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Universidad Complutense de Madrid
España

Available in: http://www.redalyc.org/articulo.oa?id=17217456026

The Spanish Journal of Psychology,
ISSN (Printed Version): 1138-7416
psyjour@sis.ucm.es
Universidad Complutense de Madrid
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www.redalyc.org
Non-Profit Academic Project, developed under the Open Acces Initiative
Impact of a School-Based Disordered Eating Prevention Program in Adolescent Girls: General and Specific Effects Depending on Adherence to the Interactive Activities

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Universitat Autònoma de Barcelona (Spain)

This study assessed the impact of a school-based program aimed at preventing disordered eating. The program was based on the media-literacy approach and has interactive format. The program was assessed under strong methodological conditions. Seven schools with 263 Spanish adolescent girls in the area of Barcelona, were randomly assigned to either the complete prevention program condition, the partial program condition or the non-treatment control condition, and assessed at pre, post and 6-month follow-up. The program was effective in generating positive changes at follow-up. The effects sizes ($ES_d = 0.29$ to $ES_d = 0.38$) were greater, on average, than that obtained up to now in selective-universal programs, and similar or greater than that achieved by targeted prevention programs. The results indicate a greater and relevant effect size of the intervention in those participants who completed the inter-session interactive activities ($ES_d = 0.29$ to $ES_d = 0.45$) although the differences were not significant. These results suggest the importance of monitoring adherence to the activities in all programs defined as “interactive”. The implications and limitations of this study are discussed.

Keywords: disorders eating, thinness ideal, adolescent girls, school-based program.

Este estudio evaluó el impacto de un programa basado en la escuela dirigido a prevenir las alteraciones del comportamiento alimentario. El programa se fundamentó en la perspectiva de alfabetización en medios de comunicación, tiene un formato interactivo y fue evaluado mediante rigurosas condiciones metodológicas. La muestra del estudio estaba constituida por 263 chicas adolescentes procedentes de siete escuelas del área geográfica de Barcelona, que fueron asignadas aleatoriamente a la condición de programa completo, a la condición de programa parcial o a la condición de grupo control sin tratamiento. La evaluación se realizó en tres momentos: pre, post y seis meses de seguimiento. El programa se ha mostrado eficaz produciendo cambios favorables en el seguimiento. Los tamaños del efecto ($ES_d = 0.29$ a $ES_d = 0.38$), en promedio, son superiores a los obtenidos por programas universal-selectivos, y similares o superiores a los obtenidos por programas de prevención dirigida. Los resultados indican un mayor tamaño del efecto de la intervención en los participantes que completaron las actividades interactivas entre sesiones ($ES_d = 0.29$ a $ES_d = 0.45$), aunque las diferencias no fueron estadísticamente significativas. Estos resultados sugieren la importancia de monitorizar la adhesión a las actividades en los programas definidos como “interactivos”. Se discuten las implicaciones y las limitaciones de este estudio.

