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Universal prevention program of eating, weight and body image problems in adolescents: A 12-month follow-up

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Abstract

Background: In recent years, the broad spectrum of weight-related problems has increased considerably among both teenage boys and girls. This makes it fundamental to create programs that are more efficient. The objective of this study was to evaluate the short-, mid- and long-term efficacy of the current prevention program applied to 14-year-old teenagers. **Method:** For this study, 73 girls and 83 boys were assigned to an experimental condition (n=156), while 68 girls and 84 boys were assigned to a control condition (n=152). We used a mixed 2 (control and experimental condition) × 3 (Time: post-test, 6 month-follow-up and 12- month-follow-up) factorial design. **Results:** Those participants who belonged to the experimental condition exhibited significantly higher scores of body satisfaction, self-esteem, emotional repair and clarity, lower scores of self-oriented perfectionism, and internalization of thinness and ideal muscularity compared to the control group in post-intervention assessments and in both follow-ups. No statistically significant gender differences were found regarding the effectiveness of the program. **Discussion:** Universal, ecological programs may be effective in reducing risk factors and/or maximizing protective factors, which could in turn reduce concerns about body image, eating and weight.

Keywords: Prevention intervention, adolescent girls and boys, risk and protection factors, weight and image problems, eating disorders.

Resumen

Programa preventivo universal de problemas de alimentación, peso e imagen corporal en adolescentes: seguimiento de 12 meses. **Antecedentes:** en los últimos años se ha producido un incremento de amplio espectro de problemas relacionados con el peso entre adolescentes. Consecuentemente, la creación de programas más eficientes es primordial. El objetivo de este estudio fue evaluar la eficacia a corto, medio y largo plazo de un programa de prevención aplicado a adolescentes de 14 años. **Método:** para este estudio, 73 chicas y 83 chicos fueron asignados a la condición experimental (n = 156), mientras que 68 chicas y 84 chicos al grupo control (n = 152). Utilizamos un diseño factorial mixto 2 (condición) × 3 (tiempo: post-test y seguimientos de 6 y 12 meses). **Resultados:** los participantes del grupo experimental mostraron puntuaciones significativamente más altas de satisfacción corporal, autoestima, reparación y claridad emocional y puntuaciones menores en perfeccionismo orientado hacia sí mismo e interiorización del ideal de delgadez y de musculatura respecto al grupo control y en las medidas post intervención y en ambos seguimientos. El género no difirió significativamente en la efectividad del programa. **Conclusiones:** los programas universales y ecológicos podrían ser efectivos para reducir los factores de riesgo y/o maximizar factores de protección, y reducir los problemas de imagen corporal, de alimentación y de peso.

Palabras clave: intervención preventiva, chicos y chicas adolescentes, factores protectores y de riesgo, problemas de peso y de imagen corporal, trastornos alimentarios.

The prevalence of eating disorders (ED) (anorexia and bulimia nervosa, binge eating disorders, and subclinical symptoms) in Spain was approximately 3.6% in an adolescent sample between 12 and 17 years of age (Rojo-Moreno et al., 2015). This rate was lower than those portrayed in other studies with the same age group (Stice, Marti, & Rohde, 2013). Furthermore, eating problems were characterized by chronicity, comorbidity and low effectiveness of intervention (Stice, 2016; Stice, Becker, & Yokum, 2013; Stice & Shaw, 2002).

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Moreover, distinct studies have indicated that most of the adolescents assessed have related negative thoughts on weight and body-image, and negative emotions (Reel, 2013; Salk & Engeln-Maddox, 2011; Shirasawa et al., 2016). One recent study points out that around 45% of girls and 20% of boys assessed reported that they followed a diet and engaged in unhealthy behavior to achieve the current beauty ideal. This behavior was associated with an increase in their weight over the following years, enlarging the prevalence of obesity (López-Guimerà et al., 2013).

Body dissatisfaction has been one of most powerful changeable risk factors in ED. Additionally, prevention programs that have been focused on this construct have verified a significant reduction in the onset of ED, and of its symptoms and other risk factors. Finally, body-image disturbances were partially related to the mass media and were also associated with health and financial problems.

In this respect, therefore, they influence public health (Halliwell, Diedrichs, & Orbach, 2015; Sharfan, 2019).

A substantial part of the relevant academic literature has focused on the diagnosis, treatment and progress of ED. Prevention has been left in the background (Austin, 2016; Noordenbos, 2016). Moreover, discrepancies have been observed in the content of preventive intervention and its assessment (Stice & Shaw, 2010), a persistence in focusing exclusively on the feminine gender and that preventive effects did not continue over the mid and long term.

Noordenbos (2016) classified preventive programs into four generations. The first focused on psychoeducational sessions about the characteristics and consequences of ED. The second aimed to reduce specific risk factors in ED. The third generation attempted to deal with health promotion and non-specific risk factors. The final generation was directe at promoting legislative change to bring about a favorable cultural context. According to the author, programs belonging to the third and fourth generations were more effective in reducing the symptoms of eating disorders. Accordingly, the preventive program of this current study is framed within the second and third generation.

Similarly, according to a systematic review that included studies with a sample of individuals having an average of 13 and from different countries, as well as a meta-analysis with an international sample, effective programs have a media-literacy component as one of their main characteristics. This component aims at providing students with a critical tool to be able to react in light of the current esthetic ideals portrayed in the media (Xie, Gai, & Zhou, 2019). Other characteristics of effective preventive programs were addressing young people; applying the program through trained teachers or health professionals in schools working with issues of emotional intelligence; body image; self-esteem; social skills; problem-solving; and nutrition (Levine & Smolak, 2016; Watson et al., 2016; Xie, Gai, & Zhou, 2019).

