Body and appearance-related self-conscious emotions, emotional regulation strategies, and disordered eating in adult men

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Abstract

Eating disorders (ED) in men are the great unknown. Although several studies have been carried out, it is still understood how men develop these disorders. In this regard, this paper explores the relationship between body and appearance-related self-conscious emotions and ED symptoms and the mediating role of emotional regulation strategies in this association. Participants were 127 (S1) and 163 (S2) adult men who responded to an online questionnaire at two different times and were classified into risk groups (general, high, and low) and healthy groups. Body shame and body guilt were positively related to ED symptoms and maladaptive strategies, whereas they were negatively associated with adaptive strategies. In contrast, authentic and hubristic body pride were negatively associated with ED symptoms (except for authentic body pride in S1), maladaptive strategies such as emotional suppression (S1), psychological withdrawal (S2) and upward social comparison (S2), and positively with adaptive strategies. Likewise, those at risk, compared to the healthy, presented more body shame and body guilt and less hubristic body pride (S2) and used more maladaptive and less adaptive strategies. Finally, maladaptive strategies partially mediated the effect of body shame and body guilt on ED symptoms (in the case of BG also adaptive ones), whereas in the case of the relationship between body pride and ED symptoms, only adaptive strategies and emotional suppression mediated. Our findings show the importance of reducing risk factors (e.g., maladaptive strategies) as well as enhancing protective factors (e.g., adaptive strategies) in prevention and intervention programs.

Keywords Eating disorders · Self-conscious emotions · Emotional Regulation strategies · Body shame · Body guilt · Body pride

Eating Disorders (EDs) are characterized by disruptive eating behaviors impacting both physical health and psychosocial functioning (American Psychiatric Association, 2013). Globally, approximately 4-32% of adults are at risk of ED development, including 29% of Hispanic adults (Budhiwianto et al., 2023; Garrido-Miguel et al., 2019). Even though about 70 million people worldwide are known to suffer from EDs according to the National Eating Disorder Association, this might be just the tip of the iceberg, with an estimated 41.9 million undiagnosed cases (Santomauro et al., 2021). COVID-19has exacerbated the issue, increasing ED cases by 20% and elevating risk levels substantially (FITA, 2020). Amid this crisis, understanding the factors driving ED development is crucial (Stice et al., 2017).

Globally, according to the National Eating Disorder Association, one in three ED sufferers is male, with prevalence steadily rising (Zhao & Encinosa, 2011). Investigating emotional regulation (ER) strategies elucidating the nexus between body-related emotions and ED symptoms in men is paramount. This is key to the design of prevention and treatment strategies fostering adaptive ER while mitigating maladaptive emotional responses tied to risky eating behaviors (Nagata et al., 2020). In this sense, contextual adaptation and gender-specific considerations enhance efficacy

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(Tamres et al., 2002). Likewise, studying varying levels of ED risk (low and high) alongside their attributes, as well as the healthy spectrum, offers vital insights into underlying ED mechanisms (Cruz-Sáez et al., 2013).

This paper aims to expand knowledge about the role of adaptive (e.g., instrumental coping, seeking emotional social support, positive reappraisal, gratitude, and self-reward) and maladaptive (e.g., psychological withdrawal, rumination, emotional suppression, and upward social comparison) ER strategies in the relationship between negative body shame (BS) and body guilt (BG) and positive (authentic body pride; ABP, and hubristic body pride; HBP) body and appearance-related self-conscious emotions in relation to ED symptoms. Specifically, we focus on a population so underrepresented in studies on ED as Spanish-speaking adult men.

Our approach integrates several theoretical frameworks. The Process Model of Self-Conscious Emotions (Tracy & Robins, 2004, 2007) posits that these emotions arise from compliance or non-compliance with social norms. The Self-Discrepancy Theory (Higgins, 1987) contends that incongruities between real and ideal self-images evoke unpleasant emotions, such as BS or BG. The Transdiagnostic Model (Fairburn et al., 2003) links emotional dysregulation to ED symptoms. Lazarus & Folkman's (1986) work categorizes ER strategies as adaptive or maladaptive based on context, a question that may be relevant to understanding the relationship between emotional dysregulation and ED.

Eating disorders in men: an overview

Traditionally, EDs were seen as affecting only women, reinforced by diagnostic criteria like amenorrhea, exclusive to ciswomen (Chmura et al., 2022). However, men constitute a significant portion of ED cases: 20% in anorexia nervosa, 30% in bulimia nervosa, 43% in binge ED, and 55-77% in specific EDs (Hay et al., 2015). The proportion of men at ED risk has surged exponentially over time (Mitchison & Mond, 2015; Nagata et al., 2020). Subclinical ED behaviors like binge eating, purging, and laxative use are nearly as prevalent in men as women (Burnette et al., 2017).

Yet, stereotypes and cultural biases hinder male ED recognition and understanding. The stigma surrounding a predominantly women-associated disorder likely leads men to downplay symptoms (Goldstein et al., 2016; Gorrell & Murray, 2019). Assessment tools sensitive to the male prototype of ED (muscle-oriented) are lacking, as are tailored prevention and intervention programs for men (Nagata et al., 2020). This contributes to underdiagnosis and misconceptions about ED nature in men (Goldstein et al., 2016; Gorrell & Murray, 2019). When men do seek help, their conditions tend to be more severe, heightening the mortality risk (Quadflieg et al., 2019).

A gender perspective to analyze this problem is crucial. Women and men share similar risk factors, although there are some gender differences in the way these are presented (Jones & Morgan, 2010). For example, men focus on muscle gain while women prioritize thinness. Behaviors differ too; men exercise and binge eat, while women resort to food restriction and compensatory actions, such as self-induced vomiting among others (Weltzin et al., 2005).

Studies often focus on English-speaking women, neglecting Spanish-speaking men (Burnette et al., 2017; Murray et al., 2017). Evidence shows Spanish-speaking men are scarcely studied, evident in systematic reviews (e.g., Richardson & Paslakis, 2020). This study tries to close this gap by examining this group of people because its results might differ from those of English-speaking men.

Authors highlight the importance of distinguishing risk profiles in predicting ED development, (Cruz-Sáez et al., 2013), it is important to differentiate between men who are at low and high risk of developing an ED. The risk of developing an ED is characterized by a high preoccupation with body weight, shape, and eating, and high ED risk entails preoccupation incorporating risky behaviors like vomiting (Graham et al., 2018). About 14% of Spanish-speaking men are at risk (Baldó-Vela & Bonfanti, 2019), with 0.3% developing ED (Rojo et al., 2015). Few studies differentiate risk profiles, opting for a general risk group (Mendia et al., 2023; Turel et al., 2018), missing nuances. Analyzing the ED profiles aids in identifying risk factors and guiding tailored prevention for low and high-risk populations.

Additional research is needed to address underrepresented samples in ED. Examining different ED levels which will shed some light on the prevention and early intervention of ED. In this sense, the present study aims to contribute knowledge about these gaps.

Body and appearance-related self-conscious emotions

Among emotional variables linked to EDs, body and appearance-related self-conscious emotions like BS, BG, ABP, and HBP have been less explored. These emotions can be explained through two theories that are related: the Process Model of Self-Conscious Emotions (Tracy & Robins, 2004, 2007) and the Self-Discrepancy Theory (Higgins, 1987). The first of them states that these emotions emerge from self-assessment against social norms. Non-compliance may trigger shame or guilt, while perceived compliance leads to ABP or HBP. The second one proposes that when a person compares their actual self with their ideal self and discrepancies are generated between both perceptions, the person will likely experience unpleasant emotions, such as shame or guilt. These emotions, evidenced in women's studies

(Mendia et al., 2021; Troop & Redshaw, 2012), may also be risk or protective factors for EDs.

Unpleasant body and appearance-related self-conscious emotions: body shame and body guilt

Presently, around 80% of individuals frequently encounter negative body-related emotions like BS and guilt (Neighbors & Sobal, 2007). These emotions are concerning, potentially triggering maladaptive eating behaviors contributing to ED development (Haedt-Matt & Keel, 2011).

In terms of these emotions' association with body and appearance, BS arises from a perceived failure to meet societal standards (Sabiston et al., 2010). In contrast, BG involves regret over body-related actions (Calogero & Pina, 2011). A meta-analysis reveals BS's stronger link to EDs than general shame, particularly in women (Nechita et al., 2021). Positive connections between BS and ED symptoms are evident in clinical and non-clinical samples of both genders (Bardone-Cone et al., 2019; Calogero & Pina, 2011; Doran & Lewis, 2012; Melo et al., 2019; Mendia et al., 2021; Mustapic et al., 2016; Troop & Redshaw, 2012; Warnick et al., 2022). Studies note BS predicts binge eating in both genders (Dakanalis et al., 2015). Lucibello et al. (2021) also identify links between BS/BG and perceiving oneself as heavy and internalizing weight stigma in a mixed-gender university sample. Research suggests men at ED risk experience higher BS (Mendia et al., 2023).

Regarding BG, women with intense guilt and low tolerance exhibit higher cognitive and behavioral restraint (Solomon-Krakus et al., 2022). This emotion correlates positively with food restraint, body checking, bulimia, binge eating symptoms, and food preoccupation in women and men (Conradt et al., 2007; Gupta et al., 2008; Solomon-Krakus & Sabiston, 2017; Vizin et al., 2022). Notably, men at risk of developing an ED had higher levels of BG than those who were not at risk (Mendia et al., 2023).

Pleasant body and appearance-related self-conscious emotions: authentic and hubristic body pride

The protective role of pleasant body-related emotions like body pride in relation to EDs has hardly been studied (Castonguay et al., 2013; McHugh et al., 2014). Two types of body pride can be distinguished: authentic, which focuses on a specific behavior related to body image (e.g., "I make an effort to take care of my physical appearance"), and hubristic, which is associated with global aspects of the self (e.g., "I feel more attractive than others"; Castonguay et al., 2013; Tracy & Robins, 2007).

Inconsistencies arise from limited research, predominantly in women, indicating both protective and adverse

associations (French et al., 1997; Skårderud, 2007). In women, an inverse relationship between body pride and EDs was found (French et al., 1997), also in a mixed-gender sample (French et al., 1995), indicating that body pride could be a protective factor against ED. Further exploration is needed, especially regarding comparisons with unpleasant body emotions (BS, BG).

When studying body pride's link to ED, differentiating its facets (ABP, HBP) is crucial (Gilchrist et al., 2018). Only two studies distinguish these facets, both ABP and HBP. These are positively associated with exercise addiction in mixed-gender adolescent samples (Alcaraz-Ibáñez et al., 2021) and adult men (Mendia et al., 2023), where their relation to ED lacked significance.

