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Emotional Intelligence and Coping Strategies as Predictive Variables of Muscle Dysmorphia Symptoms in a Population of Men

Carlos Alberto Marchena Giráldez, [degree]; and Beatriz Gómez Herráez, [degree] [AQ1: Provide academic degree(s) for both authors.]

ABSTRACT

The current study analyzes the relationship among the variables of muscle dysmorphia (MD) emotional intelligence (EI), and coping strategies (CS), as well as the role of EI and CS in predicting MD symptoms in 112 men between ages 18 and 30 years. The Muscle Dysmorphia Disorder Inventory, the Trait Meta-Mood Scale 24, and the Cope-28 [AQ2: Spell out “Cope” if it is an acronym] questionnaire were used as measures. We calculated descriptive statistics, correlation analysis, and linear regression. Results show that an inadequate EI (excessive emotional attention or a lack in both emotional clarity and repair) is related to higher levels of MD symptoms. Likewise, almost all mal-

adaptive CS showed significant positive correlations with MD symptoms, whereas just one adaptive CS showed negative correlation with MD symptoms. Only some CS (acceptance, self-blame, and denial) were shown to be predictors of MD symptoms, and they accounted for 36% of the variance. [Psychiatr Ann. 2021;51(5):xxx-xxx.]

[AQ5: Per the journal’s style, articles cannot begin with a heading; therefore, the ‘Introduction’ heading has been deleted.]

Muscle dysmorphia (MD) is a specific disorder that is a part of body dysmorphic disorder, and it is included in the spectrum of obsessive-compulsive disorder

in the *Diagnostic and Statistical Manual of Mental Health Disorders*, fifth edition (DSM-5).¹ This disorder characterized by the search for an ideal body type based on the increase in muscle mass, sometimes through the use of anabolic-androgenic steroids. This psychological problem has been associated with negative affection [AQ6: Should this be “affectation” here and throughout the manuscript?], high levels of anxiety and depression, low self-esteem, and impaired social and occupational functioning. In addition, this excessive concern about their body image often causes those with MD to avoid social gatherings, thus making interpersonal relationships deteriorate even further. All of this combined leads to clinically significant discomfort and worsening general health and quality of life.^{2,3} In the most serious cases it is one of the psychiatric disorders, along with the eating disorders (ED), with the highest mortality levels.⁴⁻⁹

Some models have suggested the existence of difficulties with emotional skills in patients with MD due to the appearance of negative affection and high levels of anxiety and depression.

Carlos Alberto Marchena Giráldez, [degree], is a [AQ3: Provide job/academic title], Universidad Francisco de Vitoria. Beatriz Gómez Herráez, [degree], is a Psychologist, Universidad Francisco de Vitoria, Facultad de Ciencias de la Salud.

Address correspondence to Carlos Alberto Marchena Giráldez, [degree], Universidad Francisco de Vitoria, [AQ4: Provide postal address.] Pozuelo de Alarcón, Madrid, Spain; email: carlosalberto.marchena@ufv.es.

Disclosure: The authors have no relevant financial relationships to disclose.
doi:10.3928/00485713-20210406-01

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The conceptual model of factors that contribute to the development of MD is explained by Grieve,¹⁰ and negative affection, low self-esteem, body dissatisfaction, perfectionism, and body distortion are risk factors that can lead MD.⁸

Research in emotional skills of people with MD has highlighted the relationship between MD and difficulties in emotional adjustment, as well as in the facial recognition of their [AQ7: Do you mean "other's" instead of their?] emotions, especially the negative ones, although deficiencies have also been found regarding neutral emotions.¹¹ In the same way, a greater number of negative emotions and deficiencies in emotional clarity were found in people with MD.^{12,13} Regarding the predictive factors of MD, a study by Pourshahbaz et al.¹⁴ conducted with 240 male body builders found a positive and significant relationship between difficulty [AQ8: Difficulty with what?] (variable of emotional regulation) and MD symptoms. Consequently, researchers concluded that emotional adjustment predicts the symptoms of MD. This finding is endorsed by other research that considers emotional adjustment as a moderating variable between perfectionism and concern about dysmorphic appearance, variables that are predictive symptoms of MD.¹⁵

