

Muscle Dysmorphia Symptoms and Self-concept in men cyclists

Síntomas de Dismorfia Muscular y Autoconcepto Físico en ciclistas varones

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Abstract

Muscle Dysmorphia (MD) is a mental disorder characterized by the underestimation of corporal shape and size. It hasn't been studied in cyclists, because this disorder is represented by a muscular body as bodybuilders which principal aim is weightlifting. The objective this work was detect MD symptoms. The method in this investigation were administered the Scale of Muscular Satisfaction to 20 cyclist men, the Questionnaire of Physical Self-concept, and the Somatomorphic Matrix, beside the anthropometric measures of the participants. The results showed that corporal dissatisfaction exists in relationship with his muscular perception doesn't correspond with the reality. His physical self-concept related is poor on his general self-concept as well as these two variables to those of physical attraction and physical condition. To conclude, in this study is verified that don't exist MD symptoms but there are an erroneous perception of his physical appearance and certain dissatisfaction in relation to the some one.

Keywords

Muscle Dysmorphia; body perception; cyclists; physical self-concept.

Resumen

La Dismorfia Muscular (DM) es un desorden mental caracterizado por la subestimación del tamaño y forma corporal. No ha sido estudiada en ciclistas, dado que son deportistas que no cumplen a priori las características de este desorden, como son el levantamiento excesivo de pesas y el desarrollo muscular. El objetivo de este trabajo es detectar síntomas de Distrofia Muscular. Se realizó una investigación que contó con 20 ciclistas varones a los que se les administró la Escala de Satisfacción Muscular, el Cuestionario de Autoconcepto Físico, y el Somatomorphic Matrix, además de registrarse las medidas antropométricas de los participantes. Los resultados muestran que existe insatisfacción corporal entre los deportistas, y que su percepción muscular no corresponde con la realidad. Su autoconcepto físico se relaciona con su autoconcepto general así como estas dos variables con las de atractivo físico y condición física. Se comprueba en este estudio que no existe DM, como tal, entre los deportistas participantes pero si una percepción errónea de su apariencia física y cierta insatisfacción en relación a la misma.

Palabras clave

Dismorfia Muscular; percepción corporal; ciclistas; autoconcepto físico.



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Introduction

Muscle Dysmorphia (MD) is a mental disorder characterized by an excessive concern, as a consequence of under-estimating the person's muscular size and shape (González-Martí, Fernández, y Contreras, 2012). According to several studies, MD is common in such sports as body-building (González-Martí, 2012), a sports modality based on Physical self-concept evaluation, in fact, it has been within this population that we have found a high prevalence of MD (González-Martí, 2012).

However, this disorder has not been studied in other sports, such is the case of cycling, even though it is a discipline where Physical self-concept appearance and its relationship with their performance can trigger certain problems because it's a sports modality with an aerobic characteristic (Ruíz de Azúa, Goñi, y Rodríguez, 2005).

On the other hand, despite the fact that cyclist perform their training with the objective of improving their performance, and not for esthetical reasons, symptoms of MD can probably appear on this type of athletes, since force as well as muscular mass are important factors for performance in this modality. (Hale, Roth, Delong, y Briggs, 2010).

Given the non-existence of studies on MD in male cyclist, the objective of this study is to detect the presence of symptoms of MD in this sports modality. A hypothesis was raised for this purpose, making reference, that because this is an aerobic sport, modality in which the highest relationship exists between corporal dissatisfaction and Physical self-concept self-concept, (Ruíz de Azúa et al., 2005), the participants would show dissatisfaction with their Physical self-concept appearance, which would have a negative repercussion on their self-concept, possibly causing an erroneous perception of their Physical self-concept appearance.

Method

Participants

Twenty male cyclist with ages ranging from 15 to 44 years ($M = 29.60$, $DT = 7.30$) took part on this study. The median height was 1.71 m ($DT = 6.75$), with a median weight of

75.61 kg ($DT = 11.33$). With respect to body fat and the median FFMI they were 12.58% ($DT = 4.72$) and 20.75 kg/m² ($DT = 1.58$) respectively.

