

# Normal-weight and overweight female adolescents with and without extreme weight-control behaviours: Emotional distress and body image concerns

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## Abstract

The objective of this study was to analyse emotional distress and concerns related to body image in 712 normal-weight and overweight adolescent girls. A total of 12.3 per cent of the normal-weight girls and 25 per cent of the overweight girls showed extreme weight-control behaviours. In normal-weight adolescents, their engagement in extreme weight-control behaviours was associated with high levels of somatic symptoms, a drive for thinness and control over eating. In overweight girls, high levels of drive for thinness and anxiety were associated with extreme weight-control behaviours. Finally, the implications for preventive and therapeutic programmes are discussed.

## Keywords

body image concerns, emotional distress, extreme weight-control behaviours, female adolescents

In recent decades, the rates of overweight and obesity in Western society have increased significantly (Ogden et al., 2006). In Spain, according to the National Health Survey (2011–2012) carried out by the Ministry of Health, Social Services and Equality (2013), 27.8 per cent of children and adolescents under the age of 17 years and 53.7 per cent of the population over the age of 18 years are overweight. Huh et al. (2012), in a study of adolescents aged between 12 and 19 years, pointed out that it is harder to lose weight as a person gets older. For example, while the overweight remission rate obtained is 40 per cent at the age of 14 years, the same rate drops to 21 per cent at the age of 19 years.

The increase in body mass index (BMI), along with social pressure regarding physical

appearance, negative self-beliefs and self-acceptance, can all lead to adolescents picking up unhealthy weight-control behaviours, particularly if they are overweight (Boutelle et al., 2002; Cruz-Sáez et al., 2013; Neumark-Sztainer, 2005). There are several studies at present that warn of the high prevalence of this type of behaviour among adolescents (Maor et al., 2006; Mellin et al., 2002; Neumark-Sztainer et al., 2002, 2003; Tam et al., 2007), even among

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those who are normal-weight, and about the potentially harmful consequences of these behaviours on one's physical, emotional and psychosocial health (Al Sabbah et al., 2010). It is also clear that this type of behaviour often precedes the development of an eating disorder (Shisslak and Crago, 2001; Striegel-Moore and Bulik, 2007; Tanofsky-Kraff et al., 2004; Vander Wall, 2011).

Furthermore, several studies have found that overweight girls are more concerned about weight, eating and their figure than normal-weight girls of the same age (Cooper and Burrows, 2001). In fact, some authors argue that these types of cognitive variables could explain the vulnerability shown in people who go on to develop an eating disorder (Fairburn et al., 1986; Garner and Bemis, 1982).

Likewise, several studies have found that overweight adolescents show a high degree of body dissatisfaction, low self-esteem and high levels of anxiety (Cebolla et al., 2011; Vila et al., 2004). To be more specific, in the study carried out by Vila et al. (2004), obese adolescents were found to suffer more mental disorders (anxiety disorders, to be specific), fewer social skills and greater difficulty with social development. In the same line, several studies have shown that adolescents who feel bad physically also feel bad emotionally (Hatata et al., 2009; Pascual et al., 2011; Vingilis et al., 2002). Hatata et al. (2009) found that adolescents with a low degree of body satisfaction showed high levels of emotional distress; they specifically revealed high levels of somatisation, obsessive concerns, depressive symptoms, increased anxiety, low self-esteem and negative beliefs about their body and eating.

According to some authors (Presnell et al., 2009; Richardson et al., 2006), there appears to be a two-way relationship between overweight/obesity, eating disorders and depressive symptomatology. With regard to this last question, Braet et al. (2012) point out that different psychological mechanisms and patterns seem to be in place in overweight adolescents. On one hand, there are those overweight adolescents who follow restrictive diets and show negative

affect and high levels of anxiety regarding their body and weight. A second group would be made up of adolescents with a predominance of affective symptoms. Finally, there would be a third group, which would be asymptomatic. The first group is more vulnerable to developing eating disorders, as they engage in more unhealthy weight-control behaviours (use of pills, laxatives, diuretics and/or vomiting) (Neumark-Sztainer et al., 2006), as well as having a higher BMI than the other two groups (Stice et al., 2005).

According to the transdiagnostic model of eating disorders (Fairburn, 2008; Fairburn et al., 2003), anorexia nervosa, bulimia nervosa and eating disorder not otherwise specified (EDNOS) have more common characteristics than differences. For Fairburn (2008), these are essentially 'cognitive disorders' that share a psychopathological core based on dysfunctional thoughts, beliefs and attitudes related to overevaluation of the importance of shape and weight, from which the remaining characteristics of ED (strict diet and weight-control behaviours) arise. And, on other hand, they also have other shared psychopathological components such as symptoms of depression, anxiety and interpersonal difficulties, among others.

