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Eating Disorders Associated Risk Factors: Trends from 2007 to 2010

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ABSTRACT

Objective: The purpose of this study was to determine the trends on risk factors associated to eating disorders in bachelor students from an urban setting in Hidalgo in the period 2007-2010. **Material and Methods:** Students were censored both in 2007 and in 2010, and registered as 455 (50.5% female, 49.5% male) students in 2007 and 434 (49.8% female, 50.2% male) in 2010, aged 15-19 years in both cases. Three questionnaires were used to assess sociocultural factors, disordered eating behaviors, and body aesthetic thin-ideal internalization. Body dissatisfaction was measured with nine body figure analogic. To assess body mass index, each subject was weighed and height measured. Comparisons by year and gender were obtained. **Results:** Body shape distress increased from 20.8% in 2007 to 21.7% in 2010; disordered eating behaviors trends increased from 2007 to 2010 both in females and males, but were statistically significant only in males. The percentage of subjects with body dissatisfaction in the sense to be thinner was the same in both years (39.8%). The risk analysis showed an increase in those with disordered eating, in thin-ideal internalization, advertising influence, and body shape distress, mainly in women. **Conclusions:** These findings must be considered in the design of preventive programs and early case detection in adolescents from Hidalgo. (REV INVEST CLIN. 2015;67:54-63)

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INTRODUCTION

The World Health Organization (WHO) has classified eating disorders (ED) among the mental diseases that are most prevalent among adolescents and pose a threat to their healthy development[1,2]. These are not modern diseases or previously unknown problem; what is new is the frequency with which they present and have been detected during the past several decades, both in industrialized societies and in developing countries. This is mainly due to the changing attitude of society towards the concept of health[3], coupled with a beauty ideal that

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deifies thinness for women[4] and muscularity for men[5] and its imposition as a standard by the media, all driven by a powerful "beauty" industry[6].

There are multiple risk factors associated with the emergence, development, and maintenance of eating disorders[7,8]. Among those most studied are: disordered eating behaviors (DEB), body mass index (BMI), and sociocultural factors, such as the influence of the media and body image. With regard to the last two factors, a study of pubescents between the ages of 11 and 15 years in the state of Hidalgo found that dissatisfaction with body image, in the sense of wanting to be thinner, was 39.5% in girls and 41% in boys. With respect to dissatisfaction with body image, the survey showed that 28% of girls and 14% of boys externalized feeling envious of the slim bodies of fashion models, athletes, and television personalities or runway models. Regarding the influence of advertising, 15.4% of young girls said that adverts, stories, and conversations about products for losing weight and "improving" body shape "often" and "always" catch their attention, against 6.4% in the men[9]. Similar data were recorded for first year students at the Institute of Health Sciences (ICSA) of the Universidad Autónoma del Estado de Hidalgo, where 77.2% of women and 80.7% of men expressed dissatisfaction with their body image. Of these, a trend towards a preference for thinness was identified both among women (59.1%) and men (45.4%), and 2.5% of women and 0.8% of men said they "always" feel influenced by advertising for weight loss and body toning products as well as by conversations and articles about weight control and obesity[10].

As for DEB, defined as abnormal behaviors related to food and eating, such as binge eating, food and weight concerns, and restrictive diets[11,12], the aforementioned survey of pubescents between the ages of 11 and 15 years showed that 6% of boys and 5.2% of girls ate restricted diets and that 17.2% of the girls expressed concern about weight and food[9]. Similarly, when we look again at the survey conducted at the ICSA, 4.2% of women and 1.7% of men also expressed concern about weight and food. The survey showed that 1% of men as well as women admitted to binge eating, and only 3.8% of women said they were on restricted diets[10]. Research on high school and college male and female students at a private institution in the city of Pachuca found the prevalence of DEB was 8.4% in women and 2.9% in men[13].

It is clear to see that several of the risk factors associated with DEB are present in students in the state of Hidalgo, so it is crucial to determine whether these have changed at all in terms of frequency, as occurred in Mexico City where the Survey on the Prevalence of Drug and Alcohol Use that was conducted on a probability sample of students comparing 1997 and 2003, found a significant increase of REB in both sexes (from 1.3% of men in 1997 to 3.8% in 2003, and from 3.4% of women in 1997 to 9.6% in 2003)[12]. The same trend was observed in the results reported in the Mexican National Health and Nutrition Survey (ENSANUT, its initials in Spanish), where the proportion of adolescents between the ages of 10 and 19 years who presented DEB in 2012[14] was 1.3%, which was half a percentage point higher than the level of DEB observed in the ENSANUT 2006 survey[15].