Palabras clave: alteraciones alimentarias, ideal de delgadez, chicas adolescentes, programas basados en la escuela.
The prevalence of disordered eating has increased in the past two decades, particularly among females. In Spain, using DSM-IV criteria, including eating disorders other not specified (EDNOS), prevalence rate of eating disorders (EDs) is around 4.1% - 6.41% in females from ages 12 to 21 (Grupo de Trabajo de la Guia de Práctica Clínica sobre Trastornos de la Conducta Alimentaria, 2009; Peláez Fernandez, Labrador, & Raich, 2007; Rojo et al., 2003). EDs are serious mental disorders, with a clear chronic tendency and high comorbidity with other mental disorders, highly resistant to treatment and associated with adverse medical conditions (Agras, 2001; Fairburn, Cooper, Doll, Norman, & O’Connor, 2000; Lewinsohn, Striegel-Moore, & Seeley, 2000). In fact, EDs are the third most prevalent chronic illness in adolescent girls after obesity and asthma (Chamay-Weber, Narring, & Michaud, 2005), and are associated with some of the highest mortality rates for any psychological disorder (Newman et al., 1996). In addition, high proportions of adolescent girls display body dissatisfaction, weight and food concerns, unhealthy dieting practices and behaviors such as skipping meals, fasting and smoking, while smaller numbers engage in extreme unhealthy weight-control practices, such as self-induced vomiting and the use of diet pills or laxatives (Neumark-Sztainer, Wall, Story, & Perry, 2003). Such attitudes and behaviors have been shown to be related to the development of eating and weight disorders (Littleton & Ollendick, 2003; López-Guimerà, Fauquet, Portell, Sánchez-Carracedo, & Raich, 2008; Neumark-Sztainer, Wall et al., 2007). As a consequence of the increasing incidence rates of clinical levels of EDs and disordered eating-related attitudes and behaviors among adolescents, a range of preventive programs have been developed in recent decades (Stice, Shaw, & Marti, 2007). In general, prevention programs targeting eating problems and EDs have led to improvements in knowledge, though only a small number of such programs have succeeded in reducing disordered eating attitudes and behaviors from baseline scores to post-test and follow-up. Data from meta-analyses (Fingeret et al., 2006; Stice & Shaw, 2004; Stice et al., 2007) show that larger effects were found for programs that were interactive, with multiple sessions, assessed with validated measures, delivered by experts, and which focused on targeted prevention (participants being high-risk, late-adolescent or adult, and female). The program designed and evaluated in the present study combines these empirically supported components, except for those associated with targeted prevention.

To date, and to the best of our knowledge, no studies have assessed participants’ adherence to the activities characteristically required by interactive programs; nor has any research explored whether there are differences in the effect of interventions depending on adherence to such activities. The current research is a continuation of a preliminary study assessing the impact of a previous intervention (Raich, Sánchez-Carracedo, López-Guimerà, Portell et al., 2008) that obtained a significant change on reducing the influence of the Beauty Ideal and on improving knowledge at post-test, though these changes had dissipated by the six-month follow-up. In the program assessed here we have introduced activities and tasks between sessions which endow it with the interactive format of the most effective programs. This study is the first to systematically register participants’ adherence to the program’s interactive activities and to assess the specific effect of having completed them, controlling the integrity of the program, one of the indicators for preventive interventions that work with children and adolescents (Carr, 2002).

The intervention was based on the social cognitive model (SCM; Levine & Smolak, 2006), and the media literacy educational approach (Center for Media Literacy, 2003). The SCM is based on social cognitive theory (SCT; Bandura, 1986) and cognitive-behavioral theory. A central concept in SCT is reciprocal determinism, which suggests that socioenvironmental, personal and behavioral factors interact with each other. According with SCT and within the eating disorder literature, particular attention is given to the sociocultural factors that create or maintain disordered eating, like the influence of the media on the internalization of the Beauty Ideal and on the development of unhealthy eating attitudes and behaviors for weight control, that is a well-supported risk factor of eating disorders (López-Guimerà, Sánchez-Carracedo, Levine, & Fauquet, 2010; Martinez-Gonzalez et al., 2003; Morris & Katzman, 2003; Thompson & Stice, 2001). The Media Literacy approach seeks to reduce this influence through the development of skills for the critical analysis of advertising messages and images, and the encouragement of active attitudes and behaviors in the face of such influence (Levine & Smolak, 2006).

The primary hypothesis of this study was that a complete selective-universal school-based prevention program (Nutrition and Media Literacy components/NUT+ML) and a partial program (Media Literacy component/ML only) would both improve disordered eating attitudes, and would both reduce the influence of the Beauty Ideal more than in a non-treatment control group. The secondary hypothesis was that the effect of both interventions would be significantly greater in participants who completed the program’s activities than in participants who received the interventions but did not complete the activities, and than in those from the non-treatment control group.