As suggested in the aforementioned studies, obesity and overweight may be significant risk conditions, especially in adolescent girls, associated with inappropriate weight-control behaviours, emotional distress (anxiety, depressive symptoms, etc.) and concerns about one's own body image (body dissatisfaction, negative beliefs about one's body and eating, etc.). In addition, in Spain, despite having some of the highest overweight/obesity prevalence rates in Europe (Serra-Majem et al., 2006), no studies have been carried out to analyse the prevalence of extreme weight-control behaviours (EWCB) and their relationship with variables of emotional distress according to weight status. Taking this into account, this study established the following objectives: (a) to compare the level of emotional distress, body image concerns and EWCB between normal-weight and overweight adolescent girls,

(b) to compare the level of emotional distress and body image concerns between normal-weight and overweight adolescent girls with EWCB and (c) to analyse the variables that can predict EWCB in normal-weight and overweight adolescent girls.

## Method

### Participants

The participants were 765 girls, aged 16–20 years from 13 secondary schools and 5 Universities in the Basque Country (Spain). Of all the participants, 43 (5.6%) were considered underweight, 572 (74.8%) in the normal-weight range and 150 (19.6%) overweight. The underweight group was excluded from further analyses. In addition, 19 adolescents (17 in the normal-weight group and 2 in the overweight group) did not answer the items corresponding to EWCB, meaning that they were also excluded from the study. The final sample consisted of 703 girls (555 in the normal-weight range and 148 considered overweight). The mean age was 17.60 years (standard deviation (SD)=1.30). The normal-weight group had a mean body mass (BMI) of 21.49 kg/m<sup>2</sup> (SD=1.7) and the overweight group a mean BMI of 27.08 kg/m<sup>2</sup> (SD=2.34).

### Measures

**Weight status.** Weight was recorded with the students fully dressed except for coats, shoes, key-chains, wallets and other heavy objects. BMI was computed using the formula: weight in kilograms divided by the square of his height in meters (kg/m<sup>2</sup>). Participants under the age of 18 years were classified into underweight, normal-weight and overweight groups according to the standard gender specific cut-offs (BMI scores of 25 or more at the age of 18 years) (Cole et al., 2000) and the underweight cut-offs for adolescents derived from the World Health Organization (WHO) thinness cut-offs (BMI value of 18.5 kg/m<sup>2</sup> at the age of 18 years) (Cole et al., 2007).

**EWCB.** To assess the presence of EWCB, 5 items were presented referring to the use of compensatory weight-loss behaviours. In each item, the behaviour had to occur at the same frequency and duration threshold as required to make an eating disorder diagnostic in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; DSM-IV-TR) (American Psychiatric Association (APA), 2000). Thus, the participants were asked if 'they had exhibited at least twice or more times a week for 3 consecutive months over the last year' any of the following behaviours: 'self-induced vomiting', 'taking laxatives', 'taking diuretics', 'taking diet pills' and 'fasting', in order to lose weight or change their body. The respondents were asked to provide a YES or NO answer to each behaviour. Finally, a dichotomous variable was created. Participants were positively scored in this variable if they had been engaged in at least one EWCB.

### Emotional distress

**General Health Questionnaire (GHQ-28).** The GHQ-28 (Goldberg and Hillier, 1979; Spanish version by Lobo et al., 1986) is a self-report questionnaire designed to detect the presence of psychiatric cases in community and non-psychiatric clinical settings and comprises four 7-item scales: Somatic symptoms, anxiety and insomnia, social dysfunction and depression. A Likert-type scale was used (0–1–2–3), with higher scores indicating greater difficulties. In the present study, the Cronbach's  $\alpha$  for the total scale was .91, and the four subscales (somatic symptoms, anxiety and insomnia, social dysfunction and depression) had internal consistencies of  $\alpha$  = .79;  $\alpha$  = .85;  $\alpha$  = .76;  $\alpha$  = .86, respectively.

