

# Emotional intelligence subdimensions as moderators in the association between body dissatisfaction and symptoms of eating disorders among female Mexican adolescents

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## Abstract

**Objective:** Strong empirical research has shown a relationship between body dissatisfaction and symptoms of eating disorders (ED) and the direct and combined influence of emotional factors and dimensions of emotional intelligence (EI) on ED symptoms. However, whether these emotional variables and competencies moderate the well-established relationship between body dissatisfaction and ED symptomatology has not yet been tested. Neither have studies of this nature been performed among high at-risk populations such as Mexican female adolescents. Thus, this research aimed to explore the moderator role of EI subdimensions in the relationship between body dissatisfaction and ED symptoms among female adolescents from Sinaloa, Mexico.

**Methods:** A total of 485 female adolescents aged 14–19 years old ( $M = 16.81$ ,  $SD = 1.33$ ) who were students in middle school, high school, and college completed questionnaires about body dissatisfaction, ED symptomatology, and EI. We conducted moderating analyses.

**Results:** Subdimensions of EI significantly moderated the relationship between body dissatisfaction and symptoms of ED. For participants high in body dissatisfaction, lower levels in stress management ability and higher levels in the interpersonal EI and Adaptability EI dimensions were associated with higher levels of ED symptomatology.

**Discussion:** Subdimensions of EI have an important role in moderating the association between body dissatisfaction and symptoms of ED. The findings of this study contribute to improving the knowledge about the role of emotional competencies in ED. Proposals for future research and to improve preventative approaches are discussed.

**Public Significance Statement:** This study shows the moderating role of EI dimensions in the well-established relationship between body dissatisfaction and ED symptomatology. The research was conducted with a population at high risk of ED: female adolescents in the northwest of Mexico. Results showed that low Stress management EI, high Adaptability EI, and high Interpersonal EI were associated with higher levels

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of ED symptomatology among participants with high (but not low) body dissatisfaction. These insightful results have theoretical and practical implications.

**KEYWORDS**

adolescents, body dissatisfaction, eating disorder symptoms, emotional intelligence, moderation

## 1 | INTRODUCTION

Adolescence is one of the most critical stages of development (World Health Organization, 2021). The characteristic changes of adolescence influence vulnerability to mental health problems. Eating disorders (ED) have a peak onset in adolescence and affect ~1 in 10 female adolescents, almost doubling the prevalence between the ages of 14 and 16 (Micali et al., 2015).

As a developing country, Mexico has significant limitations, and its largest population group comprises adolescents who are continuously exposed to problems that challenge their mental health. Specifically, female Mexican adolescents are influenced by sociocultural factors that lead them to internalize inferiority and the obligation of obedience and submission to the rest of society (Lamb et al., 2016). In addition to these considerations, young Mexican women are often exposed to inflexible and contradictory messages regarding what is normative in terms of their body shape.

The mental health statistics in Mexico show that Sinaloa is one of the states with the highest incidence and prevalence of ED symptoms in the country. The rates per 100,000 habitants are three to four times higher for women than men in all age groups. Adolescents between the ages of 14 and 19 are the most affected (Dirección General de Epidemiología, 2021).

The context adolescents experience in Sinaloa is noteworthy, as they are exposed to high levels of violence related to drug trafficking, which has impacted social factors affecting their mental health (Guevara, 2018; León-Olvera, 2019). There is a significant social pressure to modify shape and body size to achieve an ideal of feminine beauty. This pressure enhances body dissatisfaction, which becomes normalized and explains the high rates of ED in that state (León-Olvera, 2019; Pressly, 2021).

Evidence shows that the etiology of ED symptoms is multifactorial and complex (Bakalar et al., 2015). Brytek-Matera and Czepczor (2017) conducted a rigorous analysis of theoretical models for ED and their symptoms and proposed the transtheoretical model of ED, adapted to DSM-5 symptoms and diagnostic criteria. This model explains ED and their multifactorial etiology in an integrated form. According to this model, problems in the emotional sphere (e.g., avoidance in expressing and experiencing emotions, negative emotions like fear, shame, and guilt) play an important role in the onset and/or maintenance of ED symptoms.

