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# Eating disorders symptoms prevention program in Mexican children

## Programa de prevención de síntomas de trastornos alimentarios en niños mexicanos

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**SUMMARY**

*In recent decades, eating disorders (ED) prevention programs have gained relevance due to the impact they have on people, especially on children. The objective of this study was to evaluate the impact of an eating disorder prevention program in children. Sixty elementary school children assigned to one of two conditions (control and intervention) participated, who answered three measures that assess: ED symptoms, the influence of body aesthetic model, and self-esteem, before and after an 8-session intervention, aimed at reducing the symptoms associated with eating disorders. The results with the repeated measures ANOVA test indicated that compared to the control group, the intervention group significantly decreased avoidance of fattening foods, preoccupation with food, compensatory behaviors, perceived social pressure and influence of advertising, aesthetic models, and social relationships. An increase in self-esteem was also observed. The findings highlight the importance of evaluating ED prevention programs taught at an early age.*

**Keywords:** *Prevention, eating disorders, girls and boys.*

**RESUMEN**

*En décadas recientes, los programas de prevención de los trastornos del comportamiento alimentario (TCA) han cobrado relevancia debido al impacto que tienen en las personas, especialmente en los niños. El*

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*objetivo de este estudio fue evaluar el impacto de un programa de prevención de trastornos de la conducta alimentaria (TCA) en niños. Participaron 60 niños de primaria asignados a una de dos condiciones (control e intervención), quienes contestaron tres cuestionarios que evalúan síntomas de TCA, influencia de los modelos estéticos corporales y autoestima, antes y después de una intervención de 8 sesiones, dirigida a disminuir la sintomatología asociada a los TCA. Los resultados con la prueba de ANOVA de medidas repetidas indicaron que en comparación con el grupo control, el grupo con intervención disminuyó significativamente la evitación de alimentos engordantes, la preocupación por la comida, las conductas compensatorias, la presión social percibida y la influencia de la publicidad, de los modelos estéticos y de las relaciones sociales. También se observó un incremento en la autoestima. Los hallazgos destacan la importancia de evaluar programas de prevención de TCA impartidos a edades tempranas.*

**Palabras clave:** *Prevención, trastornos del comportamiento alimentario, niños y niñas.*

## INTRODUCTION

Eating disorders (ED) are characterized by severe alterations in eating behavior (1). They are psychiatric diseases that are characterized by having a definite alteration of the eating pattern or of the behavior on weight control, which produces a physical and psychosocial deterioration. Consequently, emerges malnutrition that affects the entire organism and brain function, perpetuating the mental disorder. This alteration has been related to high morbidity, as well as significant mortality, constituting a public health problem (2).

Eating disorders in children occur in direct proportion to the prevalence of diets in the population since they have been closely related to attitudes and behaviors linked to the culture of thinness that prevails nowadays (3).

The development of eating behavior is a complex process, in which participate physiological components of regulation of food intake, growth, and body weight; psychological components of the child, parents, and family, and also cultural and social components. These alterations are frequent in the first years of lifespan, which can translate into growth retardation, food aversions, and secondary difficulties in the family environment (4).

At present, we knew that there is no single causal factor in the development of ED, but it is the combination and intensity of several factors. That determines that a person undergoes the pathology. The comorbidity of psychological and sociocultural factors, with other mental and physical disorders, social, family and relationship problems, and the influence of messages directed at childhood and adolescence, are among the possible triggers of a TCA, in isolation or association with each other (5).

Regarding psychological factors, research has associated certain personality traits with a specific ED. Anorexia nervosa has been associated with perfectionism and rigidity, while bulimia nervosa has been associated with impulsivity and perfectionism (6).

In recent decades, the role of sociocultural influences as a risk factor for suffering from ED has been increasingly reevaluated, since the presentation of emaciation through the mass media as the ideal body aesthetic model, coupled with the pressure of family and friends to take care of body weight, can in some cases be the trigger for these psychopathologies (7).

Another risk factor is self-esteem, defined as the sense of liking and self-acceptance that results from the evaluation that people make of themselves about their attractiveness, competence, and ability to satisfy their aspirations. Low self-esteem can lead to various disorders including EDs (8).

Self-esteem is an important issue in the prevention of eating disorders and it has been suggested that prevention programs, specifically in children, should have as goals, increase self-esteem and sense of confidence, increase the sense of control, achieve greater independence in young people, reduce perfectionism, become more assertive and expressive, and increase positive experiences about the own body (9).

Within the programs for the prevention of eating disorders, it is necessary to update them on the topic, not only because of the associated morbidity and mortality but also because of the generated psychosocial, physical, and economic consequences (10).