### Body image concerns

**Eating Disorder Inventory (EDI-2).** This inventory assesses behaviours and symptoms associated with eating disorders (Garner, 1991; Spanish version by Corral et al., 1998). It is a self-report instrument with 91 elements. Responses are

given on a 6-point Likert-type scale (from 'never' to 'always'), providing scores on 11 scales. In this study, only the first three subscales were used, since they assess attitudes and behaviours related to eating, weight and body image: drive for thinness, bulimia and body dissatisfaction. In Spanish samples, the internal consistency of the elements has been analysed (Corral et al., 1998) applying the split-half method, with the results being similar to those obtained in the American sample, particularly as regards the clinical group (from  $r=.76$  to  $r=.91$ ). In this study, the Cronbach's  $\alpha$  was .91 for the drive for thinness subscale, .81 for bulimia and .89 for body dissatisfaction.

**Eating Disorder Belief Questionnaire (EDBQ).** This is a 32-item self-report instrument that assesses assumptions and beliefs associated with eating disorders (Cooper et al., 1997). Each item is rated on a scale from 0 (*I do not usually believe this at all*) to 100 (*I am usually completely convinced that this is true*). The questionnaire has four subscales: (a) importance of weight and body shape as a means of self-acceptance, (b) importance of weight and body shape as a means of being accepted by others, (c) negative self-beliefs and (d) control over eating. In this study, the Cronbach's  $\alpha$  for the total scale was .95, and for the subscales, it ranged from .83 to .91.

### Procedure

This study was approved by the Ethics Committee of the University of the Basque Country. After the education centres in question agreed to participate in the research study, a letter providing relevant information was sent to the students' parents.

The participants were given the questionnaires with the tasks to be performed, along with instructions for completing them. They were then given approximately half an hour to complete the scales and questionnaires described above and, in the case of those who were over 18 years to sign an informed consent form. In those cases in which participants were under age, the informed consent of their

families was requested. In all cases, the participants were reminded that the required information was anonymous and confidential.

The instruments were applied by two qualified psychologists in the classrooms of the students' school or university. In order to encourage them to take part in the study, the psychologists offered to send them the results.

### Design and statistical analyses

This research used a cross-sectional study with a non-probabilistic sample. The statistical analyses were carried out using the SPSS program (version 20.0 for Windows) and Exploratory Software for confidence intervals (CIs) (Cumming, 2012). Logistic regression binary (Wald forward method) was used to investigate the effect of emotional distress and body image concerns variables (independent variables) on engagement in at least one EWCB (as dependent variable) in normal-weight girls and overweight girls. The predictive value of the model was calculated using the Nagelkerke  $R^2$ . In addition,  $\chi^2$  and Hosmer–Lemeshow (H-L) statistics were calculated for goodness-of-fit tests. A significance level of .05 was used.

## Results

### Correlations among BMI, emotional distress, body image concerns and EWCB variables

In general, as can be seen in Table 1, highly significant positive relationships ( $p<.001$ ), of small to moderate magnitude, were found between the variables BMI, emotional distress, body image concerns and EWCB.

Regarding the BMI, the highest correlations occurred with the EDI-2 scales, body dissatisfaction and drive for thinness. The association between the BMI and the EWCB variable was small ( $r(701)=.15$ ,  $p<.001$ ). As regards the EWCB variable, the highest associations were with the EDI-2 scales, drive for thinness and body dissatisfaction, the EDBQ scales, importance of weight and body shape for self-acceptance and

**Table 1.** Correlations among BMI, emotional distress, body image concerns and extreme weight-control behaviours variables.

	BMI	GHQ-28	SS	AAI	D	SD	DFT	Bulimia	BD	IWBS-SA	IWBS-AO	NSB	COE	EWCB
BMI	1													
GHQ-28		1												
Total score	.13**	1												
SS	.09*	.80**	1											
AAI	.07	.87**	.63**	1										
D	.15**	.79**	.46**	.55**	1									
SD	.09*	.71**	.38**	.49**	.56**	1								
EDI-2 scales														
DFT	.39**	.45**	.30**	.39**	.39**	.34**	1							
Bulimia	.12*	.45**	.29**	.35**	.42**	.42**	.49**	1						
BD	.44**	.42**	.28**	.35**	.41**	.30**	.68**	.43**	1					
EDBQ scales														
IWBS-SA	.27**	.42**	.29**	.35**	.37**	.31**	.70**	.39**	.56**	1				
IWBS-AO	.24**	.49**	.31**	.35**	.52**	.40**	.55**	.35**	.47**	.67**	1			
NSB	.19**	.56**	.35**	.38**	.67**	.39**	.45**	.36**	.48**	.52**	.62**	1		
COE	.25**	.52**	.31**	.42**	.51**	.42**	.67**	.46**	.54**	.73**	.75**	.57**	1	
EWCB	.15**	.32**	.27**	.28**	.24**	.26**	.38**	.27**	.33**	.36**	.26**	.18**	.36**	1