In light of what we have seen above, the purpose of this investigation was to examine trends in risk factors associated with DEB in students at a private preparatory school in Pachuca, Hidalgo in the period 2007 to 2010. Having data about the specific frequencies of these factors over a certain period of time will provide the basis for better planning and implementation of effective prevention programs together with early detection and referral for treatment, making it easier to help adolescents achieve and maintain their physical and mental health.

MATERIAL AND METHODS

Subjects

This was a comparative, cross-sectional field study that was conducted at a private preparatory school in city of Pachuca, Hidalgo, in which a census was taken of all of the students present on the day of the assessment in the 2007 and 2010 school years. Table 1 shows the distribution of data by age and gender of the subjects at each of the assessments.

One of the reasons for conducting this research at a private institution lies in the fact that while ED and risk factors for them occur in populations of all socioeconomic and ethnic backgrounds[16], the tendency for them is greater in the upper socioeconomic levels, which is commonly measured by type of school (public-private)[17] or level of social exclusion[18].

Table 1. Distribution for each year by gender and mean age

		Women			Men		
Year	N total	N	%	Mean age (SD)	N	%	Mean age (SD)
2007	455	230	51.6	16.04 (0.94)	225	50.8	16.04 (1.08)
2010	434	216	48.4	16.24 (1.00)	218	49.2	16.39 (0.99)
TOTAL	889	446			443		

Instruments

Three self-assessment tools were used for the evaluation: DEB, sociocultural factors, attitudes toward body shape, and body image satisfaction/dissatisfaction.

The first questionnaire was Risk Factors Associated to Eating Disorders in Pubescents Questionnaire (FRATAP, its initials in Spanish). The reliability and validity of this tool was established in public and private middle-school students in Mexico City, yielding Cronbach's alpha coefficients of 0.83 for women and 0.75 in the version for men[19]. It uses a four-point Likert-type scale that allows four response choices: (1 = never, 2 = rarely, 3 = sometimes, 4 = always). In general, the higher the score the higher the risk factor, except for meal times as in this case a higher score means better eating behavior. In order to be able to make a comparison both per year and per gender between the FRATAP versions, we decided to only analyze the three factors of the tool that are equally valid for both men and women, i.e. we only describe: advertising influence, body shape distress, and meal times. The "advertising influence" factor asks the participants about how much adverts related to weight control, diets, and for improving body shape in magazines and businesses as well as radio and/or television programs and reports on the subjects that catch their attention. The "body shape distress" factor measures aspects related to the comparison the subject makes of his or her own body with those of athletes, models, and show business celebrities and about how much they would like to look like that person. Finally, the "meal times" factor refers to the frequency with which an individual has breakfast, lunch, and dinner or a snack and how often he or she has these three main meals during the day[9].

The next questionnaire is known as the Brief Questionnaire for Risky Eating Behaviors (CBCAR, its initials in Spanish). This questionnaire was developed and validated in Mexico City in adolescents and young women[20]. It consists of 10 questions that are scored using a four-point Likert-type scale with four response options (never or rarely = 0, sometimes = 1, often/twice a week = 2 and, very often/more than twice a week = 3). A cut-off score of > 10 was used to identify women at risk[23]. This questionnaire has been widely used in several studies to examine DEB in groups of adolescents[21,22] and very specifically in the ENSANUT surveys in 2006[15] and in 2012[14].

Internalization of the aesthetic ideal of thinness was measured using the Attitudes toward Body Figure Questionnaire, which was developed on the basis of experience with students and patients between the ages of 15 and 24 with ED in Mexico City. This construct refers to awareness of the existence of and practice of behaviors to achieve the aesthetic ideal of thinness[23]. This instrument consists of 15 items, with a cut-off score of ≥ 37 for women, which is obtained from the sum of the responses. It has a four-point Likert-type scale for responses ranging from 1 (never or rarely) to 4 (very often)[24].

As there were no cut-off points for males in the last two questionnaires, we obtained these from the mean plus one standard deviation[25,26]. The cut-off score obtained for CBCAR was ≥ 8, with a Cronbach's alpha coefficient of 0.70, while for the Attitudes Questionnaire it was ≥ 34, with a Cronbach's alpha coefficient of 0.89. Likewise, cut-off scores for each of the FRATAP factors were calculated using the same method and the following values were found: ≥ 2.41 for advertising influence, ≥ 2.76 for body shape distress, and ≥ 4 for meal times. With respect to this tool, it is important to mention that for the first two factors, subjects with scores at or above the cut-off point are considered to be at risk. On the contrary, for the meal times factor, subjects with scores at or above the cut-off point had better eating behavior.

