PRINT CONTENTS
Original Research Papers
111 M.C. Escoto Ponce de León, J.M. Mancilla Díaz, and E.J. Camacho Ruiz
Eating disorder prevention
119 T. Yanover, and W.P. Sacco
Eating beyond satiety
129 B. Roth, S. Munsch, A. Meyer, E. Isler, and S. Schneider
Obese children and mothers' psychopathology
137 D. Hambrock, and K. Tchanturia
Machiavellianism in anorexia nervosa
142 G.M. Ruggiero, S. Bertelli, L. Boccalari, F. Centorame, A. Ditucci, C. LaMela, A. Scarinci, P. Vinal, S. Scarone, and S. Sassaroli
Stress, cognitive variables and measures of eating disorders
149 Z.L. Tao, and W.F. Zhong
Chinese mothers' and children's attitudes

ELECTRONIC CONTENTS
Proceedings of the Symposium "Advancements in Neuroendocrine and Autonomic Control of Metabolic Functions and their Pathological Significance"
Verona, Italy, September 27, 2007

e40 A. Bartolomucci, A. Moles, and E.E. Müller
Introduction

e42 S. Gaetani, W.H. Kaye, V. Cuomo, and D. Piomelli
Acylethanolamides and eating disorders

e49 A. Bartolomucci, A. Moles, A. Levi, and R. Possenti
Pathophysiological role of TLQP-21

e55 R. Coccurello, F.R. D’Amato, and A. Moles
Olanzapine delayed-feeding termination

e61 E.E. Müller
Control of metabolic functions

Non-peptide ligands of ghrelin receptor
CONTENTS OF
VOLUME 13,
No. 3, 2008

PRINT CONTENTS
Original Research Papers

111  M.C. Escoto Ponce de León, J.M. Muncilla Díaz, and E.J. Camacho Ruiz
A pilot study of the clinical and statistical significance of a program to reduce eating
disorder risk factors in children

119  T. Yanover, and W.P. Sacco
Eating beyond satiety and body mass index

129  B. Roth, S. Munsch, A. Meyer, E. Isler, and S. Schneider
The association between mothers’ psychopathology, childrens’ competences and
psychological well-being in obese children

137  D. Hambrook, and K. Tchanturia
A pilot study exploring Machiavellianism in anorexia nervosa

142  G.M. Ruggiero, S. Bertelli, L. Boccalari, F. Centorame, A. Ditucci,
C. La Mela, A. Scarinci, P. Vinaì, S. Scarone, and S. Sassaroli
The influence of stress on the relationship between cognitive variables and
measures of eating disorders in healthy female university students:
A quasi-experimental study

149  Z. Tao, and W. Zhong
The correlation of Chinese mothers’ eating attitudes and psychological
characteristics with their children’s eating attitudes, as well as the gender
effect on eating attitudes of children

ELECTRONIC CONTENTS
Proceedings of the Symposium “Advancements in Neuroendocrine and
Autonomic Control of Metabolic Functions and their Pathological Significance”
Verona, Italy, September 27, 2007

e40  A. Bartolomucci, A. Moles, and E.E. Müller
Advancements in neuroendocrine and autonomic control of metabolic
functions and their pathological significance

e42  S. Gaetani, W.H. Kaye, V. Cuomo, and D. Piomelli
Role of endocannabinoids and their analogues in obesity and eating disorders

e49  A. Bartolomucci, A. Moles, A. Levi, and R. Possenti
Pathophysiological role of TLQP-21: Gastrointestinal and metabolic functions

e55  R. Coccurello, F.R. D’Amato, and A. Moles
Chronic administration of olanzapine affects Behavioural Satiety Sequence
and feeding behaviour in female mice

e61  E.E. Müller
Neuroendocrine and autonomic control of metabolic functions: Recent advances

e67  E. Bresciani, L. Tamiazzo, A. Torsello, I. Bulgarelli, D. Rapetti, S. Caporali, D. Perrissoud,
A. Moulin, J.-A. Fehrentz, J. Martinez, and V. Locatelli
Ghrelin control of GH secretion and feeding behaviour: The role of the GHS-R1a
receptor studied in vivo and in vitro using novel non-peptide ligands
PUBLISHING DIVISION

Chief Executive Officer
Canzio Fusé (Milano)
Editorial Office Coordinator
Alessia Fusé (Milano)

ISSN online 1590-1262 ISSN print 1124-4909

BUSINESS MATTERS

One year personal subscription: print + online € 70.00 (shipping charges outside Italy: € 14.00).
One-year online subscription: € 45.00. One year subscription for institutions: print + online € 120.00 (shipping charges outside Italy: € 18.00). Price for single issue: € 20.00 (personal) € 25.00 (Institutional) (shipping charges outside Italy: € 3.50). Changes of address: Allow six weeks for all changes to become effective.

