

Original Research Article

Adaptation, validation and reliability of the Spanish version of eating pattern inventory for children EPIC-C in a sample of Mexican adolescents

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ABSTRACT

Background: Eating behavior represents an important public health issue. This study shows the results of the adaptation and validation of the questionnaire eating pattern inventory for children (EPI-C) in the Spanish version, what can be very useful in Spanish-speaking contexts.

Methods: The adaptation and validation of the questionnaire was carried out with a statistically representative sample of 417 adolescents of Mexico City. Different statistical analysis were applied.

Results: The analysis of the adapted version reproduced the same factorial structure and psychometric properties as the original questionnaire. The adapted inventory consisted of 20 items, formed by 4 subscales dietary restraint (8 items), external eating (6 items), parental pressure to eat (3 items), and emotional eating (3 items) which explained the 68,8% of the total variable.

Conclusions: The scores of the subscales were associated with the body weight of the adolescents with normal weight and overweight-obesity, with the level of the anxiety state, with the emotional eating and with the dietary restraints which suggests initial evidence of its validity and utility in Spanish speaking countries.

Keywords: Adaptation, Adolescents, Eating behavior, Questionnaire EPI-C, Validity

INTRODUCTION

Eating behaviors and their effects on body weight and health represent a complex phenomenon that can be investigated from different perspectives. The medical and dietary disciplines emphasize the physiological and nutritional factors like the eating preferences, food selection, and the composition of the dietary intake; while the psychological factors comprise the attitudes, experiences, and related individual needs.¹ These aspects stimulate the eating behavior (for instance, eating to face determined emotional states and therefore, they are important to explain and understand these processes.^{2,3} Additionally, such specific psychological factors are related to eating disorders, that is to say, with the presence of anorexic, bulimic, or compulsive intake.

Obesity prevention has become a priority in the investigation of public health, especially in the infant-juvenile population, which justifies the need to study the possible determinants of the behavior that leads to weight gain in children and adolescents to identify possible methods of prevention. Obesity rates are high in both developed and developing countries.⁴ In Mexico the percentage of the population with overweight and obesity rating from 12 to 19 years of age has passed from a combined prevalence of 35.8% in women and 33.2% in men in the year 2012 to a combined prevalence of 41.1% in women and 35.8% in men in the year 2018. Being 5 percentage points higher in urban areas (39.7%) than in rural areas (34.6%).^{5,6}

In an obesity prevention context, it is necessary to have robust instruments that evaluate both behavioral factors associated to the intake and emotional factors in children and adolescents adapted and validated in the Spanish language. The eating pattern inventory for children (EPI-C) is an evaluation instrument that collects behavioral and emotional factors associated to the eating intake patterns in children and adolescents, that can be useful as a screening instrument in prevention programs.⁷ The purpose of this study was to evaluate translation and adaptation, the convergent and discriminant validity of the Spanish version of the eating pattern inventory for children in a community sample of Mexican adolescents.⁷

METHODS

Study design

It was an observational, cross-sectional, analytical study of translation and adaptation of an evaluation inventory.

Ethics approval and consent to participate

School principals were sent letters of invitation with information about the study. Parents were then sent information sheets and consent forms. Only children who had returned their signed consent forms were invited to participate in the study. There was no incentive for participation for the schools or participant. The questionnaires were anonymous, participation was voluntary, and data were kept confidential.

Participants

Our sample consisted of 417 adolescents between the ages of 15 and 17 from secondary schools in Mexico City. Reference population was 558643 public high school students in Mexico City. The sample was determined by an expected proportion of 50%, a margin of error of 4%, and a level of reliability of 96%. The selection of the participants was done by means of two-stage sampling, with probabilities proportional to the sizes of the first-stage units (high schools). The mean age of the adolescents in the sample was 15.40 years (SD=0.787). Regarding sex, 49.2% of the participants were men and 50.8% women. Most of the participants came from a household with at least one parent. The mean BMI of the sample was 23.34 (SD=5.44). Most of the participants were within the BMI range of normal weight (56.4%), 40.5% overweight-obese, and 3.1% underweight.