Another risk factor assessed was satisfaction/dissatisfaction with body image, as measured by the Gómez Pérez-Mitré, et al.[27] visual scale for adolescents, which consists of nine body shapes ranging from very thin to very obese (of men or women, as applicable), randomly ordered and which was shown at two points: the first time to select the current body shape and the second for selection of the ideal shape. Zero difference between the actual body shape and the ideal shape is classified as satisfaction; a positive difference indicates dissatisfaction in the sense of wanting to be thinner, and a negative difference is classified as dissatisfaction in the sense to be more robust.

The BMI was calculated by weighing and measuring each subject. The students were asked to come as early as possible, in a fasting state, and wearing clothes that were light; they were asked to remove their shoes and any accessories that might affect their weight or height (cell phones, belts, keys, tiaras, combs, etc.) when the anthropometric measurements were made.

A Tanita brand digital scale with a capacity of 120 kg was used for measuring body weight. Height was measured with a SECA brand portable stadiometer with a height rod. To classify participants, age- and gender-specific percentile values recommended by the U.S. National Center for Health Statistics[28] were used: < 5 malnutrition, > 5 to < 15 underweight, ≥ 15 to < 85 normal, ≥ 85 to < 95 overweight, and ≥ 95 obesity.

Procedure

After obtaining the approval of the preparatory school's administrators and agreeing with them on the logistics for the work, we went to the school and the questionnaires were applied in a grupal way. This activity was carried out in the assigned place on the days and times indicated by the relevant authorities. The students were explained the purpose of the research and the importance of voluntary participation, and anonymity and confidentiality of the information were guaranteed. Verbal consent was obtained from students as under Mexican law on research involving human subjects; in studies such as this one that involve no more than minimal risk, signed informed consent of participants is not required[29]. The instructions for filling out the questionnaires were given. Once this activity was completed, the weight and height of each subject was taken by staff who had previously received standardized training.

We then proceeded to capture the data using SPSS version 19 for Windows. To meet the stated objective, a descriptive analysis of the different variables by gender and age was performed at the time of each of the two measurements (in 2007 and in 2010). Chi-square analysis was conducted to assess for significant differences between the measurements. Pearson's correlation was used to determine possible associations between the variables. Lastly, to measure the association of impact, odds ratio (OR) analysis was performed with 2×2 contingency tables and statistical significance was determined by X^2 analysis. Since all three of the scales used were Likert-type scales, in order to perform the risk analysis the participants were separated into two categories, one called "risk" and one "without risk". It was considered that subjects who were at risk were those who scored at or above the cut-off point in each of the tools used, i.e. CBCAR, the questionnaire that measured attitudes toward body figure, and the two risk factors assessed with FRATAP (advertising influence and body shape distress), whereas subjects who were not at risk were those below each of the cut-off points.

RESULTS

In the BMI analysis by gender for women, none of the trends showed any significant difference, not even the malnutrition category, which decreased from 2.2% in 2007 to 0.5% in 2010. The most important change in trend was found for men, both overweight (from 19.1% in 2007 to 12.8% in 2010) and obese (from 5.8% in 2007 to 8.7% in 2010) although it was not statistically significant. By year, an increase in the percentage of obesity was seen as in 2007 there were 6.8% of students in this category while in 2010 there were 8.5%. On the other hand, there was a decrease in those classified as overweight, from 17.8% in 2007 to 14.5% in 2010. These differences were not statistically significant either. Table 2 shows the distribution of BMI per year and gender.