Based on the well-established direct relationship between body dissatisfaction and ED symptoms (Rohde et al., 2015), we aimed to explore personal resources that could be related to them. According to the literature, emotional intelligence (EI) is one of the most

remarkable resources (Romero-Mesa et al., 2021; Zhang et al., 2022). The most widely used questionnaire to measure the relationship between EI and ED symptoms among adolescents is the Emotional Quotient Inventory (EQ-i; Bar-On & Parker, 2000). The most used EI model, the “Bar-On model” (Romero-Mesa et al., 2021), considers EI a collection of cognitive abilities, competencies, and skills that influence the ability to cope with environmental demands and pressures. The dimensions with emotional abilities comprising the Bar-On model are (a) Intrapersonal, understanding and communicating one's emotions to others; (b) Interpersonal, understanding the emotions of others, and having satisfying interpersonal relationships; (c) Stress management, managing one's emotions and responding calmly to stressful events in daily life; and (d) Adaptability, as being realistic, flexible, and effective in managing change and in problem-solving (Bar-On & Parker, 2000).

A systematic review found that high levels of EI were positively associated with better mental health among both clinical and healthy samples (Baudry et al., 2018). In addition, recent systematic reviews and meta-analyses conducted with general and clinical populations across the developmental lifespan, primarily adults, found that those with ED symptoms regularly have difficulties managing emotions (Romero-Mesa et al., 2021; Zhang et al., 2022). Moreover, Nurmohadian and Boland (2016) found a negative association between body dissatisfaction and levels of EI among university students.

Therefore, there is theoretical and empirical support for the association between body dissatisfaction and ED symptoms and for associations between EI and its deficits with ED symptomatology (especially among adults). However, to our knowledge, no study has yet explored how EI dimensions could moderate the well-established relationship between body dissatisfaction and ED symptomatology. In addition, there are no empirical studies on the factors associated with ED symptoms in this at-risk population from Sinaloa, Mexico. Thus, this research sought to explore the moderator role of EI subdimensions in the relationship between body dissatisfaction and ED symptoms among female adolescents from Sinaloa, Mexico. We applied several variables included in the transtheoretical model of Brytek-Matera and Czepczor (2017), including body dissatisfaction, EI subdimensions (Bar-On, 2000), and ED symptoms.

## 2 | MATERIALS AND METHODS

### 2.1 | Participants

The sample comprised 485 female adolescents aged 14–19 years old ( $M = 16.81$ ,  $SD = 1.33$ ), native Spanish-speaking students from

middle school, high school, and college from Culiacán, Sinaloa, a capital city in the northwest of Mexico. Participants were selected using non-probability sampling. The inclusion criteria were being a Mexican female adolescent between the ages of 14 and 19 years. Assent and informed consent were required for minors, signed by parents or guardians. Students reporting possible pregnancy were excluded.

## 2.2 | Measures

The participants were asked about age, education level, and if they were pregnant in the sociodemographic variables section.

The *EQi: Youth Version-Short* (Bar-On & Parker, 2000) was used to evaluate EI dimensions. Esnaola et al. (2018) validated it in the Mexican population. It is a self-report with 30 items in a 7-point Likert response format (1–4), with four dimensions: Intrapersonal ( $\alpha = .85$ ,  $\omega = 0.80$ ), Interpersonal ( $\alpha = .72$ ,  $\omega = 0.70$ ), Stress management ( $\alpha = .86$ ,  $\omega = 0.84$ ) and Adaptability ( $\alpha = .85$ ,  $\omega = 0.81$ ). In this study, the instrument obtained adequate total reliability  $\alpha = .83$  and  $\omega = 0.88$ . A high score means high EI and the presence of abilities that comprise each dimension. Regarding the confirmatory factor analysis indexes, comparative fit index (CFI) = 0.97, Tucker–Lewis index (TLI) = 0.96, and root mean square error of approximation (RMSEA) = 0.06.