Instruments

To calculate the percentage of real body fat of the participants, we recorded the height and weight through a portable height-meter (SECA, model 206) and a digital scale (SECA, Hamburg, Germany). We also used a fiber metric tape to measure the perimeters and for the subcutaneous folds we used a skinfold caliper (AW610 Holtain). We measured six folds: (triceps, sub-scapular, pectoral, supra-spinous, abdominal and the front of the thigh), following Jackson and Pollock's formula (1978): ($[\% \text{ Corporal Fat} = .217x - .00029x^2 + .133y - 5.73]$). In this formula, "X" corresponds to the sum of the sub-cutaneous fold measurements and "Y" is the age of the participant.

To find out the real musculature level of the participant, we used the Fat-Free Mass Index (FFMI; Kouri, Pope, Katz, and Oliva, 1995), an objective measurement to calculate the real musculature level of the participants. This measurement corresponds to: $[\text{weight} (100 - \% \text{ corporal fat}) / 100] / \text{height}^2 + 6.1 (1.8 - \text{height})$, obtaining by this method the true FFMI of the athlete. The interpretation of the results obtained from them is as follows: 16 – 17 Kg/m² represents a man with a low level of musculature, 19 – 20 Kg/m² is equivalent to the typical body for a young man, 22 – 23 Kg/m² describes a man's body with notable musculature, and above 25 Kg/m² represents a musculature suspicious for use of steroids (Pope et al., 2000). The body fat was calculated through the formula given in the preceding paragraph.

To find out the body's perception, we used the Somatomorphic Matrix (Gruber, Pope, Borowiecki, y Cohane, 1999), a bi-dimensional software that evaluates through corporal silhouettes the Physical self-concept perception with respect to the musculature and body fat of the individual. For its implementation, we required information such as weight, height and real FFMI (Kouri et al., 1995) for each athlete. This test consists of 100 images that have various body compositions in 10 different levels of body fat and 10 levels of FFMI. The athlete has to modify several figures according to their body's perception and a series of five statements, of which we considered the first two for this study, that allowed the person to

know their perceived FFMI and perceived body fat and the desired FFMI and the desired body fat.

To detect the symptoms of Muscle Dysmorphia, we used a Muscular Satisfaction Scale (MSS; González-Martí, Fernández, Contreras, y Mayville, 2012) comprised of 19 items, grouped in 5 variables referred to as *muscular dissatisfaction*, *dependence to bodybuilding*, *verification conducts*, *substance abuse* and *injuries*. The answers were evaluated with a Likert type scale with 5 points ranging from 1 (*totally disagree*) to 5 (*totally agree*). Items 1, 4 and 14 are graded inversely because they are worded in a negative form. The test results is the sum of the grading for each item, establishing categories of muscular dissatisfaction according to them: (19 – 95), as being satisfied with the musculature of those participants with grading between 19 to 39 points (Category 1), mildly dissatisfied with grading between 39 to 58 points (category 2), moderately dissatisfied with their musculature those that score above 58 points (category 3), and affected by MD those that score above 76 points (category 4) (González-Martí, Fernández-Bustos, Hernández-Martínez y Contreras 2014). Cronback's Alfa for this questionnaire was 73.

To find out Body's self-concept, we complemented a Body Self-Concept Questionnaire (BSQ; Goñi, Ruiz de Azúa y Liberal, 2004) comprised of 36 items that evaluate through a Likert type scale of 5 points which advances from 1 (*false*) to 5 (*true*), which allowed us to obtain grading for each of the specific measurements of their body's self-concept, following the Fox and Corbin Model (1989): *physical ability*, *physical condition*, *physical attractiveness and force*, as well as two general measurements, *general self-concept* and *general body's self-concept*. Cronback's Alfa for this questionnaire was 93.

Procedure

The selection criteria of the participants was as follows: they were federated in cycling during the season when the data was collected, and that they had participated in Regional Championships. After assessing the athletes that could participate in this investigation, we established contact with them to explain to them the objective of this study. Once we had obtained their authorization, and the investigators provided the infrastructure necessary to collect the data, each participant signed an informed consent where it was explained to them

the objective of the investigation, document that in the case of athletes that were still minors, was signed by their legal guardian. The gathering of the data was done based on the procedure protocol of the International Society for the Advancement of Kinanthropometry (ISAK; Marfell-Jones, Olds, Stewart y Carter, 2006), registering the height and the weight early in the morning. Immediately, we proceeded to the anthropometric measurements, gathering the relative information to their body fat on the selected body folds, that allow us to find out the total body fat percentage of the athlete and applying this data to the Jackson and Pollock's formula (1978). Lastly, the participants filled out the following questionnaires: Muscular Satisfaction Scale (MSS; González-Martí et al., 2012), Body's Self-Concept Questionnaire (BSQ; Goñi et al., 2004), and a Somatomorphic Matrix (SM; Gruber, et al., 1999). The gathering of all data did not take more than 20 minutes for each athlete.

