subjects classified as "total satisfaction with muscular appearance" had the highest average age range (31.17 ± 12.55 years), while those who demonstrated "dissatisfaction most of the time" had the lowest average age range (20.40 ± 1.82 years). Concerning the number of training sessions per week, it was observed that those who performed more training sessions per week (5.40 ± 1.50 sessions) were classified in the "dissatisfaction most of the time" group, while those with fewer training sessions per week (3.91 ± 1.16 sessions) were in the "total satisfaction with

muscular appearance" group. The same pattern was observed in the subjective perception of effort during training, with the highest effort reported by the "dissatisfaction most of the time" group (8.20 ± 1.48) and the lowest by the "total satisfaction with muscular appearance" group (6.17 ± 2.05) (Table 1).

Expanding on the aforementioned results, the Spearman correlation showed a negative correlation of risk of muscle dysmorphia with age (ρ =-0.197; p = 0.01), a positive correlation with the number of training sessions per week (ρ = 0.320; p = 0.01), and with the subjective perception of effort (ρ = 0.255; p = 0.01) (Table 1).

Table 1

Differences (ANOVA) and Correlations (Spearman) of Muscle Dysmorphia Risk with Personal and Training Variables (N = 160)

Variable	Total satisfaction with muscular appearance	Satisfaction most of the time	Satisfaction sometimes yes. Sometimes no	Dissatisfaction most of the time	Anova	Spearman
Sex n (%)	♀: 14 (8.75%) ♂: 9 (6.62%)	♀:57 (35.63%) ♂:45 (28.13%)	♀: 9 (5.62%) ♂: 21 (13.13%)	♀: 2 (1.25%) ♂: 3 (1.87%)	F = 2.52 p= 0.60	ρ = 0.192 p = 0.10
Age (x̄±dp) years	31.17 ± 12.55	24.88 ± 6.72	24.97 ± 7.30	20.40 ± 1.82	F = 4.96 p=0.03*	ρ = -0.197 p = 0.01*
Training time (x̄±dp) years	1.80 ± 1.23	1.68 ± 1.30	1.85 ± 1.44	1.60 ± 1.08	F =0.247 p= 0.83	ρ = 0.971 p = 0.10
Sessions week (x̄±dp) days	3.91 ± 1.16	4.55 ± 0.98	5.00 ± 0.94	5.40 ± 1.50	F = 6.07 p=0.01*	ρ = 0.320 p = 0.01*
Number of exercises (x̄±dp)	6.13 ± 2.07	6.25 ± 1.83	7.23 ± 1.99	6.20 ± 2.38	F = 2.24 p= 0.08	ρ = 0.151 p = 0.06
RPE (x̄±dp) score	6.17 ± 2.05	7.03 ± 1.54	7.60 ± 1.56	8.20 ± 1.48	F = 4.19 p=0.01*	ρ = 0.255 p = 0.01*

RPE: subjective perception of exertion; * p < 0.05.

Note: Age was treated as a continuous variable and analyzed across groups defined by MASS score classification. No pre-defined age intervals were used.

Discussion

Muscular dysmorphia is characterized by a distortion in one's perception of their own body image, manifested through an excessive concern with muscular appearance. This condition can lead individuals to adopt behaviors harmful to their health, such as the use of anabolic substances, the adoption of extremely restrictive diets, and the practice of intense physical exercise (Soohinda et al., 2020).

Although muscular dysmorphia is often associated with bodybuilding practitioners (Badenes-Ribera et al., 2019), the present study observed that the majority of subjects do not exhibit this condition (f = 106.36; p = 0.01). Using the Muscle Appearance Satisfaction Scale (MASS), it was found that the majority of participants (63.75%) reported being satisfied with their muscular appearance most of the time, while only a minority (3.12%) reported dissatisfaction most of the time.

Such findings are aligned with global values, as observed by Minty and Minty (2021), who demonstrated that the prevalence of muscular dysmorphia in the world population varies between 0.5% and 3.2%. These numbers reflect the increasing awareness of the benefits of exercise for a healthy life. However, the authors also emphasize the need to

intensify awareness efforts regarding the importance of exercise for health, especially among bodybuilding practitioners. This is particularly crucial, as the presence of a variety of morphological characteristics in environments such as gym environments can trigger disorders of body self-image.

In addition to the information that contemporary society has on the subject, biological aging seems to positively contribute to the acceptance of body self-image, as highlighted by Ganson et al. (2023). Younger individuals among the strength training practitioners evaluated in this study showed a greater propensity for body image distortions and the development of risk of muscle dysmorphia. In the present study, we observed a significant difference ($f = 4.96$; $p = 0.03$) among different self-image perceptions. Subjects who reported "total satisfaction with muscular appearance" had the highest average age range (31.17 ± 12.55 years), while those who demonstrated "dissatisfaction most of the time" had the lowest average age range (20.40 ± 1.82 years).

These findings, along with the significant negative correlation of the age variable ($\rho = -0.197$; $p = 0.01$), suggest that, among the strength training practitioners evaluated, younger individuals showed higher levels of body image dissatisfaction, which may enhance the development of disorders such as risk of muscle dysmorphia.

In this regard, it is reported in the scientific literature (Feijoo & Vizcaíno-Verdú, 2025) that aesthetic pressure imposed by social media has become a growing concern for young people, directly influencing their self-image perception and generating significant repercussions on mental health.

In line with the findings of this study, Mitchison et al. (2022) identified that the young population, especially those who regularly engage in physical exercise, shows a significant predisposition to the development of mental health complications, especially those associated with body image disorders, making them more susceptible to conditions such as risk of muscular dysmorphia. Similar results were corroborated by Gordillo-Tobar et al. (2023), who found that approximately 14% of the young population (aged 10 to 24 years) presented some type of disorder related to body image distortion.