The study by Smolak et al. (11), in which the *Smart Eating* program was applied, takes up the teaching of good nutrition, accompanied by physical activity, as the main point, and of a preventive nature, also, it included parents by joining the family bond and to be able to take up positively, the different body figures, as well as to accept them.

Smolak and Levine (12), with the *Eating Smart, Eating for Me* program, applied to children from 11 to 13 years old, did not achieve changes in motivation to lose weight, in the internalization of thinness neither in self-esteem.

Varnado-Sullivan et al. (13) evaluated the impact of a prevention program (The Body Logic Program) in children between 12 and 13 years old, addressing issues such as the positive and negative body image, sociocultural pressures towards thinness, the relationship between body image and self-esteem, coping skills against sociocultural pressures, the impact of puberty on self-image and self-esteem, nutrition, and exercise. The results indicated an improvement in eating habits and a decrease in a drive to lose weight and in the internalization of thinness.

McVey et al. (14) evaluated a program (Healthy Schools-Healthy Kids) with 11-year-old Canadian children. The program included topics such as media literacy, ways to promote self-esteem and body image, individual variability in body size and shape, and set-point theory, ways to promote non-diet-based eating, active living, stress management techniques, and relationship skills. The results indicated a decrease in unhealthy eating habits and the internalization of thinness. There were no changes in self-esteem or drive to lose weight.

In recent years, there has been a growing interest in the primary prevention of eating disorders, which has mainly focused on working with school children, teacher training, and working with parents, to approach the question of What is the impact of a program to prevent eating disorders symptoms in children? In this sense, it has opted for prevention strategies that aim to favor the development of skills (positive self-esteem, assertiveness, communication skills, confidence in their body image, etc.), and resources in children and young people, to face many everyday life situations. This kind of action places schools as privileged settings, and parents and teachers as important prevention agents (9). Therefore, the objective of this study was to evaluate the impact of a program to prevent symptoms associated with eating disorders in children.

## METHODS

### Participants

A quasi-experimental study was carried out and the non-random sample included 60 children between 10 and 11 years of age (M = 10.18, SD = 1.30) belonging to two groups (A and B groups) of fifth grade from a public primary school in the municipality of Nezahualcóyotl, State of Mexico. This municipality is considered a low-income area. The control group included 30 children (18 girls and 12 boys), as did the intervention group (18 girls and 12 boys).

### Measures

*Children´s Eating Attitudes Test* (CHEAT; 15). This test assesses the characteristic symptoms and concerns of anorexia. It consists of 26 items with a Likert-type scale of 6 options (1 = *never*, 6 = *always*), the range of responses goes from 0 to 78 points. High scores denote more ED symptoms. The instrument was validated in Mexico by Escoto and Camacho (16) and the internal consistency of the ChEAT was adequate ($\alpha = 0.82$).

*Influence of the Body Aesthetic Model Questionnaire (CIMEC*; 7*),* assesses the relationship between a person and the culture, with 40 items. It measures the impact that certain social products (such as magazines, movies, or advertisements), have on the attitudes and evaluations that people develop about their body. The questionnaire was adapted and validated in the Mexican population by Vázquez et al. (17) and has a good internal consistency ($\alpha = 0.94$).

*The Children Self-Esteem Scale* (PAI), which was developed by Pope et al. (8), evaluates the perception of oneself (objective vision) and the ideal of oneself (what they would like to be), based on 21 items with three answer options.

In Mexico it was adapted and validated by Caso (18), who found the reliability of 0.82 and three factors: 1) Perception of Competence (7 items), 2) Negative Evaluation (6 items), and 3) Positive Evaluation (8 items). In the present investigation, the total score of this instrument was used with participants.

**Intervention Program**

The *Body Image Program* (PIC; 9), is a program aimed at students of both sexes between 10 and 15 years of age. Its purpose is to change the attitudes and behaviors associated with the development of Eating Disorders. The program is designed to be applied collectively. It is important to note that this program is not intended for patients with eating disorders and therefore is not a substitute for therapy. The program takes place in eight sessions (one per week), each lasting 60 minutes. Each session begins with the explanation of the topic corresponding to the unit to be discussed, and the general objectives pursued in such unit are proposed. It is a universal and primary prevention program that has been created to sensitize participants about the importance of adopting healthy eating patterns, and providing them with space for personal and group reflection to share their ideas and concerns. Topics and activities include:

Unit I. Interpersonal relationships: activities focused on the self-image of the own body. Unit II. To identify and to practice positive qualities in others and ourselves; to assess different parts of the body. Unit III. To identify and accept the physical, psychological, and social changes that occur during adolescence; to promote the generation of different alternatives to solving conflicts related to prejudices about body weight; to dismiss common myths about body fat. Unit IV. To recognize the difference between effective and ineffective communication; to understand and practice aggressive behaviors and passive behaviors related to weight and appreciate different parts of the body. Unit V. To clarify our positions and values; to rescue the *beauty* shown by the media; to identify and resist unhealthy and unrealistic media messages; to learn to discriminate between healthy and unhealthy media messages. Unit VI. To encourage variety and flexibility in the daily diet; to promote the importance of eating three meals a day; to replace the rigid notion that exists between good and bad foods; to understand the difference between a restrictive diet and having a healthy diet; to dismissing myths about a fatty diet and designing a healthy menu. Unit VII. To identify and respond appropriately to emotional hunger and other *appetites* by substituting inappropriate behaviors related to emotional hunger with behaviors appropriate to the identified emotional need and requiring a nutriment other than food. Unit VIII. To strengthen relationships between group members; to show the concept of healthy social relationship as a key aspect of the environment of people's well-being; to define the *relationship* with oneself and with others; to practice conflict resolution related to body weight and body shape and commit to applying what you have learned in your daily life and environment.

The PIC harnesses a set of cognitive and behavioral techniques grouped in a "training package". The techniques of the program are peer tutors, self-instructional training, verbal instruction, molding, modeling, role play, timely practice, reinforcement, feedback, and activities to do at home. The set of teaching procedures includes antecedents of the behavior of interest (through instructions or modeling), the behavior itself (practice, self-instruction that guides the execution), and feedback (reinforcement, self-reinforcement).

**Procedure**

The present study was made under the ethical principles of the Declaration of Helsinki of the World Medical Association for research with human beings. Informed consent was given to parents and assent to children to participate in this research. The measures were responded by both groups, but only in the group with intervention the Body Image Program was implemented for 8 weeks by the first author. The intervention took place in the classroom during regular class hours. At the end of the intervention, the measures were answered by participants again, to compare the scores between the two groups. At the end of the study, the control group received a paper flyer including relevant information about eating disorders prevention.

**Analysis plan**

The repeated-measures ANOVA was used to make comparisons of the control and intervention groups between pre-test and post-test, with the SPSS version 18 program.

## RESULTS

Table 1 shows that in the factors Fattening Foods Avoidance, Food Concern, and Compensatory Behaviors, there was a significant impact in the group with intervention. In the Drive for thinness factor, there was no impact in the intervention group. Regarding the CIMEC, it was found that in the factors Perceived Social Pressure, Influence of Advertising, Influence of Aesthetic Models, and Influence of Social Relationships there was a significant impact in the intervention group, however, in the factor Discomfort due to Body Image there was no impact. Finally, self-esteem increased significantly in the group with intervention from pre-test to post-test (Table 1).

Table 1

Means and standard deviations obtained by the group with intervention and control in the pre-test and post-test in the CHEAT, CIMEC, and PAI factors

| | Group | | | | | | |
|---|---|---|---|---|---|---|---|
| | Intervention (n=15) | | Control (n=15) | | | | |
| | Pre-test M (SD) | Post-test M (SD) | Pre-test M (SD) | Posttest M (SD) | | | |
| Measure/Factor | | | | | F | p | d |
| CHEAT | | | | | | | |
| Drive for thinness | 3.00 (3.46) | 1.23 (2.08) | 0.67 (1.87) | 0.60 (1.68) | 2.89 | 0.10 | 0.10 |
| Fattening Foods Avoidance | 2.54 (2.00) | 0.23 (0.59) | 1.47 (2.00) | 0.67 (1.80) | 3.91 | 0.05 | 0.13 |
| Food Concern | 2.23 (1.87) | 0.31 (0.63) | 1.27 (2.86) | 1.20 (1.42) | 4.66 | 0.04 | 0.15 |
| Compensatory Behaviors | 2.15 (2.11) | 0.62 (1.26) | 0.93 (1.66) | 0.93 (1.79) | 6.99 | 0.01 | 0.21 |
| CIMEC | | | | | | | |
| Perceived Social Pressure | 2.15 (2.07) | 0.23 (0.83) | 0.93 (1.66) | 1.00 (2.44) | 5.35 | 0.02 | 0.17 |
| Influence of Advertising | 5.69 (1.75) | 0.08 (0.27) | 5.93 (5.78) | 5.07 (6.88) | 3.92 | 0.05 | 0.13 |
| Discomfort due to Body Image | 4.08 (1.60) | 0.92 (1.03) | 4.73 (3.59) | 4.07 (4.09) | 2.29 | 0.14 | 0.08 |
| Influence of Aesthetic Models | 5.54 (3.50) | 0.62 (0.76) | 4.47 (4.65) | 4.20 (3.53) | 4.97 | 0.03 | 0.16 |
| Influence of Social Relationships | 4.92 (2.25) | 1.38 (1.75) | 2.00 (3.18) | 1.87 (2.69) | 6.79 | 0.01 | 0.20 |
| PAI | | | | | | | |
| Self-esteem | 38.53 (1.80) | 55.70 (5.23) | 51.27 (7.52) | 41.00 (5.55) | 13.28 | 0.001 | 0.19 |

Note: M = mean, DE = standard deviation, f = ANOVA, p = significance, d = effect size.