BMI: body mass index; GHQ: General Health Questionnaire; SS: somatic symptoms; AAI: anxiety and insomnia; D: depression; SD: social dysfunction; DFT: drive for thinness; BD: body dissatisfaction; IWBS-SA: importance of weight and body shape for self-acceptance; IWBS-AO: importance of weight and body shape for acceptance by others; NSB: negative self-beliefs; COE: control over eating; EWCB: extreme weight-control behaviours; EDI-2: Eating Disorder Inventory; EDBQ: Eating Disorder Belief Questionnaire.

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

control over eating, and with the GHQ-28 total score.

### *Differences in emotional distress, body image concerns, and EWCB between normal-weight and overweight adolescent girls*

The results of the analyses carried out are shown in Table 2. In comparison with normal-weight adolescents, those who were overweight obtained significantly higher scores (although of low magnitude) in the GHQ-28 total score and in the GHQ-28 depression scale.

In the EDI-2 subscales too statistically significant differences were found, of medium and large magnitude, in drive for thinness and body dissatisfaction. Yet again it was overweight adolescents who obtained the highest scores in both cases.

Overweight adolescents also scored significantly higher in all EDBQ subscales. The effect

size was, in general, medium. In overweight adolescents, body weight and shape had greater importance in both self-acceptance and acceptance by others. Similarly, overweight adolescents had more negative self-beliefs and control over eating. All EWCB (self-induced vomiting, taking laxatives, diuretics, diet pills and fasting) occurred with greater frequency in overweight than in normal-weight adolescents, with statistically significant differences ( $p < .05$ ), except in the case of taking laxatives.

### *Differences between the normal-weight and overweight adolescent females who both have EWCB*

The results related to the comparisons between the normal-weight girls with EWCB and the overweight girls with EWCB only showed statistically significant differences with a small magnitude in drive for thinness ( $r = .29$ ) and negative self-beliefs ( $r = .24$ ), and with a medium

**Table 2.** Differences between normal-weight and overweight adolescents in relation to emotional distress, body image concerns, and extreme weight-control behaviours.

Variables	Normal-weight (n=555)		Overweight (n=148)		t (gl)	Cohen's d (95% CI)
	M	DS	M	DS		
<i>Emotional distress</i>						
GHQ-28 (total score)	21.78	10.38	24.21	11.47	t(682) = -2.47*	0.22 (0.20, 0.64)
Somatic symptoms	5.66	3.44	6.05	3.72	t(682) = -1.19	0.11 (0.32, 0.54)
Anxiety and insomnia	6.36	4.13	6.84	4.26	t(693) = -1.22	0.11 (0.32, 0.54)
Depression	2.46	2.99	3.49	3.81	t(690) = -3.02**	0.30 (0.13, 0.73)
Social dysfunction	7.20	2.56	7.61	2.49	t(682) = -1.90	0.16 (0.02, 0.34)
<i>Body image concerns</i>						
<i>EDI-2 subscales</i>						
Drive for thinness	3.98	4.94	7.96	6.25	t(668) = -6.99***	0.71 (0.52, 0.89)
Bulimia	1.84	2.89	2.41	3.59	t(667) = -1.73	0.17 (0.01, 0.35)
Body dissatisfaction	7.78	6.13	13.46	7.25	t(656) = -8.49***	0.85 (0.66, 1.04)
<i>EDBQ subscales</i>						
IWBS-SA	35.80	25.26	50.79	27.20	t(690) = -6.28***	0.57 (0.38, 0.76)
IWBS-AO	13.56	17.01	22.66	22.54	t(692) = -4.56***	0.46 (0.29, 0.63)
Negative self-beliefs	16.11	16.50	23.09	19.44	t(691) = -3.99***	0.39 (0.37, 0.41)
Control over eating	15.54	18.39	24.47	21.94	t(694) = -4.53***	0.44 (0.42, 0.46)
<i>EWCB</i>						
	n	%	n	%	$\chi^2$	OR (95% CI)
Vomit	19	3.4	11	7.4	4.597*	2.26 (1.05, 4.87)
Laxatives	5	0.9	3	2	1.317	2.28 (0.54, 9.63)
Diuretics	9	1.6	12	8.1	16.964***	5.35 (2.21, 12.96)
Diet pills	6	1.1	8	5.4	11.194**	5.23 (1.79, 15.31)
Fasting	53	9.5	23	15.5	4.349*	1.74 (1.03, 2.95)
At least one EWCB	68	12.3	37	25	14.945***	2.39 (1.52, 3.75)

IWBS-SA: importance of weight and body shape for self-acceptance; IWBS-AO: importance of weight and body shape for acceptance by others; OR: odds ratio; CI: confidence interval.