The aim of the present study was to evaluate effectiveness in a mid- and long-term universal prevention program implemented on third-year secondary-school boys and girls with a control group. Dependent variables were compared inter and intra group. The confusionist variables that were analyzed were gender, BMI, socioeconomic level and ethnicity.

We hypothesized that, in post and follow-up measures at 6 months and 1 year, participants in the experimental condition would obtain lower scores for ED symptomatology, diet, awareness and internalization of beauty ideals and perfectionism compared to the control group and pre-post measure. Concurrently, better scores of body dissatisfaction, criticism of current esthetic ideals, self-esteem, emotional intelligence, eating habits and physical activity were obtained.

Method

Participants

Participants were recruited from five secondary schools in Barcelona (Spain). Verbal consent was required from participants and written consent from parents. Sampling and assignment were incidental. The initial sample was 308 boys and girls.

As regards sociodemographic data, 110 participants were girls (53 experimental condition and 57 control) and 114 were boys (46 experimental condition and 58 control group). 76.44% of the sample was European; 16.89% South-American; 4.89% Asian; 1.33% from Arabic countries; and 0.45% from other continents. The average age of participants was 14.6 years with a 0.54 standard deviation.

Regarding socioeconomic level, 28.97% of participants were middle to mid-low class.

Instruments

Socioeconomic level and sociobiographic data. Through an ad-hoc questionnaire, the participants were asked about the following aspects: Presence or absence of diet to change physical appearance and what this consisted of. Additionally, participants were asked about the educational and professional background of their parents or their main caregivers. The Hollingshead Index was obtained from this information. This index is organized into five levels: the higher the index, the lower the socioeconomic level (Hollingshead, 1975). This information was also extracted from a weighted formula. Finally, eating and physical activity habits were collected.

Body Mass Index Level (BMI). BMI was calculated from in situ weight and height measures using Seca 100g scale and a Kw 444.440 Kawe measuring rod (World Health Organization, 2006). Measures were taken in a private space close to the classroom, respecting confidentiality and intimacy at all times.

Eating Attitudes toward food (EAT-26) (Garner, Olmsted, Bohr, & Garfinkel, 1982). This questionnaire measured disturbing eating attitudes and behavior. A high score was associated with a higher risk. The questionnaire consisted of 26 items assessed in 6-point scales. We used its official Spanish adaptation (*Servicio de Promoción de la Salud, Instituto de Salud Pública*, 2013). In the current sample, the total consistency of scores at each one of the assessment measures was excellent ($\alpha \geq .92$).

Perfectionism Scale for children and adolescents (CAPS) (Hewitt, Flett, Turnbull-Donovan, & Mikail, 1991). We used the official Spanish adaptation of this by Castro et al. (2004). It was a self-report questionnaire of 22 items based on conceptualization of the multidimensional construct of perfectionism shaped by two subscales: social-perceived and self-perceived perfectionism, both consisted of a Likert scale. A high score was associated with a higher level of perfectionism. The sample data obtained displayed good internal consistency, with .89 in the Self-Oriented factor and .79 in the Socially Perceived factor.

Body Image Questionnaire (QUIC). This questionnaire asked both genders about distinct part of the body. Responses were assessed through a Likert scale. A high score was associated with a higher body satisfaction. Regarding convergent and divergent validity data, the instrument has correlations with other recurrently used scales as EAT-40, EDE-Q and CIMEC. In this sample these factors displayed good internal consistency, with .89 for Torso and .85 for Head and Limbs.

Rosenberg Self-Esteem Scale (RSE). We used the official Spanish adaptation (Atienza, Moreno, & Balaguer, 2000). This consisted of a self-report of 10 items that measured self-esteem as a global and unidimensional measure. A high score was associated with a higher self-esteem. The Spanish adaptation had psychometric characteristics that are as good as the English version (Gray, Williams, & Hancock, 1997). In this sample, the internal consistency reached in each of the measures was excellent ($\alpha \geq .95$).

Trait Scale of Emotional-States Meta-Knowledge (TMMS-24). This self-report questionnaire assessed perceived emotional

intelligence. It involved 3 scales: attention, clarity and emotional reparation. A high score was associated with a higher emotional intelligence. The response scales were Likert type (Fernández-Berrocal, Extremera, & Ramos, 2004). Internal consistency obtained through the responses of this sample was excellent ($\alpha \geq .94$).

Sociocultural influences Questionnaire (SATAQ-4). This was composed of 22 items that measured level of approval of current standard esthetic ideals. Response scales were Likert type, involving two factors: sociocultural pressure and body-ideal internalization. The first factor has three subscales: pressure from peers; family; and media. The internalization factor has two subscales: thin-ideal internalization or low-level lipids; and muscled ideal internalization. A high score was associated with greater pressure and internalization of beauty ideals. The Spanish validation by Llorente, Gleavews, Warren, Pérez, and Rakhkovskaya (2015) was used. Internal consistency for this sample was excellent ($\alpha \geq .95$).