Given all of the above, we suggest that in Spanish-speaking adult men, unpleasant body and appearance-related self-conscious emotions (BS and BG) will be positively related to ED symptoms and maladaptive ER strategies, while will be negatively related to adaptive ER strategies (H1.1). In contrast, pleasant body and appearance-related self-conscious emotions (ABP or HBP) will not be significantly related to ED symptoms, although they will be positively related to adaptive ER strategies and negatively related to maladaptive ER strategies (H1.2). Secondly, as to unpleasant body and appearance-related self-conscious emotions (BS and BG), we expect that, in general, at-risk men will score higher than healthy men; and also, that high-risk men will score higher than low-risk and healthy men (H2.1). However, concerning pleasant body and appearance-related self-conscious emotions (ABP and HBP), we do not expect to find statistically significant differences between groups (H2.2).

Given all of the above, we propose that in Spanish-speaking adult men, unpleasant body emotions (BS, BG) will correlate positively with ED symptoms and maladaptive ER strategies, inversely with adaptive ER strategies (H1.1). Conversely, pleasant body emotions (ABP/HBP) won't significantly correlate with ED but will align positively with adaptive ER strategies and negatively with maladaptive ones (H1.2). In terms of unpleasant emotions, at-risk men will likely score higher than healthy men, and high-risk higher than low-risk/healthy (H2.1). However, for pleasant emotions, no significant intergroup differences are anticipated (H2.2).

Emotional regulation strategies as mediating variables

The connection between body and appearance-related self-conscious emotions and EDs could involve specific ER strategies. ER describes person's attempts to modulate their emotions in order to respond to the demands of the context
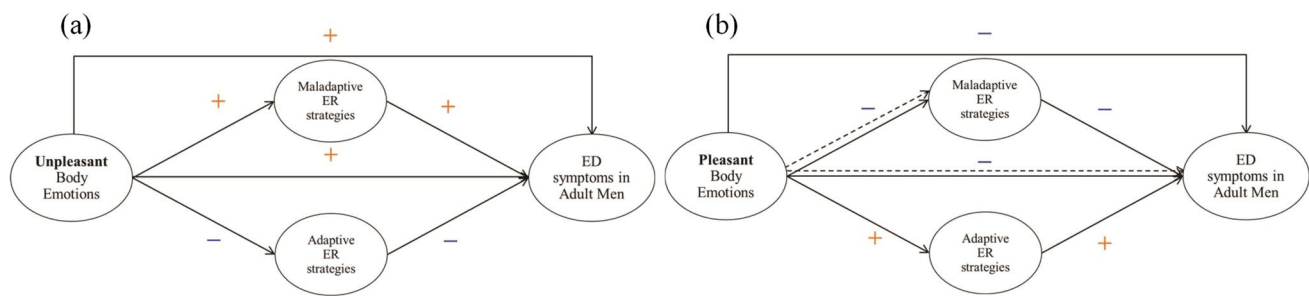
Fig. 1 Theoretical model (**a**) unpleasant body emotions & (**b**) pleasant body emotions

(Gross, 2014). The link between these emotions and emotional dysregulation is substantiated by the Transdiagnostic Model assertion that ED symptoms stem from inadequate emotional state management (Fairburn et al., 2003). Individuals experiencing high BS, BG, and low body pride might develop ED symptoms due to maladaptive handling of body-related emotions (emotional dysregulation). Additionally, some studies (Lin et al., 2022; Piotrowski, 2019) establish links between self-conscious emotions and adaptive and maladaptive ER strategies (e.g., rumination, suppression). Several studies show that the use of adaptive ER strategies (e.g., instrumental coping, seeking emotional social support, problem-solving, reappraisal, and gratitude; Langer et al., 2011; Prefit et al., 2019) is negatively associated with ED symptoms, whereas maladaptive ER strategies are positively associated with ED symptoms (e.g., rumination, suppression, avoidance strategies, such as psychological withdrawal, upward social comparison; Pinkasavage et al., 2015; Prefit et al., 2019; Smith et al., 2018).

Taking into account all of the above and that people with an ED have more difficulties regulating their emotions than healthy people (Mallorquí-Bagué et al., 2018), it is postulated that the healthy group will manifest a heightened inclination toward employing the adaptive ER strategies in comparison to the risk groups (H2.3). About maladaptive strategies, it is anticipated that the risk/high-risk group will use these strategies to a greater extent when contrasted with the healthy group/low-risk group (H2.4). Specifically, maladaptive ER strategies, as opposed to adaptive ones, are expected to exert a more substantial influence on the risk of developing EDs, as suggested by prior research (Prefit et al., 2019). Nonetheless, adaptive strategies are anticipated to function as mitigating factors concerning ED symptoms.

However, to our knowledge, no study has explored the role of the use of adaptive and maladaptive ER strategies in the relationship between body- and appearance-related self-conscious emotions and ED in Spanish-speaking adult men (see Fig. 1). However, proximal mediational models that have studied the mediating role of ER strategies regarding ED symptoms have been proposed.

Khodabakhsh & Leng (2020) found in a sample of university students that body image disturbances were related to ED symptoms through difficulties in ER. Similarly, in another study with female university students, evidence was found in favor of the mediating role of ER difficulties between general shame and ED symptoms (Gupta et al., 2008).

To summarize, we expect that adaptive and maladaptive ER strategies will partially mediate the relationship between BS (H3.1) and BG (H3.2) and ED symptoms. Regarding ABP (H3.3) and HBP (H3.4), we set out to investigate the possible mediating role of adaptive and maladaptive ER strategies in the direct and indirect relationship that these emotions possess with ED symptoms in an exploratory manner to fill the identified gap (see theoretical model Fig. 1). This will add evidence to the scarce literature on the relation between both types of body pride and ED symptoms, and the mediating role of adaptive and maladaptive ER strategies.

Study 1

This study was conducted in November 2019, a few months before the COVID-19 pandemic broke out, and arises to expand scientific knowledge about how men develop ED. It focuses on unpleasant (BS and BG) or pleasant emotions (ABP and HBP) body and appearance-related self-conscious emotions, as well as maladaptive ER strategies (rumination and emotional suppression) and adaptive ER strategies (positive reappraisal), which could act as protective or risk factors. And, focused on analyzing the mediating role of ER strategies (maladaptive and adaptive) in the relationship between pleasant emotions and unpleasant emotions. It also incorporates a healthy and at-risk sample, which offers us clues for designing future prevention and intervention programs aimed at such an invisible sample as men who are at risk of developing an ED or who suffer from it.

Method

Design and participants

This study is based on a cross-sectional design with non-probability sampling using the snowball technique. This work is part of a larger study involving 2,474 participants. After applying the inclusion criteria, 197 adult men aged 18–50 years ($M = 34.15$; $SD = 9.15$) of Spanish (84.1%) or Latin American (Argentina, Colombia, Ecuador, Mexico, and Peru; 15.9%) nationality were selected. According to the weight and height reported by the participants and according to the criteria established by the World Health Organization, 25 (12.7%) were underweight, 110 (55.8%) were normal weight, 42 (21.3%) were overweight and 20 (10.2%) were obese.

Participants were classified into two groups: 122[1] men met the criteria for being at risk of developing an ED ($M_{age} = 32.87$; $SD_{age} = 8.92$) and 75 ($M_{age} = 36.26$; $SD_{age} = 9.56$) to be considered healthy. Within the at-risk group, 47 (38.5%) men met the risk criterion related to risky eating behaviors and 115 (94.3%) met the criteria for having a strong desire to be muscular and exhibiting typical bulimic habits.. Overall, 82 (67.2%) men met only one criterion, while the remaining 40 (32.8%) met both. No statistically significant differences were found between the two groups in any of the BMI categories, except for obesity, with a higher proportion of people with obesity in the at-risk group ($\chi^2(3) = 8.13$; $p = .043$).

Measures

The instruments presented below are part of a larger study that collected information on other variables. The instruments used to create the groups are described in detail below:

Drive for Muscularity Scale (DMS; Yelland & Tiggemann, 2003, adapted from Mendia et al.,,, unpublished). It consists of seven items assessing obsession with muscularity. Participants were asked to indicate how often they identified with the items (e.g., "I am terrified of looking like I am not strong") using a six-point *Likert*-type scale (0 = *Never* and 5 = *Always*). Three authors who were fluent in the language translated this scale into Spanish and had it reviewed by a native translator. The authors made a great effort to maintain a version similar to the original, respecting cultural variations. The Anglo-Saxon validation of this measure and our results confirm its unifactorial structure, as well as an adequate validity and reliability fit (Tod et al., 2012). In this study, this scale obtained a Cronbach's alpha of 0.83.

Bulimia and behavioral items sub-scale of the EDI-3-RF (Garner, 2004; adapted from Elosua et al., 2010). The bulimia sub-scale consists of eight items assessing typical symptoms of bulimia nervosa. Participants were asked to rate how frequently they felt as stated in the items(e.g., "I think about vomiting to lose weight") on a six-point *Likert*-type response scale (0 = *Never* and 5 = *Always*). The frequency of ED-related behavioral symptoms during the past three months was also measured (e.g., "During the past three months, how often have you made yourself vomit to control your weight?") via a *Likert*-type scale (0 = *Never* and 5 = *Once a day or more*). In this study, this scale obtained a Cronbach's alpha of 0.86.

Brief Symptom Checklist (BSC; Abuín & de Rivera, 2014). This checklist consists of 50 items to identify those at risk of developing a disorder. The Psychopathological Risk Index scale was the only one used in this study. Participants were required to rate how much they had experienced each symptom listed in the items.(e.g., "I have thoughts of ending my life") during the past few weeks using a five-point *Likert*-type scale (0 = *Not at all* and 4 = *Very much*). In this study, the Psychopathological Risk Index subscale obtained a Cronbach's alpha of 0.89. On the other hand, this study also evaluated body and appearance-related self-conscious emotions and the use of ER strategies through the following instruments.

Body and Appearance Self-Conscious Emotions Scale (BASES; Castonguay et al., 2014; adapted scale by Alcaraz-Ibáñez & Sicilia, 2018). The scale has 15 items grouped into four subscales: BS, BG, ABP, and HBP. Participants indicated how often they identified with what was mentioned in the items (example of items related to each of the subscales, shame, guilt, ABP, and HBP, respectively: "ashamed of my physical appearance", "remorseful for not having worked to improve my physical appearance", "proud for making an effort to improve my physical appearance" and "proud for being more attractive than other people") using a five-point *Likert*-type response format (1 = *Never* and 5 = *Always*). Cronbach's alphas for the different subscales ranged from 0.91 to 0.95 in this study.