Method

Participants

Three public and four grant-aided private (GAP) schools from Terrassa, one of the most important industrial cities in the Barcelona metropolitan area, were approached to participate in this study. All of them agreed to participate. These schools took part from a previous trial (Raich, Sánchez-Carracedo, López-Guimerà, Portell et al., 2008)
with thirteen schools that were selected as a representative sample of all second year students of the secondary school system in a school district in Terrassa. Participants in this study were 263 eighth-grade (second-grade in Spanish secondary education) female students with a mean age of 13.41 years (SD = 0.38 years) and a mean BMI of 21.19 kg/m² (SD = 3.8 kg/m²), corresponding to normal weight status range following international criteria (Cole, Bellizzi, Flegal, & Dietz, 2000; Cole, Flegal, Nickolks, & Jackson, 2007). The seven schools were randomly allocated (cluster randomization) to the following conditions: two of the schools were allocated to the complete program (NUT+ML, n = 57); another two went to the partial program (ML, n = 78); and the other three were allocated to the non-treatment control group (NT, classes as normal; n = 128). In total, 252 girls (95.82%) had data points at pre and post measures, and 226 (85.93%) had data points at pre and 6-month follow-up. Reduction in cate size was mainly due to absence of the subject at the times of the assessment, a change of school or incomplete questionnaires. The review of missing data, due to incomplete questionnaires, suggests that the major reason for missing data was language problems (a small percentage of the sample comes from socio-cultural non-Spanish context).

Baseline body mass index did not significantly differ across the NUT+ML (M = 20.65 kg/m²; SD = 3.41 kg/m²), ML (M = 21.07 kg/m²; SD = 3.83 kg/m²), and NT (M = 21.51 kg/m²; SD = 3.94 kg/m²) groups; groups; nor were significant differences found in the self-report measures. The participants from the public schools were white, and from lower-middle-income and middle-income families. Those from the GAP schools were white and from middle-income families only. Of the total participants, 236 (89.73%) were Spanish, 14 (5.32%) were of Latin-American origin, six (2.28%) were of North-African origin, five (1.90%), 2 had mixed origins and a further 2 (0.76%) were of unspecified origin. Date of birth was the only additional demographic characteristic assessed. The study was approved and mediated by the Terrassa Institute of Health and Social Welfare (IMSSBS; Institut Municipal de Salut i Benestar Social), which was responsible for obtaining the school and parental consent required for carrying out the research.

Intervention

The intervention was based on the social cognitive model (Levine & Smolak, 2006) and the media literacy educational approach (Center for Media Literacy, 2003). The format of the program, whose description can be found in a manual (Raich, Sánchez-Carracedo, & López-Guimerà, 2008), is multimedia and interactive. The prevention program has two components. The NUT component consists of one 90-minute session, which includes the following topics: balanced eating concept, the concepts of eating and nutrition and their differentiation, nutrients, the food pyramid and foods, the importance of water, and analysis of diet. The ML component consists of two 90-minute sessions plus two 60-minute activity sessions. Topics included in the 90-minute sessions are: The feminine Beauty Ideal throughout history, in different cultures and today in the media, and how to deal with media messages. The activity sessions include analysis of advertising and writing model letters of complaint to the media (see Table 1 for sequence and full details). The NUT component is presented in the first session only to classes assigned to the complete program (NUT+ML). The remaining intervention sessions were administered to classes assigned to the complete and partial program conditions (NUT+ML and ML). Classes allocated to the complete program received the program one session per week for five weeks, and classes allocated to the partial program received the program one session per week for four weeks. The intervention was developed from a previous version which was shorter and without activities, reported in a previous trial (Raich, Sánchez-Carracedo, López-Guimerà, Portell, et al., 2008). All intervention sessions were conducted by two of the intervention’s authors, one female (GLG) and one male (DSC); the control class received their normal lessons from their usual teachers. The two activities in the ML component were administrated by academic tutors working at each school, who underwent previous training for this purpose. The intervention was presented as a project focused on healthy eating habits and the issues of body image and the feminine Beauty Ideal. It was not explicitly presented as a disordered eating prevention program, as this covert approach has been found to yield better results (Stice & Shaw, 2004).

Measures

Body Mass Index (BMI). Weight and height were measured in situ, with participants standing up, without shoes and wearing light clothing, using precision measuring apparatus. Weight and height measures were only taken at pretest and at the six-month follow-up.