Questionnaire on criticism felt towards the thin ideal for girls and the muscle ideal for boys portrayed in the media, based on McLean, Paxton, and Wertheim (2013). This instrument enquired into 10 items that were distinct for each gender. Higher scores showed less critical ability and stronger belief of the idea that the ideals shown in the media are real, easy to obtain and, that if obtained, the possessor would be more intelligent, beautiful/handsome, perfect, happy and experience greater enjoyment.

Procedure

This study began by asking participants and their parents or legal tutors for reported consent. Our research project was approved by the Ethics Committee of the Universitat Autònoma de Barcelona. The research had a quasi-experimental and longitudinal design. To avoid the spill-over effect, individuals belonging to the control group attended a different school than that of the experimental group. Four measures were taken during school hours on paper-pencil forms (pre-intervention, post-intervention, six months and one year later).

Program

The theories that substantiated our prevention program were Cognitive-social theory, a feminist approach and the general skills model. Cognitive-social theory was proposed by Bandura (1986), who recognized that the development of ED is regulated by internal and external aspects through social agents. Regarding the feminist model, this characterises gender roles displayed by social agents that focus on making physical appearance a means of achieving approval and success, so that women learn to see their bodies as an object. Additionally, underlying pressure is not at all coherent with biogenetic parameters in most of these (López-Guimerá & Sánchez- Carracedo, 2010; Sinton & Taylor, 2010). Regarding the general skills model, this holds that mental disorders develop if the vulnerabilities surpass protection factors (López-Guimerá & Sánchez-Carracedo, 2010).

With respect to the experimental condition, the itinerary followed was that portrayed in Table 1**.** The procedure consisted of eight weekly sessions, lasting fifty minutes each, during normal class time with the tutor. Nine previously trained psychology researchers, PhD students or PhD holders, women from 24 to 45 years old, implemented the intervention program and assessment sessions. The components of this program were media literacy; healthy eating habits; physical activity; emotional intelligence; and activism. During the program sessions, the control group attended a regular class.

Data analysis

Statistical analyses were performed with STATA12.0. An analysis of mixed design 2 × 3 (Intergroup comparison, control and experimental × Intragroup comparison. Time: post, follow-up of 6 months and 1 year) of repeated measures, adjusted for baseline level, sex, BMI and socioeconomic level was used. By hierarchical models, since the interaction of the effect (group × Time) turned out to be significant, this interaction was first analyzed and its main effects were subsequently interpreted according to the level of significance equal to or greater than 0.05. Bonferroni-adjusted post-hoc analyses were performed to assess mean differences (95%

Table 1
Prevention program content

Session 1 and 2	Media literacy	– History of the beauty ideal analyzed from a historical perspective (girls: Greeks, Marylin and Barbie icons; boys: masculinity in the 20th century and great development of muscles). – Beauty ideal from a cross-cultural perspective (giraffe-women, obese women in Mauritania, deformed feet in Chinese women). – Analysis of advertising messages. – Promotion of traditional roles through toys.
Session 3	Healthy eating habits	– Promotion of intake of fruits and vegetables. – Advertising and food choice. – Definition and difference between nutrition and food. – Definition and analysis of balanced nutrition (food pyramid). – Food myths (carbohydrates, fats, forbidden foods, etc.) – Full awareness and satiety. – Differentiating functions and food groups. Identifying type of menus.
Session 4 and 5	Healthy coping styles. Emotional intelligence	– Knowledge of the relationship between nutrition and emotions. Types of emotions – Problem solving with practical examples of the participants and fragments of films (How to act against loss, insult, failure) – Benefits of doing physical activity and the relationship with emotion modulation and self-esteem. – Social abilities (assertive communication)
Session 6, 7 and 8	Activism	– Making a video parody of an advertisement from a guided critical analysis. – Exhibition of videos; competition.

confidence intervals) between the groups, and effect sizes were calculated through Cohen's *d*. Results were interpreted as small if the values of *d* were less than or equal to 0.2, average for values of *d* less than or equal to 0.5 and large for values greater than 0.8 (Rosnow & Rosenthal, 1996).

Results

A sampling loss of 26.95% was registered**,** which was largely explained by a change of school or by not answering an assessment measure.

As regards Body Mass Index (BMI), the mean for boys was 21.25 (*SD* = 3.80) and 21.60 (*SD* = 4.58) for girls.

Table 2 shows the means and standard deviations obtained from each of the dependent variables considered at each moment of evaluation, in addition to the level of significance of time and the interaction of time and condition.

All measurements were adjusted by baseline level and BMI. The other confounding variables contemplated (SES and gender) did not show a change greater than or equal to 10% compared to the pure model.

RSES results

Results indicated that the score obtained by the participants of the experimental condition was 1.91 points higher, $\chi^2(3, N = 225) = 14.58$,

Table 2
Observed means (and SD) of measures over time and Chi-Squared Distribution results