In the comparative analysis of FRATAP by gender and taking the cut-off points for each factor into account, there was a significant decrease from 2007 to 2010

Table 2. Trends in the distribution of body mass index by gender and per year

	2007			2010		
	Women (n = 230)	Men (n = 225)	Total (n = 455)	Women (n = 216)	Men (n = 218)	Total (n = 434)
Malnutrition	2.2%	0.9%	1.5%	0.5%	0.5%	0.5%
Underweight	0.9%	1.8%	1.3%	0.9%	1.4%	1.2%
Normal weight	72.6%	72.4%	**72.5%**	74.1%	76.6%	**75.3%**
Overweight	16.5%	19.1%	**17.8%**	16.2%	12.8%	**14.5%**
Obesity	7.8%	5.8%	**6.8%**	8.3%	8.7%	**8.5%**

in advertising influence in the sample of women, but not in body shape distress. In men, advertising influence remained the same, while body shape distress showed an increase although it was not statistically significant. With regard to the meal times, which is considered to be a protective factor since it asks about the frequency with which breakfast, lunch, and dinner are eaten, there was a significant increase from 2007 to 2010 in women only. The advertising influence tendency decreased significantly from 2007 to 2010 in the sample as a whole; body shape distress increased, but not significantly, from 20.8% in 2007 to 21.7% in 2010, while meal times increased significantly from 2007 to 2010 (Table 3).

On examining the results of the CBCAR questionnaire and of the survey measuring body thin-ideal internalization by gender (Table 4), we found an increase from 2007 to 2010 in the women, both in the percentage of students who scored at risk for DEB and in those who had internalized thin as the ideal body shape, although neither was statistically significant. Interestingly, in men there was a slight decrease in the body thin-ideal internalization, but a significant increase in risk for DEB from 2007 to 2010 was seen.

With respect to body image satisfaction/dissatisfaction, table 5 shows that, in the sample as a whole, there were significant differences as there was a decrease in dissatisfaction in the sense of wanting to be more robust, which caused an increase in satisfaction; however, there was virtually no change over time in the number of students who felt dissatisfaction because of wanting to be thinner. On examining the results by gender, this circumstance was much more drastic and significant in women: the proportion of those experiencing dissatisfaction with body image, in the sense of wanting to be thinner, stood out, being over 50% in both years. Meanwhile, in men the change was not significant we must point out that there was an increase in dissatisfaction because of wanting to be thinner.

Pearson's correlations were also performed by gender, with women found to have the highest value of risk for DEB and body thin-ideal internalization ($r = 0.640$; $p < 0.01$), followed by the correlation between body shape distress and advertising influence ($r = 0.607$; $p < 0.01$). Likewise, it was observed as weel as increased body thin-ideal internalization and followed of DEB, advertising influence and body shape distress increased too. The same correlations were found at the same level of significance in men, but values were lower, ranging from 0.516 between DEB and body thin-ideal internalization to 0.306 between this last one and advertising influence.

Lastly, associations of impact by year, by gender, and in the total sample were determined for DEB, attitudes toward body figure (body thin-ideal internalization) and the sociocultural factors evaluated by FRATAP, particularly the advertising influence and distress of body shape.

Risk analysis per year did not identify any significant associations for any factor. However, by gender, women were found to have a higher risk for all with respect to men. Specifically, compared to men, women are at a 2.4-times higher risk for DEB ($X^2 = 19.99$, df 1; $p < 0.001$; 95% CI:1.6-3.5); 1.5-times more likely to have internalized the aesthetic ideal of thinness ($X^2 = 4.766$, df 1; $p = 0.029$; 95% CI:1.04-2.07); have 5.9-times greater risk of being influenced by advertising for weight loss and body toning products ($X^2 = 42.93$, df 1; $p < 0.001$; 95% CI: 3.28-10.66), as well as 3.3-times more likely to report body shape distress ($X^2 = 45.64$, df 1; $p < 0.001$; 95% CI: 2.29-4.65).

Table 3. Trends in the variables evaluated with Risk Factors Associated to Eating Disorders in Pubescents Questionnaire by gender and per year at the cut-off points

	2007	2010	χ^2
Women	n = 224	n = 216	
– Advertising influence*	20.5%	12.0%	5.8§
– Body shape distress†	31.4%	29.6%	ns
– Meal times‡	28.1%	41.7%	9.89§
Men	n = 212	n = 211	
– Advertising influence*	3.2%	3.2%	ns
– Body shape distress†	10.0%	13.8%	ns
– Meal times‡	49.5%	53.7%	ns
Total	n = 436	n = 427	
– Advertising influence*	12.0%	7.6%	4.71¶
– Body shape distress†	20.8%	21.7%	ns
– Meal times‡	38.7%	47.7%	8.95§

*Advertising influence: questions related to how much attention is paid to adverts or reports on television and radio, in magazines and in businesses about weight loss products, as well as remarks about weight, diets and body shape.
†Body shape distress: measures aspects related to how envious the subject is with regard to the bodies those of fashion models, athletes or celebrities. It also asks the participant if they would like to have a body like that of some famous show business personality, for example: Anahí, Belinda, Místico, William Levy.
‡Meal times: this factor refers to the frequency with which the participant eats the three main meals during the day (breakfast, lunch and dinner).
§$p < 0.01$.
¶$p < 0.05$.
df = 3; ns = not significant.