Data Analysis

Data analysis was performed using descriptive techniques to present the basic characteristics of the variables being studied, as well as the bivariate correlations to determine to what extent the data obtained from the questionnaires being used responded to the investigation hypothesis. All of this with the help of statistical package SPSS 20.0

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Results

Body's Perception

The body's perception of the participating athletes is given in Table 1 which has a higher real FFMI than the perceived FFMI, and at the same time, both lower than the desired FFMI. This says that the real musculature of the participants is higher than what they perceive and both at the same time, lower than the musculature they desire. With respect to the real body fat variable, we observed that the corresponding value was lower than the perceived body fat and the desired body fat.

Table 1. Objective and subjective variables about body's perception and satisfaction

	<i>M</i>	<i>DT</i>
FFMI (real)	20.75	1.58
FFMI (perceived)	21.67	5.93
FFMI (desired)	22.18	2.15
Real Physical self-concept Fat	12.58	4.72
Perceived Fat	16.40	8.19
Desired Fat	15.16	5.59

With respect to the categories in MSS, we observed that the participating cyclist were included in categories 1 and 2, with 35% and 65% respectively, which means that they seem to be satisfied or mildly dissatisfied with the musculature they possess, data which is interesting to consider, giving the results obtained through MS.

Body's Self-Concept

In regards to the self-concept perception of the participants we observe a relationship between the items *sport's ability* and *physical condition* ($r = .83, p < .01$), additionally between this last item and *general Physical self-concept self-concept* ($r = .79, p < .01$), *general self-concept* ($r = .80, p < .01$), and *physical attractiveness* ($r = .72, p < .01$). Likewise, it is remarkable the relationship between *general Physical self-concept self-concept* and *general self-concept* ($r = .90, p < .01$), as well as between these and *physical attractiveness* ($r = .80, p < .01$), with which it shows the same correlation value.

Muscular Dissatisfaction

Considering the variable in MSS we observe relationships between the parameter *dependence to bodybuilding* with *conduct verification* ($r = .58, p < .01$), as well as between this last item and *injuries* ($r = .45, p < .01$).

Relationship between FFMI, Real Body Fat, Muscular Dissatisfaction and Body's Self-Concept

As shown in Table 2, the FFMI significantly and negatively correlates with *athletic ability* ($r = -.56, p < .05$), as well as, inversely correlated with the Real Body Fat Variable ($r = -.46, p < .05$). In one hand, the Real Body Fat Variable is also related with *athletic ability* ($r = -.47, p < .05$) and *injuries* ($r = .49, p < .05$). On the other hand, paying attention to the measurements from the instruments used, it stands out the relationship between *physical attractiveness* and *muscular dissatisfaction* ($r = -.62, p < .01$).

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Sporting ability	1	.83**	.51**	.69**	.60**	.61**	-.56*	-.47*	-.28	-.07	-.07	-.05	-.33
2. Physical Condition		1	.72**	.68**	.79**	.80**	-.39	-.30	-.16	-.00	-.03	-.14	-.31
3. Physical attractiveness			1	.52*	.80**	.80**	-.10	-.32	-.06	-.14	-.38	-.09	-.62**
4. Strength				1	.60**	.62**	-.03	-.11	.15	.27	.01	.09	-.18
5. General Body's Self-concept					1	.92**	-.05	-.16	.08	-.08	-.14	-.05	-.44
6. General Self-Concept						1	-.19	-.30	.13	.02	-.24	.00	-.39
7. FFMI							1	.46*	.40	.10	.13	.07	.03
8. Real Body Fat								1	.18	.10	.49*	-.13	.28
9. Dependence to bodybuilding									1	.58**	.14	.27	.30
10. Verification Conducts										1	.45*	.34	.26
11. Injuries											1	-.11	.18
12. Use of substances												1	.12
13. Muscular dissatisfaction													1

Table 2. Correlations between MSS, FFMI, Real Body Fat and GBSC (general body self-concept) * $p > .05$ ** $p > .01$

Discussion

The objective of this study is to evaluate the symptoms of Muscle Dysmorphia in cyclists. To give an answer to this objective, we proposed a hypothesis which made reference that this being an aerobic sport, the type of sport in which the largest relationship has been found with corporal dissatisfaction and Physical self-concept self-concept (Ruíz de Azúa et al., 2005), the participants would show dissatisfied with their corporal appearance. This fact would have negative repercussions on their self-concept, possibly causing an erroneous perception of their Physical self-concept appearance.