In this scenario, it interesting to mention the concept of emotional intelligence (EI), which can be considered as an ability that is centered on the processing of emotional information that links emotions and reasoning. It is important both in the most basic psychological processes and in the most complex ones, such as emotional adjustment and the fostering of emotional and intellectual growth. Therefore, it allows people to use emotions to make reasoning effective and to think in a more intelligent way. This skill leads to an effective solution of the

problems and a better adaptation to the environment.^{16,17} Thus, considering the previously mentioned difficulties in emotional skills in people with MD, the relationship between MD and EI can be expected. However, research in MD has not generally been focused on EI-specific components (attention, clarity and repair). In addition, from a transdiagnostic perspective in which MD can be considered an ED (which would make it the most common ED in the male population),^{5,18} studies based on the relationship between EI and EDs have been conducted mostly with women, so there is a gap in research about how MD symptoms are related to EI components in men.

On the other hand, based on the research carried out by Folkman and Moskowitz¹⁹ and Skinner and Zimmer-Gembeck,²⁰ some relationships between EI and coping strategies (CS) have been found, as well as between ED and CS.²¹ Other research has found significant correlations between the CS, body mass index, the self-perception of a person's body, and the risk of developing an ED.²²

Other researchers have found that CS measures can predict an ED diagnosis. For example, Villa et al.²³ found that the COPE-28 questionnaire used to measure CS showed a greater discriminative capacity than the Eating Disorder Inventory-2 questionnaire for people suffering from anorexia and bulimia. In the same way, Pascual et al.,²⁴ found that CS showed a significant capacity to discriminate the risk of developing anorexia nervosa in the control group, which defines the importance of the CS in the nonclinical population to prevent an ED. Despite the contribution of these studies, the relationship between EI components and CS has only been studied in relation to anorexia and bulimia symptoms, but not DM symptoms (thus generally only in women).

Further studies are needed to solve gaps in research that analyze the re-

lationship between EI, CS, and MD symptoms in the male population. The findings in this area, due to the increase in the prevalence and severity of MD disorder, could promote prevention of the disorder through interventions focused on enhancing EI and CS in the male population.

METHOD

Participants

The study recruited 112 men between ages 18 and 30 years (mean age of 22.67 years; SD of 3.76 years) using "snowball" sampling. The study used an internet-based form for participants to provide informed consent, and the form also contained a brief explanation of the study.

Procedure

The design of the study took into account the regulations and ethics of the Official College of Psychologists of Madrid, for which participants were previously informed about the procedures of this investigation (confidentiality issues, type of participation). Using a previous questionnaire, a new questionnaire was created *ad hoc* to provide sociodemographic information about the participants as well as to report a previous or current diagnosis of an ED or MD. Finally, standardized assessment questionnaires were administered.

Instruments

Muscle Dysmorphia Disorder Inventory. The Muscle Dysmorphia Disorder Inventory, validated by Sepúlveda et al.,²⁵ was composed of three subscales, divided into 13 items on a 5-point Likert scale (1 = *totally disagree*; 5 = *totally agree*). The first subscale was the Drive for Size factor, which examines the nonconformity regarding the body musculature size as well as recognizing one's self as skinny with a desire to improve one's muscles. This subscale is associated with the pattern

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of thinking that is characteristic in patients with MD.²⁵ The second subscale was the Appearance Intolerance factor, which examines the presence of avoidance behavior regarding showing one's own body. The third factor, Functional Impairment, examines the need to maintain a routine of excessive exercise. This records the level of discomfort that a person may feel when their routine is modified as well as avoidance behavior in social situations, which are related to the criterion of a negative impact on daily life in *DSM-5*.¹ Internal consistency values [AQ9: Cronbach's alpha?] in all the factors were from alpha = 0.73 to alpha = 0.85.