According to Nagata et al. (2022), there is a higher prevalence of body image disorders among young people, who are willing to take extreme measures to improve, in their perception, their physical shapes in the pursuit of the ideal body, including the use of anabolic steroids and excessively strenuous workouts. These results corroborate an important pattern observed in this study, where participants who exhibit less dissatisfaction attend bodybuilding more frequently on a weekly basis (5.40 ± 1.50 sessions), while those who do not express dissatisfaction have a lower weekly training volume (3.91 ± 1.16 sessions) ($f = 6.07$; $p = 0.01$). This relationship was positive and significant ($\rho = 0.320$; $p = 0.01$), indicating that the higher the dissatisfaction, the higher the weekly frequency of participation in bodybuilding sessions.

The present study revealed that those with a higher likelihood of developing a disorder, such as risk of muscular dysmorphia, feel a more intense need to spend more time in the gym, training more days per week than those with a lower likelihood of developing such a condition. This finding is congruent and confirmed by the study conducted by Sanchez-Castro et al. (2022), which also used the MASS scale and identified a higher frequency in the gym for subjects with risk of muscular dysmorphia.

Corroborating these findings, Corazza et al. (2019) and Scharmer et al. (2020) mention that exercise addiction may indicate a potential risk, as the individual becomes compulsively

training, distancing themselves from social interaction, thereby enhancing the development of other mental disorders such as anxiety, stress, and depression. According to Freire et al. (2023), exercise dependence is a common characteristic among individuals with muscular dysmorphia, especially among bodybuilding practitioners, who, in addition to extremely voluminous workouts, have a predominance of highly intense training.

In the study by Tariq & Saad (2025), it is emphasized that excessive training associated with the pursuit of an idealized body image can have significant repercussions on individuals' mental health. The constant pursuit of physical perfection can lead to chronic body dissatisfaction and impaired self-esteem, resulting in a negative cycle of thoughts and behaviors that are harmful to health.

The training intensity observed in this study reveals that in addition to the higher weekly volume, individuals who reported the greatest dissatisfaction with body image also engaged in training with higher intensities (8.20 ± 1.48), according to subjective perception of effort, while those who expressed greater satisfaction trained with lower intensities (6.17 ± 2.05) ($f = 4.19$; $p = 0.01$). This pattern also showed a positive and significant correlation ($\rho = 0.255$; $p = 0.01$), indicating a trend that the lower the dissatisfaction, the more intense the training tends to be.

Dissatisfaction with body image can drive individuals to dedicate themselves to physical exercise; however, beyond a certain point, this dedication can become obsessive, excessive, and immoderate. This phenomenon is supported by Legendre et al. (2024), who highlight that individuals with muscular dysmorphia utilize intensity and effort in the gym to a higher degree. In this context, high training intensity is often used as a strategy to achieve aesthetic results more rapidly (Zheng et al., 2021), even if incorrectly and without boundaries.

From a theoretical perspective, the findings of this study reinforce and expand upon the current literature on muscular dysmorphia and body image dissatisfaction among non-competitive strength training populations. Previous studies (e.g., Mitchell et al., 2017; Ganson et al., 2023; Freire et al., 2023) have highlighted that excessive concern with muscularity, combined with high training frequency and exposure to social and cultural ideals, can contribute to symptoms related to body image disorders. Our results align with this body of work by confirming that younger individuals who train more frequently and intensely tend to exhibit higher levels of dissatisfaction with muscular appearance. These findings add to the theoretical framework that explores how exercise behavior, self-perception, and societal expectations interact to shape mental health outcomes in recreational fitness contexts. By focusing on a non-clinical, non-competitive sample, our study also helps to bridge the gap between clinical populations and everyday gym-goers, expanding the applicability of current theoretical models.

Identifying the prevalence and profiling vulnerabilities in bodybuilding practitioners at risk of muscular dysmorphia is extremely relevant for the diagnosis and early intervention of this mental disorder. Such a profile was identified in the present study, with the most vulnerable subjects characterized as being younger, training more frequently per week, and training with higher intensity. One limitation of this study is the lack of effect size estimation in the ANOVA analyses. Future studies are encouraged to include this measure to better evaluate the practical significance of the observed differences. Additionally, further research could stratify participants by age groups with fixed intervals (e.g., 18–22, 23–27, etc.) to refine the analysis of age-related differences.

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It is important to emphasize that the MASS scale is a self-report instrument and does not provide a clinical diagnosis of muscular dysmorphia. Therefore, in this study, participants were not diagnosed with the disorder but rather identified as presenting symptoms or levels of dissatisfaction that may indicate a risk for developing muscular dysmorphia. This distinction is critical for both ethical and methodological clarity.

However, it is important to note some limitations of this research, such as its cross-sectional nature and the fact that it was conducted through an electronic form that only reached individuals who are part of social networks, restricting participation to a specific sample, and the self-perception of risk of muscular dysmorphia identified by the MASS, which, although a validated instrument for the Brazilian population, may be influenced by subjective factors, such as the interpretation of questions, potentially biasing the results.

Conclusion

Thus, we can conclude that the majority of bodybuilding practitioners in the present study did not exhibit risk of muscular dysmorphia, while those who reported this condition displayed a vulnerability profile characterized by being younger, attending the gym more frequently per week, and training with higher intensities. These findings have the potential to contribute to the early identification of possible body image disorders in bodybuilding practitioners. However, further studies are recommended to better elucidate this profile, utilizing cross-sectional methodologies, more diversified samples, and more robust diagnostic instruments, in order to reduce bias in identifying the disorder condition.

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Data Availability

The entire dataset supporting the results of this study has been published in the article itself.

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