Measure (minimum ÷ maximum)	Observed mean (SD)					Chi-Squared Distribution (P value)	
	Group (n)	Pre-test (baseline)	Post-test (month 1)	1st follow-up (month 6)	2nd follow-up (month 12)	Interaction	Time
RSES (0 ÷ 40)	ECOPREV (109)	26.42 (3.068)	28.71 (4.37)	29.58 (3.87)	29.69 (3.99)	**14.58**	**91.18**
	Control (116)	27.34 (3.07)	28.61 (3.87)	28.60 (3.71)	28.73 (4.08)		
TMMS- 24 emotional attention (0 ÷ 40)	ECOPREV (109)	23.35 (7.02)	23.74 (6.73)	23.53 (6.79)	24.34 (6.91)	2.24	6.41
	Control (116)	24.05 (6.59)	22.34 (6.53)	23.39 (6.15)	23.95 (7.25)		
TMMS-24 clarity (1 ÷ 40)	ECOPREV (109)	24.90 (6.37)	25.34 (5.89)	25.68 (6.31)	27.42 (6.68)	**23.85**	**16.28**
	Control (116)	27.61 (5.98)	25.29 (5.89)	25.65 (5.26)	26.97 (6.37)		
TMMS-24 emotional repair (1 ÷ 40)	ECOPREV (109)	24.42 (6.26)	27.50 (6.71)	29.03 (6.61)	29.72 (6.89)	**76.65**	**46.52**
	Control (116)	27.99 (6.43)	27.34 (6.88)	25.71 (6.19)	28.22 (6.46)		
EAT-26 (0 ÷ 78)	ECOPREV (109)	6.96 (7.02)	5.61 (6.42)	4.54 (5.26)	4.61 (5.50)	7.23	16.71
	Control (115)	7.23 (8.15)	6.14 (8.40)	6.17 (7.12)	6.95 (7.26)		
CAPS Self-oriented (1 ÷ 60)	ECOPREV (103)	37.93 (7.90)	35.43 (8.03)	35.28 (7.23)	34.81 (8.01)	**15.43**	12.85
	Control (115)	35.87 (6.60)	35.58 (7.05)	35.49 (7.83)	35.60 (8.51)		
CAPS socially perceived (1 ÷ 50)	ECOPREV (106)	27.55 (6.75)	26.08 (7.91)	25.42 (7.81)	25.52 (7.26)	7.38	10.64
	Control (111)	25.87 (7.40)	25.28 (7.46)	24.80 (7.99)	26.58 (8.82)		
QUIC- Torso (0 ÷ 70)	ECOPREV (109)	50.9 (1.50)	54.89 (1.27)	55.62 (1.19)	54.17 (1.04)	**31.03**	**10.71**
	Control (116)	53.61 (1.05)	53.09 (0.90)	54.07 (1.03)	56.29 (1.17)		
QUIC- Head and limbs (0 ÷ 110)	ECOPREV (109)	66.36 (19.22)	72.91 (13.86)	73.37 (13.78)	74.06 (14.85)	**46.91**	**14.34**
	Control (116)	70.1 (12.97)	69.39 (12.28)	70.72 (13.36)	70.13 (13.78)		
General physical appear-ance (0 ÷ 10)	ECOPREV (107)	7.43 (1.80)	7.87 (1.53)	7.98 (1.39)	8.02 (1.34)	**25.59**	**13.80**
	Control (115)	7.83 (1.26)	7.47 (1.55)	7.74 (1.31)	7.71 (1.34)		
SATAQ fitness pressure (1 ÷ 25)	ECOPREV (109)	12.52 (4.99)	12.32 (4.97)	11.89 (5.29)	12.08 (4.89)	2.64	5.70
	Control (116)	11.6 (5.06)	11.73 (4.84)	11.51 (4.64)	12.05 (5.20)		
SATAQ thinness pressure (1 ÷ 25)	ECOPREV (109)	12.75 (5.70)	12.80 (5.96)	11.69 (5.52)	12.42 (5.45)	1.24	13.29
	Control (116)	12.40 (5.41)	12.33 (5.03)	11.88 (4.90)	12.47 (5.42)		
SATAQ familiar pressure (1 ÷ 20)	ECOPREV (116)	7.05 (3.35)	6.98 (3.39)	7.17 (3.61)	7.50 (3.62)	3.16	5.60
	Control (116)	7.99 (3.64)	7.41 (3.59)	7.32 (3.56)	8.08 (4.26)		
SATAQ peer pressure (1 ÷ 20)	ECOPREV (109)	5.65 (2.72)	5.55 (2.48)	5.74 (2.74)	6.19 (3.21)	1.07	7.42
	Control (116)	6.18 (2.98)	5.87 (2.67)	5. 62 (2.57)	6.41 (3.45)		
SATAQ media pressure (1 ÷ 20)	ECOPREV (109)	12.40 (5.41)	12.33 (5.03)	11.88 (4.90)	12.47 (5.42)	.89	.46
	Control (109)	12.52 (4.99)	12.32 (4.97)	11.89 (5.29)	12.08 (4.89)		
Dietary Habits (0 ÷ 40)	ECOPREV (107)	23.21 (4.16)	22.79 (4.67)	23.87 (4.48)	22.71 (4.20)	5.22	4.83
	Control (115)	22.98 (3.94)	23.57 (4.18)	23.48 (3.41)	23.41 (3.86)		

Note: Data highlighted in bold are statistically significant

p <.0005, 95% CI (.86, 2.96), d = 0.26 with respect to the control group in the 6 month follow-up, and 1.58 points higher, p = .003, 95% CI(.52, 2.63), d = 0.24 in the yearly follow-up, as shown in Figure 1.

TMMS-24 results

Regarding the scale of emotional clarity, the experimental group obtained 2.50 points more than the control group, $\chi^2(3, N = 225) = 23.85$, p = .005, d =0.01, 95% CI = (.77, 5.24). In the 6 month follow-up, 4.29 points more, p <.0005, d = 0.07, 95% CI = (2.55, 6.02) and in the yearly follow-up 2.62 points more, p = .003, d = 0.07, 95% CI = (.88, 4.36).