Trait Meta-Mood Scale: (TMMS-24). This is a scale for the calculation of the attention/perception, understanding, and emotional adjustment that measures interpersonal EI. Specifically, the Spanish adaptation of TMMS-24 was used.²⁶ This was made up of 24 items on a 5-point Likert scale (1 = *totally disagree*; 5 = *totally agree*), which are grouped together in three dimensions: attention, clarity, and emotional repair.¹⁶ The internal consistency values found by Ferrandez-Berrocal et al.²⁶ ranged from good to excellent (alpha = 0.86 to alpha = 0.9).

COPE-28. The COPE-28 questionnaire is composed of 28 items divided into 14 subscales. Items use the Likert scale with four possible answers, where the values can vary between 0 (*I never do this*) to 3 (*I always do this*). The 14 subscales (representing the type of coping strategies used) are (1) active coping, (2) planning, (3) using emotional support, (4) using instrumental support, (5) religion, (6) (3) positive reframing, (7) acceptance, (8) denial, (9) humor, (10) self-distraction, (11) self-blame, (12) behavioral disengagement, (13) venting, and (14) substance use. Values of internal consistency ranged from medium to excellent (from alpha = 0.58 to alpha = 0.93) except for the accep-

tance subscale, which had a Cronbach's alpha score of 0.30.²⁷ [AQ10: Table 1 says .653. Which value is correct?]

Data Analysis

First, to guarantee test reliability, a test for Cronbach's alpha was carried out for all the measures and subscales.

Second, a descriptive analysis for all the subscales of MD, EI, and CS was obtained. Third, to analyze the relationship among MD, EI, and CS, a Pearson correlation coefficient was conducted.

Regarding the explanatory model for MD, a linear regression was conducted

Table 1.

Reliability and Descriptive Analysis of the Measures

Variables	Mean	SD	Cronbach's alpha
Muscle dysmorphia			
Drive for size	9.71	3.939	.856
Appearance intolerance	7.81	3.705	.856
Functional impairment	7.12	3.563	.841
Total muscle dysmorphia score	24.63	7.694	-
Emotional intelligence			
Attention	27.92	6.417	.886
Clarity	28.27	5.584	.872
Repair	28.35	6.033	.838
Adaptative CS			
Active coping	4.17	1.246	.711
Planning	3.84	1.258	.443
Using emotional support	3.55	1.541	.804
Using instrumental support	3.50	1.452	.708
Religion	1.13	1.550	.798
Positive reframing	3.67	1.589	.729
Acceptance	4.36	1.173	.653
Maladaptative CS			
Denial	1.60	1.392	.776
Humor	3.99	1.398	.509
Self-distraction	3.67	1.460	.777
Self-blame	3.42	1.374	.782
Behavioral disengagement	1.75	1.497	.700
Venting	2.88	1.474	.651
Substance use	0.88	1.487	.861

Abbreviations: CS, coping strategies; SD, standard deviation.

Table 2.

Correlation Analyses Between Measures

Measure	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18				
V1 Total MD score	1	.251 ^a	-.228 ^b	-.325 ^a	-.141	-.113	-.059	-.122	.021	-.023	-.230 ^b	.387 ^b	.152	.224 ^b	.530 ^a	.360 ^a	.194 ^b	.291 ^a				
V2 Attention	1		-.047	-.030	-.010	-.128	.161	.167	.069	.001	-.255 ^a	.148	-.136	.113	.280 ^a	.166	.314 ^a	.182				
V3 Clarity	1			.264 ^a	.302 ^a	.340 ^a	.343 ^a	.230 ^b	.013	.317 ^a	.333 ^a	-.300 ^a	.217 ^b	-.141	-.015	-.336 ^a	.163	-.152				
V4 Repair	1				.136	.112	.164	.117	-.061	.507 ^a	.285 ^a	-.187 ^b	.167	-.206 ^b	-.237 ^b	-.050	-.149	-.182				
V5 Active coping	1					.484 ^a	.290 ^a	.589 ^a	.072	.308 ^a	.369 ^a	-.029	.156	.063	-.017	-.214 ^b	.314 ^a	.009				
V6 Planning	1						.22 ^b	.338 ^a	.043	.278 ^a	.364 ^a	-.258 ^a	.313 ^a	.071	.098	-.187 ^b	.159	.014				
V7 Emotional support	1							.576 ^a	.045	.341 ^a	.207 ^b	.079	.011	.102	.059	-.080	.313 ^a	.033				
V8 Instrumental support	1								-.089	.191 ^b	.257 ^a	.063	.099	.174	.052	-.038	.312 ^a	.025				
V9 Religion	1									.169	-.132	.184	-.188 ^b	.068	-.035	.011	-.014	.163				
V10 Positive reframing	1										.352 ^a	-.066	.280 ^a	-.039	.135	-.002	-.005	.011				
V11 Acceptance	1											1	-.255 ^a	.345 ^a	.149	.047	-.299 ^a	.118	-.198 ^b			
V12 Denial	1													1	-.020	.251 ^b	.228 ^b	.395 ^a	.162	.271 ^a		
V13 Humor	1															1	.099	.306 ^a	.012	.108	.034	
V14 Self-distraction	1																	1	.192 ^b	.018	.152	.198 ^b
V15 Self-blame	1																		1	.176	.326 ^a	.221 ^b

