

Comparison of the indicative of muscle dysmorphia among recreational and competitive Crossfit athletes

Comparação do indicativo de dismorfia muscular entre atletas recreacionais e competitivos de Crossfit

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Abstract – This cross-sectional study compared the indicative of Muscle dysmorphia in CrossFit athletes. Participants were 276 male and female CrossFit athletes with an average age of 28.56 ± 8.08 years. A questionnaire was used with questions about age, practice time and frequency of Crossfit practice, as well as the questionnaire of the Adonis complex. Data analysis was conducted through Kolmogorov-Smirnov and Mann-Whitney tests, and Spearman correlation ($p < 0.05$). The adopted significance was $p < 0.05$. The results showed that men obtained higher indicative of muscle dysmorphia in comparison to women as well as competitive athletes showed higher score than recreational athletes ($p < 0.05$). It was found significant ($p < 0.05$) and negative correlation of the indicative of muscle dysmorphia with training frequency ($Rho = -0.51$) among recreational athletes, and positive correlation ($Rho = 0.19$) among competitors. It is concluded that being male and having a competitive profile are actors in the presence of Muscle dysmorphia in CrossFit athletes.

Key words: Motor activity; Exercise; Body dissatisfaction; Sport Psychology.

Resumo – Este estudo transversal comparou o indicativo de dismorfia muscular em praticantes de crossfit. Participaram da pesquisa 276 praticantes de CrossFit, de ambos os sexos, com idade média de $28,56 \pm 8,08$ anos. Utilizou-se um questionário com perguntas sobre idade, tempo e frequência da prática do Crossfit, além do questionário do complexo Adonis. A análise de dados foi conduzida por meio dos testes de Kolmogorov-Smirnov e Mann-Whitney, e a correlação de Spearman ($p < 0,05$). Os resultados evidenciaram que os homens apresentaram maior indicativo de dismorfia muscular em quando comparados às mulheres assim como os competidores apresentaram escores superiores do que os praticantes recreacionais ($p < 0,05$). Verificou-se correlação significativa ($p < 0,05$) e negativa do indicativo de dismorfia muscular com a frequência de treinamento ($Rho = -0,51$) entre os praticantes recreacionais, e correlação positiva ($Rho = 0,19$) entre os competidores. Concluiu-se que ser homem e ter um perfil competitivo são fatores que podem desencadear a dismorfia muscular em praticantes de crossfit.

Palavras-chave: Atividade motora; Exercício; Insatisfação corporal; Psicologia do Esporte.

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INTRODUCTION

Most findings of muscle dysmorphia indicate as one highest popular disorder of body image among exercise practitioners^{1,2}. This disorder its often shown as dysmorphic disorientation of the body and dissatisfaction with anything related to the human body^{3,4}. Formally defined as a pathologic preoccupation with muscularity also the point to practice exercise is focused to result on their appearance²⁻⁴.

Aesthetic sports practitioners (e.g., gymnastics and weight training) are typically involved with high pressure to exhibit perfect bodies and increases restrict food intake^{2,4}. Prevalence through studies show that body image distortion most often found in persons who are physically active². Past research confirms the higher prevalence of body image distortion in athletes when compared to the general population³⁻⁵.

Presented with various forms of exercise that attract the attention of practitioners, CrossFit has an expressive growth of practitioner number. With much of the data, having been access from general population, athletes, healthy individuals, overweight and obesity, influences change and encourage challenging and motivational characters^{6,7}. This sport characterized as a physical conditioning method with regularly functional movements performed in high intensity composed of gymnastics aspects, weightlifting (Olympic entitle) and cycling exercises⁷.

Unfortunately, despite the growing attention points to a positive association between exercise practice and disorder of body image²⁻⁴, few associations between the training profiles of CrossFit practitioners with the indications of muscle dysmorphia explored yet. These findings can contribute to the best action of professionals involved in the field of physical exercise and can help the maintenance of the physical and mental health practitioners. Thus, the present investigation aimed to compare the indicative of muscular dysmorphia according to age, practice time, profile, and weekly training frequency of CrossFit athletes.

METHODS

Participants

The participants of this cross-sectional study included 276 males (mean age of 30.06 ± 5.51 years) and females (mean age of 30.41 ± 6.32 years) CrossFit athletes, with a mean age of 28.56 ± 8.08 years. Participants recruited from a non-probabilistic way and for convenience from different regions (south, southeast, northeastern) of Brazil. The criteria established for the inclusion of participants have minimal 18 years and to be a CrossFit athletes for at least three months. All participants voluntarily signed a free and clarified consent term.

Instrument

A semi-structured questionnaire conducted to collect information about age, sex, practice time, athletes profile and weekly frequency training of CrossFit practice. Comparison of dysmorphia according to age, weekly frequency and practice time athletes divided in two groups according to the process of "Median Split".