Measurement of Affect Regulation Styles (MARS; Larsen & Prizmic, 2004; adapted scale by Páez et al., 2012). This instrument consists of 56 items, grouped into 23 ER strategies, which measure the frequency with which people use to manage unpleasant emotions. Participants responded how frequently they engaged in each of the actions listed in each item(e.g., an item related to the emotional suppression strategy: "Try not to show my feelings, to suppress all expression") to modify their feelings

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[1] A power analysis was carried out with G*Power 3.1. (Faul et al., 2009) to estimate *a priori* the minimum sample size. Meta-analyses conducted by Nechita et al. (2021) and Smith et al. (2018) found a moderate relationship between body shame or rumination and disordered eating. Based on these results, via linear multiple regression: random model with an alpha = .05 and a power of = .95, the projected sample size would be $N = 60$.

using a seven-point *Likert*-type scale (0 = *Never* and 6 = *Always*). In this work, only the strategies of Rumination, Emotional suppression, and Positive reappraisal were used, which obtained a Cronbach's alpha of 0.78, 0.73, and 0.78, respectively.

Demographic information Each participant disclosed information about their age, gender, and country of origin.

Procedure

First, an online questionnaire was developed and disseminated in November 2019 through social networks (e.g., Twitter) by people working in ED prevention and by other collaborators. The questionnaire was completed in Spanish and was accessible via a link to the Qualtrics platform. Participants completed the full questionnaire in approximately 30 minutes, and they were not paid for taking part in the study.

The sample had to meet the following inclusion requirements in order to take part in the study:(1) self-identify as a man; (2) be between 18 and 50 years old; (3) not have self-reported an ED or been detected through a set of *ad-hoc* criteria based on the DSM-5 (American Psychiatric Association, 2013) and; (4) have completed at least 80% of the items in each instrument.

As noted above, the selected individuals were classified into two groups: men at risk of developing an ED and healthy men. The risk of developing an ED was estimated according to two criteria based on the Eating Disorders Inventory Third Edition-Referral Form (EDI-3-RF; Garner, 2004; adapted from Elosua et al., 2010) and adapted for men: (1) the total score obtained on the Drive for Muscularity Scale (Yelland & Tiggemann, 2003, adapted by Mendia et al., unpublished) and Bulimia subscales of the EDI-3-RF and; (2) the behavioral items of the EDI-3-RF (e.g., "During the past three months, how often have you used laxatives to control your weight or shape?"). Although the original risk criteria also include a BMI criterion, we did not take it into account because it is a weight-centered criterion that can generate false positives. Thus, to be considered men at risk, it was sufficient to meet at least one of the two criteria described above. On the other hand, men considered healthy did not meet any of the risk criteria according to the scores obtained in the Brief Symptom Checklist (Abuín & de Rivera, 2014), were not at risk of developing any other disorder, and stated that they were not receiving any type of treatment.

The University of the Basque Country/Euskal Herriko Unibertsitatea (UPV/EHU) Committee for Research Involving Human Subjects gave its approval to this study, which was carried out in accordance with the Helsinki Declaration (M10/2018/268MR1).

Data analysis

Statistical analyses were performed using SPSS 25.0 statistical package. First, we carried out descriptive (means and standard deviations) and *Pearson* correlational analyses for all variables. Next, we performed a *t-test* to compare the at-risk and the healthy groups along with Cohen's *d* effect size. Finally, we posed four multiple mediation models to explore whether rumination, emotional suppression, and positive reappraisal could mediate the effect of body and appearance-related self-conscious emotions on ED symptoms. Mediation analyses were performed through PROCESS macro for SPSS.

Results

Descriptive analyses

Descriptive statistics (mean and standard deviations) and correlations between all variables included in the study are presented in Table S1 (see Supplementary Material). ED symptoms showed a positive and significative association with BS and BG (confirming Hip. 1), rumination, and emotional suppression (between $r = .26$ and $r = .71$, all $p < .001$), whereas it was negative to HBP and positive reappraisal ($r = -.24$ and $r = -31$, all $p = < .001$). ED symptoms have no significant association with ABP ($r = -0.10$, $p = .155$). On the other hand, BS and BG were significative and positively related to rumination and emotional suppression ($r = .14$, $p = .043$ and $r = .48$, $p < .001$), negatively to positive reappraisal ($r = -.29$ and $r = -.22$, all $p < .001$). Finally, ABP and HBP showed a negative relationship with emotional suppression and a positive one with positive reappraisal (correlations ranged between -.19 and .30). These results support hypotheses H1.1 and H1.2 (although the latter, partially).

Differences between the at-risk group and the healthy group

Likewise, there were statistically significant differences between the at-risk and healthy groups in all the variables under study, except for the two types of body pride. In line with hypotheses 2.1 to 2.4, the results showed that the at-risk group, compared to the healthy one, scored higher on BS, BG, rumination, and emotional suppression while scoring lower on positive reappraisal. The magnitude of the differences between the groups was large for both unpleasant emotions (BS and BG) and the use of emotional suppression, medium for the use of rumination and positive reappraisal, and small for HBP (see Table 1).

Table 1 Study 1: Differences in the variables between the group of men at risk of developing an ED and the group of healthy men

	At risk		Healthy				
	M	SD	M	SD	t	p	d
Unpleasant body emotions							
Body shame	2.82	1.16	1.66	0.68	-7.87	**<.001**	1.15
Body guilt	3.22	1.11	2.09	1.06	-6.98	**<.001**	1.03
Pleasant body emotions							
Authentic body pride	2.11	0.92	2.14	1.04	0.21	.415	0.03
Hubristic body pride	1.82	0.79	1.91	0.92	0.78	.219	0.11
ER strategies							
Rumination	4.78	1.26	4.06	1.46	-3.68	**<.001**	0.54
Emotional suppression	3.75	1.19	2.91	0.98	-5.06	**<.001**	0.74
Positive reappraisal	4.03	1.28	4.56	1.40	0.00	**.003**	0.40

At risk *n* = 122/121, Healthy *n* = 75/74. Statistically significant differences are indicated in bold.

Multiple mediation models

In this study, four independent multiple mediation models have been carried out, one for each of the body and appearance-related self-conscious emotions. Regarding the models that included BS (Model 1) and BG (Model 2) as independent variables, it should be noted that hypotheses H3.1 and H3.2 were partially fulfilled. These emotions were positively associated with the use of rumination and emotional suppression, while they were negatively associated with the use of positive reappraisal. In both models, the use of rumination and emotional suppression was positively related to greater ED symptoms. Positive reappraisal, on the other hand, was significantly and negatively associated with ED symptoms only in the BG model. In this sense, there is an indirect effect of both mediation models (BS and BG) on ED symptoms through the use of rumination, and emotional suppression. However, the indirect effect via positive reappraisal was only significant in the model related to BG (Model 2), but not in the one related to BS (Model 1). In both models, significant total effects were found, which were reduced by the effect of significant mediating variables, indicating partial mediation (see Table 2). These results partially supported hypotheses 3.3 and 3.4.

Second, concerning ABP (Model 3) and HBP (Model 4), as in the case of unpleasant emotions, our hypotheses (H3.3. and H3.4) were also partially fulfilled. Both types of body pride were negatively related to the use of emotional suppression and positively related to the use of positive reappraisal, and these were positively and negatively related (respectively) to ED symptoms. However, rumination was not significantly associated with either body pride. Thus, the indirect effect of emotional suppression and positive reappraisal was significant in both models (3 and 4), whereas rumination was not a significant mediating variable in either case. Regarding ABP (Model 3), the total effect disappeared due to the effect of the mediating variables,

indicating complete mediation, whereas in HBP (Model 4), it decreased, showing partial mediation.

Study 2

This study initially aimed to verify the findings of S1 within the same sample but with a one-year gap. Specifically, data collection took place in November 2020, after the COVID-19 epidemic had begun.

While sharing the same objectives as S1, this research offers two pivotal contributions to the understanding of these disorders. Firstly, it introduces distinct risk levels (low and high), a facet emphasized by previous research (Cruz-Sáez et al., 2013), which enables a more holistic examination by facilitating the development of a profile that closely aligns with a clinical population. Secondly, it integrates novel ER strategies that not only have the potential to function as protective factors (e.g., instrumental coping, seeking emotional social support, positive reappraisal, gratitude, and self-reward) against the development of these disorders but also serve as key risk factors (e.g., psychological withdrawal, rumination, emotional suppression, and upward social comparison).

Method

Design and participants

A total of 163 men aged between 18 and 50 (*M* = 34.84; *SD* = 9.39) participated, of whom 86.5% were Spanish and 13.5%, were Latin-American (Argentina, Colombia, Ecuador, Mexico, and Peru) Of the total sample, 0.6% of the men were underweight, 43.2% were normal weight, 30.9% were overweight and 25.3% obese.

In this study the participants were classified into three groups: 45 met the criteria for being at high risk of

Table 2 Study 1: Direct, indirect, and total effects from several multiple mediation models (N = 197)