The *Eating Attitudes Test 26* (EAT-26; Garner et al., 1982), validated by Franco-Paredes et al. (2016) among Mexican women, was used to detect ED symptomatology. It has 26 items in a 6-point Likert response format. A total score  $> 20$  suggests the presence of clinically significant ED symptoms. The EAT-26 obtained total adequate reliability ( $\alpha = .91$  and  $\omega = 0.94$ ), with CFI = 0.93, TLI = 0.96, and RMSEA = 0.06.

The *Body Shape Questionnaire-8D* (BSQ-8D; Evans & Dolan, 1993) is the short version of the BSQ-34 developed by Cooper et al. (1987) to assess the experience of feeling fat and the evaluation of dissatisfaction with body shape and size. It includes eight items with a 6-point Likert response format (1–6). BSQ-8D scores had excellent psychometric properties and, specifically, a high internal consistency (Franco-Paredes et al., 2021). This study's internal consistency was also adequate, with  $\alpha = .90$  and  $\omega = 0.92$  and CFI = 0.99, TLI = 0.99, and RMSEA = 0.04.

As reported in Supplement A, all the measurements replicated the factors' structure of their original versions and confirmed validity.

## 2.3 | Procedure

The South University Centre Ethics Committee approved the study (register CB/021/2019). We presented the project to school authorities. Four schools agreed to participate and forwarded the invitation to the students. In the case of minors, the invitation consisted of a written informant consent signed by the parents or tutors. Informant consent included a statement that even with the adults' authorization, adolescents' participation had to be entirely voluntary, and they had

the right to reject the invitation before, during, or after responding to the questionnaires. We received back the forms signed by the parents or tutors. Participants aged 18 and 19 years old were informed about the confidentiality, aim, risks, and characteristics of the study by informed consent. Adolescent participants also responded with voluntary assent to participate after this information was read and explained aloud to them by the researchers. The questionnaires were face-to-face and administered during a tutoring class in group form in their classrooms. The duration was  $\sim 25$  min.

We provided participants and schools with a summary report as feedback. In addition, we sent infographics on EI and mental health that were distributed to the students by the schools.

## 2.4 | Data analysis

Regarding response rate, missing values represented 1% and were imputed, including the average value. According to Graham (2009), this procedure can be used when missing values represent  $< 5\%$  without affecting database quality. Missing completely at random tests (MCAR; Little, 1988) indicated that the missing values were random and unproblematic ( $p > .999$  for all tests).

We computed descriptive statistics (means, standard deviations) and correlations using SPSS (25th edition). We calculated Student's *t*-test to compare participants scoring above versus at or below the EAT-26 cut point and Cohen's *d* to estimate the effect size of group differences. To examine the potential moderating role of EI dimensions (independent variable) on the relationship between body dissatisfaction (predictor) and ED symptoms (dependent variable), we conducted a series of hierarchical regression analyses using SPSS. Body dissatisfaction and EI dimensions were entered in the first step. In the second step, a multiplicative term between body dissatisfaction  $\times$  EI dimensions was entered (scores were mean-centered prior to creating the product term). In order to assess the extent of multicollinearity between study variables, we calculated tolerance statistics and variance inflation factors (VIFs) for regression equations. Additionally, we performed four moderation analyses using SPSS and PROCESS macro (Hayes, 2018; Hayes & Matthes, 2009).

## 3 | RESULTS

Table 1 shows descriptive statistics for all study measures. In total, 10% of participants scored above 20 on the EAT-26. Participants scoring above ( $n = 49$ ) versus those scoring below the EAT-26 cut point ( $n = 436$ ) reported significantly higher body dissatisfaction scores ( $t = 9.20$ ,  $p < .001$ ; Cohen  $d = 1.39$ , very large effect), lower Stress management EI scores ( $t = 3.34$ ,  $p = .001$ ; Cohen  $d = .50$ , medium effect), and higher Interpersonal EI scores ( $t = 2.79$ ;  $p = .005$ ; Cohen  $d = .42$ , medium effect).