Table 4. Trends per cut-off score on the Brief Questionnaire for Risky Eating Behaviors and the Attitudes Toward Body Figure Questionnaire by gender and per year

	2007	2010	χ^2
Women			
– CBCAR (> 10)	7.5%	12.0%	ns
– Attitudes toward body figure (≥ 37)	20.7%	22.2%	ns
Men			
– CBCAR (> 8)	**4.5%**	**15.6%**	15.15*
– Attitudes toward body figure (≥ 34)	16.3%	15.1%	ns

*$p < 0.001$.
ns = not significant.

Table 6 shows the risk analysis of subjects with DEB and a significant association between body thin-ideal internalization, advertising influence, and body shape distress can be seen. Likewise, subjects who have internalized the aesthetic ideal of thinness are at a greater risk for feeling influenced by advertising and experiencing body shape distress, a strong association between these two factors also being observed.

DISCUSSION

This study provides information about trends in risk factors in adolescents at a private institution in Hidalgo who, according to Benedito, et al.[31], constitute a group at risk for ED because they overestimate the size of their bodies, are dissatisfied with their bodies and/or physical appearance, leading them to follow

Table 5. Trends for the satisfaction/dissatisfaction with body image variable by gender and per year

	2007	2010
Women	n = 225	n = 216
– Dissatisfaction with body image (wanting to be more robust)	25.3%	12.0%
– Satisfaction with body image	19.6%	37.0%
– Dissatisfaction with body image (wanting to be thinner)	**55.1%**	**50.9%**
– $\chi^2 = 22.69$, gl 2; $p < 0.01$		
Men	n = 224	n = 218
– Dissatisfaction with body image (wanting to be more robust)	38.4%	33.5%
– Satisfaction with body image	37.9%	39.9%
– Dissatisfaction with body image (wanting to be thinner)	23.7%	26.6%
– $\chi^2 = 1.23$, gl 2; ns		
Whole sample	n = 449	n = 434
– Dissatisfaction with body image (wanting to be more robust)	31.8%	22.8%
– Satisfaction with body image	28.7%	38.5%
– Dissatisfaction with body image (wanting to be thinner)	39.4%	39.7%
– $\chi^2 = 12.86$, gl 2; $p < 0.01$		

restrictive diets, fasts, and other DEB. This finding has been confirmed by the results of this study, which was conducted precisely in this age group.

In the sample studied, we found that there was a rise in the tendency to obesity, a circumstance that accords with the results of ENSANUT 2012[14], which reported that from 2006 to 2012, there was an increase in the prevalence of obesity in both sexes in the sample of adolescents (from 10.9 to 12.1% in women and from 13 to 14.5% in men).

Several studies[10,12,13,32] have suggested that it is possible that the increase in obesity is one of the factors that has influenced the increase in DEB, as young people who desire to be thin use strategies that are not always healthy to reach this goal; in addition to the increase in negative beliefs and attitudes, not only towards their own food, weight, and body shape[33], but also towards people with obesity, stigmatizing them in such a way that they become targets of discrimination[34].

Although most of the advertisements are aimed at women, it is a fact that the influence of advertising is starting to persuade men[6-7,9,35]; we can clearly observe young men developing an interest in products that improve and/or tone body shape and, when it comes to buying beauty products, the spotlight is already on them, much as it has been on women ever since this type of advertising began[36]. In the same way, the influence of advertising feeds and strengthens dissatisfaction with body image[37], so that the trend in women is to want a slimmer body, a result consistent with this study because on average 51.5% of the participants want to be thinner.

On the other hand, according to Acosta and Gómez-Peresmitré[38], dissatisfaction in men focuses on wanting a larger, more muscular, mesomorph body type, a finding that this study agrees with since, of the 33.5% of those who wanted to be more robust in 2010, 49% chose a mesomorph body type. It is interesting to mention that when the questionnaires were being filled out, many youths opted for this picture, remarking that "he's only missing some killer abs" and some of them even drew some on the picture.