	B	(SE)	t	p-value	LL 95% CI	UL 95% CI
Body Shame						
Direct Effects						
BS on rumination	0.19	(0.08)	2.60	**.010**	0.055	0.400
BS on emotional suppression	0.48	(0.07)	7.43	**< .001**	0.369	0.635
BS on positive reappraisal	-0.32	(0.08)	-4.68	**< .001**	-0.551	-0.224
Rumination on ED	0.14	(0.54)	2.60	**.010**	0.343	2.475
Emotional suppression on ED	0.13	(0.72)	2.20	**.029**	0.167	3.008
Positive reappraisal on ED	-0.08	(0.59)	-1.48	.138	-2.043	0.285
BS on ED	0.59	(0.73)	10.24	**< .001**	6.026	8.901
Indirect Effects						
via rumination	0.02	(0.01)			0.002	0.058
via emotional suppression	0.06	(0.02)			0.010	0.123
via positive reappraisal	0.03	(0.02)			-0.011	0.072
Total Effects						
BS on ED	0.71	(0.65)	13.75	**< .001**	7.642	10.202
Body Guilt						
Direct Effects						
BG on rumination	0.27	(0.08)	3.78	**< .001**	0.150	0.477
BG on emotional suppression	0.46	(0.06)	7.07	**< .001**	0.337	0.598
BG on positive reappraisal	-0.27	(0.08)	-3.80	**< .001**	-0.472	-0.150
Rumination on ED	0.12	(0.60)	2.08	**.039**	0.062	2.413
Emotional suppression on ED	0.17	(0.77)	2.62	**.010**	0.500	3.552
Positive reappraisal on ED	-0.13	(0.63)	-2.14	**.034**	-2.599	-0.103
BG on ED	0.50	(0.75)	8.05	**< .001**	4.590	7.572
Indirect Effects						
via rumination	0.03	(0.02)			0.001	0.072
via emotional suppression	0.08	(0.03)			0.020	0.140
via positive reappraisal	0.03	(0.02)			0.002	0.079
Total Effects						
BG on ED	0.64	(0.68)	11.51	**< .001**	6.494	9.180
Authentic Body Pride						
Direct Effects						
Authentic BP on rumination	0.11	(0.10)	1.47	.142	-0.052	0.357
Authentic BP on emotional suppression	-0.20	(0.08)	-2.79	**.006**	-0.421	-0.073
Authentic BP on positive reappraisal	0.21	(0.10)	2.89	**.004**	0.092	0.488
Rumination on ED	0.21	(0.68)	3.26	**.001**	0.870	3.538
Emotional suppression on ED	0.35	(0.85)	4.99	**< .001**	2.572	5.932
Positive reappraisal on ED	-0.19	(0.73)	-2.78	**.006**	-3.472	-0.589
Authentic BP on ED	-0.01	(0.95)	-0.14	.889	-2.016	1.750
Indirect Effects						
via rumination	0.02	(0.01)			-0.008	0.065
via emotional suppression	-0.07	(0.03)			-0.132	-0.018
via positive reappraisal	-0.04	(0.02)			-0.085	-0.007
Total Effects						
Authentic BP on ED	-0.09	(1.07)	-1.34	.183	-3.551	0.684
Hubristic Body Pride						
Direct Effects						
Hubristic BP on rumination	0.03	(0.12)	0.37	.712	-0.191	0.280
Hubristic BP on emotional suppression	-0.20	(0.10)	-2.77	**.006**	-0.480	-0.080
Hubristic BP on positive reappraisal	0.30	(0.11)	4.31	**< .001**	0.262	0.704
Rumination on ED	0.21	(0.66)	3.35	**< .001**	0.912	3.532

Table 2 (continued)

	B	(SE)	t	p-value	LL 95% CI	UL 95% CI
Emotional suppression on ED	0.34	(0.84)	4.93	**< .001**	2.472	5.770
Positive reappraisal on ED	-0.16	(0.74)	-2.30	**.022**	-3.164	-0.245
Hubristic BP on ED	-0.12	(1.09)	-1.92	.057	-4.268	0.060
Indirect Effects						
via rumination	0.06	(0.02)			-0.027	0.046
via emotional suppression	0.07	(0.03)			-0.127	-0.017
via positive reappraisal	-0.05	(0.03)			-0.106	-0.005
Total Effects						
Hubristic BP on ED	-0.24	(1.20)	-3.32	**< .001**	-6.354	-1.613

*S*tandardized coefficients are presented. Significant coefficients are emphasized in bold. Lower limit; *UL*, Upper limit; *CI*, Confidence Interval. *BS*, Body shame, *BG*, Body guilt; *ED*, Eating Disorder Symptoms; *BP*, Body pride.

developing an ED (M_{age} = 30.78; SD_{age} = 8.17), 58 were at low risk of developing an ED (M_{age} = 34.86; SD_{age} = 9.59), and 60 were considered healthy (M_{age} = 37.92; SD_{age} = 9.03). When analyzing the differences between the groups in BMI, significant differences were only found when comparing the high-risk group with the healthy group, with the former having the highest BMI.

Measures

In this study, all the measures used in S1 were included: DMS, EDI-3-RF, BSC, BASES y MARS. The internal consistency indices for each of the measures used are shown below: Drive for muscularity (α = .83); Bulimia (α = .90), psychopathological risk index (α = .92), BS (α = .94), BG (α = .94), ABP (α = .92), HBP (α = .94).

Although in this case, we extracted more ER strategies from Measurement of Affect Regulation Styles (MARS; Larsen & Prizmic, 2004; adapted scale by Páez et al., 2012). An exploratory factor analysis1 confirmed the structure and distribution of the strategies with the two expected underlying factors. The strategies were classified into adaptive and maladaptive strategies. The adaptive ER strategies (α = .90) are instrumental coping (three items, "I made a plan or resolution to change this situation", α = .83), seeking emotional social support (two items, "I spoke in order to get understanding and support", α = .76), positive reappraisal (three items: "I tried to put things in perspective" α = .73), and gratitude and self-reward (three items: "I tried to be grateful for the things in my life that are going well", α = .69). The maladaptive ER strategies (α = .78) are: psychological withdrawal (four items, "I withdrew from or avoided the situation" α = .58), rumination (two items: "I thought quickly about what had happened, about the emotional effects of the situation" α = .59), emotional suppression (item: "I tried not to think about what had happened, to ignore the emotions I was feeling", α = .73) and upward social comparison (one item: "I compared myself to people who have more resources, personal resources, and done better than me, to improve the situation").

Procedure

Men who participated in S1 were contacted via email to participate in a new data collection one year later, that is, in November 2020. The procedure used was very similar to that of S1. An online questionnaire was elaborated through the Qualtrics platform, which was disseminated through social networks. Participants took 30 minutes to complete the questionnaire.

Regarding the creation of groups, the same criteria were maintained as in S1, although in this study two degrees of risk of developing an ED were determined: high (meeting two criteria) and low (meeting only one criterion). Thus, the participants were classified into three groups: (a) men at high risk of developing an ED, (b) men at low risk of developing an ED, and (c) healthy men.

Data analysis

As in S1, first, descriptive and Pearson correlational analyses were performed between all the variables under study. Moreover, one-way ANOVA followed by Bonferroni post-hoc analysis was conducted to explore the differences between the high-risk group, the low-risk group, and the healthy group in the variables studied. Finally, four multiple mediation models were carried out to analyze the extent to which adaptive and maladaptive strategies could mediate the relationship between each of the body and appearance-related self-conscious emotions and ED symptoms.

Table 3 Study 2: Comparing the three groups: high-risk, low-risk, and healthy

	High-risk group		Low-risk group		Healthy group				
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	*p*	η^2
Unpleasant body emotions									
Body shame	3.62[a]	1.05	2.96[a]	1.06	1.65[a]	0.63	62.19	**<.001**	.44
Body guilt	3.75[b]	1.04	3.31[a]	1.08	2.09[ab]	1.02	35.59	**<.001**	.31
Pleasant body emotions									
Authentic body pride	1.81	0.87	2.06	0.90	2.24	1.15	2.42	.092	.03
Hubristic body pride	1.58[a]	0.79	1.75	0.80	2.17[a]	1.15	5.48	**.005**	.07
Adaptive ER strategies									
Instrumental coping	3.76[a]	1.10	3.93[b]	1.34	4.59[ab]	1.43	6.10	**.003**	.07
Emotional social support	2.80[a]	1.22	3.07	1.46	3.52[a]	1.53	3.37	**.037**	.04
Positive reappraisal	3.70[a]	1.30	3.83[b]	1.39	4.58[ab]	1.23	7.23	**<.001**	.08
Gratitude and self-reward	3.76[a]	1.34	4.02	1.25	4.51[a]	1.13	5.12	**.007**	.06
Maladaptive ER strategies									
Psychological withdrawal	3.80[a]	1.25	3.31[b]	1.07	2.50[ab]	0.84	20.94	**<.001**	.21
Rumination	4.97[a]	1.41	4.59[b]	1.17	3.93[ab]	1.16	9.53	**<.001**	.11
Emotional suppression	3.96[a]	1.46	3.68[b]	1.32	2.81[ab]	1.07	12.02	**<.001**	.13
Social comparison	3.02[a]	1.81	2.84[b]	1.56	2.07[ab]	1.28	5.93	**.003**	.07

N = 163. Groups with the same letter are significantly different.

Results

Descriptive analyses

Means, standard deviations, and correlations between all the variables included in S2 are presented in Table S2. Partially supporting our hypotheses H1.1 and H1.2, we found a positive association between ED symptoms and BS, BG and the use of maladaptive ER strategies such as psychological withdrawal, rumination, emotional suppression, and upward social comparison (correlation ranged between .38 and .79). In contrast, ED symptoms was negatively related to ABP, HBP, and the use of adaptive ER strategies such as instrumental coping, seeking emotional social support, positive reappraisal, and gratitude and self-reward (correlation ranged between -.26 and -.32). Likewise, BS and BG showed a positive association with the use of psychological withdrawal, rumination, emotional suppression, and upward social comparison (correlation ranged between .27 and .44) and a negative relation with the use of instrumental coping, seeking emotional social support, positive reappraisal, and gratitude and self-reward (correlation ranged between -.16 and -.32). ABP and HBP were positively related to the use of instrumental coping, seeking emotional social support, positive reappraisal, and gratitude and self-reward (correlation ranged between .20 and .40) and negatively to psychological withdrawal (*r* = -.18 and -.17, respectively). Finally, ABP showed a positive correlation with the use of upward social comparison (*r* = .17, *p* = .031).

Differences between those at risk of developing an ED: the high-risk group, low-risk group, and the healthy group