Table 2 shows correlations among study variables. Body dissatisfaction and ED symptoms were positively associated with each other and Interpersonal EI. In contrast, significant negative

**TABLE 1** Descriptive statistics.

Variable	Mean	SD	Minimum	Maximum
<i>Total sample (N = 485)</i>				
EQi:YV-S				
Intrapersonal EI	13.27	4.11	6	24
Interpersonal EI	18.68	2.98	10	24
Stress management EI	15.68	4.22	6	24
Adaptability EI	16.27	3.63	7	24
Dependent variables				
Body dissatisfaction (BSQ-8D)	22.60	10.22	8	48
ED symptoms (EAT-26)	8.75	8.70	0	59
<i>Population at risk (n = 49)</i>				
Intrapersonal EI	12.98	4.53	6	23
Interpersonal EI	19.80	2.85	13	24
Stress management EI	13.80	4.60	6	22
Adaptability EI	16.81	3.64	8	24
Body dissatisfaction (BSQ-8D)	34.37	8.91	13	48
<i>Non-at-risk population (n = 436)</i>				
Intrapersonal EI	13.30	4.07	6	24
Interpersonal EI	18.55	2.97	10	24
Stress management EI	15.89	4.12	6	24
Adaptability EI	16.21	3.63	7	24
Body dissatisfaction (BSQ-8D)	21.28	9.50	8	48

Abbreviations: BSQ-8D, Body Shape Questionnaire-8D; EAT-26, Eating Attitudes Test 26; EQi:YV-S, Emotional Quotient Inventory: Youth Version-Short.

**TABLE 2** Intercorrelations among measures.

Variable	1	2	3	4	5
1. Intrapersonal EI	—				
2. Interpersonal EI	.15**	—			
3. Stress management EI	.11*	.02	—		
4. Adaptability EI	.24***	.37***	.01	—	
5. Body dissatisfaction	-.20***	.10*	-.24***	-.06	—
6. ED symptoms	-.08	.15**	-.22***	.07	.54***

Note:  $N = 485$ .

Abbreviations: ED, eating disorders; EI, emotional intelligence.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

associations were found between body dissatisfaction and ED symptoms with Stress management EI. Associations between Adaptability EI and body dissatisfaction or ED symptoms were not statistically significant.

Regression analyses showed that body dissatisfaction and three out of the four EI dimensions (Interpersonal EI, Stress management EI, and Adaptability EI) explained a significant percentage of the variance of ED symptoms. Additionally, the interaction of body dissatisfaction and these three EI dimensions explained a small but statistically significant percentage of the variance beyond the main effects of body dissatisfaction and EI dimensions. In contrast, Intrapersonal EI did not represent a significant moderation effect for body dissatisfaction and ED symptoms. Results are presented in Table 3.

In the case of Interpersonal EI, the results of the analysis of the simple slope indicated that the association between body dissatisfaction and ED symptoms was more robust for participants with high levels of Interpersonal EI ( $b = 0.57$ ,  $p < .001$ ; Figure 1) than for those with low levels of Interpersonal EI ( $b = 0.37$ ,  $p < .001$ ), the opposite of what we had hypothesized. The same pattern was found for Adaptability EI, again opposite to our hypothesized moderator relationship. The association between body dissatisfaction and ED symptoms was significantly stronger for higher levels of Adaptability EI ( $b = 0.55$ ,  $p < .001$ ) than for lower levels of Adaptability EI ( $b = 0.38$ ,  $p < .001$ ; Figure 2). At high, but not low, levels of body dissatisfaction, girls who reported higher Interpersonal EI and Adaptability EI (compared with those