Eating Attitudes Test (EAT) (Garner & Garfinkel, 1979), in its Spanish adaptation (Castro, Toro, Salamero, & Guimerà, 1991), was used for assessing attitudes towards eating. The Spanish version has good psychometric characteristics (Cronbach’s alpha = 0.93, sensitivity = 91%, specificity = 69.2% for a cut-off point of 20). Factor analysis of the Spanish version of the EAT revealed the existence of three factors explaining 41% of total variance. Factor I, or “Diet and preoccupation with food” (DIET) explained the highest percentage of variance (29.6%). EAT is one of the two main outcome measures of the effect of the program into reduction of unhealthy eating attitudes.

Questionnaire on influences on body shape model-26 (CIMEC-26) (Toro, Salamero, & Martinez, 1994) was designed directly in Spanish to assess the potential impact of different social agents on the development of attitudes towards one’s own body. This questionnaire has been shown to have good psychometric properties (Cronbach’s
alpha = 0.93, sensitivity = 83.1%, specificity = 64% for a cut-off point of 17). Factor analysis of the CIMEC-26 yielded five factors explaining 52.7% of total variance. Factor I, or “Distress about Body Image” (DBI) explained the highest percentage of variance (32.9%). CIMEC is the other main outcome measure of the effect of the program into reduction of influence of the sociocultural influences on the internalization of the Beauty Ideal.

Indicator of adherence to activities (ACT). For each participant a record was kept of whether or not they had completed the two ML component activities (see Table 1).

Design and procedure

The effect of the intervention was assessed by means of a quasi-experimental group design with NT control group and pretest, post-test and six-month follow-up measures. Dependent variables were total scores on the EAT and CIMEC, score on the DIET subscale of the EAT questionnaire, and score on the DBI subscale of the CIMEC questionnaire. Choice of these subscales is based on a criterion of explained variance. It is acknowledged that randomization of classes to programs is not as effective as random assignment of individuals in controlling for confounding variables, but random assignment of individuals is much more difficult to achieve in a school setting. In order to increase control over type of school, public and GAP schools were balanced for treatment conditions (one public and one GAP school allocated to all conditions, except in “NT”, where one public and two GAP were allocated). One of the researchers was responsible for making the school assignments. No exclusion criteria were used, and full classes participated. All classes from each school were allocated to single conditions, so as to avoid a “spillover” effect (Levine & Smolak, 2006). In order to maintain a natural atmosphere in class, the assessment and interventions involved both male and female participants, though only the females’ results have been analyzed. The intervention is a universal prevention program, but it becomes in a typical selective-universal one because data are analyzed only in females on the basis of gender risk status (Neumark-Sztainer, 2006). Recruitment, interventions and outcome assessments took place between September 2005 and October 2006. The pretest was carried out one week before the first intervention session, and the post-test one week after the last activity session of the program. The assessments were made by previously-trained undergraduate and Master’s Psychology students (Moher, Schulz, & Altman, 2001). The study is registered in the “International Standard

Table 1

<table>
<thead>
<tr>
<th>Nutrition</th>
<th>Media Literacy</th>
</tr>
</thead>
</table>

1. Eating and nutrition

- Balanced eating concept
- Concepts of eating and nutrition
- Nutrients
- Food pyramid and foods
- The importance of water
- Analysis of diets

1. Feminine beauty ideal

- Beauty throughout history
- Recent changes in the criteria of beauty
- Beauty in different cultures
- Thinness in Western culture today

The feminine beauty ideal in the media

- Analysis of advertising messages and values transmission
- What advertising hides from us
- The comparison trap
- Introduces the first activity

2. Activity 1: advertising analysis

- Guided critical analysis of an advertisement
- Responding to a 10-question media literacy-based script

3. How to deal with media messages

- Groups complete and discuss the work done in activity 1.
- “You can do something”: How to develop active attitudes and behaviour
- Introduces the second activity

4. Activity 2: complaint letters to the media

- Prepare and write a complaint letter
- Give the letter to the academic tutors

1Power Point presentation; 2Guided by academic tutors; 3Criteria for assessing adherence to the activities; 4The researchers collected and sent letters to advertisers.
Randomized Controlled Trial Number Register” of “Current Controlled Trials” (http://www.controlled-trials.com/ISRCTN07896919/).