## DISCUSSION

The objective of the present investigation was to prevent symptoms associated with eating disorders in childhood. The results of this work allow us to conclude that school children between 10 and 11 years old are at a latent risk of developing some type of eating disorder since, although in minimal percentages, some of them present symptoms of eating disorders.

To test the hypothesis, the implementation of the intervention program will reduce the symptoms related to the appearance of eating disorders in childhood, an ANOVA of repeated measures analysis was performed comparing the scores obtained by the participants.

Regarding the CHEAT, in the Preoccupation with Food factor, we obtained positive and significant changes in the participants of the intervention group after implementing the program. Similar data were reported by Escoto, Camacho, and Mancilla (19), in both cases there were considerable changes.

In the present investigation, a significant decrease in food concern was observed in the intervention group, unlike the study by Elizathe et al. (20), who did not achieve changes in this factor.

Regarding the drive for thinness, as in the study by Smolak and Levine (12), and McVey et al. (14), no significant changes were achieved.

In the factor influence of the aesthetic models, in the girls, we obtained a considerable significance. Similar results were reported by Escoto et al. (19), who found an impact of the program on women but not on men.

In the publicity influence of the CIMEC, in comparison with the study carried out by Escoto et al. (19), no significance was obtained for this factor, while in the present study there were significant changes, this is because the program was applied by specialists in the delivery of health education programs, who have the methodological tools that allow a positive change in lifestyles, in this case, this favored to obtain significance in this factor. For the same factor, in a study conducted by Oliva et al. (21), similar results were obtained to our study, this may be due to the fact that the strategies used during the intervention are very similar, and with this, the results for this factor are the same.

In the study by Oliva et al. (21), in the CIMEC body image discomfort factor, a considerable significance was obtained, while in our study for this factor the significance we expected was not achieved, this could be because it was not such a relevant issue for children and therefore, it was not possible to impact them within this factor in comparison with the previous study.

Regarding the cut-off point in the CHEAT measure, in the study carried out by Escoto et al. (19), the percentage of participants who exceeded the cut-off point in the pre-test (greater than 20 points), was 12.24 %, while in our study the percentage was 23.1 %. It is worth mentioning that this percentage for the post-test was reduced to 13.3 %.

In addition, the intervention had a considerable effect on self-esteem in participants; this is because the appropriate strategies and methods were used so that the expected impact was obtained. Similar studies (12,14) failed to improve self-esteem. This highlights the relevance of the findings of the present study.

## CONCLUSIONS

Eating disorders have been widely studied in adolescents and women, but very little in children, hence the importance of this research: Knowing how these types of disorders occur and implementing preventive actions that help reduce this problem. As it could be observed within the investigation, the program was applied previously, achieving results that allow a positive change in habits and lifestyles, in addition to emphasizing prevention, which is the first action area to eradicate any type of disease, in this case, symptoms of eating disorder (22).

It is worth highlighting the importance of consolidating an educational community in which parents, teachers, and students establish appropriate relationships with each other, through a permanent dialogue with an attitude of respect and solidarity. This would have an impact on the learning and health of children and could even

set the foundations to discuss changes in health policies; in addition, this work allows giving continuity to the works of the first author's line of research.

It is important to remember that no isolated method of intervention is effective, and that education can increase people's knowledge (23). Therefore, it is important to continue designing prevention, communication, and social mobilization strategies, that integrate massive information and education campaigns for the open population that addresses myths and rumors, which can promote or perpetuate erroneous information, including its methodology, actions in education, training and education of the general population (24).

Despite the contribution of this study, we can highlight some limitations, for example, the sample was recruited from one public school only, this could be not representative of children from other Spanish-speaking cities, so future studies could include samples representative from other Spanish-speaking regions. Another limitation of this study is that the sample included participants from 10 to 11 years, so this aspect should be addressed in future studies, with younger and older participants. In the present study, we measured variables at pre-test and post-test only. Future studies could include a follow-up at three or six months, to verify if the changes achieved by the intervention are maintained. Finally, within the limitations of the present research, is the fact that the participants were not randomly selected; also, the size of the groups was reduced.

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