All communications should include both old and new addresses (with postal codes) and should be accompanied by a mailing label from a recent issue. Claims are accepted and journals replaced on condition that subscription department is notified of non receipt within 3 months of issue date.

All business matters, including correspondence and remittances relating to subscriptions, reprints and advertising should be sent to:

Editrice Kurtis s.r.l.
Via Luigi Zona, 30
20153 Milano, Italy
Tel. 39 02 48202740
Fax 39 02 48201219
Internet: http://www.kurtis.it
E-mail: info@kurtis.it

Editrice Kurtis also publishes the following journals: Aggiornamento Medico - Aging Clinical and Experimental Research - Annali dell'Istituto Superiore di Sanità - Il Cardiologo - Il Ginecologo - Ipertensione e prevenzione cardiovascolare - Journal of Endocrinological Investigation - l'Endocrinologo - Obesity and Metabolism - Sindrome Metabolica e Malattie Cardiovascolari - Uroterapia

Pubblicazione trimestrale a cura di:
Editrice Kurtis s.r.l.
Via Luigi Zona 30
20153 Milano, Italy
Tel. 39 02 48202740 - Telefax 39 02 48201219
Internet: http://www.kurtis.it - E-mail: info@kurtis.it

Direttore responsabile: Canzio Fusé

ROC (Registro Operatori Comunicazione) n. 6133.

Please fill in this form and send it to: Editrice Kurtis s.r.l. - Via Luigi Zona 30, 20153 Milano, Italy, or fax to 39 02 48201219.

☐ One-year personal subscription: Print + online € 70.00 (shipping charges outside Italy: € 14.00)
☐ One-year online subscription: € 45.00
☐ One-year subscription for Institutions: Print + online € 120.00 (shipping charges outside Italy: € 14.00)

Methods of payment:
☐ Postal payment C.C.P. 13282207
☐ Cheque n. ____________________________

☐ Credit Card: ☐ CartaSi ☐ Visa ☐ Eurocard ☐ Mastercard CVV2

Exp. Date ______________ Date of birth ____________ Signature ____________

Send journals to:
Name ________________________________
City _____________________________ State ___________________________ Zip ________________
Phone ___________________________ Fax ___________________________ E-mail ___________________________

VAT registration number ___________________________

P. IVA/C. Fiscale ___________________________

Date ___________________________ Signature ___________________________

EU members please specify your VAT registration number. Italian Subscribers: IVA paid by the Publisher.

Privacy Policy. Manual and electronic handling and processing of personal data necessary for the shipping of this journal and other medical-scientific material is managed in compliance with Italian law 196/03, Art. 13. The data processing is also compliant with Italian law 196/03, Art. 11. The Publisher may disclose the personal data to business partners involved in the shipping of the copy of this journal. The data processing rights are held by Editrice Kurtis, via Luigi Zona 30, 20153 Milano, Italy, to whom the readers may request at any time to update, integrate, cancel their data or perform any other operation foreseen by Italian law 196/03, Art. 7.

☐ Please tick the box should you not wish to receive further communications from Editrice Kurtis (Law 196/03). Signature ___________________________
A pilot study of the clinical and statistical significance of a program to reduce eating disorder risk factors in children

M.C. Escoto Ponce de León*, J.M. Mancilla Díaz**, and E.J. Camacho Ruiz***

*Centro Universitario UAEM Ecatepec, Tierra Blanca, Ecatepec de Morelos. **Jefe del Proyecto de Investigación en Nutrición, Facultad de Estudios Superiores Iztacala, Universidad Nacional Autónoma de México, Los Reyes Iztacala, Tlalnepantla, and ***Universidad Autónoma del Estado de México. Unidad Académica Profesional Nezahualcóyotl, Colonia Benito Juárez, Nezahualcóyotl, Estado de México, México