This allows us to confirm that at present, young men are more concerned with having a slender but muscular shape, like that of their favorite performers or athletes, and with being the most popular guy and the most handsome and they are willing to do anything

Table 6. Odds ratio for disordered eating behaviors (DEB), attitude toward body figure (body aesthetic thin-ideal internalization), advertising influence, and body shape distress

			OR	X^2	95% CI	p
	Body thin-ideal internalization					
DEB	At risk	No risk				
– At risk	80	58	11.2	170	7.42-16.84	0.000
– No risk	80	648				
	Advertising influence					
DEB	At risk	No risk				
– At risk	53	86	13.5	150.9	8.23-22.03	0.000
– No risk	32	699				
	Body shape distress					
DEB	At risk	No risk				
– At risk	83	55	9.43	149.6	6.32-14.07	0.000
– No risk	101	631				
	Advertising influence					
Internalization	At risk	No risk				
– At risk	55	107	11.46	130	7.03-18.7	0.000
– No risk	30	669				
	Body shape distress					
Internalization	At risk	No risk				
– At risk	86	75	7.3	124.6	4.99-10.62	0.000
– No risk	95	603				
	Body shape distress					
Advertising influence	At risk	No risk				
– At risk	66	17	21.88	186.3	12.4-38.6	0.000
– No risk	118	665				

to achieve it, which increases the adolescent's vulnerability to developing an eating disorder[39,40] or a muscle dysmorphic disorder[41,42].

When analyzing the sociocultural factors assessed by FRATAP, it should be said that from 2007 to 2010, they were observed to have decreased in women, which is the opposite of what has been seen in men. Furthermore, the results reported a significant level of DEB and body thin-ideal internalization in women, showing a slight increase in both risk factors between 2007 and 2010. In males, the internalization of the thinness ideal declined, although not significantly, but with regard to DEB, it nearly quadrupled from 2007 to 2010, together with an increase (not significant) in the level of dissatisfaction with body image, in the sense of wanting to be thinner. These data should be expanded to identify the variables that may explain with greater precision why DEB has increased because the last several years have seen a significant increase in these risk factors in men[43-45].

The failure to identify significant increases in all of the risk factors assessed as we had expected may be attributable to the fact that since 2007, the year when we conducted the first census of the institution, those in authority at the school began to conduct a health awareness week (one every semester), in which issues

related to proper nutrition, ED, healthy lifestyles, and self-esteem, among others, are addressed. This impact can also be seen in the rise from 2007 to 2010 in the number of satisfaction with body image and the "meal times" factor.

Nevertheless, it can be said that these interventions have not had the hoped for impact because, if they had, all of the risk factors would have decreased significantly and that did not happen, in addition to the fact that the prevalence of some of them increased in men. All this should lead to a review of the content and structure of these interventions and especially the way in which they are being addressed in men, as their behavior and cognition is very different from those of women[40]. Furthermore, these data should be corroborated with new samples at the same institution or followed up to make sure it was not an isolated event.

In spite of these contradictions, it was possible to confirm, as in other studies[12,14-17], that a higher rate of DEB, higher body thin-ideal internalization and greater the impact of sociocultural factors in both men and women.

The main limitations of this study are due to the inability to generalize the results to all Hidalgo adolescents as we have not dealt with a statewide probabilistic sample, and by the fact that the types of questionnaires administered were self-assessment forms. Nonetheless, the findings are valid for the study samples, as on one hand the same questionnaires were administered in both years, with use of the same methods and even in the same spaces. The same cut-off points were used for the interpretation of findings, ensuring that the data analysis and results do identify differences in the behavior of the population between 2007 and 2010. Furthermore, this work opens the door to continue exploration in this field, not only in private schools in the city of Pachuca, but also in public institutions and similar places in the state of Hidalgo.

To conclude, the differences in behavior between men and women are a fact, which was corroborated by our findings regarding the prevalence of DEB and other risk factors associated with ED. That said, the common behavior in both sexes was that in subjects with DEB, the risk of body thin-ideal internalization, advertising influence, and body shape distress increases greatly, and this manifests itself predominantly in women.

It is important to note that the risk indices that were calculated are not valid for establishing a causal relationship, i.e. they are not valid enough to conclude that the triggering factor is the cause of the outcome studied. In order to establish a causal relationship between the factors, experimental studies are needed, which was impossible to carry out in this retrospective study.

The main contribution of this study is that it examines for the first time ever in the city of Pachuca, trends in risk factors associated with ED over a period of three years. This information complements that already obtained in other studies conducted in the same city. Concurrently, they provide the basis not only for the planning and implementation of effective prevention programs and health promotion for both men and women, but also for the early detection and treatment referral.

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