In addition, on the emotional-repair scale, the experimental group obtained 3.73 points more than the control group in the subsequent measure, $\chi^2(3, N = 225) = 76.65$, p <.0005, d = 0.02, 95% CI (2.13, 5.33); 6.88 points more than the control group in the first follow-up, p <.0005, d = 0.52, 95% CI = (5.28, 8.48); and, finally, 5.07 points more in the second follow-up, p <.0005, d = 0.22, 95% CI = (3.47, 6.67).

CAPS results

The ECOPREV group obtained statistically lower scores than the self-oriented scale in at each of the evaluation moments, as shown in Figure 3. In the subsequent measurement, it obtained 2.08 points less, $\chi^2(3, N = 225) = 15.57$, p = .024, d = 0.2, 95% CI = (-3.89,- .27). In the first follow-up, 2.22 points less p = .017, d = 0.3, 95% CI = (-4.04, -.40) and in the yearly follow-up, 3.61 less, p <.0005, d = 0.095, 95% CI = (-5.42, -1,80), as shown in Figure 2.

QÜIC results

The ECOPREV group obtained 4.27 points more on satisfaction in the Torso scale with respect to the control group in the subsequent test, $\chi^2(3, N = 225) = 31.03$, p = .001, d = 1.66, 95% CI = (1.68, 6.86); 4.31 points more, p = .001, d = 1.40, 95% CI = (1.72, 6.91) in the first follow-up; and, finally, 4.93 points more p<.0005, d = 1.92, 95% CI= (2.35, 7.51), as shown in Figure 3.

Moreover, the ECOPREV group obtained 6.57 points for level of satisfaction in the Head and limbs' scale with respect to the control group in the post-test $\chi^2(3, N = 225) = 46.91$, p <.0005, d = 3.50, 95% CI = (2.90, 10.25). At the 6-month follow-up, the ECOPREV group obtained 4.21 points more than the control group p = .024, d = 1.92, 95% CI = (0.54, 7.88). At the 1- year follow-up, The ECOPREV group obtained 4.82, p =.010, d = 2.29, 95% CI = (1.17, 8.47), as shown in Figure 4.

Regarding overall body assessment, the ECOPREV group obtained .56 points more than the control group in the post measurement, $\chi^2(3, N = 225) = 25.59$, p = .002, d = 0.26, 95% CI = (.20, .92). In the first follow-up, the ECOPREV group obtained .40 more compared to the control group, p = .030, d = 0.18, 95% CI = (.04, .76) and .50 points more in the follow-up year, p = .006, d = 0.23, 95% CI = (.14, .87) as shown in Figure 5.

Similarly, in the other measures contemplated in Table 2, no statistically significant differences were obtained.

Questionnaire regarding criticism of the aesthetic ideal

This was administered one year subsequently**,** and participants belonging to the experimental group presented statistically lower levels compared to the control group. It was considered appropriate to adjust the model by ethnicity and BMI variables since these were the only variables that contributed to a difference greater than or equal to 10% with respect to the pure model. For Caucasian ethnicity, the experimental group obtained 2.41 points less than the control group, $F(6, 212) = 6.36$, p = .04, d = 0.54, 95% CI =

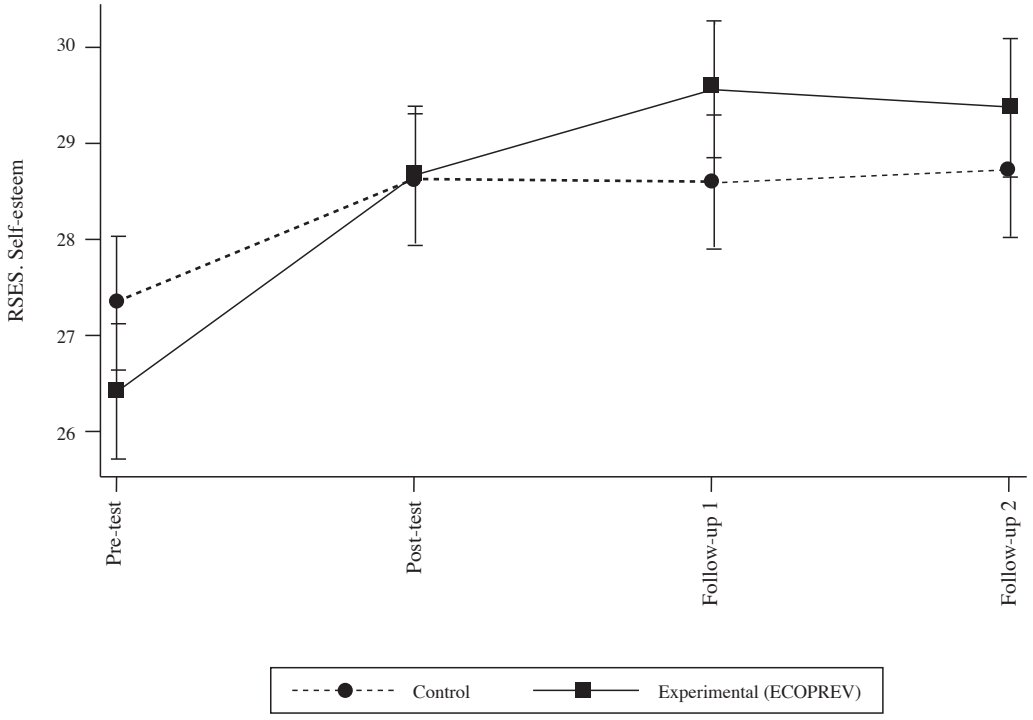

Figure 1. Mean scores for RSES adjusted by BMI in the three groups over the follow-up months showing predictive margins of conditions with 95% confidence interval

(-4.65, -.16). In the Hispanic ethnic group, the experimental group obtained 10.12 points less than in the control group, p <. 0005, d = .71. Individuals belonging to the Asian and Arabic ethnic groups obtained reductions that were not statistically significant.