The results showed statistically significant differences between the groups in all variables except in ABP. The magnitude of the differences when comparing levels was large in unpleasant body emotions, medium in some maladaptive strategies (psychological withdrawal, emotional suppression, and rumination, from highest to lowest), and small in the rest of the study variables (overall, the adaptive strategies showed the smallest differences). As shown by the Bonferroni *post hoc* test, the high-risk group had the highest levels of BS, compared to the low-risk (*p* = .001) and the healthy group (*p* = <.001). In addition, although we found no differences between the risk levels, the high-risk and low-risk groups scored significantly higher than the healthy group on BG (*p* = <.001 and, *p* = <.001), psychological withdrawal (*p* = <.001 and, *p* = <.001), rumination (*p* = <.001 and, *p* = .014), emotional suppression (*p* = <.001 and, *p* = <.001) and upward social comparison (*p* = .007 and, *p* = .021), and scored lower on instrumental coping (*p* = .005 and, *p* = .021) and positive reappraisal (*p* = .003 and, *p* = .007). Finally, the high-risk group, compared with the healthy group, scored lower on HBP (*p* = .006), seeking emotional social support (*p* = .038), and gratitude and self-reward (*p* = .007) (see Table 3). These findings show evidence in favor of our hypotheses H2.1-H2.4, although only partially.
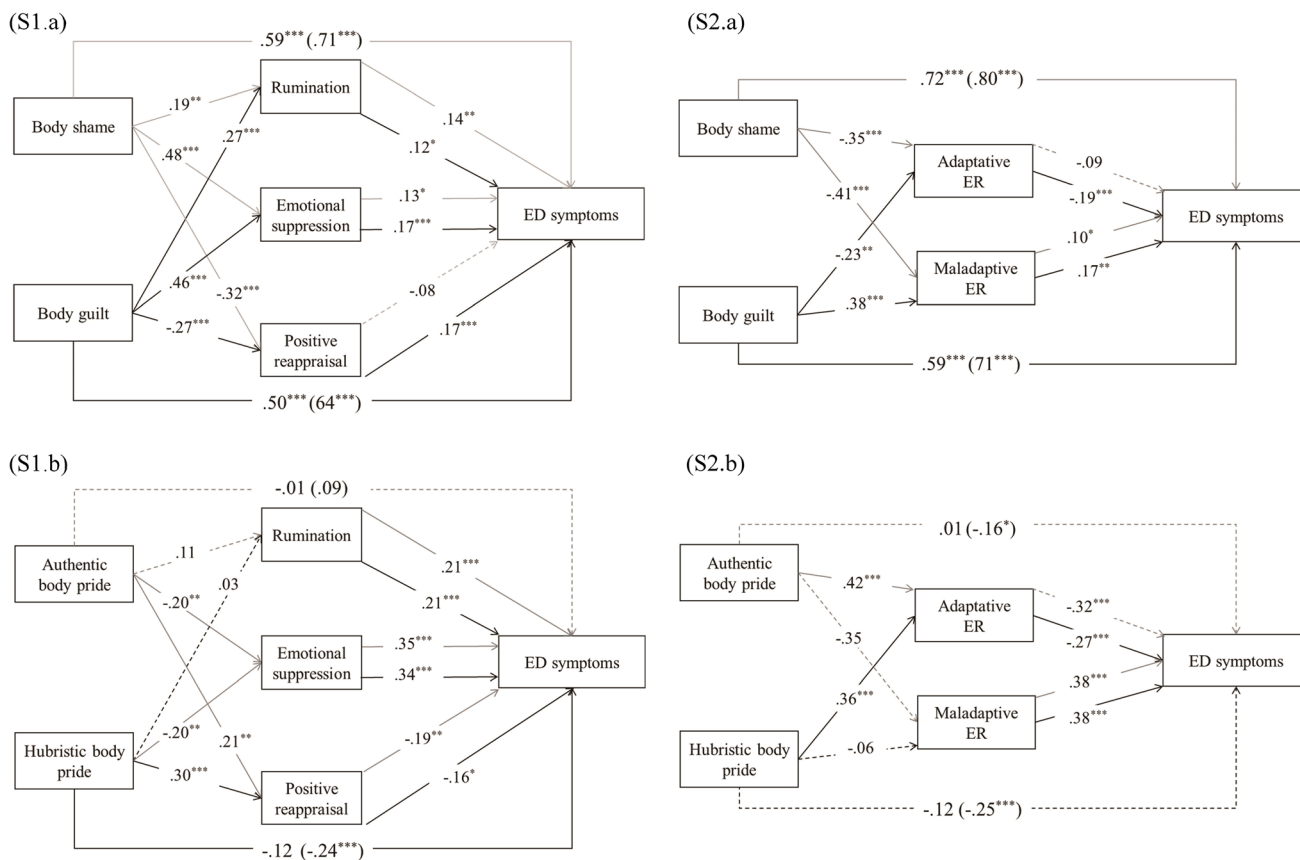
Fig. 2 Multiple mediation models of unpleasant and pleasant body emotions: Study 1 and Study 2. *Note*: In each graphical model, two independent model mediation are illustrated. One by each unpleas-ant body emotion. (**a**) body guilt (Model 1) and body shame emotions (Model 2); (**b**) authentic body pride (Model 3) and hubristic body pride (Model 4). *$p < .05$; **$p < .01$; ***$p < .001$

Multiple mediation models

Several multiple mediation models were proposed to explore the extent to which adaptive and maladaptive strategies could mediate the relationship between body and appearance-related self-conscious emotions. Thus, four mediation models were proposed, one for each emo-tion. First, with respect to unpleasant emotions, BS (Model 1) and BG (Model 2) was negatively associated with the use of adaptive ER strategies and positively with those considered maladaptive (Fig. 2, S1.a & S1.b). In turn, the adaptive ER strategies were negatively associated with ED symptoms (this association was not significant in model 1 related to BS), whereas the maladaptive ones were posi-tively associated with ED symptoms. Our findings dem-onstrate the existence of an indirect effect of BG on ED symptoms through the use of adaptive and maladaptive ER strategies (Model 2). When mediating variables are introduced, the total effect of BG is reduced (although still significant), thus reflecting a partial mediation. However,

the connection between this emotion and ED symptoms was not mediated by any of the variables in the case of BS (Model 1).These results support partially the hypotheses H3.1 and H3.2.

On the other hand, if we refer to pleasant body emo-tions, two models were also proposed related to ABP (Model 3) and HBP (Model 4). Our findings are partially in favor of our hypotheses H3.3 and H3.4, showing a posi-tive relationship between both types of body pride and the use of adaptive ER strategies, whereas neither pride was significantly associated with maladaptive strategies (see Fig. 2). Moreover, the use of adaptive ER strategies was negatively associated with ED symptoms; in contrast, maladaptive ones were positively associated. Thus, in both models (3 and 4) there was an indirect effect of the use of adaptive ER strategies, but not of maladaptive ones. The total effect of both types of body pride on ED symptoms was significant and, again, was reduced when mediating variables were introduced, demonstrating a partial media-tion effect in both models (see Table 4).

Table 4 Study 2: Direct, indirect, and total effects from several multiple mediation models (N = 163)

	B	(SE)	t	p-value	LL 95% CI	UL 95% CI
Body Shame						
Direct Effects						
BS on adaptive ER strategies	-0.35	(0.69)	-4.73	**<.001**	-4.691	-1.928
BS on maladaptive ER strategies	0.41	(0.47)	5.79	**<.001**	1.795	3.653
Adaptive ER strategies on ED ED	-0.09	(0.06)	-1.90	.058	-0.249	0.004
Maladaptive ER strategies on ED symptoms	0.10	(0.09)	2.08	**.038**	0.010	0.387
BS on ED	0.72	(0.65)	13.02	**<.001**	7.288	9.894
Indirect Effects						
via adaptive ER strategies	0.03	(0.01)			-0.001	0.076
via maladaptive ER strategies	0.04	(0.02)			-0.000	0.103
Total Effects						
BS on ED	0.80	(0.57)	16.70	**<.001**	8.409	10.665
Body Guilt						
Direct Effects						
BG on adaptive ER strategies	-0.23	(0.70)	-3.02	**.002**	-3.525	-0.742
BG on maladaptive ER strategies	0.38	(0.46)	5.25	**<.001**	1.530	3.372
Adaptive ER strategies on ED	-0.19	(0.06)	-3.64	**.000**	-0.392	-0.116
Maladaptive ER strategies on ED	0.17	(0.10)	3.02	**.002**	0.110	0.527
BG on ED	0.59	(0.68)	10.24	**<.001**	-0.392	-0.116
Indirect Effects						
via adaptive ER strategies	0.04	(0.02)			0.013	0.094
via maladaptive ER strategies	0.06	(0.03)			0.014	0.133
Total Effects						
BG on ED	0.71	(0.65)	12.70	**<.001**	7.026	9.613
Authentic Body Pride						
Direct Effects						
ABP on adaptive ER strategies	0.42	(0.83)	5.81	**<.001**	3.189	6.468
ABP on maladaptive ER strategies	-0.35	(0.63)	-0.55	.580	-1.602	0.900
Adaptive ER strategies on ED	-0.32	(0.09)	-4.26	**<.001**	-0.598	-0.219
Maladaptive ER strategies on ED	0.38	(0.12)	5.69	**<.001**	0.466	0.963
ABP on ED	-0.01	(1.09)	-0.09	.921	-2.274	2.056
Indirect Effects						
via adaptive ER strategies	-0.13	(0.03)			-0.212	-0.069
via maladaptive ER strategies	-0.01	(0.03)			-0.082	0.044
Total Effects						
Authentic BP on ED	-0.16	(1.14)	-2.03	**.044**	-4.605	-0.064
Hubristic Body Pride						
Direct Effects						
HBP on adaptive ER strategies	0.36	(0.88)	4.96	**<.001**	2.633	6.117
HBP on maladaptive ER strategies	-006	(0.65)	-0.81	.414	-1.831	0.759
Adaptive ER strategies on ED	-0.27	(0.09)	-3.81	**.000**	-0.536	-0.170
Maladaptive ER strategies on ED	0.38	(0.12)	5.68	**<.001**	0.461	0.953
HBP on ED	-0.12	(1.09)	-1.77	.078	-4.116	0.221
Indirect Effects						
via adaptive ER strategies	-0.10	(0.03)			-0.165	-0.045
via maladaptive ER strategies	-0.02	(0.03)			-0.091	0.039
Total Effects						
HBP on ED	-0.25	(1.16)	-3.31	**.001**	-6.177	-1.567

*S*tandardized coefficients are presented. Significant coefficients are emphasized in bold. Lower limit; *UL*, Upper limit; *CI*, Confidence Interval. BS: Body shame, *BG*, Body guilt; *ED*, Eating Disorder Symptoms; *BP*, Body pride.

General discussion

EDs in men have been invisible for many years, generating a great stigma and lack of knowledge about them. This, together with an increase in the prevalence of EDs in men (FITA, 2020) and the high mortality rates linked tothese disorders (Quadflieg et al., 2019), has made them a real public healthissue that requires attention..Thus, it has become essential to investigate the variables that foretell the emergence of ED in men.. In this sense, we conducted two studies in Spanish-speaking adult men to explore the relationship between body and appearance-related self-conscious emotions and ED symptoms, as well as the mediating role of adaptive and maladaptive ER strategies in this relationship.

First, in keeping with our hypothesis (H1.1) and prior studies (Lin et al., 2022; Mendia et al. 2023; Piotrowski, 2019; Prefit et al., 2019), both unpleasant body emotions were positively related to ED symptoms and to the use of all maladaptive ER strategies, whereas they showed a negative association with the use of all adaptive ER strategies (S1 & S2). However, both body prides exhibited a negative relation with ED symptoms (although in S1 it is not significant for ABP). This contradicts our hypothesis (H1.2) and the results of previous research with men (Mendia et al., 2023). However, it concurs with Mendia et al. (2021), who found a negative connection between ED symptoms and body pride in a sample of women.. The scarcity of studies with which to compare these results leads us to suggest the need to further investigate this line of research. On the other hand, there is no inverse relationship between body pride and all maladaptive ER strategies (partial fulfillment H1.2). We only found a significant and negative association between body pride and emotional suppression (S1) and psychological withdrawal (S2), and a positive one between body pride and social comparison (S2).