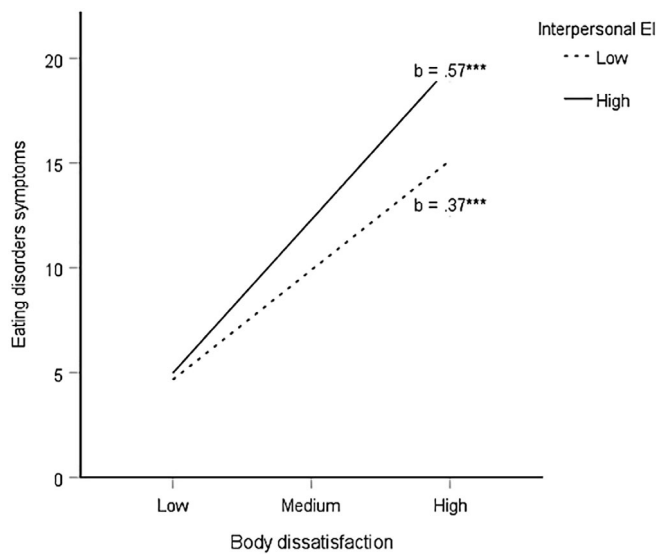
	B	SE B	$\Delta R^2$
<b>Step 1</b>			
Body dissatisfaction	0.47***	0.03	.30***
Intrapersonal EI	0.07	0.08	
<b>Step 2</b>			
Body dissatisfaction × Intrapersonal EI	−0.21	0.34	.00
<b>Step 1</b>			
Body dissatisfaction	0.45***	0.03	.30***
Interpersonal EI	0.27*	0.11	
<b>Step 2</b>			
Body dissatisfaction × Interpersonal EI	0.76*	0.31	.01*
<b>Step 1</b>			
Body dissatisfaction	0.44***	0.03	.30***
Stress management EI	−0.18*	0.08	
<b>Step 2</b>			
Body dissatisfaction × Stress management EI	−1.03**	0.32	.02**
<b>Step 1</b>			
Body dissatisfaction	0.47***	0.03	.30***
Adaptability EI	0.23*	0.09	
<b>Step 2</b>			
Body dissatisfaction × Adaptability EI	0.84**	0.32	.02**

**TABLE 3** Regression results for the moderating effect of EI dimensions on the relationship between body dissatisfaction and ED symptoms.

Note: B, Unstandardized beta; SE B, standard error of beta;  $\Delta R^2$ , Change in  $R^2$ .

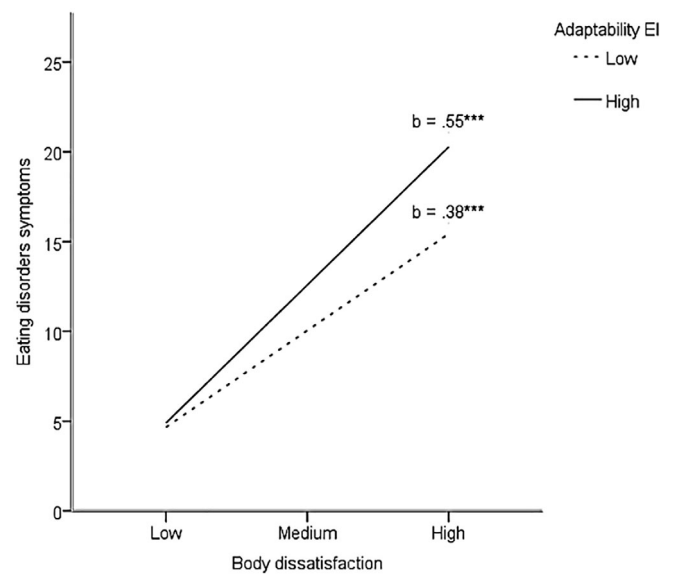
Abbreviations: ED, eating disorders; EI, emotional intelligence.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .



Note. \*\*\*  $p < .001$

**FIGURE 1** Interpersonal emotional intelligence (EI) and body dissatisfaction in predicting eating disorders (ED) symptoms.