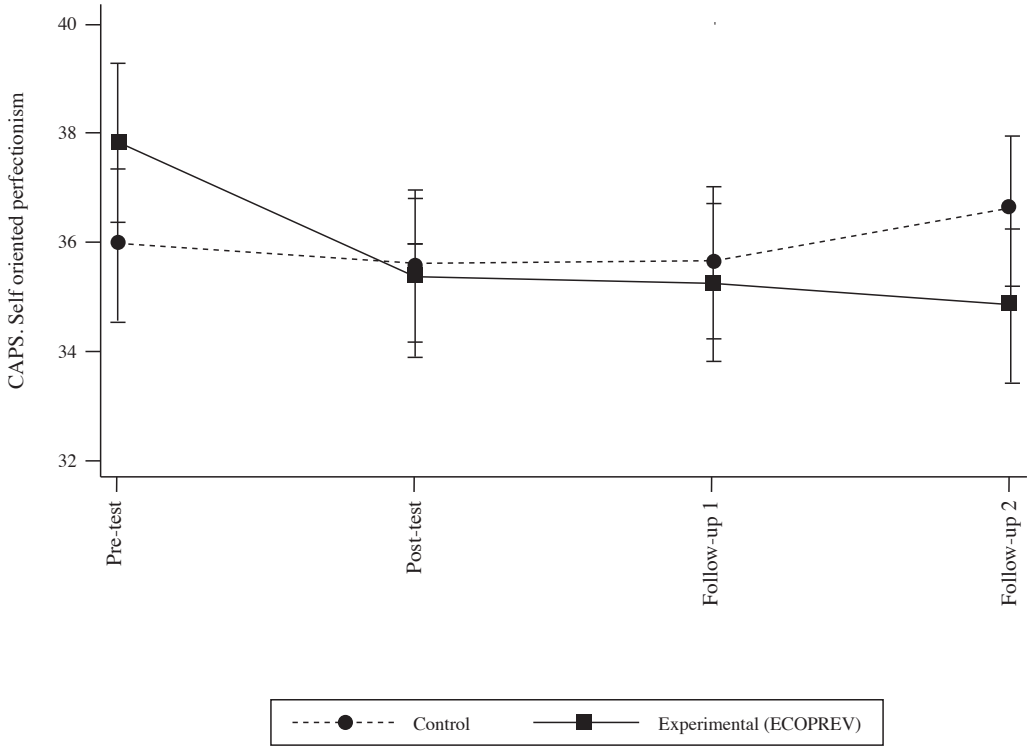

Figure 2. Mean scores for the Self-Oriented Perfectionism scale adjusted by BMI in the three groups over the follow-up months showing predictive margins of conditions with 95% confidence interval

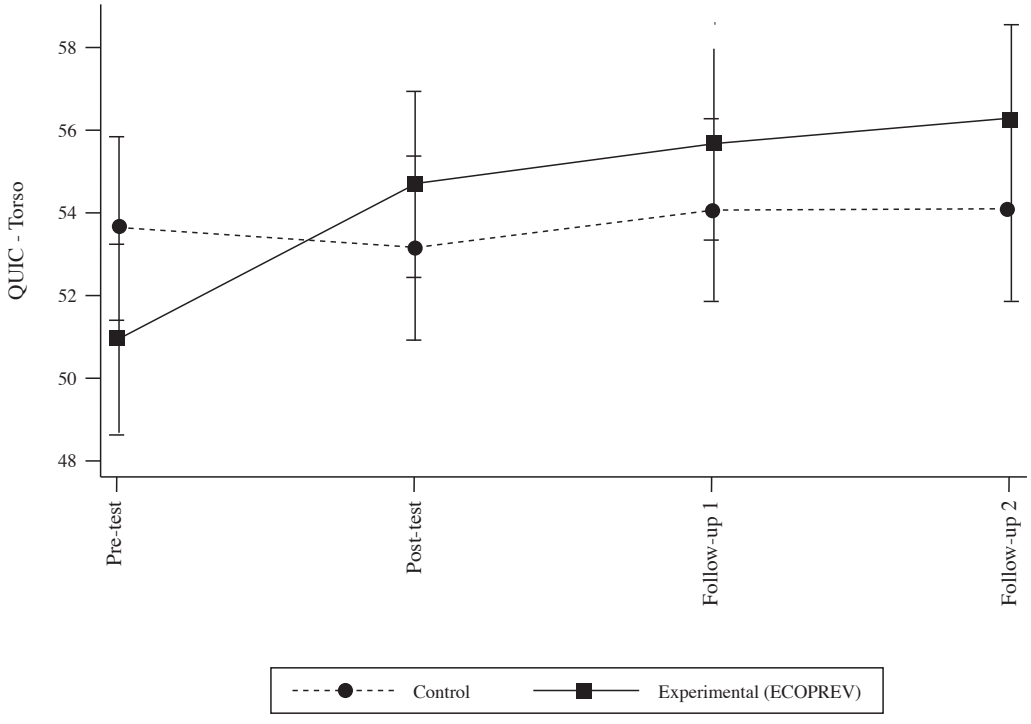

Figure 3. Mean scores for the Torso scale of QÜIC adjusted by BMI in the three groups over the follow-up months showing predictive margins of conditions with 95% confidence interval