ABSTRACT. The current study used clinical and statistical significance tests to investigate the effects of two forms (didactic or interactive) of a universal prevention program on attitudes about shape and weight, eating behaviors, the influence of body aesthetic models, and self-esteem. Three schools were randomly assigned to one, interactive, didactic, or a control condition. Children (61 girls and 59 boys, age 9-11 years) were evaluated at pre-intervention, post-intervention, and at 6-month follow-up. Programs comprised eight, 90-min sessions. Statistical and clinical significance tests showed more changes in boys and girls with the interactive program versus the didactic intervention and control groups. The findings support the use of interactive programs that highlight identified risk factors and construction of identity based on positive traits distinct to physical appearance.


INTRODUCTION

There is consensus that eating disorders are multifactorial and reflect the accumulative effect of multiple genetic, psychological, familial, and sociocultural risk factors (1). Prevention of eating disorders involves an intervention that can interrupt accumulation of these factors, decreasing the likelihood of developing an eating disorder. The modifiable risk factors include diet, negative body image (2), low self-esteem (3), thinness idealization (4), drive for thinness, avoidance of fatty foods (5), and body dissatisfaction (6).

It has been suggested that men and their evaluation, should be included in eating disorder prevention programs, because they are part of the social environment that creates and maintains unhealthy diet norms and exerts pressure for thinness (7). Additionally, males comprise 9-10% of the eating disordered population (8, 9). However, few universal prevention programs have included prepubertal adolescent males (10-12).

Didactic programs, which introduce information to participants using an expository method, have achieved changes in participants’ knowledge but not in attitudes or behaviors. However, changes in attitudes and unhealthy behaviors using interactive programs, which include discussion, guided discovery, cognitive techniques, and cognitive dissonance, have been accomplished (13).

Usually, the effectiveness of prevention programs has been evaluated using statistical significance tests. Comparisons between pre-post treatment data to determine whether a prevention program is responsible for change in functioning relative to a control or comparison group are common. Such tests evaluate the change in likelihood but do not evaluate the effectiveness of an intervention in terms of the number of participants for whom risk is reduced, that is, whether the results of the intervention are clinically significant. Jacobson et al. (14) proposed a method to evaluate and compare the clinical significance of treatments: the reliable change index. Moreover Kendall et al. (15), proposed an additional approach known as normative comparisons. The evaluation of clinical significance represents an important proceed in the assessment of therapy outcome research, which extends to prevention as well (16).

The purpose of this study was to use clini-
cal and statistical tests of significance to evaluate the effects of two forms (didactic or interactive) of a universal eating disorders prevention program for fifth-grade boys and girls. We hypothesized that the interactive program would decrease inappropriate attitudes and behaviors, related to feeding, body shape, and weight, and increase self-esteem in comparison to didactic program and a control condition.

**METHOD**

**Participants**

The sample (61 girls and 59 boys; age 9-11 years, M=9.93, SD=0.44) was recruited from three elementary public schools in the northern part of Mexico City. The three schools had three classes of fifth graders. In each school, one of three classes was randomly assigned to each condition. First school received interactive program (21 girls and 20 boys); second school received didactic program (19 girls and 21 boys); and last school was the control condition (21 girls and 18 boys). The study started at the beginning of the school year, and the attrition rate was 0% at post-intervention and follow-up.

**Intervention**

The intervention comprised the application of the body image program designed and published previously (17). This program is based on Social Cognitive Theory (SCT), which states that behaviour is influenced by the interaction between cognitive and emotional processes within the person. Within the eating disorder literature, particular attention is given to the sociocultural factors that create or maintain disordered eating. The focus of SCT-driven prevention programs is on decreasing risk factors associated with disordered eating (using cognitive-behavioural techniques), while also nurturing protective factors (18). From this perspective, the program focuses on changes of adolescence, sociocultural pressures for thinness, coping to adverse comments about weight and shape, dissatisfaction with body shape, self-esteem, and healthy eating. The program includes eight units, each one delivered in a 90-min weekly session. There were two versions of the intervention. In the interactive version, extensive use of discussion, guided discovery, role-play, guided meditation, and free-write exercises was made. The didactic version offered the same topics and contents using a primarily didactic expository approach and included questionnaires, analysis, discussion, and homework (Appendix 1). The first author administered the interventions.