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

magnitude in body dissatisfaction ( $r = .36$ ). Despite the fact that both groups showed signs of EWCB, the overweight adolescent females had a greater drive for thinness, more body dissatisfaction and more negative self-beliefs (Supplementary Table 3).

### *Emotional distress and body image concerns as predictors of EWCB in normal-weight and overweight females*

The adolescent females with EWCB (both normal-weight and overweight) obtained the worst scores (the highest scores) in the analysed

variables. There were also statistically significant differences between both groups in some variables (drive for thinness, body dissatisfaction and negative self-beliefs). Bearing this in mind, we aimed to analyse the independent variables to find out which of them showed greater predictive power as regards the EWCB variable, both in the normal-weight and in the overweight adolescent groups. The corresponding results are shown in Supplementary Table 4.

In the case of the normal-weight adolescent females, the model consisting of the somatic symptoms, negative self-beliefs, control over eating and drive for thinness variables showed

good fit, as the Chi-square value was significant,  $\chi^2(4)=89.78$ ,  $p=.000$ , and the Hosmer–Lemeshow test was not significant,  $\chi^2_{HL}(8)=7.01$ ,  $p=.536$ . Considering Nagelkerke's  $R^2$ , the model explained 36.2 per cent of the variance. The level of sensitivity (correct classification of the normal-weight girls who engaged in EWCB) was 36 per cent and the level of specificity (correct classification of the normal-weight women who did not engage in EWCB) was 98.2 per cent. In the normal-weight girls, the greater presence of somatic symptoms, Exp (B)=1.13 and the greater drive for thinness, Exp (B)=1.11, proved to be the most important variables in engagement in EWCB.

In the case of the overweight girls, the model consisting of drive for thinness and anxiety and insomnia variables also showed good fit, as the Chi-square value was significant,  $\chi^2(2)=41.91$ ,  $p=.000$ , and the Hosmer–Lemeshow test was not significant,  $\chi^2_{HL}(8)=7.94$ ,  $p=.439$ . In this case, the model explained 44.5 per cent of the variance. The level of sensitivity (correct classification of the overweight women who engaged in EWCB) was 55.2 per cent and the level of specificity (correct classification of the overweight women who did not engage in EWCB) was 93.3 per cent.

## Discussion

The rate of overweight adolescent females obtained in this study (19.6%) was similar to that found by Olaiz et al. (2006) in Mexican adolescent females and by Huh et al. (2012) with Latin American adolescent females in the United States, but it was clearly lower than the 27 per cent obtained in the National Health Survey (2010–2012) for under-17s carried out by Spain's Ministry of Health, Social Services and Equality (2013). This lower rate of overweight people found in our study (with adolescents aged between 16 and 20 years) may be explained, at least partially, because, according to the findings of a study by Huh et al. (2012), the prevalence of overweight fell slightly at the start of late adolescence (14–16 years) and fell once again between the age of 17 and 19 years.

Normal-weight and overweight female adolescents showed statistically significant differences in the emotional distress (GHQ-28 total score and depression) variables. They showed differences in the drive for thinness, body dissatisfaction and in the variables related to beliefs associated with eating disorders. As has already been seen in previous studies (Cebolla et al., 2011; Hatata et al., 2009), overweight adolescent girls obtained significantly higher scores. As regards the use of EWCB, 12.3 per cent of normal-weight adolescent females and 25 per cent of overweight adolescent females engaged in this type of unhealthy behaviour, which is in keeping with other studies (Neumark-Sztainer et al., 2007; Vander Wall, 2011). The most frequent weight-control behaviours in the normal-weight group were fasting (9.5%) and self-induced vomiting (3.4%); and in the overweight group, fasting (15.5%), taking diuretics (8.1%) and self-induced vomiting (7.4%). The only behaviour in which significant differences were not found between both groups was taking laxatives. Being overweight increased the probability of taking diuretics 5.35 times, of taking slimming pills 5.23 times and of being engaged in at least one EWCB 2.39 times. This finding is consistent with related research showing that overweight/obese girls are at increased risk for unhealthy or EWCB (Boutelle et al., 2002; Neumark-Sztainer et al., 2006). The high percentage of overweight girls (one in four) reporting EWCB shows that as indicated by Neumark-Sztainer et al. (2007), adolescent girls may simultaneously experience multiple weight-related problems and suggests that obesity prevention and treatment interventions might broaden their focus to address a fuller spectrum of eating and weight-related problems (Sánchez-Carracedo et al., 2012).