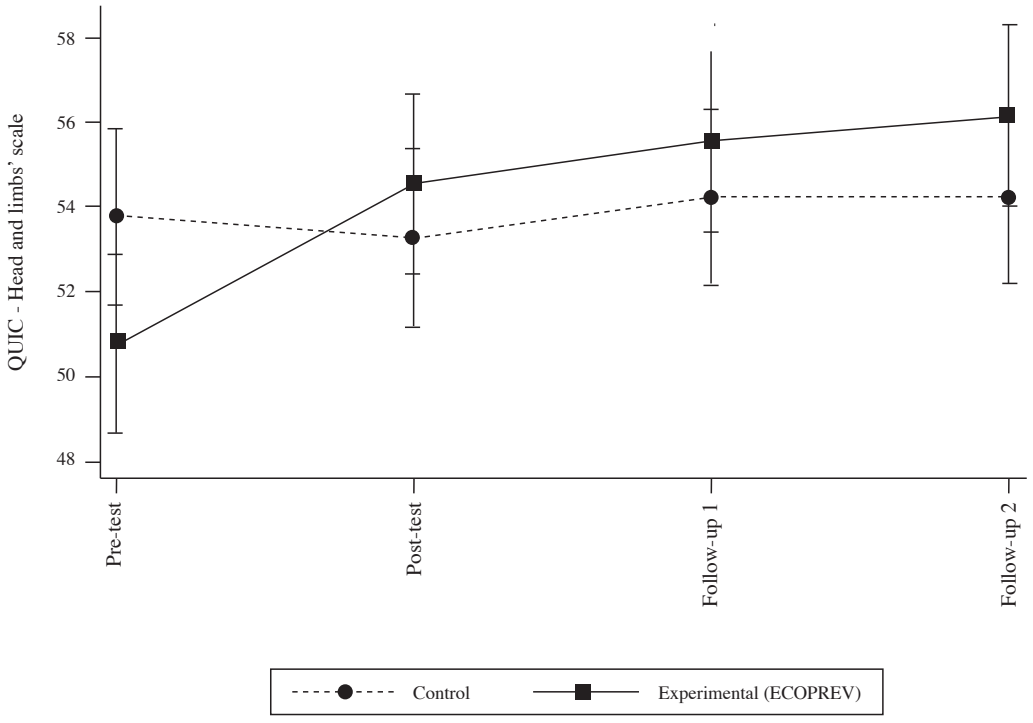

Figure 4. Mean scores for the Heads and Limbs' scale adjusted by BMI in the three groups over the follow-up months showing predictive margins of conditions with 95% confidence interval

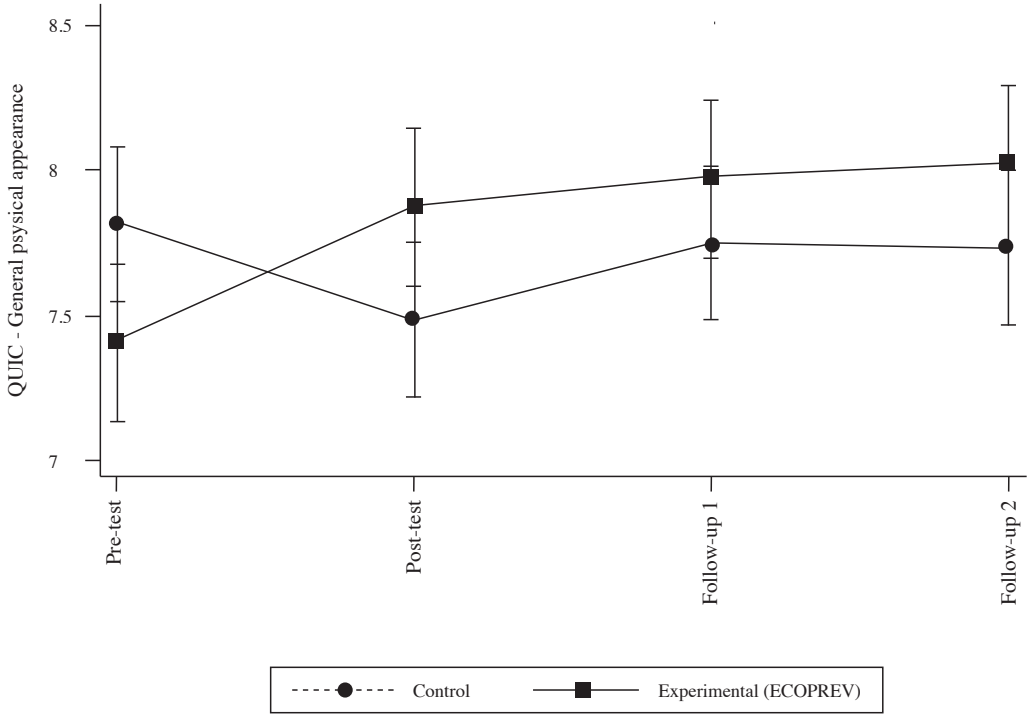

Figure 5. Mean scores for General physical appearance adjusted by BMI in the three groups over the follow-up months showing predictive margins of conditions with 95% confidence interval

Discussion

The aim of this study was to ascertain the short-, mid- and long-term effectiveness of a universal prevention program administered to adolescents in their school environment. The contents of this program were media literacy, healthy eating habits and physical activity, emotional intelligence and activism.