**Measures**

**Eating disorder symptoms**

The Children’s Eating Attitudes Test (ChEAT) (19) was used to assess eating disorder symptoms. This 26-item test is a well-established scale designed to assess maladaptive or problemmatic attitudes and behaviors among children (19, 20). Each item is rated on a Likert scale from 1 (always) to 6 (never), and for each question, the most symptomatic response is recoded to score of 3, the next to 2, and the next to 1. The next choices receive a score of 0, so ChEAT” scores range from 0 to 78. Maloney et al. (19) found an adequate test-retest reliability (0.81) and internal reliability (0.76) for a sample of 3rd-6rd graders. Smolak et al. (20) also found adequate internal reliability (0.87) and demonstrated an acceptable concurrent validity. A ChEAT’s Spanish version showed internal reliability and concurrent validity acceptable for a Mexican sample (21). To assess eating disorder symptoms, ChEAT’s total score was used. Cronbach’s alpha for the present study was 0.82.

**Body dissatisfaction**

Total score on Body Shape Questionnaire (BSQ) was used to assess body dissatisfaction (22). Each item is rated on a Likert scale from 1 (never) to 6 (always), and for each question, the most symptomatic response is recoded to score of 6, so BSQ’ scores range from 34 to 204. Higher BSQ scores reflect greater body shape dissatisfaction. This 34-item test was adapted for the Spanish population (23), and it has been used with 12-year (24) and 10-year Mexican children (5). BSQ has a Cronbach’s alpha of 0.98 for Mexico (25) and 0.97 for Spain (26). Internal consistency in this study was 0.93.

**Overeating**

The Bulimia Test’s (BULIT) (27) Overeating Subscale proposed by Álvarez et al. (28) was used. Cronbach’s alpha for the present study was 0.85 for this subscale.

**Influence of body aesthetic models**

The Influence of the Body Aesthetic Models Questionnaire (CIMEC) (29) is a 40-item instrument. Each item is rated on a Likert scale from 1 to 3, so CIMEC’ scores range from 40 to 120, and higher scores reflect greater influence of the models. CIMEC has been used in Mexican children with a mean age of 10 years (5), and adolescents from 11 to 18 years (30). The alpha reliability coefficient of 0.94 indicates that the CIMEC has satisfactory internal consistency in a sample of 14 to 33-year females (5). We used the total score, and Cronbach’s alpha for the present study was 0.92.
Self-esteem
The Children’s Self-Esteem Inventory (PAI) (31) evaluates one’s self-perception and ideal. The 21-item inventory was validated in Mexico by Caso (32), who found a good reliability (α=0.82). In this study, we used the total score, with a Cronbach’s alpha of 0.84.

Procedure
Before beginning of the study, children and their parents were informed of nature of program and provided signed consent to participate and allow anonymous use of data. All participants completed the instruments as part of the class curriculum in three times: Before the intervention, 1 week after completing the intervention, and at a 6-month follow-up. Children were asked to provide sociodemographic data required for the study at the first time point only. The instructions for each instrument were read aloud to participants. Once everyone understood how to answer the questions using a Likert scale, the researcher read and slowly repeated each question in the scale. Each participant received a white sheet of paper as a guide to identify the line corresponding to each question. At the end of each page, they were asked to check that they had answered all the questions and then, to continue reading on the following page. Each questionnaire was administered in a session in the next order: ChEAT, CIMEC, BSQ, PAI, and the BULIT Overeating subscale. The same procedure was used in pre-intervention, post-intervention, and at follow-up.

The interventions were delivered 1 week after participants first completed the instruments, in presence of the children’s teacher. We asked teachers not to discuss the content of the program in between sessions or after finishing it. To prevent communication between participants, a different school for each condition was selected.

Data analysis
SPSS 10.0 was used for statistical analyses. To determine if participants in the intervention programs experienced reductions over time in comparison to control group, repeated measures ANOVA were applied to each dependent variable (self-esteem, body dissatisfaction, overeating, influence of body aesthetic models, and ED symptoms) using the within-subjects factor time (pre-intervention, post-intervention, and follow-up) and the between-subjects factor condition (interactive, didactic, and control). The Bonferroni test (p<0.05) for post hoc comparisons was used. Power analysis was performed using G*Power Software (33).