One of the key contributions of this work is the comparison of the different levels of risk with "healthy" people. In general, a pattern of high unpleasant emotions was observed in the risk group versus the healthy group (confirmed H2.1, S1 & S2). These results are consistent with Higgins' Self-Discrepancy Theory (1987), which postulates that unpleasant emotions are evoked or sparked by differences between the real and ideal selves. It is worth mentioning that we did not find differences between risk levels in BG (S2, partial fulfillment of H2.1), although we did find differences in BS, where the high-risk group presented higher levels. This difference could be due to the disparate characteristics between shame and guilt. Whereas guilt refers to an unpleasant emotion motivated by a specific behavior (without direct effect on the self), shame refers to the whole self, has effects on identity (Tangney et al., 1996) and is implicated in various psychopathologies (e.g., Nechita et al., 2021).

Another key aspect is pleasurable body emotions, although in S1 we found no differences between groups in any of the body pride (H2.2), in S2, body pride is lower in the high risk group, suggesting that these low levels could be linked to ED risk (partial compliance H2.2). Although we did not expect to find this based on Mendia et al. (2023), this could be explained in much the same way as for unpleasant emotions. ABP is an emotion evoked by a specific behavior, whereas HBP is the result of the evaluation of global aspects of the self (Tracy & Robins, 2004). Thus, it is not unexpectedthat a high level of risk implies a devaluation of the self. However, it is necessary to go deeper into these aspects and their relationship in order to draw more consistent conclusions.

When comparing the findings obtained in research with men and women regarding bodily emotions we can observe clear gender differences. In general, findings from a sample of women at risk for ED show that both pleasant (lower scores than healthy people) and unpleasant (higher scores than healthy people) bodily emotions are affected (Mendia et al., 2021). On the other hand, our findings in men at risk for ED show a similar pattern in unpleasant emotions (higher at risk group), while in pleasurable bodily emotions, men do not see their ABP affected in our work, and in others studies they keep both types of body pride intact even though they belong to the at-risk group. We can observe that this problem affects self-image and the emotions it generates, to a greater extent, in women.

Likewise, the risk groups used more adaptive ER strategies than the healthy group, with a small magnitude of differences. However, only two of the four adaptive ERs, those with larger difference sizes, showed differences between low and high risk level (instrumental coping and positive reappraisal). Moreover, although there were no differences between low and high risk on the use of maladaptive ER strategies, in both studies the risk group showed a higher tendency to use maladaptive ER strategies. Among all types of strategies, maladaptive ones, compared to adaptive ones, were shown to be more relevant in the development of ED symptomatology. Lazarus agrees with those findings. & Folkman 1986, which states that using adaptive strategies is related to a larger increase in longterm psychological adjustment, as with previous literature on the ER and psychopathology (see Aldao et al., 2010). Furthermore, this is consistent with more specific literature noting that emotional suppression and rumination may be risk factors for ED (Prefit et al., 2019). Likewise, the study also emphasizes the innovative role of psychological withdrawal, a variable that, to date, has hardly been studied and that could play a relevant role in these disorders.

At this point, it seems important to synthesize and profile the low-risk group. This group presents higher levels of unpleasant bodily emotions and greater use of

maladaptive strategies compared to the healthy group. At the same time, it is similar to the healthy group in pleasant emotions (a result that does not occur when comparing healthy vs. risk or healthy vs. high risk), as well as in the frequency of use of adaptive strategies such as seeking emotional, social support and gratitude and self-reward. Based on our results and some previous evidence, we could suppose that pleasant bodily emotions and a higher use of adaptive strategies could be protective factors against the risk of developing ED and, therefore, key tools in prevention and intervention programs (Prefit et al., 2019; Tylka & Kroon Van Diest, 2015).

In relation to the mediation analyses performed, our hypotheses (H3.1 and H3.2) were partially supported. In S1, maladaptive ER strategies partially mediated the link between both negative emotions and ED symptoms. However, adaptive ER only mediated the relationship between guilt and ED symptoms (Model 2), not shame (Model 1). In S2, the relationship between guilt and ED symptoms (as in S1) was partially mediated by both adaptive and maladaptive ER strategies. There was no significant mediation model for BS. Mediation models for pleasant emotions and their relationship to ED symptomatology showed discrepant findings between S1 and S2. In S1, ABP was not significant (Model 3), whereas HBP (Model 4) and its relationship ED symptoms was partially mediated by adaptive ERs and conversely maladaptive ERs. In contrast, in S2, the relationship between both types of body pride and ED symptoms was mediated by adaptive ERs, but not by maladaptive ERs (confirms H3.3 and partially H3.4).

In line with previous research and the Transdiagnostic Model (Fairburn et al., 2003), the role of ER strategies as an underlying mechanism is confirmed. This is supported by the view that several authors have of EDs as ER strategies that are activated to manage emotional distress (Brockmeyer et al., 2013). In addition to experiencing unpleasant bodily emotions (especially in the case of guilt), the way in which these emotions are regulated is also a determining factor in the emergenceof ED symptoms (Evers et al., 2010). Negative affect is expected to decrease when maladaptive ER strategies are replaced by adaptive ones (Brytek-Matera, 2021; Prefit et al., 2019). In fact, if we implement adaptive ER strategies (such as positive reappraisal) they may possibly help us to increase and lengthen a pleasant affective state (Tugade and Fredrickson, 2007). This would allow, to break into the "vicious circle" (Goss & Gilbert, 2002) or feedback dynamics between the negative emotional balance, the use of maladaptive strategies and their relationship with ED symptomatology (Haedt-Matt & Keel, 2011). Furthermore, this would explain why maladaptive strategies do not mediate the relationship between pleasurable bodily emotions and ED symptomatology. Only emotional suppression, a strategy that people with ED symptomatology use to inhibit not only

their negative emotions, but also their positive ones, does (Lampard et al., 2011).

Limitations and practical implications

Our research yields promising results, yet we acknowledge its limitations and provide recommendations for upcoming studies. Given the limitations of the work, the results should be interpreted with caution, especially in the case of S2, since we have not controlled for the detrimental effect that the COVID-19 pandemic might have had on our findings (Devoe et al., 2023). The fact that a cross-sectional design is used, which prevents the establishment of causal links, is another significant constraint. Also, participant selection may exhibit bias towards those more willing to engage in this type of study. Men who responded to the majority of items (>80%) were included, potentially introducing sampling bias. Additionally, in both studies, there are more men at risk for ED than men considered healthy, suggesting a possible selection bias. Likewise, while some men not meeting risk criteria may not necessarily be healthy. Due to internalized stigma, some men tend to minimize or even deny the symptoms of ED (Goldstein et al., 2016; Gorrell & Murray, 2019). For future investigations, we recommend incorporating more representative samples of men and exploring diverse profiles and ages. In this sense, it would also be of great interest to explore risk or protective factors and relapse factors through the incorporation of samples of men with a diagnosis of ED and recovered. Also, it should be mentioned that a cognitive accessibility effect resulting from the sequence of the items may have an impact on the outcomes. In this line, we used an instrument that has not been validated (DMS) and that, given the length of the questionnaire, there is a possibility of fatigue in the participants. It is also advised to adopt quasi-experimental approaches with differentiated temporal measurements for predictors and mediators or manipulate the body and appearance-related self-conscious emotions with control groups and varying ED risk levels. Likewise, it is important to advance in the study of the protective role of some adaptive strategies, such as seeking emotional social support and gratitude, and self-reward, and to carry out a more detailed analysis of the role that could be played by the maladaptive and adaptive ER strategies included in S2. Such future inquiries would offer a clearer knowledge of ED in men, the role of the body and appearance-related self-conscious emotions and the impact of ER strategies in this process.

Limitations aside, the results of this work have relevant practical and clinical implications that are worth highlighting. Since this work provides a better understanding of how men develop ED, its results will be able to contribute to the design and implementation of specific prevention and therapeutic strategies aimed at men. More specifically, this work

emphasizes the significance of prevention and intervention programs focusing on both addressing or reducing risk factors (e.g., negative emotionality toward the body or the use of maladaptive strategies), as well as enhancing protective factors (positive emotions toward the body or adaptive ER strategies like seeking emotional support or being grateful and self-rewarding). In this sense, if we adopt a gender perspective and a transdiagnostic approach when working with people with disordered eating, preventive and therapeutic interventions will be more successful, having positive effects on other mental health problems that often appear comorbidly with ED (e.g., symptoms of anxiety or depression).

Simultaneously, our research expands upon prior empirical findings by investigating Body and Appearance-Related Self-Conscious Emotions, ER Strategies, and ED symptoms in adult men. In sum, this study highlights the role of BS, BG, ABP, and HBP on ED symptoms in such an underdiagnosed and underserved population as men. It also highlights the difficulties men at risk of developing an ED have in managing these emotions and the importance of promoting protective factors in prevention and intervention programs.

Conclusión

This investigation presents noteworthy strengths. It encompasses two studies conducted at different times: S1 before the COVID-19 pandemic and S2 during it, providing data from the year 2020 that reflect the pandemic's negative impact on EDs (Devoe et al., 2023). In essence, it addresses a blind spot in scientific literature by focusing on EDs in Spanish-speaking adult men of Iberian and Ibero-American origins, a population rarely studied in this field. The comparison of groups of men with varying levels of ED risk, using validated clinical screenings, is innovative and valuable. Moreover, the detailed analysis of ER strategies and their relationship with body and appearance-related self-conscious emotions and ED symptoms offers unique insights among men. Ultimately, it contributes to understanding the etiology of ED in men, combats stigma through visibility, and broadens its scope with practical implications that can be instrumental in the development of effective prevention and intervention tools for this population.

Declarations

References

Abuín, M. R., & Rivera, L. D. (2014). La medición de síntomas psicológicos y psicosomáticos: el Listado de Síntomas Breve (LSB-50). *Clínica y Salud, 25*(2), 131–141. https://doi.org/10.1016/j.clysa.2014.06.001

Alcaraz-Ibáñez, M., & Sicilia, A. (2018). Psychometric evaluation and sex invariance of the Spanish version of the Body and Appearance Self-Conscious Emotions Scale. *Body Image, 25*, 78–84. https://doi.org/10.1016/j.bodyim.2018.02.006

Alcaraz-Ibáñez, M., Chiminazzo, J. G. C., Sicilia, Á., & Fernandes, P. T. (2021). Body and appearance-related self-conscious emotions and exercise addiction in Brazilian adolescents: A person-centred study. *Journal of Sports Sciences, 39*(13), 1528–1536. https://doi.org/10.1080/02640414.2021.1883290

Aldao, A., Nolen-Hoeksema, S., & Schweizer, S. (2010). Emotion-regulation strategies across psychopathology: A meta-analytic

review. *Clinical Psychology Review, 30*(2), 217–237. https://doi.org/10.1016/j.cpr.2009.11.004

American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders, fifth edition (DSM-5)*. American Psychiatric Association.