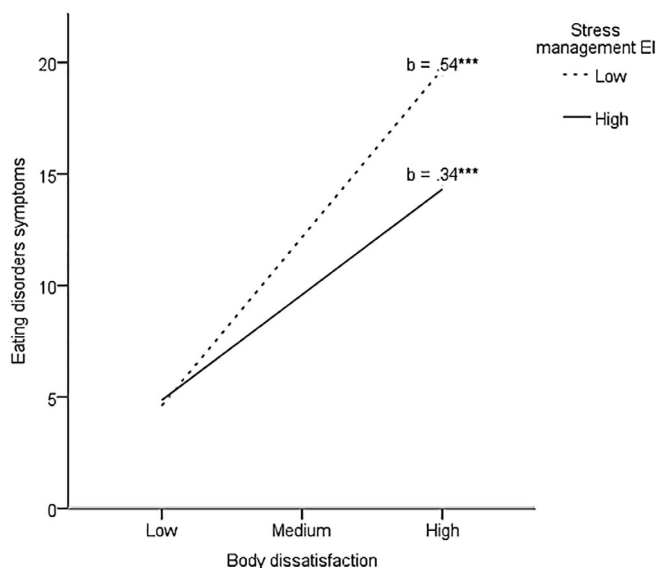


Note. \*\*\*  $p < .001$

**FIGURE 2** Adaptability emotional intelligence (EI) and body dissatisfaction in predicting eating disorders (ED) symptoms.

with lower levels) scored higher in ED symptoms. Post hoc analyses showed that the slopes of the two lines were significantly different for both Interpersonal EI ( $t = 2.28$ ;  $p < .05$ ) and Adaptability EI ( $t = 2.69$ ;  $p < .05$ ).

In contrast, the pattern for Stress management EI was as expected. The association between body dissatisfaction and ED symptoms was more robust for adolescents with lower levels of Stress



Note. \*\*\*:  $p < .001$

**FIGURE 3** Stress management emotional intelligence (EI) and body dissatisfaction in predicting eating disorders (ED) symptoms.

management EI ( $b = 0.54, p < .001$ ; see Figure 3) than for adolescents with higher levels of Stress management EI ( $b = 0.34, p < .001$ ). At high, but not low, levels of body dissatisfaction, the adolescents with lower levels of Stress management EI (compared with those with higher levels) scored higher in ED symptoms. Post hoc analyses showed that the slopes of the two lines were significantly different ( $t = 3.13; p < .01$ ).

All tolerance statistics were above 0.65, and all VIF values were smaller than 1.5; thus, multicollinearity was not a problem in this analysis according to standard guidelines (Cohen et al., 2002).

## 4 | DISCUSSION

This study aimed to explore the moderating role of EI subdimensions in the relation between body dissatisfaction and ED symptoms among female adolescents from Sinaloa, Mexico. Small but statistically significant moderation effects were found for Interpersonal EI, Stress management EI, and Adaptability EI, but not for Intrapersonal EI, whereby the direction of the moderation effect was as hypothesized (i.e., negative) for Stress management EI and opposite to our expectation (i.e., positive) for Interpersonal EI and Adaptability EI.

A significant moderation effect was found for Stress management EI; specifically, the association between body dissatisfaction and EAT-26 scores was the strongest for girls reporting low levels of stress management ability. Among adolescents high in body dissatisfaction, low scores in Stress management EI were associated with higher EAT-26 scores. These results accord with previous theoretical studies and empirical research (Christensen & Haynos, 2020; Claudat & Lavender, 2018; Haynos et al., 2018). Notably, according to a recent

review of emotion regulation on ED (Christensen & Haynos, 2020), the habitual use of adaptive emotion regulation strategies (e.g., acceptance, reappraisal, and problem-solving) is associated with lower ED symptoms. These strategies constitute an effective way to manage stress, thus reducing ED pathologies.