The clinical significance of change was examined in two ways. First, we calculated the Reliable Change Index (RCI) (14); a RCI >1.96 indicates that the change was due to a nonrandom treatment effect, with 95% reliability. Second, we performed normative comparisons of treatment effects using the procedures proposed by Kendall et al. (15). Normative comparisons included only those participants who surpassed ChEAT’s cut-off (score ≥15) (19) at pre-intervention.

RESULTS

Preliminary analysis
One-way ANOVA at pre-intervention indicated no significant group differences (p>0.05) in age, nutritional index, body dissatisfaction, overeating, the influence of body aesthetic models, and self-esteem scores for girls and boys, separately.

Statistically significant changes
Table 1 shows participants’ mean scores on dependent measures at the three times. There were no gender effects on any variable at post-intervention or follow-up (p>0.05).

Changes in girls
For body dissatisfaction scores, there were main effects of group, F(2, 58) =7.51, p=0.001 only. There was a small decrease in body dissatisfaction scores from pre-intervention to post-intervention and follow-up for the interactive group, while there was no change in scores for didactic and control groups.

For overeating scores, there were main effects of group, F(2, 58) =3.39, p=0.04, only. Overeating scores decreased from pre-intervention to follow-up in the interactive group but did not reach significance. There were no changes for the didactic and control groups.

A main effect of Time x Group interaction, F(2, 58) =2.71, p=0.03, was observed for the influence of body aesthetic models. In the interactive group, there was a significant decrease in the scores from pre-intervention to follow-up, while there were no changes for didactic and control groups.

For self-esteem, there were main effects of group, F(2, 58) =4.03, p=0.02, and Time x Group interaction, F(2, 58) =7.60, p=0.001. However, scores did not reach significance for the interactive and didactic groups.

For ChEAT scores, there were main effects of group, F(2, 58) =5.66, p=0.006 only. Scores decreased from pre-intervention to post-intervention and follow-up in the interactive group but did not reach significance. There were no changes for the didactic and control groups.
### TABLE 1
Mean scores of groups on pre-treatment, post-treatment, and follow-up.