Baldó-Vela, D. B., & Bonfanti, N. (2019). Eating disorders risk assessment on semi-professional male team sports players. *Nutricion Hospitalaria, 36*, 1171–1178. https://doi.org/10.20960/nh.02630

Bardone-Cone, A. M., Johnson, S., Raney, T. J., Zucker, N., Watson, H. J., & Bulik, C. M. (2019). Eating disorder recovery in men: A pilot study. *International Journal of Eating Disorders, 52*(12), 1370–1379. https://doi.org/10.1002/eat.23153

Brockmeyer, T., Holtforth, M. G., Bents, H., Herzog, W., & Friederich, H. (2013). Lower body weight is associated with less negative emotions in sad autobiographical memories of patients with anorexia nervosa. *Psychiatry Research-neuroimaging, 210*(2), 548–552. https://doi.org/10.1016/j.psychres.2013.06.024

Brytek-Matera, A. (2021). Negative Affect and Maladaptive Eating Behavior as a Regulation Strategy in Normal-Weight Individuals: A Narrative Review. *Sustainability, 13*(24), 13704. https://doi.org/10.3390/su132413704

Budhiwianto, S., Bennett, C., Bristow, C. A., & Dart, J. (2023). Global Prevalence of Eating Disorders in Nutrition and Dietetic University Students: A Systematic Scoping review. *Nutrients, 15*(10), 2317. https://doi.org/10.3390/nu15102317

Burnette, C. B., Kwitowski, M., & Mazzeo, S. E. (2017). "I don't need people to tell me I'm pretty on social media:" A qualitative study of social media and body image in early adolescent girls. *Body Image, 23*, 114–125. https://doi.org/10.1016/j.bodyim.2017.09.001

Calogero, R. M., & Pina, A. (2011). Body guilt: Preliminary evidence for a further subjective experience of self-objectification. *Psychology of Women Quarterly, 35*, 428–440. https://doi.org/10.1177/0361684311408564

Castonguay, A. L., Gilchrist, J. D., Mack, D. E., & Sabiston, C. M. (2013). Body-related pride in young adults: An exploration of the triggers, contexts, outcomes and attributions. *Body Image, 10*(3), 335–343. https://doi.org/10.1016/j.bodyim.2013.03.001

Castonguay, A. L., Sabiston, C. M., Crocker, P. R., & Mack, D. E. (2014). Development and validation of the Body and Appearance Self-Conscious Emotions Scale (BASES). *Body Image, 11*(2), 126–136. https://doi.org/10.1016/j.bodyim.2013.12.006

Chmura, A., Baciur, P., Skowrońska, K., & Karaś, A. (2022). Men's eating disorders – A literature review. *Journal of Education, Health and Sport, 12*(11), 11–17. https://doi.org/10.12775/jehs.2022.12.11.001

Conradt, M., Dierk, J. M., Schlumberger, P., Rauh, E., Hebebrand, J., & Rief, W. (2007). Development of the Weight- and Body-Related Shame and Guilt Scale (WEB–SG) in a non-clinical Sample of obese individuals. *Journal of Personality Assessment, 88*(3), 317–327. https://doi.org/10.1080/00223890701331856

Cruz-Sáez, S., Pascual, A., Salaberría, K., Etxebarria, I., & Echeburúa, E. (2013). Risky eating behaviors and beliefs among adolescent girls. *Journal of Health Psychology, 20*(2), 154–163. https://doi.org/10.1177/1359105313500683

Dakanalis, A., Carrà, G., Calogero, R., Fida, R., Clerici, M., Zanetti, M. A., & Riva, G. (2015). The developmental effects of media-ideal internalization and self-objectification processes on adolescents' negative body-feelings, dietary restraint, and binge eating. *European Child & Adolescent Psychiatry, 24*(8), 997–1010. https://doi.org/10.1007/s00787-014-0649-1

Devoe, D., Han, A., Anderson, A., Katzman, D. K., Patten, S. B., Soumbasis, A., Flanagan, J., Paslakis, G., Vyver, E., Marcoux, G., & Dimitropoulos, G. (2023). The impact of the COVID-19 pandemic on eating disorders: A systematic review. *International Journal of Eating Disorders, 56*(1), 5–25. https://doi.org/10.1002/eat.23704

Doran, J., & Lewis, C. A. (2012). Components of shame and eating disturbance among clinical and non-clinical populations. *European Eating Disorders Review, 20*(4), 265–270. https://doi.org/10.1002/erv.1142

Elosua, P., López-Jáuregui, A., & Sánchez-Sánchez, F. (2010). *Manual técnico con la adaptación al euskera del Eating Disorder Inventory-3*. TEA Ediciones.

Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A "Transdiagnostic" theory and treatment. *Behaviour Research and Therapy, 41*(5), 509–528. https://doi.org/10.1016/s0005-7967(02)00088-8

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149–1160. https://doi.org/10.3758/brm.41.4.1149

French, S. A., Story, M., Downes, B., Resnick, M. D., & Blum, R. W. (1995). Frequent dieting among adolescents: Psychosocial and health behavior correlates. *American Journal of Public Health, 85*(5), 695–701. https://doi.org/10.2105/ajph.85.5.695

French, S. A., Story, M., Neumark-Sztainer, D., Downes, B., Resnick, M., & Blum, R. (1997). Ethnic differences in psychosocial and health behavior correlates of dieting, purging, and binge eating in a population-based sample of adolescent females. *International Journal of Eating Disorders, 22*(3), 315–322. https://doi.org/10.1002/(SICI)1098-108X(199711)22:3<315::AID-EAT11>3.0.CO;2-X

Fundación FITA (2020). Memoria 2020. https://fitafundacion.org/wp-content/uploads/2021/09/Memoria-FITA-2020.pdf

Garner, D. M. (2004). *Eating Disorder Inventory-3: Professional manual*. Psychological Assessment Resources.

Garrido-Miguel, M., Oliveira, A., Cavero-Redondo, I., Álvarez-Bueno, C., Pozuelo-Carrascosa, D. P., Soriano-Cano, A., & Martínez-Vizcaíno, V. (2019). Prevalence of Overweight and Obesity among European Preschool Children: A Systematic Review and Meta-Regression by Food Group Consumption. *Nutrients, 11*(7), 1698. https://doi.org/10.3390/nu11071698

Gilchrist, J. D., Pila, E., Castonguay, A. L., Sabiston, C. M., & Mack, D. E. (2018). Body pride and physical activity: Differential associations between fitness- and appearance-related pride in young adult Canadians. *Body Image, 27*, 77–85. https://doi.org/10.1016/j.bodyim.2018.08.010

Goldstein, M. A., Alinsky, R., & Medeiros, C. (2016). Males with restrictive eating disorders: Barriers to their care. *Journal of Adolescent Health, 59*(4), 371–372. https://doi.org/10.1016/j.jadohealth.2016.07.022

Gorrell, S., & Murray, S. B. (2019). Eating disorders in males. *Child and Adolescent Psychiatric Clinics of North America, 28*(4), 641–651. https://doi.org/10.1016/j.chc.2019.05.012

Graham, A. K., Trockel, M., Weisman, H., Fitzsimmons-Craft, E. E., Balantekin, K. N., Wilfley, D. E., & Taylor, C. B. (2018). A screening tool for detecting eating disorder risk and diagnostic symptoms among college-age women. *Journal of American College Health, 67*(4), 357–366.

Gross, J. J. (2014). Emotion regulation: Conceptual and empirical foundations. In J. J. Gross (Ed.), *Handbook of emotion regulation* (pp. 3–20). The Guilford Press.

Gupta, S., Zachary Rosenthal, M., Mancini, A. D., Cheavens, J. S., & Lynch, T. R. (2008). Emotion regulation skills mediate the effects of shame on eating disorder symptoms in women. *Eating Disorders, 16*(5), 405–417. https://doi.org/10.1080/10640260802370572

Haedt-Matt, A. A., & Keel, P. K. (2011). Revisiting the affect regulation model of binge eating: A meta-analysis of studies using

ecological momentary assessment. *Psychological Bulletin, 137*(4), 660–681. https://doi.org/10.1037/a0023660

Hay, P., Girosi, F., & Mond, J. (2015). Prevalence and sociodemographic correlates of DSM-5 eating disorders in the Australian population. *Journal of Eating Disorders, 3*(1), 19. https://doi.org/10.1186/s40337-015-0056-0

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review, 94*(3), 319–340. https://doi.org/10.1037/0033-295x.94.3.319

Jones, W. R., & Morgan, J. F. (2010). Eating disorders in men: A review of the literature. *Journal of Public Mental Health, 9*(2), 23–31. https://doi.org/10.5042/jpmh.2010.0326

Khodabakhsh, S., & Leng, C. S. (2020). Relationship between social media usage and body image evaluation in Malaysian youth. *Malaysian Journal of Medical Research, 4*(4), 62–67. https://doi.org/10.31674/mjmr.2020.v04i04.013

Lampard, A. M., Byrne, S., McLean, N. J., & Fursland, A. (2011). Avoidance of affect in the eating disorders. *Eating Behaviors, 12*(1), 90–93. https://doi.org/10.1016/j.eatbeh.2010.11.004

Langer, Á. I., Ulloa, V., Aguilar-Parra, J. M., Araya, C. E., & Brito, G. (2011). Validation of a Spanish translation of the Gratitude Questionnaire (GQ-6) with a Chilean sample of adults and high schoolers. *Health and Quality of Life Outcomes, 14*(1). https://doi.org/10.1186/s12955-016-0450-6

Larsen, R. J., & Prizmic, Z. (2004), Affect regulation. En R. Baumeister & K. Vohs (Eds.), Handbook of self-regulation research (pp. 40-60). Guilford Press.

Lazarus, R. S., & Folkman, S. (1986). Cognitive theories of stress and the issue of circularity. In M. H. Appley & R. Trumbull (Eds.), *Dynamics of stress: Physiological, psychological, and social perspectives* (pp. 63–80). Plenum Press.