Exclusion criteria

The presence of a significant medical condition; abnormal hepatic, renal, or thyroid function; use of medication known to impact body weight; greater than 5 pounds (2.3 kilograms) of weight loss in the previous three months; enrolment in a weight loss treatment

program; or the presence of a psychiatric disorder that might impede protocol compliance.

Instruments

Eating pattern inventory for children (EPI-C).⁷ The EPI-C is an instrument that evaluates psychological dimensions of eating behavior in children and not only symptomatology of the TCA. It is applicable in both clinical and nonclinical populations. The EPI-C is based on the German inventory eating behavior and weight problems inventory (EWI-C) for Children.^{7,8} The EPI-C is a self-administered inventory formed by 20 items with a Likert type response of 4 points (1=not at all, 2=little, 3=mostly, 4 totally). It evaluates 4 factors: *Restricción de la dieta* (dietary restraint; DR), *Alimentación Externa* (external eating; EX), *Presión Paterna para Comer*; (parental pressure to eat; PP). And *Alimentación Emocional* (emotional eating; EM). The DR factor is formed by 8 items that comprise affective, cognitive, and behavioral aspects of the dietary restraint, such as fear to be overweight, concerns about food and weight and the real restrictions in the feeding forming a unique dimension. The EX factor consists of 5 items related to the external eating (eating in response to stimuli related to food independently of the internal states of hunger and satiety, as well as the constant sensation of being hungry). The PP factor consists of 4 items that express the pressure of the parents to eat. The EM consists of 3 items related to the emotional eating; that is to say, eating as a way to cope with emotional stress. The original version of the EPI-C has been shown to have satisfactory internal consistency -0.93 for dietary restraint, 0.80 for emotional eating, 0.74 for external eating and 0.72 for parental pressure to eat.⁷ More recently, the factorial structure and reliability have been established in a sample of preadolescents, with an explained variance of 64.8% and good internal consistency for three of the four of the EPI-C (Cronbach's α =0.73-0.92).⁹

Children's eating attitudes test (ChEAT-26).¹⁰ The ChEAT-26 is a children's version of the eating attitude test (EAT).¹¹ ChEAT-26 is a self-report questionnaire used to assess disordered eating attitudes among children. It consists of 26 items scored on a 6-point Likert scale with answer options 'never', 'rarely', 'sometimes', 'often', 'usually', and 'always'. The maximum score is 78 points. The higher the score, the higher the possibility for disorder eating symptom. The original ChEAT-26 had three subscales: dieting, bulimia and food preoccupation and oral control, respectively, with 13, 6 and 7 items. In this study, the Spanish adaptation of ChEAT-26 was used.¹²

Children's Depression Inventory (CDI-S).¹³ It is a self-report questionnaire for measuring depression symptoms in children between the ages of 8 and 18. The short CDI-S version has ten items and is sensitive as well as brief.¹⁴ Total scores range from 0 to 20, with higher scores indicating more depressive symptoms and a

recommended cut-off of 3 for the short-form.¹⁵ The CDI-S was used in the adolescent sample, chosen to be time-efficient and to replicate past work which had used the CDI-S.¹⁶ The Spanish adaptation was used in this study.¹⁷

State-trait anxiety inventory for children (STA-IC).¹⁸ This scale was developed to measure trait and state anxiety symptoms in children and is one of the most frequently used self-report instruments for evaluating children's anxiety. The STAI-C offers high reliability and satisfactory validity. For the analysis in the present study, we used only the trait anxiety scale, composed of 20 items, with a 3-point scale that goes from 1 (almost never) to 3 (many times) that assesses a temporary state of anxiety of the individual conditioned by the current situation. The scale was validated in a Spanish sample for children from 9 to 18 years of age.¹⁹

Body mass index (BMI). BMI was estimated on the basis of the child's height and weight: $BMI = \text{weight (kg)}/\text{height (m)}^2$. The children were classified into BMI categories of underweight, normal weight or overweight/obese using the age-and gender-specific BMI cutoffs provided by the International Obesity Task Force.^{20,21} The children were assessed without shoes.