<table>
<thead>
<tr>
<th>Scale/group</th>
<th>Pre</th>
<th>Time</th>
<th>Post</th>
<th>Follow-up</th>
<th>Pre</th>
<th>Time</th>
<th>Post</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
<td>M</td>
<td>M</td>
<td>M</td>
<td>F</td>
</tr>
<tr>
<td></td>
<td>(EE)</td>
<td>(EE)</td>
<td>(EE)</td>
<td></td>
<td>(EE)</td>
<td>(EE)</td>
<td>(EE)</td>
<td></td>
</tr>
<tr>
<td>Body dissatisfaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive</td>
<td>73.15</td>
<td>55.70</td>
<td>55.90</td>
<td>3.31*</td>
<td>58.67</td>
<td>45.67</td>
<td>47.43</td>
<td>3.27*</td>
</tr>
<tr>
<td>Didactic</td>
<td>73.19</td>
<td>60.00</td>
<td>62.24</td>
<td>1.40</td>
<td>75.84</td>
<td>66.53</td>
<td>69.00</td>
<td>0.67</td>
</tr>
<tr>
<td>Control</td>
<td>76.56</td>
<td>71.72</td>
<td>69.89</td>
<td>0.21</td>
<td>73.33</td>
<td>74.24</td>
<td>73.33</td>
<td>0.02</td>
</tr>
<tr>
<td></td>
<td>(1.91)</td>
<td>(1.47)</td>
<td>(0.98)</td>
<td></td>
<td>(1.16)</td>
<td>(1.59)</td>
<td>(1.01)</td>
<td></td>
</tr>
<tr>
<td>Overeating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive</td>
<td>21.50</td>
<td>18.95</td>
<td>15.00</td>
<td>4.75*</td>
<td>17.14</td>
<td>15.86</td>
<td>13.95</td>
<td>1.57</td>
</tr>
<tr>
<td>Didactic</td>
<td>19.43</td>
<td>21.38</td>
<td>16.52</td>
<td>2.65</td>
<td>19.58</td>
<td>20.74</td>
<td>17.63</td>
<td>0.87</td>
</tr>
<tr>
<td>Control</td>
<td>20.11</td>
<td>17.33</td>
<td>21.11</td>
<td>2.25</td>
<td>19.76</td>
<td>18.43</td>
<td>20.62</td>
<td>0.63</td>
</tr>
<tr>
<td></td>
<td>(1.50)</td>
<td>(1.21)</td>
<td>(1.18)</td>
<td></td>
<td>(1.27)</td>
<td>(1.70)</td>
<td>(1.16)</td>
<td></td>
</tr>
<tr>
<td>Body aesthetic models influence</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive</td>
<td>19.20</td>
<td>14.35</td>
<td>10.85</td>
<td>1.46</td>
<td>15.29</td>
<td>9.9</td>
<td>7.05</td>
<td>2.09</td>
</tr>
<tr>
<td>Didactic</td>
<td>17.57</td>
<td>15.24</td>
<td>8.90</td>
<td>2.30</td>
<td>21.42</td>
<td>16.32</td>
<td>18.58</td>
<td>0.52</td>
</tr>
<tr>
<td>Control</td>
<td>16.00</td>
<td>18.50</td>
<td>14.33</td>
<td>0.54</td>
<td>14.33</td>
<td>19.05</td>
<td>17.29</td>
<td>0.77</td>
</tr>
<tr>
<td></td>
<td>(3.81)</td>
<td>(3.96)</td>
<td>(2.44)</td>
<td></td>
<td>(4.03)</td>
<td>(2.78)</td>
<td>(1.14)</td>
<td></td>
</tr>
<tr>
<td>Self-esteem</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive</td>
<td>54.05</td>
<td>55.25</td>
<td>59.50</td>
<td>4.42*</td>
<td>60.10</td>
<td>56.67</td>
<td>60.69</td>
<td>3.09</td>
</tr>
<tr>
<td>Didactic</td>
<td>54.10</td>
<td>52.62</td>
<td>57.29</td>
<td>2.39</td>
<td>54.95</td>
<td>54.84</td>
<td>58.68</td>
<td>2.17</td>
</tr>
<tr>
<td>Control</td>
<td>55.11</td>
<td>53.61</td>
<td>56.78</td>
<td>0.74</td>
<td>55.10</td>
<td>54.55</td>
<td>56.38</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>(1.94)</td>
<td>(2.03)</td>
<td>(1.50)</td>
<td></td>
<td>(1.25)</td>
<td>(1.62)</td>
<td>(1.33)</td>
<td></td>
</tr>
<tr>
<td>Eating disorder symptoms</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interactive</td>
<td>11.75</td>
<td>9.40</td>
<td>5.30</td>
<td>2.88</td>
<td>7.24</td>
<td>4.81</td>
<td>4.43</td>
<td>1.64</td>
</tr>
<tr>
<td>Didactic</td>
<td>9.43</td>
<td>10.29</td>
<td>5.95</td>
<td>1.38</td>
<td>8.79</td>
<td>10.32</td>
<td>6.84</td>
<td>0.54</td>
</tr>
<tr>
<td>Control</td>
<td>11.28</td>
<td>7.28</td>
<td>7.44</td>
<td>0.81</td>
<td>11.76</td>
<td>15.57</td>
<td>11.43</td>
<td>1.13</td>
</tr>
<tr>
<td></td>
<td>(2.27)</td>
<td>(2.14)</td>
<td>(1.18)</td>
<td></td>
<td>(1.26)</td>
<td>(1.32)</td>
<td>(0.97)</td>
<td></td>
</tr>
</tbody>
</table>

M=mean; SE=standard error. Means within the same row with different subscripts were statistically significantly different (p<0.05). *p<0.05, **p<0.01, ***p<0.001.

**Changes in boys**

For body dissatisfaction scores, there were main effects of time, F(2, 56) = 9.15, p=0.0001 only. There was a decrease in body dissatisfaction scores from pre-intervention to post-intervention and follow-up for the interactive group, while there was no change in scores for didactic and control groups.