The associations between body dissatisfaction and EAT-26 scores were strongest for girls reporting high levels of Interpersonal EI and Adaptability EI. Among participants with high (but not low) body dissatisfaction, high scores of Interpersonal EI and Adaptability EI were associated with higher EAT-26 scores. These findings contradict the empirical evidence as lower scores in ED symptomatology were expected among participants high in these EI dimensions (Costarelli et al., 2009; Filaire et al., 2011; Peres et al., 2020). One possible explanation for these unexpected findings is that in the sociocultural context experienced by our sample (i.e., extreme social pressure to comply with feminine-sexy inflexible beauty standards, to show obsequiousness to others, and minimal empowerment), especially among those with high body dissatisfaction, high scores in Adaptability EI and Interpersonal EI may be indicating an over-adaptation to the context. Therefore, variables like social overadjustment (i.e., the overexertion to constantly adjust to others' social norms and expectations) and vulnerability to peer and social pressure might explain these results. Future studies are needed to test these revised hypotheses, determine whether our results can be replicated, and, if so, whether they apply in particular to a Latino context and an at-risk population of female adolescents versus adolescents in other cultures in general.

In addition, and aligned with the proposal of a “dark side” of EI, Davis and Nichols (2016) concluded, in a systematic review, that there is evidence of adverse effects of EI across multiple settings, suggesting that outcomes depend on the context and pre-existing qualities of people. They also state that individuals with high levels of emotional abilities but with lower self-perceptions of their emotional skills manage worse than those with more balanced profiles. Although these investigations were carried out with European adults, some of the rationales could be applied to the context of our study. In a highly socially demanding context towards body image like the northwest part of Mexico, high levels of EI (Interpersonal and Adaptability) among female adolescents high in body dissatisfaction (and presumably more “status driven” and more oriented to adapt to the female-beauty rigid canons) might have contributed to increase their stress and challenge their mental health. Additionally, these adolescents likely have a poor perception of their abilities, even if they are reasonable, which might lead them to poorer performance in several areas. Instead, contrarily to the ability to adapt to the social context, abilities like self-affirmation, self-empowerment, and criticism or even rejection of social and mainstream prescriptions about the ideal body or appearance might contribute to improving mental health and diminishing ED symptoms in the challenging context of these adolescents (American Psychological Association, Girls and Women Guidelines Group, 2018).

These findings might also have some practical implications. In line with the strengths-based approach proposed by American Psychological Association, Girls and Women Guidelines Group (2018),



therapeutic or prevention intervention guidelines could be aimed not only at reducing body dissatisfaction among those at risk for ED or with ED symptoms but also at strengthening emotional skills, particularly those related to boosting self-empowerment, stress management and criticism of inflexible aesthetic canons.

As limitations, the study design was cross sectional, precluding temporal or causal inferences. Ours was a nonprobabilistic sample of female-only Mexican adolescents from northwest Mexico, limiting generalizability to other populations. Despite these limitations, this study contributes preliminary evidence of EI subdimensions' role in the relationship between body dissatisfaction and ED symptoms among one of the most at-risk populations in Mexico in an unexplored context. This research constitutes one small step to examine the variables contributing to body dissatisfaction and ED symptomatology among this population.

## AUTHOR CONTRIBUTIONS

**Violeta R. Castro-López:** Conceptualization, data curation, formal analysis, investigation, methodology, project administration, software, visualization, writing – original draft, and writing – review and editing. **Karina Franco-Paredes:** Conceptualization, methodology, project administration, supervision, writing – original draft, and writing – review and editing. **María Angeles Peláez-Fernández:** Formal analysis, investigation, methodology, software, supervision, validation, visualization, writing – original draft, and writing – review and editing. **Eva María Trujillo Chi Vacuán:** Writing – original draft and writing – review and editing.

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## CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

## DATA AVAILABILITY STATEMENT

The data and code are not publicly available due to privacy and ethical restrictions by Ethics Committee register.

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## SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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