Translation process

Two direct translations of the EPIC were carried out from the version in the English language to Spanish. The translations were carried out in an independent manner by persons whose mother tongue was Spanish. One of the translations was carried out by a professional translator and the other by a professional in the field of psychology with extensive experience in adolescence and high knowledge of the English language. The assessment of the degree of equivalence of both translations showed that 85% (n=17) of the items was classified as a perfect conceptual equivalence and that these translations showed both a literal and semantic parallelism with the original version, and a 15% (n=3) like items that kept their original meaning, but that did not present a satisfactory conceptual equivalence. The Cohen's concordance index between the two translators was good (Kappa=0.615; CI 95%, 68.30-98.77; p=0.003). Subsequently to assess the degree of comprehension of the translated items a comprehension test was carried out with a sample of adolescents of both sexes male and female. To do that a Likert scale was used ranging from 1 to 5 points (1= poor understanding; 5= high understanding) for each of the 20 items of the questionnaire. The mean score of comprehension for the set of items of the scale was good (M=4.10; SD=0.36).

Statistical analysis

One-way ANOVA tests (ANOVA one-way) were used to identify statistically significant differences (p<0.05) in the eating behavior among the adolescents of both sexes male

and female and the rates of the body mass of the normal weight-overweight.

The effect sizes were calculated taking into account the difference between the mean of the sample by sex and rate of body mass, divided into the combined standard deviation.²² The convergent validity was evaluated by means of the correlation coefficient of Spearman range between the EPI subscales, the Cheat-26 subscales, the anxiety trait and the depressive symptomatology.

To determine the number of factors in the exploratory factor analysis (EFA), the Optimal Implementation of Parallel Analyses (PA) was used.²³ The factor analysis was based on polychoric correlations and performed with robust unweighted least squares (RULS) and robust promin rotation.²⁴

The structural validity of the EPIC was evaluated via a confirmatory factorial analysis (CFA). The statistical squared chi- was evaluated and different indexes of practical fit model.²⁵ These included the root mean square error of approximation (RMSEA) the comparative fit index (CFI), the standardized root mean square residual (SRMR), the goodness of fit index (GFI), and the adjusted goodness of fit index (AGFI).^{26,27} The RMSEA values less than or equal to 0.06 indicate an excellent fit of the model, while the values of RMSEA between 0.06-0.08 an acceptable fit of the model.^{28,29} The SRMR values less than or equal to 0.08 were considered acceptable. For the indexes CFI, GFI and ACFI an excellent fit of the model was indicated by values greater than or equal to 0,95, while it was considered that the values between 0.90 and 0.95 were an acceptable fit of the model.^{27,29} Reliability of the EPIC was assessed using Cronbach's alpha, ordinal alpha, and coefficient omega.

Statistical analyses were conducted using SPSS version 24, factor analysis 10 and Lisrel 8.

RESULTS

In the following table (Table 1) the descriptives of the variables of the study are shown. The differences in the distribution of boys and girls between weight groups were not significant $\chi^2 (2, N=417) = 5.23, p=0.073$.

The ANOVA one-way analysis (Table 2) showed statistically significant differences in the subscales dietary restraint and emotional eating, with mean scores significantly higher in dietary restraint in the group of girls (M=1.85; SD=0.81) than the ones obtained in the group of boys (M=1.45; SD=53) and in emotional eating with mean scores higher in the group of girls (M=1.81; SD=0.65) than the ones found in the group of boys (M=1.66; SD=57). The size of the effect was moderate for the difference in dietary restraint (Cohen's $\delta=0.58$) and small in emotional eating (Cohen's $\delta=25$). No statistically significant differences were observed in the mean scores of the scales external eating and parental pressure to eat between groups (Figure 1).

Table 1: Descriptive statistics for study variables.