Data analysis

Statistical hypothesis testing was carried out using change scores calculated so that a positive value indicated a change in the direction defined by the hypotheses. The decision to utilize change scores was based on (i) the independence between allocation procedure and baseline or pretest measurements (Judd & Kenny, 1981), and (ii) the possibility of controlling the effect of a hypothetical lack of homogeneity (Manly, 1992). Because of violations of the normality assumption, determined by Shapiro-Wilk test (Shapiro, Wilk, & Chen, 1968), a one way non-parametric analysis of variance was applied in order to allow comparisons of the medians of change between the groups by means of an F statistic (Wilcox, 2003). With the aim of determining the differences between the two intervention groups and the control group, with respect to the dependent variables of the study, three linear contrasts ($\varphi_1$) were defined, based on the median of change scores by group (Wilcox, 2003), assuming the control group as reference group. As regards the effect of the intervention administered, the first contrast ($\varphi_{11}$) compares the change observed in the group receiving the ML component with that observed in the control group. The second contrast ($\varphi_{21}$) compares the change in the group receiving the NUT+ML components with the change occurring in the control group. Finally, the third contrast ($\varphi_{31}$) compares the change in the group receiving the NUT+ML with the change in the group receiving only the ML component. With regard to the specific effect of having completed the two activities, the analysis strategy followed is the same as that applied for assessing the effect of the intervention.

For all the situations analyzed the effect size ($ES$) was determined by means of a non-parametric analog of Glass’s “delta” statistic, defined by the standardized difference between two medians, taking as standardizer a robust estimator of the standard deviation of the control group (Grissom & Kim, 2005). $ES$ is interpreted in the conventional sense (Cohen, 1988). The analyses were carried out with the SPSS (v14.0.2) and R (v2.2.1) statistical systems.

Results

Effect of the intervention on eating attitudes and the influences of the Beauty Ideal

Table 2 shows the distribution of the dependent variables in the control group and in the two intervention groups. Table 3 presents the results of the analysis of variance, of the linear contrasts and of effect sizes. In the case of the EAT, of all the comparisons made, two attain statistical significance. In the pretest vs. post-test change, the median of change for the DIET subscale in the NUT+ML group is significantly higher than the median of change for the NT group. On the other hand, in the case of pretest vs. follow-up, the statistically significant contrast corresponds to the comparison between the ML and NT groups in the DIET subscale. The effect size for each one of these contrasts indicates low or medium-low levels of effects. The most relevant results concern the DIET subscale in the pretest vs. follow-up comparison in both intervention groups ($ES_j = 0.37$). Note that, although statistical significance is not attained, in the NUT+ML versus NT comparison (contrast $\varphi_{31}$), the trend towards change with respect to the NT group suggests that the group receiving the complete intervention either remains stable or improves. This result indicates a favorable effect of the intervention on eating attitudes in both the group that receives the partial program (ML) and the group that receives the complete program (NUT+ML) in the follow-up.

In the case of the CIMEC, statistical significance is attained on comparing the median pretest vs. follow-up change scores between the group that receives the complete NUT+ML program and the NT group ($ES_j = 0.38$). This result indicates a favorable effect of the complete intervention on reduction of the influences of the Beauty Ideal, compared to the NT group, in the follow-up. Both in the EAT and in the CIMEC, the differences between the two intervention groups were not statistically significant (see Table 3, contrast $\varphi_{31}$).

Effect of adherence to the activities on eating attitudes and the influences of the Beauty Ideal

The percentage of participants who completed the two activities in the ML intervention group was 67.9%, and in the NUT+ML group, 61.4%. These percentages indicate a relatively balanced distribution with regard to fulfillment of the adherence criterion (completion of the activities) across the two groups. Table 4 shows the statistical description of the dependent variables in the NT group and in the two groups generated according to adherence or non-adherence to the activities (INT and INT+AC).