We can confirm that the results for all of the variables contemplated in the study were in keeping with what we had previously hypothesized. However, we obtained statistically significant changes only for the scales of clarity and emotional repair, body satisfaction, critical ability with respect to the aesthetic ideal, self-esteem and self-perceived perfectionism. In addition, as in other similar studies aimed at teenagers of a similar age in Spain, the sizes of effect are small or medium.

In this study we obtained unexpected results linked to a greater degree of maturation than expected in the scales pertaining to body satisfaction and clarity and emotional repair, compared to similar studies (Mora et al., 2015), which may have affected the ability to show the reality of the change produced by the program. The explanation that we considered most plausible for this is that biological effects are associated with growth. In adolescence, changes taking place in the brain would facilitate an increase in individuals' emotional abilities. A cohort design of 14 to 19 years obtained results that could confirm a tendency of growth in the ability to cope with stressful situations, linked to emotional intelligence. In addition, we observed covariates that could explain differences between rhythms of maturity such as school and family connections (Lando-King, 2011). Regarding maturity related to body satisfaction, this could be attributed to the biological changes produced in adolescence, since in certain cases, especially in boys, these can help achieve current aesthetic requirements such as an increase in muscle mass or the development of genitals in boys and the development of buttocks or breasts in girls (Hayward, 2003).

Internalization of current aesthetic ideals, body satisfaction, self-esteem and perfectionism

Other similar studies (both Spanish and from other countries) with teenage populations obtained significant changes in reducing the internalization of current aesthetic ideals (González, 2011; Sánchez-Carracedo et al., 2016; Wilkch, 2013); better body satisfaction (Espinoza, Penelo, & Raich 2013; Wilkch, 2013; Dunstan, 2017); self-esteem (Richardson & Paxton, 2010); and less perfectionism (Castillo, Solano, & Sepúlveda, 2016). Similarly, no statistically significant differences were obtained between the control and the experimental group in altered eating behavior, in contrast to González, et al., (2011). However, we observe that the contemplated changes in the experimental group were maintained or increased in the mid and long term, unlike other previous studies (Austin, 2016; Diedrichs, 2015; Franko, Cousineau, Rodgers, & Roehrig, 2013).

According to O'Dea (2012), based on cognitive-social theory, the promotion of better body self-perception reflects changes in beliefs and attitudes that, without such changes, would predict risk behaviors related to weight and diet.

On the one hand, emotional regulation is the ability to modify emotional states and the evaluation of such modification. It allows a state of openness towards feelings, to modulate one's own and those of others, as well as promoting understanding and personal growth. To manage one's emotions, it is necessary to be able to observe, distinguish and label them, to believe that they can be modified and to implement more specific strategies in order to modify negative emotions (Mestre & Fernández-Berrocal, 2007). A longitudinal study showed that adolescents who obtained lower scores in emotional regulation were associated, after one year, with higher levels of anxiety, depression, social stress, poor psychological adjustment and worse general mental health.

On the other hand, a meta-analysis showed evidence that emotional-adaptive regulation was one of the risk factors with the largest size of mediating effect between insecure attachment and eating disorders. In addition, other risk factors were found such as body dissatisfaction and perfectionism (Cortés-García, Takkouche, Seoane, & Senra, 2019).

Although no statistically significant differences were obtained in the presence or absence of diets at the distinct evaluation times between the control and experimental groups, qualitative differences were observed in the content of diets after intervention, with respect to the control group. These differences are characterized by the greater extent of consumption of fruit, vegetables (five daily intakes), healthy fats and water, and less varied diets, restrictions or skipping intakes and banning certain foods.

These results could mean that the ECOPREV program facilitates behavioral changes according to healthier eating habits. It should also be noted that no statistically significant differences between the control group and experimental group in other indicators of healthy habits were found.

In terms of other limitations, weight of the proportion of sample loss is similar to other longitudinal investigations. Nevertheless, we consider sample loss in our study to be high; certainly, it implies a loss of important data (López-Guimera et al., 2011). At the same time, most of the measures that were used in this investigation were self-reported, and no longitudinal measures of criticism regarding aesthetic ideals were obtained. In addition, this type of incidental sampling limits the extraction of chance (Xie, Gai, & Zhou, 2019). We also need to bear in mind the Hawthorne Effect (McCarney et al., 2007), by which adolescents may have biased their responses when observed by researchers. Future research should analyze the data in a more sophisticated way by using Generalized Estimation Equations (GEE) to increase the rigor of the data assessed (Liang, & Zeger, 1986).

However, this study has several strengths. First, it used a mixed sample. Second, it focused on protective factors both in the content of the program and in the evaluation of its effectiveness. And finally, it records mid- and long-term cognitive and behavioral changes pertaining to protection and risk factors related to eating disorders.

Consequently, programs that focus on protection and risk factors can generate mid- and long-term changes in adolescents' strategies for reducing the prevalence and severity of weight and body-image problems. In addition, offering these programs within an educational context could be a valuable idea for accessing the largest number of integrators using fewer resources (Neumark-Sztainer, 2016).

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