The profile of normal-weight and overweight adolescent females who engage in EWCB was similar. In this case, the only statistically significant differences between both groups were found in drive for thinness, body dissatisfaction and negative self-beliefs. To be more specific, the overweight women scored

significantly higher on all three variables. In the other variables (emotional distress, bulimia, importance of weight and body shape for self-acceptance, importance of weight and body shape for acceptance by others and control over eating), no statistically significant differences were found between both groups. These results are consistent with the underpinnings of the transdiagnostic model of eating disorders (Fairburn, 2008) and confirm those found in previous studies regarding the negative consequences of this type of behaviour on a person's physical, emotional and psychosocial health (Al Sabbah et al., 2010), regardless of whether they are normal-weight or overweight. Furthermore, as we pointed out in the introduction, this type of behaviour often precedes the development of an eating disorder (Shisslak and Crago, 2001; Striegel-Moore and Bulik, 2007; Tanofsky-Kraff et al., 2004; Vander Wall, 2011) and a greater weight gain in the long term (Neumark-Sztainer et al., 2012).

With regard to the variables that predict engagement in EWCB, those that proved to have the greatest predictive power in the case of normal-weight women were the somatic symptoms (emotional distress), negative self-belief, control over eating and drive for thinness variables. As we have seen, the profile depicted by these variables is that of an adolescent female obsessed with thinness, who controls her eating, who has a tendency to somatise and who has negative self-beliefs (low self-esteem) (Wade et al., 2006). These results lead us to think that social pressure to achieve an aesthetic model of thinness possibly leads normal-weight adolescent females to repeatedly engage in weight-loss practices that are damaging to health (Cruz-Sáez et al., 2013; Mask and Blanchard, 2011).

In the case of overweight girls, the variables that better explained engagement in EWCB were drive for thinness and anxiety and insomnia (emotional distress). These results are in keeping with those obtained in studies by other authors (Cebolla et al., 2011; Goossens et al., 2009; Lampard et al., 2012; Vila et al., 2004). The results of this study show that overweight

adolescent girls are more likely to adopt unhealthy weight-loss behaviours only if, in addition to drive for thinness, they have high levels of anxiety.

Different authors have endeavoured to explain the relationship between being overweight and emotional variables. According to the affect regulation theory (Grilo and Shiffman, 1994), binge-eating is used as a mechanism to regulate and reduce negative emotions. If the ideal thinness model and the pressure to slim are also present, then low self-esteem and negative affect will also very probably appear (Mustillo et al., 2003). Thus, the greater the discrepancy between actual weight and ideal weight, the more self-conscious emotions entailing social judgements such as guilt and shame will increase, and the acceptance of one's own body will decrease (Castonguay et al., 2012).

This study investigated an extensive sample of adolescents and it is the first project to be carried out in Spain focusing specifically on EWCB in normal-weight and overweight adolescents. Nevertheless, some limitations should be noted. First, the study was limited by its cross-sectional design and cause-effect relationships could not be established. Therefore, future studies using a longitudinal design will be required to clarify the direction of these associations. Second, data were collected from students using self-report questionnaires, which, in spite of being completed anonymously, could be subject to misinterpretation or to social desirability reporting bias. Third, socio-economic status, intra-family relations and socio-cultural factors (e.g. messages from family, friends and the media), which some studies have found to be significant variables in this subject (Cromley et al., 2010; Unikel et al., 2012), were not evaluated in this study.

The results of this study suggest the need for preventive programmes encouraging the adoption of appropriate eating behaviours through the provision of consistent messages about healthy weight-control methods to adolescents (Sánchez-Carracedo et al., 2012). Likewise, treatment, which has not always

been effective (Stice et al., 2006), should be implemented at an early stage and go beyond mere nutritional education and physical activity. According to the results, emotional distress, excessive importance placed on physical appearance, low self-esteem and the negative cognitions associated with the body and eating, play an important role in the development of weight-control behaviours. that put adolescent girls' health at risk.

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