The strategy for testing the statistical hypothesis was the same as that applied in assessing the effect of the intervention (see Table 5). Of all the contrasts made, the only statistically significant ones were those corresponding to the comparisons between the INT+AC and NT groups in the DIET ($ES_j = 0.29$) and DBI ($ES_j = 0.43$) subscales in the assessment of the change between the pretest and post-test. As regards the change between the pretest and the follow-up, it is important to highlight the effect sizes found in all the comparisons between INT+AC and NT ($\varphi_{31}$), as against the comparisons between INT and NT ($\varphi_{31}$). This result suggests a relevant effect of the activities in the sample
Table 2
Descriptive statistics of the dependent variables for the intervention group and time of study

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th></th>
<th>Post-test</th>
<th></th>
<th>6-month follow-up</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EAT</td>
<td>DIET</td>
<td>CIMEC</td>
<td>DBI</td>
<td>EAT</td>
<td>DIET</td>
</tr>
<tr>
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<td>N</td>
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<td></td>
<td></td>
<td>126</td>
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</tr>
<tr>
<td>M</td>
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<td>14.53</td>
<td>5.83</td>
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<td>10.50</td>
<td>4.69</td>
<td>11.91</td>
<td>10.11</td>
</tr>
<tr>
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<td>12.00</td>
<td>4.50</td>
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<tr>
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<td></td>
<td></td>
<td>74</td>
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</tr>
<tr>
<td>M</td>
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<td>13.50</td>
<td>5.64</td>
<td>14.04</td>
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<tr>
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<td>11.00</td>
<td>5.00</td>
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<td>NUT+ML</td>
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<td>8.00</td>
<td>2.00</td>
<td>10.00</td>
<td>5.00</td>
</tr>
</tbody>
</table>

EAT: Eating Attitudes Test; DIET: Sub-scale “Diet and preoccupation with food”; CIMEC: Questionnaire on influences on body shape model-26; DBI: Sub-scale “Distress about Body Image”; NT: Non-treatment control group; ML: Intervention group in “Media Literacy”; NUT+ML: Intervention group in “Nutrition” and “Media Literacy”; N: Size group (variations in sample size were due to incomplete data on questionnaires); M: Mean; SD: Standard deviation; Md: Median.

Table 3
Analysis of variance and linear contrasts to assess the relationship between the intervention group and scores for change in the dependent variables

<table>
<thead>
<tr>
<th></th>
<th>Pretest vs. Post-test</th>
<th>Pretest vs. 6-month follow-up</th>
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<tr>
<td></td>
<td>F</td>
<td>CI</td>
</tr>
<tr>
<td>EAT</td>
<td>.431</td>
<td>-2.32 to 2.32</td>
</tr>
<tr>
<td>(p = .65)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DIET</td>
<td>4.250</td>
<td>-6.7 to 2.67</td>
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<td>(p = .01)</td>
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<tr>
<td>CIMEC</td>
<td>0</td>
<td>-1.97 to 1.97</td>
</tr>
<tr>
<td>(p = .02)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DBI</td>
<td>2.949</td>
<td>0 to 2.04</td>
</tr>
<tr>
<td>(p = .07)</td>
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<td></td>
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</table>

EAT: Eating Attitudes Test; DIET: Sub-scale “Diet and preoccupation with food”; CIMEC: Questionnaire on influences on body shape model-26; DBI: Sub-scale “Distress about Body Image”; F: F statistical test; p: p-value; CI: confidence interval at 95%; ESd: effect size; Φ21: contrast ML vs. NT; Φ31: contrast NUT+ML vs NT; Φ32: contrast NUT+ML vs ML; * p < 0.05.
Table 4  
Descriptive statistics of the dependent variables for group activity and time of study

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest</th>
<th></th>
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<th>Post-test</th>
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<td>6.50</td>
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<td>3.00</td>
</tr>
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<td>84</td>
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<td>10.00</td>
<td>4.00</td>
<td>8.00</td>
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</tr>
</tbody>
</table>