- Age (up to 29.5 years and more than 29.5 years).

- Weekly frequency (up to 4x per week and more than 4x per week)
- Practice time (up to 3 years and more than 3 years).

Muscle dysmorphia

The Adonis Complex Questionnaire (ACQ) developed by Pope, Phillips, and Olivardia 2000⁸, it was used to identify signs and symptoms related to muscle dysmorphia. It consists of 13 items, each with three answer options. The research participant pointed out the alternative that was closest to his reality. The result corresponds to the simple sum of the values of the questions, separating the group into four distinct classifications. They are: 1. Mild to slightly 2. Mild to moderate; 3. Serious problem; and 4. Severely Problem. According to Hair et al.⁹ the Cronbach's alpha of the instrument for the present study ($\alpha=.73$) is strong.

Procedures

The research is an integral part of the institutional project approved under Opinion (3.036.578) of the Ethics Committee in research, following the human research standards of resolution 466/12 of the National Health Council. The collection of quantitative data took place through an online form made available by Survey Monkey. Subjects that had an interest in participating the research made the accepted through the free and clarified consent term in the online form, indicating "I agree".

The link designed to host the electronic questionnaire designed for the study and it circulated via social media (Facebook, Instagram, and WhatsApp). The participants were not identified, since only the disclosure was made through social media and the questionnaire was filled out anonymously by Survey Monkey. The platform for completing the questionnaires was available for receiving the answers of the subjects for 30 days. Before completion, participants received a brief instruction containing information regarding the purpose of the research, the target audience, and the estimated time to complete the questionnaire (approximately 15 minutes).

Data analysis

Data analysis was conducted through SPSS software version 22.0. Descriptive and inferential statistics were used. Frequency and percentage were used for categorical variables (sex, age group, athletes' profile, practice time and weekly frequency). For numerical variables, Kolmogorov-Smirnov test was applied to verify the data distribution normality. As data did not present a normal distribution, median (Md) and quartiles (Q1; Q3) were used as central tendency and dispersion measures. Mann-Whitney U-test was used to compare the variables between two groups, while Spearman's correlation coefficient was used to analyze the correlation between variables. The significance adopted was $p < 0.05$. All analyzes were performed using SPSS 22.0 software.

RESULTS

Two hundred seventy-six CrossFit athletes participated in the study (Table 1), with prevalence of female subjects (54,7%). According to profile of participated,

most respondents is recreational athletes (58%). In addition, 83,3% the participants have been practicing CrossFit up to 3 years and, regarding the frequency of training, most participants train up to 4x per week (50,7%).

When comparing the indicative of muscle dysmorphia among CrossFit athletes according to socio-demographic variables (Table 2), it was found significant difference only between men and women ($p=0.004$) and between athletes' profile ($p=0.003$). Specifically, men obtained higher indicative of muscle dysmorphia in comparison to women as well as competitive athletes showed higher score than recreational athletes; however, there was no difference according to age group ($p>0.05$). There was no significant difference ($p>0.05$) in the comparison of the indications of muscle dysmorphia according to the profile (competitive and recreational) of the practice of CrossFit (Table 3).

In Table 4, it was found significant ($p<0.05$) and negative correlation of the indicative of muscle dysmorphia with training frequency ($Rho=-0.51$) among recreational athletes, and positive correlation of the indicative of muscle dysmorphia with training frequency ($Rho=0.19$) among competitors.

Table 1. Characterization of the study sample (n = 276).

Variables	n	%
Sex		
Male	125	45,3
Female	151	54,7
Age group		
Up to 29.5 years	138	50
Over 29.5 years	138	50
Practice time		
Up to 3 years	230	83,3
More than 3 years	46	16,7
Weekly Frequency		
Up to 4x per week	140	50,7
More than 4x per week	136	49,3
Athletes profile		
Competitive	116	42
Recreational	160	58

Table 2. Differences in the indicative of muscle dysmorphia of CrossFit athletes according to socio-demographic variables.

Variables	Muscle Dysmorphia	p-value
	Md (Q1-Q3)	
Sex		
Male	1.50 (1.00; 2.50)	0.004*
Female	1.00 (1.00; 2.00)	
Age group		
Up to 29.5 years	1.00 (1.00; 2.00)	0.326
Over 29.5 years	1.00 (1.00; 2.00)	
Athlete's profile		
Competitive	1.50 (1.00; 2.00)	0.003*
Recreational	1.00 (1.00; 2.00)	

Note. *Significant difference to $p<0.05$. Md = Median; Q1 = Quartile 1; Q3 = Quartile 3.

Table 3. Comparison of the indicative muscle dysmorphia of CrossFit athletes according to the practice profile.