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Table 2. (continued)

Correlation Analyses Between Measures

Measure	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	V12	V13	V14	V15	V16	V17	V18
V16																1	-.008	.134
V17																	1	.415 ^a
V18																		1

Abbreviations: MD, muscle dysmorphia; V, variable.
^ap ≤ .01. ^bp ≤ .05.

along consecutive steps inserting MD as a variable criterion and using the EI and CS subscales, which showed significant correlations with MD as predictor variables (as linear regression requires as assumption).

Also, to ensure compliance with linear regression assumptions, variance inflation factors (VIF) and tolerance levels were examined to analyze multicollinearity, and Durbin-Watson statistics were examined for independence of residuals. All the analyses were carried out by using the statistics program SPSS (version 22).

RESULTS

In **Table 1**, we can see evidence of internal consistency in each of the dimensions of the variables under study. Cronbach's alpha was good in almost all the subscales except for the planning and humor subscales of CS, which were medium.

As also shown in **Table 1**, the measures obtained in the three subscales that assess EI were found to be average for the optimum parameters of all of them, as well as the average of the total MD score. On the other hand, in the results regarding the subscales that assess the different CS, we need to emphasize the acceptance and active coping variables, as they have the highest average values (4.36 and 4.17, respectively, with 8 being the maximum). In contrast, the substance use, religion, denial, and behavioral disengagement variables show the lowest averages (between 0.88 and 1.75). [AQ11: Table 1 states 1.6. Which value is correct?]

The correlations between the variables are given in **Table 2**. Several statistically significant correlations have been found between some variables. EI has positive correlations between total MD with attention, and a negative correlation with clarity and repair. Secondly, regarding CS, all the maladaptive CS (except humor)

showed positive correlations with MD symptoms, and negative correlations between positive CP [AQ12: Please spell out the abbreviation "CP".] acceptance and MD symptoms.

The linear regression analysis was carried out using total MD as a variable criterion and the significant subscales of EI and CS as predictor variables. As shown in **Table 3**, the third explanatory model, composed of self-blame, blame, and acceptance variables, there is a 36% variance in the DM variable, with self-blame being the most significant variable to predict DM symptoms. None of the EI subscales were significant predictors of MD symptoms.

Regarding the statistics of collinearity, we can observe how the VIF goes up slightly, as well as a slight decrease in tolerance, which indicates that the third explanatory model doesn't show any collinearity among its variables. Furthermore, the Durbin-Watson statistic for the independence of the residuals showed optimum values, thus the linear regression assumptions were achieved.

DISCUSSION

The aim of this study was to analyze the relationship among EI, CS, and MD symptoms, as well as the ability of the two first variables to predict MD symptoms in a male population that ranged from age 18 to 30 years.