EAT: Eating Attitudes Test; DIET: Sub-scale “Diet and preoccupation with food”; CIMEC: Questionnaire on influences on body shape model-26; DBI: Sub-scale “Distress about Body Image”; NT: Non-treatment control group; INT: Group of complete and partial program participants that did not deliver the activities; INT+AC: Group of complete and partial program participants that delivered the activities; N: Size group (variations in sample size were due to incomplete data on questionnaires); M: Mean; SD: Standard deviation; Md: Median.

studied. In this regard, of special relevance are the effect sizes found in the change scores for the CIMEC and DBI (ES\(_g\) = 0.45) in the contrast (\(\phi_{1g}\)). Moreover, the greatest effect size found is for the comparison between INT+AC and INT (\(\phi_{2g}\)) in the DIET subscale (ES\(_g\) = 0.53). These results indicate that the intervention has a greater effect on these measures in those participants who receive the interventions and complete the activities than in those who do not complete them. Finally, it is important to stress that both the effects of the intervention and those of adherence to the activities occurred in the absence of relevant differences in BMI between pretest and follow-up.

Discussion

Intervention effect

The change in eating attitudes is partially consistent with the hypothesis. Level of favorable change in the EAT and in the DIET subscale is higher in both intervention groups with respect to the control group. This difference is more accentuated in the follow-up.

The most relevant results are found for the DIET subscale in the follow-up in both intervention groups, though it is in the group that receives only the ML component that the difference is statistically significant with respect to the NT group. Both intervention groups obtain a medium-low effect size of 0.37 with respect to NT. The effect of the program assessed in the present study is much greater than that achieved to date by universal programs (\(d = 0.08\)) (Littleton & Ollendick, 2003), and similar to the effect obtained by selective prevention programs (\(d = 0.28\)) (Fingeret et al., 2006).

The DIET subscale, in addition to measuring attitudes and worries related to eating, also assesses concerns about weight and the desire to be slimmer. The results obtained suggest that an intervention based on the educational perspective of ML can be a good strategy for achieving stable changes in eating attitudes and in weight concerns. Our study is the second work that has succeeded in reducing weight concerns in the follow-up by means of a prevention program based on school and on media literacy (Wade, Davidson, & O’Dea, 2003).

The group that received the complete intervention obtained a higher mean change in the EAT, even though this change did not attain statistical significance. These results may be due to various factors. First, for example, the NUT component, unlike the ML component, has a basically psychoeducational format, a format that has already shown itself to be of little effectiveness in producing lasting changes in eating attitudes and behaviors (Littleton & Ollendick, 2003; Stice & Shaw, 2004). And secondly, we should consider the possible presence of a “floor effect” (Fingeret et al., 2006), since the group receiving the complete intervention presents, in general, lower scores in the pretest than the other two groups.

As regards the reduction of influences of the Beauty Ideal, the most relevant changes are found in the comparison between pretest and follow-up in both intervention groups with respect to the control group. The group receiving the complete intervention obtains a statistically significant
Table 5: Analysis of variance and linear contrasts to assess the relationship between group activity and scores for change in the dependent variables

<table>
<thead>
<tr>
<th>Pretest vs. 6-month follow-up</th>
<th>Pretest vs. Post-test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EAT</strong></td>
<td><strong>DIET</strong></td>
</tr>
<tr>
<td><strong>F (p = .25)</strong></td>
<td><strong>F (p = .01)</strong></td>
</tr>
<tr>
<td>4.259</td>
<td>2.210</td>
</tr>
<tr>
<td>(0.01)</td>
<td>(0.01)</td>
</tr>
<tr>
<td>-2.32 to 2.32</td>
<td>-2.32 to 2.32</td>
</tr>
<tr>
<td><strong>ES</strong></td>
<td><strong>ES</strong></td>
</tr>
<tr>
<td>0.45</td>
<td>0.29</td>
</tr>
<tr>
<td>(-0.97 to 2.97)</td>
<td>(-0.97 to 2.97)</td>
</tr>
</tbody>
</table>

Activity effect

Around 70% of the participants completed the two activities, a result which can be interpreted as reflecting high involvement. The most notable effects were found once more at follow-up, even though they did not attain statistical significance. In the group of participants who received some type of intervention and completed the two activities there is greater mean change at the six-month follow-up, with respect to the control group, both in eating attitudes and in reduction of the influence of the Beauty Ideal, with medium-low effect sizes of 0.29 to 0.45.