Lin, D., Bi, J., Zhang, X., Zhu, F., & Wang, Y. (2022). Successful emotion regulation via cognitive reappraisal in authentic pride: Behavioral and event-related potential evidence. *Frontiers in Human Neuroscience, 16*. https://doi.org/10.3389/fnhum.2022.983674

Lucibello, K. M., Nesbitt, A., Solomon-Krakus, S., & Sabiston, C. M. (2021). Internalized weight stigma and the relationship between weight perception and negative body-related self-conscious emotions. *Body Image, 37*, 84–88. https://doi.org/10.1016/j.bodyim.2021.01.010

Mallorquí-Bagué, N., Vintró-Alcaraz, C., Sánchez, I., Riesco, N., Agüera, Z., Granero, R., Jiménez-Murcia, S., Menchón, J. M., Treasure, J., & Fernández-Aranda, F. (2018). Emotion regulation as a transdiagnostic feature among eating disorders: Cross-sectional and longitudinal approach. *European Eating Disorders Review, 26*(1), 53–61. https://doi.org/10.1002/erv.2570

McHugh, T. L. F., Coppola, A. M., & Sabiston, C. M. (2014). "I'm thankful for being native and my body is part of that": The body pride experiences of young Aboriginal women in Canada. *Body Image, 11*(3), 318–327. https://doi.org/10.1016/j.bodyim.2014.05.004

Melo, D., Oliveira, S., & Ferreira, C. (2019). The link between external and internal shame and binge eating: The mediating role of body image-related shame and cognitive fusion. *Eating and Weight Disorders - Studies on Anorexia, Bulimia and Obesity, 25*(6), 1703–1710. https://doi.org/10.1007/s40519-019-00811-8

Mendia, J., Pascual, A., & Conejero, S. (2019). *Adaptación al castellano de la Drive for Muscularity Scale* [unpublished manuscript]. Basic Psychological Processes and Development,. University of the Basque Country.

Mendia, J., Pascual, A., Conejero, S., & Mayordomo, S. (2021). The relationship between body and appearance-related self-conscious emotions and disordered eating: The mediating role of symptoms of depression and anxiety. *International Journal of Psychology and Psychological Therapy, 21*(1), 93–105.

Mendia, J., Borreguero, N., Pascual, A., & Conejero, S. (2023). Emociones autoconscientes relacionadas con el cuerpo y la apariencia y trastornos alimentarios en una muestra de hombres adultos. *Revista Mexicana de Trastornos Alimentarios, 13*(2), 108–118.

Mitchison, D., & Mond, J. (2015). Epidemiology of eating disorders, eating disordered behaviour, and body image disturbance in males: A narrative review. *Journal of Eating Disorders, 3*(1). https://doi.org/10.1186/s40337-015-0058-y

Murray, S. B., Nagata, J. M., Griffiths, S., Calzo, J. P., Brown, T. A., Mitchison, D., Blashill, A. J., & Mond, J. (2017). The enigma of male eating disorders: A critical review and synthesis. *Clinical Psychology Review, 57*, 1–11. https://doi.org/10.1016/j.cpr.2017.08.001

Mustapic, J., Marcinko, D., & Vargek, P. (2016). Body shame and disordered eating in adolescents. *Current Psychology, 36*(3), 447–452. https://doi.org/10.1007/s12144-016-9433-3

Nagata, J. M., Ganson, K. T., & Austin, S. B. (2020). Emerging trends in eating disorders among sexual and gender minorities. *Current Opinion in Psychiatry, 33*(6), 562–567. https://doi.org/10.1097/yco.0000000000000645

Nechita, D., Bud, S., & David, D. (2021). Shame and eating disorders symptoms: A meta-analysis. *International Journal of Eating Disorders, 54*(11), 1899–1945. https://doi.org/10.1002/eat.23583

Neighbors, L. A., & Sobal, J. (2007). Prevalence and magnitude of body weight and shape dissatisfaction among university students. *Eating Behaviors, 8*(4), 429–439. https://doi.org/10.1016/j.eatbeh.2007.03.003

Páez, D., Martínez-Sánchez, F., Sevillano, V., Mendiburo, A., & Campos, M. (2012). Medida de Estilos de Regulación Afectiva (MARS) ampliada en ira y tristeza. *Psicothema, 24*(2), 249–254.

Pinkasavage, E., Arigo, D., & Schumacher, L. M. (2015). Social comparison, negative body image, and disordered eating behavior: The moderating role of coping style. *Eating Behaviors, 16*, 72–77. https://doi.org/10.1016/j.eatbeh.2014.10.014

Piotrowski, K. (2019). Perfectionism and identity processes in two domains: mediational roles of worry, rumination, indecisiveness, shame, and guilt. *Frontiers in Psychology, 10*. https://doi.org/10.3389/fpsyg.2019.01864

Prefit, A. B., Cândea, D. M., & Szentagotai-Tătar, A. (2019). Emotion regulation across eating pathology: A meta-analysis. *Appetite, 143*, e104438. https://doi.org/10.1016/j.appet.2019.104438

Quadflieg, N., Strobel, C., Naab, S., Voderholzer, U., & Fichter, M. M. (2019). Mortality in males treated for an eating disorder—A large prospective study. *International Journal of Eating Disorders, 52*(12), 1365–1369. https://doi.org/10.1002/eat.23135

Richardson, C., & Paslakis, G. (2020). Men's experiences of eating disorder treatment: A qualitative systematic review of men-only studies. *Journal of Psychiatric and Mental Health Nursing, 28*(2), 237–250. https://doi.org/10.1111/jpm.12670

Rojo, S., Linares, T., Arguis, C. B., & Félix-Alcántara, M. (2015). Trastornos de la conducta alimentaria. *Medicine - Programa de Formación Médica Continuada Acreditado*. https://doi.org/10.1016/j.med.2015.09.004

Sabiston, C. M., Brunet, J., Kowalski, K. C., Wilson, P. M., Mack, D. E., & Crocker, P. R. E. (2010). The role of body-related self-conscious emotions in motivating women's physical activity. *Journal of Sport and Exercise Psychology, 32*(4), 417–437. https://doi.org/10.1123/jsep.32.4.417

Santomauro, D. F., Melen, S., Mitchison, D., Vos, T., Whiteford, H., & Ferrari, A. J. (2021). The hidden burden of eating disorders: An extension of estimates from the Global Burden of Disease Study 2019. *The Lancet Psychiatry, 8*(4), 320–328. https://doi.org/10.1016/s2215-0366(21)00040-7

Skårderud, F. (2007). Shame and pride in anorexia nervosa: A qualitative descriptive study. *European Eating Disorders Review, 15*(2), 81–97. https://doi.org/10.1002/erv.774

Smith, K. E., Mason, T. B., & Lavender, J. M. (2018). Rumination and eating disorder psychopathology: A meta-analysis. *Clinical Psychology Review, 61*, 9–23. https://doi.org/10.1016/j.cpr.2018.03.004

Solomon-Krakus, S., & Sabiston, C. M. (2017). Body checking is associated with weight- and body-related shame and weight- and body-related guilt among men and women. *Body Image, 23*, 80–84. https://doi.org/10.1016/j.bodyim.2017.08.005

Solomon-Krakus, S., Uliaszek, A. A., & Sabiston, C. M. (2022). General and body-related self-conscious emotions predict facets of restrictive eating in undergraduate women. *Eating Behaviors, 45*, e101624. https://doi.org/10.1016/j.eatbeh.2022.101624

Stice, E., Gau, J. M., Rohde, P., & Shaw, H. (2017). Risk factors that predict future onset of each DSM-5 eating disorder: Predictive specificity in high-risk adolescent females. *Journal of Abnormal Psychology, 126*(1), 38–51. https://doi.org/10.1037/abn0000219

Tamres, L. K., Janicki, D., & Helgeson, V. S. (2002). Sex differences in coping behavior: A meta-analytic review and an examination of relative coping. *Personality and Social Psychology Review, 6*(1), 2–30. https://doi.org/10.1207/S15327957PSPR0601_1

Tangney, J. P., Miller, R. S., Flicker, L., & Barlow, D. H. (1996). Are shame, guilt, and embarrassment distinct emotions? *Journal of Personality and Social Psychology, 70*(6), 1256–1269. https://doi.org/10.1037/0022-3514.70.6.1256

Tod, D., Morrison, T. G., & Edwards, C. (2012). Evaluating validity and test–retest reliability in four drive for muscularity questionnaires. *Body Image, 9*(3), 425–428. https://doi.org/10.1016/j.bodyim.2012.02.001

Tracy, J. L., & Robins, R. W. (2004). Putting the self into self-conscious emotions: A theoretical model. *Psychological Inquiry, 15*(2), 103–125.https://doi.org/10.1207/s15327965pli1502_01

Tracy, J. L., & Robins, R. W. (2007). The self in self-conscious emotions: A cognitive appraisal approach. In J. L. Tracy, R. W. Robins, & J. P. Tangney (Eds.), *The self-conscious emotions: Theory and research* (pp. 3–20). Guilford Press.

Troop, N. A., & Redshaw, C. (2012). General shame and bodily shame in eating disorders: A 2.5-year longitudinal study. *European Eating Disorders Review, 20*(5), 373–378. https://doi.org/10.1002/erv.2160

Turel, T., Jameson, M. M., Gitimu, P. N., Rowlands, Z., Mincher, J., & Pohle-Krauza, R. J. (2018). Disordered eating: Influence of body image, sociocultural attitudes, appearance anxiety and depression - A focus on college males and a gender comparison. *Cogent Psychology, 5*(1), 1483062. https://doi.org/10.1080/23311908.2018.1483062

Tylka, T. L., & Van Diest, A. M. K. (2015). Protective factors. In *John Wiley & Sons, Ltd eBooks* (pp. 430–444). https://doi.org/10.1002/9781118574089.ch33

Vizin, G., Horváth, Z., Vankó, T., & Urbán, R. (2022). Body-related shame or guilt? Dominant factors in maladaptive eating behaviors among Hungarian and Norwegian university students. *Heliyon, 8*(2), e08817. https://doi.org/10.1016/j.heliyon.2022.e08817

Warnick, J. L., Darling, K. E., & Rancourt, D. (2022). The association between negative body talk and body shame on disordered eating symptoms among college students. *Eating Behaviors, 46*, 101648. https://doi.org/10.1016/j.eatbeh.2022.101648

Weltzin, T. E., Weisensel, N., Franczyk, D., Burnett, K., Klitz, C., & Bean, P. (2005). Eating disorders in men: update. *The Journal of Men's Health & Gender, 2*(2), 186–193. https://doi.org/10.1016/j.jmhg.2005.04.008

Yelland, C., & Tiggemann, M. (2003). Muscularity and the gay ideal: Body dissatisfaction and disordered eating in homosexual men. *Eating Behaviors, 4*(2), 107–116. https://doi.org/10.1016/s1471-0153(03)00014-x

Zhao, Y., & Encinosa, W. (2011). *Update on Hospitalizations for Eating Disorders, 1999 to 2009.* HCUP Statistical Brief #120. Agency for Healthcare Research and Quality, Rockville, MD. http://www.hcup-us.ahrq.gov/reports/statbriefs/sb120.pdf