Variables	Muscle Dysmorphia		p-value
	Md (Q1-Q3)		
Weekly Frequency			
Up to 4x per week	1.00 (1.00; 2.00)		0.155
More than 4x per week	1.00 (1.00; 2.00)		
Athlete's time			
Up to 3 years	1.00 (1.00; 2.00)		0.442
More than 3 years	1.00 (1.00; 2.00)		

Note. Md = Median; Q1 = Quartile 1; Q3 = Quartile 3.

Table 4. Correlation of Muscle Dysmorphia with age, practice time and training frequency.

Variables	Indicative of Muscle Dysmorphia	
	Competitive	Recreational
Age	0.00	-0.08 (p=0.39)
Practice time	-0.08 (p=0.39)	-0.08 (p=0.39)
Training frequency	0.19* (p=0.020)	-0.51* (p=0.009)

Note. *Significant correlation (p<0.05).

DISCUSSION

This research compared the indicative of muscle dysmorphia among recreational and competitive CrossFit athletes. The main findings showed that training frequency showed positive association with the indicative of muscle dysmorphia among competitive athletes and negative association among recreational athletes. Further, male and professional athletes show a higher indicative of muscular dysmorphia. Training frequency showed positive association with the indicative of muscle dysmorphia among competitive athletes and negative association among recreational athletes.

According to the literature, the results found show that compromise to the exercise is one of the factors contributing to the development of disorder of body image^{10,11}. Belief confirmed at verifying that CrossFit competitors have shown higher indicative of muscular dysmorphia when compared to recreational athletes. These findings show that muscle dysmorphia is associated with the excessive pursuit of healthy eating¹². In this way, the findings of this study are supported by literature because athletes demonstrate a higher prevalence of developing disorder of body image than exercise athletes in general^{13,14}.

It is worth noting that individuals affected by muscle dysmorphia often experience significant limitations in daily activities, dedicating many hours to weight lifting and hypertrophy diets¹⁵, which is inferred to be more common in professional athletes. Also, as body weight has quite effective on performance, the professional athletes have a huge fear of gaining weight, and generally this fear is the origin of body image and weight-related disorders¹⁶.

Another relevant finding showed that men were more likely to develop muscle dysmorphia than women. Although literature shows that women are more expected to develop risk behavior¹⁷⁻¹⁹. Souza et al.²⁰ observed dietary patterns, body image and exercise level in women exercising with resistance, noting that most women had shown some distortion in body image and there was a linear association between body image and the development of inadequate dietary

behavior. Our findings corroborate the literature, showing that men presented higher prevalence in developing muscle dysmorphia, by the obsessive goal of a maximum hypertrophy with minimal body fat¹⁻⁵. This result may be related to the culture, habits, lifestyle, and exercise mode to which people are inserted, interfere directly with these factors in relation to sex^{21,22}.

Despite our findings reveal relevant contributions to the literature, we need to cite some imitations of the study. Our first limitation is that we assessed only athletes of one type of exercise. Thus, we cannot generalize our results for participants of other types of exercise. Nevertheless, our evidence revealed important information for physical education professionals who work with exercise prescription, as well as for other health professionals, such as nutritionists, psychologists, and doctors. Second, it is the absence of anthropometric measures, which would give more indicative about the real association with muscle dysmorphia among CrossFit athletes. It is also worth highlighting that the cross-sectional design of the study does not allow inferences of cause and effect between the variables. In this perspective, future studies should assess participants of other types of exercise as well as adopt a prospective design to expand the evidence found in this study.

CONCLUSION

In conclusion, this study showed that sex and profile of the athletes can be considered as intervenient factors to the indicative of muscle dysmorphia among Crossfit athletes. In particular, men and competitors showed higher evidence of muscle dysmorphia. In addition, the weekly training frequency presented association directly proportional with the indicative of muscle dysmorphia among the competitors and inverse association among recreational athletes. From the practical point of view of this investigation, since that muscle dysmorphia is a serious phenomenon and requires more research about it in this population. It is of paramount importance that Trainers be aware that their athletes may be at risk and thereby provide a favorable solution for individuals to practice the exercise in a healthy way.

Compliance with ethical standards

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Ethical approval

Ethical approval was obtained from the local Human Research Ethics Committee –Cesumar University and the protocol (no.3.036.578) was written in accordance with the standards set by the Declaration of Helsinki.

Conflict of interest statement

The authors have no conflict of interests to declare.

Author Contributions

Conceived and designed the experiments: GLMF, MFS and SESX. Performed the experiments: GLMF. Analyzed the data: JFVNM and GLMF. Contributed reagents/materials/analysis tools: DVO and JРАНJ. Wrote the paper: DVO, GLMF and JРАНJ.

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