At follow-up there were practically no differences between the control group and the group that failed to complete the activities, a result which highlights the importance of carrying out some type of task or activity involving the learning of new skills. Our results are consistent with those reported in recent meta-analyses (Stice & Shaw, 2004; Stice et al., 2007) indicating that the effects of psychoeducational programs, at follow-up, are practically nil, while programs with interactive formats obtain low or medium-low effects. The effect sizes obtained in our study are greater than those obtained up to now in programs with characteristics similar to our own. As regards the impact of the intervention at the six-month follow-up on the DIET subscale, this is considerably more intense in those participants who completed the activities, compared to those who did not do so (ES = 0.53). These results lend support to the view that activities aimed at developing skills for critical analysis of advertising messages and images and at reducing or eliminating the social comparison – a process that seems to exacerbate the negative effects of advertising images on body dissatisfaction (Cattarin, Thompson, Thomas, & Williams, 2000; López-Guimerà et al., 2010) – constitute a good tool for modifying disordered eating attitudes. In sum, the activities designed boost the effect of the intervention on attitudes related to eating and to the influence of the Beauty Ideal at follow-up.
Finally, it is important to note that, although the differences were not significant, the results indicate a greater and relevant effect size of the intervention in those participants who completed the inter-session interactive activities. This result should be encouraged to replicate the study with other samples, and suggest the importance of monitoring adherence to the activities in all programs defined as “interactive”. Future research should also investigate possible variables that affect the adherence to the activities (e.g., personality traits, social desirability, etc.).

Strengths and limitations of the study

The most relevant strengths of the study are: (i) the high percentage of retention at the three assessment points (86%); (ii) it is one of the few programs with more than one intervention group as well as a non-treatment control group; (iii) correct and complete administration of the program was guaranteed; (iv) it is the only work of these characteristics that records and reports on fulfillment of the activities requirement and analyzes its effect; (v) it is one of the few works in this field that provides information on effect sizes; (vi) it assesses the effects of the program through instruments validated in our country and makes weight and height measurements in situ; (vii) to date, it is the only program assessed in a controlled fashion in Spain that incorporates the ML perspective.

At the same time, the study has some limitations. Thus, it would be advantageous to: (i) although the sample size of the groups is equivalent or higher to approximately 50% of programs published to date with similar characteristics (see, e.g. López-Guimerá & Sánchez-Carracedo, 2010), it should be increase the sample size in order to assess the effect of the activities within each intervention group and test if there are significant differences; (ii) carry out longer follow-ups to enable assessment of the preventive effect in the long term; (iii) validate gold standard measures for assessing the Thin-ideal internalization like the SATAQ-3 (Thompson, van den Berg, Roehrig, Guarda, & Heinberg, 2004) in Spanish population to avoid use measures such as CIMEC only validated in Spanish population; (iv) assess disordered eating behaviors; (v) include specific measures to assess the effect of the program in adolescent boys and, (vi) further works are necessary to develop valid imputation methods of missing data for those situations where formal requirements (normality, homogeneity of variances, …) are not satisfied.

Future research should aspire, first, to improving the methodological problems usually associated with universal prevention (Pratt & Woolfenden, 2002), second, to designing programs with a more ecological format that would bring together efforts from different levels of influence on children and young people (parents, teachers, peers, etc.), targeted to the audience (Wilksch, Durbridge, & Wade, 2008), and third, to assessing the efficacy of the program with designs that permit the transition from efficacy to effectiveness in disordered eating prevention (Becker, Ciao, & Smith, 2008).

References


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Received October 9, 2009
Revision received February 17, 2010
Accepted April 27, 2010