The distortion or erroneous perception of the participants becomes evident once we observe the data. All the participants have a Real FFMI (Kouri et al., 1995) lower than the one they perceived, contrary to what was presented by Murray et al. (2012), and they desired a higher FFMI than the two previous, which could be due to that expectations of the male gender have always been predetermined, oriented towards muscular development (Menees, 2010; Wilson, 2010). In fact, it seems that adult men have to choose, as their ideal, a higher level of musculature than the one they possess (Gruber et al., 1999), which entails the desire to be more muscular. However, the results obtained with MSS indicate a mild corporal dissatisfaction in 65% of the participating athletes.

In relation to the previous observations, based on studies done in different sport modalities, we have seen how athletes desire to be more muscular than they are. (González-Martí, 2012; Grammas y Schwartz, 2009; Gruber et al., 1999; Kelly, Neufeld, y Musher-Eizenman, 2010). Conversely, the results do not coincide with the data presented by Urpadilleta, Aspavlo, Masse y Docteur (2010), from a research performed on swimmers, in which the desired FFMI of the participants were similar to the self-perceived FFMI.

The problem that could derive from the non-coincidence between the desired FFMI and the perceived FFMI is muscular dissatisfaction. Said dissatisfaction is related to physical attractiveness in this investigation, and as we have documented, it could also be said of

dependency to exercise (González-Martí et al., 2012), more frequent in athletes that are below their ideal weight (Arbinaga, 2005).

In relation to Physical self-concept self-concept we need to consider that not only it refers to the person's subjective perception that they have of their abilities or their physical condition, but rather, to the feelings and perceptions about their appearance. Thus, the value given by a person to their physique will have repercussions on their Physical self-concept self-concept, and therefore on their general self-concept.

Again, making reference to muscular dissatisfaction, this study negatively correlates the values for *muscular dissatisfaction* and *physical attractiveness* ($r = -.62$, $p < .01$), which could be related to low self-esteem (Wolke y Saupona, 2008) and a low Physical self-concept self-concept. This data coincides with the data presented by Sokolova, González-Martí, Contreras y Fernández (2013) which highlighted little consideration to Physical self-concept attractiveness and low self-concept in persons suffering of MD. To this respect, we should consider the lack of precision of the perception of Physical self-concept image associated with low self- esteem, poor Physical self-concept image and even depression. (Olivardia, Pope, Borowiecki, Cohane y Geoffrey, 2004).

In reference to self-concept of athletes, in this study we have encountered a relationship between their *athletic ability* and *physical condition* ($r = .83$, $p < .01$), as well as between the last one and *physical attractiveness*, *general self-concept* and *general Physical self-concept self-concept*. ($r = .72 - .80$, $p < .01$). Likewise, we have found a relationship amongst the last three variables ($r = .55$; $p < .01$), partially coinciding with the investigations of González-Martí, et al., (2014) and Moreno, Moreno, y Cervelló (2009).

Limitations for this study


The sample population is made-up of male participants from a single sports modality, thus, we have to interpret the information with caution. In order to enrich our knowledge concerning this subject-matter, future investigations could be based in studying MD in other sports modalities, including participants from both sexes, with the objective to make

comparisons and help to establish common criteria based on specific characteristics for each sport, thus aiding the prevention of this type of disorders.

Conclusions

It has been observed that in this type of activity of aerobic characteristics, such as in the case of cycling, the athletes demonstrate muscular dissatisfaction and devalued Physical self-concept self-concept as a consequence of their erroneous body's perception, one of the symptoms of MD. Likewise, we have detected a relationship between the variables *physical condition* with *general self-concept* and *general Physical self-concept self-concept*, as well as between these and *physical attractiveness*.

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