For overeating scores, there were main effects of group, F(2, 56) = 5.09, p=0.01, and Time x Group interaction, F(2, 56) = 6.07, p=0.0001. There was a significant decrease from pre-intervention to follow-up in the interactive group. There were no changes for didactic and control groups.

A main effect of time, F(2, 56) = 8.14, p=0.001, was observed for the influence of body aesthetic models. Both, in the interactive and didactic group, there were a decrease in the scores from pre-intervention to post-intervention and follow-up however did not reached significance.

For self-esteem, there were main effects of time, F(2, 56) = 9.18, p=0.0001 only. Scores significantly increased from pre-intervention to follow-up for interactive group.

For ChEAT™ scores, there were main effects of group, F(2, 56) = 5.66, p=0.006 only. Scores decreased from pre-intervention to post-intervention and follow-up in the interactive group.
but did not reach significance. There were no changes for didactic and control groups.

**Clinically significant changes**

**Reliable change index (RCI)**

Table 2 indicates the percentage of subjects who showed a positive change, above a RCI of 1.96 at post-intervention or follow-up. Deterioration effect was not found in any cases. A number of relatively higher positive RCI percentages were found for intervention groups in comparison to control. In contrast, no cases in control group showed reliable change (omitted data). Boys in interactive group showed reliable change on all variables whereas in didactic group improvement was found in all scales except for overeating. Changes in girls were almost the same in all scales, except for overeating and ED symptoms.

**Normative comparisons**

Normative comparisons of the effects of treatments were made for participants who surpassed ChEAT’s cut-point. In girls interactive intervention promoted significant clinically changes in scores on all scales, whereas didactic intervention promoted changes in self-esteem only. In boys, both interactive and didactic intervention promoted changes in all scales except in eating disorders symptoms. In all cases, changes were maintained to follow-up. It is important to establish that there were no wrong outcomes.

**DISCUSSION**

This study focused on development, implementation, and evaluation of a universal eating disorder prevention program for fifth-grade boys and girls in a school environment. Participants reported decreases in scores on overeating and influence of body aesthetic models. These results are consistent with those for focused prevention aimed at adolescent women (34–36) and partially support the idea that interactive programs, emphasizing social competences and instruction of social ability, promote more changes than did didactic programs emphasizing transmission of information (13). We did observe some changes in behaviors of boys and girls in didactic group. This can be explained by the program content and the inclusion of tasks such as questionnaires, interviews, and reflections, which probably promoted self-reflection.

Tests of clinical significance determined that the most widespread improvement occurred in the interactive group. These changes are attributable to intervention, which in the literature has been shown to decrease identified risk factors, including social idealization of thinness, which leads to body dissatisfaction and recurrent restrictive dieting to lose weight (37).

Of the participants with eating disorder symptoms before the intervention, a higher percentage of girls in the interactive group than in the didactic group showed improvement. These results are in accordance with those reported by Stice et al. (13), who found that interactive interventions promoted more changes than did didactic interventions. It is relevant to point out that equivalence tests indicated that the scales had sufficient statistical power to determine the effectiveness of the interventions.

We did not find evidence of harmful effects of the interventions (38). Our results are attributable to the fact that program content did not include information about eating disorders or methods for weight control.

Previous studies on eating disorder programs, evaluated the effects of only one modality, interactive or didactic. Thus, our study makes an important contribution in this sense. In addition, our participants were boys and girls aged 9-11 years, and our goal was to establish an authentic scenario in order to reflect the natural social environment of children, because the literature indicates that men are part of a subculture that supports the idealization of thinness (7).

Our results support the idea that lessons directed to develop a sense of identity based on
competencies rather than physical appearance, increase self-esteem by confronting participants with the idea that it is necessary to be slimmer to achieve health, success, and good interpersonal relationships. This may have a positive effect on the unhealthy and unreal attitudes that culture promotes.

The sample size was small, so results should be interpreted with caution. Because the groups were small, random assignment is of limited utility. However, statistical power was between 0.59 and 1.00 for all scales except self-esteem, where it was 0.24.

In future investigations, it is important that in addition to self-report questionnaires, also blind diagnostic interviews be used to evaluate eating disorder symptoms, because they offer a more precise evaluation. It is necessary to replicate the study with a larger sample size including students from both, public and private schools. This would increase the statistical power and generalizability. In addition, it will be important to conduct investigations with a longer follow-up, in order to verify if effects continue.