Our findings highlight the relationship between the different analyzed variables. Firstly, regarding EI, the three subscales were significantly related to DM symptoms, which is congruent with results of previous research.¹¹⁻¹⁴ For the attention variable within IE, the correlation was direct, which suggests that more emotional attention is related with more levels of MD symptoms. Despite this subscale having not been studied previously, this finding could be related to what

Table 3.

Predictive Models of Muscle Dysmorphia					
Model of MD ^a	Delta R ²	Beta	T [AQ11: T test?]	Tolerance	VIF
1 (Constant)			8.772		
Self-blame ^b	.267	.523	6.468	1	1
2 (Constants)			8.255		
Self-blame ^b		.459	5.771	0.944	1.059
Denial ^b	.331	.271	3.404	0.944	1.059
3 (Constants)			6.968		
Self-blame ^b		.482	6.173	0.931	1.074
Denial ^b		.215	2.669	0.875	1.142
Acceptance ^b	.363	-.201	-2.570	0.925	1.081

Abbreviation: MD, muscle dysmorphia; VIF, variance inflation factor.

^aCriterion variable.

^bPredictive variable.

was suggested by Cunningham et al.¹⁵ about the relationship between perfectionism as a predictor symptom of body dysmorphic disorder, which sometimes involves an excess of attention as an obsessive component and is also a characteristic of EDs, especially in anorexia nervosa.

For the other two subscales, clarity and repair, significant negative correlations were found with MD symptoms. These results indicate that higher levels of MD symptoms are related with lower levels of clarity and emotional repair. Both findings are similar to previous research in which difficulties were found in emotional clarity as well as in the facial recognition of emotions in people diagnosed with MD.^{10,15,16} Additionally, repair is the subscale most strongly related to MD symptoms, and is the EI variable most studied in MD and ED.¹⁵

However, despite significant correlations between EI components and MD symptoms, none of them were significant predictors of MD symptoms. This

finding could be due to the fact that all of the studies that found EI as a predictor of MD symptoms are based on clinical samples or specific groups such as bodybuilders, all of whom are characterized by a high dysmorphic level.

Regarding the CS, direct correlations between MD symptoms and all maladaptive CS were found, except for the case of humor. This finding suggests that higher levels of maladaptive CS are related with higher levels of MD symptoms. Within maladaptive CS, self-blame was the most strongly related to MD symptoms. In a different way, the adaptive CS of acceptance showed a significant negative correlation, which means that lower levels of acceptance are associated with higher levels of MD symptoms. These results are consistent with previous studies in the field of CS and EDs, showing that CS is related to body-mass index, body satisfaction, and difficulties in how participants perceived their figures. In fact, these variables are considered by scien-

tific literature as relevant in people with DM symptoms.²²

Finally, the resulting predictive model showed that CS of self-blame, denial, and acceptance were significant variables to predict MD symptoms, a model that accounted for 36% of the variance. This model is congruent with the previously mentioned studies in which CS resulted in predictors of EDs.^{23,24,28}

STUDY LIMITATIONS

The present study has some limitations. First, the transversal design and the subclinical sample used requires taking the results and conclusions with caution, based on the relationship between variables and not on causality. Second, the difficulty of interpreting the attention subscale must be mentioned, given that it is not a linear variable but a quadratic one, as both low and high levels of emotional attention are considered inadequate, whereas intermediate levels are considered the most appropriate. Thus, results about this EI component should be taken with caution.

CONCLUSION

Based on the obtained results, a relationship among MD symptoms, EI, and CS has been found. Higher levels of emotional attention and lower levels of emotional clarity and repair are related to higher levels of MD symptoms; however, none of the EI components resulted in predictors of MD symptoms. With regard to CS, higher levels of maladaptive CS are related to higher levels of MD symptoms. This relationship was found also for the case of one adaptive CS (acceptance) and two maladaptive CS (self-blame and denial).

The results of the present study are congruent with previous literature but fill a gap in research of the area, which is frequently focused on the most com-

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mon EDs and mostly with female participants. Thus, the present study represents one more step in research of the ED field from a transdiagnostic perspective, which has clinical implications for the design and implementation of intervention programs for male populations focused on improving CS and EI to prevent MD disorder.

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