The two programs were administered by the author of the study. Unfortunately, the design of the study did not include any instrument to evaluate the fidelity of the program administration (e.g., to record the intervention and to have a blind supervisor that evaluate the recorded prevention sessions).

### APPENDIX 1.

**Activities used in programs. (cont.)**

<table>
<thead>
<tr>
<th>Unit/Content</th>
<th>Interactive</th>
<th>Activities/techniques</th>
<th>Didactic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interpersonal relationships.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Qualities unrelated to appearance.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>III. Changes in adolescence.</td>
<td>Guided discovery: Changes in adolescence. Cognitive restructuring and feedback: Prejudices about obese and thin people using clips from magazines. Homework: Elaborate a family album, commenting on changes that have happened in their lives.</td>
<td>Script information, reading, brainstorm, and free-writing: Changes observed in partners or familial adolescents, prejudices about shape and weight, and fat myths. Homework: Same as interactive.</td>
<td></td>
</tr>
<tr>
<td>Prejudices about shape and weight.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX 1.
Activities used in programs

<table>
<thead>
<tr>
<th>Unit/Content</th>
<th>Interactive</th>
<th>Didactic</th>
</tr>
</thead>
<tbody>
<tr>
<td>VI. Healthy feeding.</td>
<td>Food classification.</td>
<td>Script information, brainstorm and</td>
</tr>
<tr>
<td></td>
<td>Menu preparation.</td>
<td>scramble: Healthy/unhealthy feeding.</td>
</tr>
<tr>
<td></td>
<td>Compare preferred foods (record) to</td>
<td>Questionnaire: Feeding preferences.</td>
</tr>
<tr>
<td></td>
<td>nutritional pyramid.</td>
<td>Homework: Same as interactive.</td>
</tr>
<tr>
<td></td>
<td>Homework: Interview the person that</td>
<td></td>
</tr>
<tr>
<td></td>
<td>prepares meals at home; ask about</td>
<td></td>
</tr>
<tr>
<td></td>
<td>healthy foods that he/she included</td>
<td></td>
</tr>
<tr>
<td></td>
<td>in the menu.</td>
<td></td>
</tr>
<tr>
<td>VII. Feeding and handling emotions.</td>
<td>Description of situations where they</td>
<td>Script information: Appropriate</td>
</tr>
<tr>
<td></td>
<td>have felt different emotions and how to</td>
<td>expression of emotions.</td>
</tr>
<tr>
<td></td>
<td>respond to them.</td>
<td>Reading, case study and free-writing:</td>
</tr>
<tr>
<td></td>
<td>Role-play with reinforcement and</td>
<td>Emotional hunger and ways to answer</td>
</tr>
<tr>
<td></td>
<td>feedback: Expression of different</td>
<td>it.</td>
</tr>
<tr>
<td></td>
<td>emotions.</td>
<td>Homework: Same as interactive.</td>
</tr>
<tr>
<td></td>
<td>Guided meditation: Management of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>emotions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Homework: Ask other people in which</td>
<td></td>
</tr>
<tr>
<td></td>
<td>body part they feel different emotions.</td>
<td></td>
</tr>
<tr>
<td>VIII. Healthy relationships.</td>
<td>Elaboration of a social constellation.</td>
<td>Script information, case reading, and</td>
</tr>
<tr>
<td>Conflict solving.</td>
<td>Identification of interpersonal problems.</td>
<td>free-writing.</td>
</tr>
<tr>
<td></td>
<td>Role-play with expression of emotions</td>
<td>Closure: Same as interactive.</td>
</tr>
<tr>
<td></td>
<td>and feelings related to interpersonal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>problems.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closure: Agreement to apply what was</td>
<td></td>
</tr>
<tr>
<td></td>
<td>learned.</td>
<td></td>
</tr>
</tbody>
</table>

ACKNOWLEDGEMENTS

Grant sponsors: UAEM 1914/2004-2 and 2343/06; PAPIT IN304606; CONACYT 50305-H.

REFERENCES


14. Jacobson S., Truax P.: Clinical significance: A statistical approach to defining meaningful change in psy-