Body mass index (BMI)	Boys	Girls	Total
Underweight	1.9 (8)	1.2 (5)	3.1% (13)
Normal weight	30% (125)	26.4%(110)	56.4% (235)
Overweight-obesity	17.3% (72)	23.3% (97)	40.5% (169)
	Mean	SD	95% CI
Age (years)	15.40	0.78	15.32-15.47
Body mass index (BMI)	22.68	3.55	22.32-23.00
Eating pattern inventory for children (EPIC)			
Dietary restraint	1.65	0.71	1.58-1.72
External eating	2.09	0.61	2.04-2.15
Parental pressure to eat	2.79	0.69	2.73-2.86
Emotional eating	1.73	0.61	1.67-1.79
Children's eating attitudes test (Cheat-26)			
Dieting	3.45	4.50	3.00-3.87
Oral control	2.46	2.72	2.22-2.74
Bulimia and food preoccupation	0.98	1.88	0.80-1.16
Children's depression inventory (CDI-short)	3.87	0.52	3.82-3.92
State-trait anxiety inventory for children (STAI-T)	34.97	6.56	34.33-35.60

Table 2: ANOVA eating pattern inventory for children (EPI-C) subscale mean scores by sex.

EPIC Subscales	Boys (n=205)			Girls (n=212)			F (1,415)	p ^a	d ^b
	M	SD	IC 95%	M	SD	IC 95%			
Dietary restraint	1.45	0.53	1.35-1.54	1.85	0.81	1.76-1.94	35.07	0.000	0.58
External eating	2.10	0.60	2.01-2.18	2.09	0.63	2.01-2.18	0.003	0.956	0.01
Parental pressure to eat	2.81	0.66	2.72-2.91	2.78	0.73	2.68-2.87	0.235	0.628	0.02
Emotional eating	1.66	0.57	1.57-1.74	1.81	0.65	1.73-1.89	6.44	0.011	0.25

Note. M and SD scores are based on the mean item response coded 1=not at all, 2=little, 3=mostly, 4=totally. ^ap values derived from F One-way ANOVA test. ^bEffect sizes calculated Cohen's d from F-tests.

Table 3: ANOVA eating pattern inventory for children (EPI-C) subscale mean scores, standard deviations, and d' values with confidence interval by normal-weight and overweight-obesity groups.

EPIC subscales	Normal weight (n=235)			Overweight-obesity (n=169)			F (1,402)	p	δ'
	M	SD	CI 95%	M	SD	CI 95%			
Dietary restraint	1.46	0.64	1.38-1.45	1.95	0.72	1.84-2.06	50.87	0.000	0.72
External eating	2.11	0.60	2.03-2.19	2.06	0.61	1.96-2.15	0.65	0.41	0.08
Parental pressure to eat	2.87	0.64	2.79-2.95	2.67	0.75	2.56-2.78	8.22	0.004	0.29
Emotional Eating	1.76	0.60	1.68-1.84	1.71	0.64	1.61-1.80	0.793	0.374	0.09

Note. M and SD scores are based on the mean item response coded 1=not at all, 2=little, 3=mostly, 4=totally. ^ap values derived from F One-way ANOVA test. ^bEffect sizes calculated Cohen's δ from F-tests.

The comparisons in the mean scores of the EPIC subscales between groups of normal-weight and overweight-obesity (the underweight group was excluded due to its minimal size) showed statistically significant differences in the mean scores in the subscales dietary restraint and parental pressure to eat. The mean score of the dietary restraint was greater in the overweight-obesity group (M=1.95; SD=0.72) than in the normal-weight group (M=1.46; SD=0.64), whereas the parental pressure to eat was greater in the normal-weight group (M=2.87; SD=0.64) than in the overweight (M=2.06; SD=0.61). The effect size was moderate for the difference in dietary restraint (Cohen's δ=0.72) and small in parental pressure to eat (Cohen's δ=0.29). No statistically significant

differences were found in the mean scores of the external eating and emotional eating scales between the normal-weight and overweight-obesity groups (Table 3; Figure 2).

The sample adequacy measure to perform exploratory factor analysis (EFA), the value of the Kaiser-Meyer-Olkin index was good (KMO=0.878), and the Bartlett Sphericity test presents a value $\chi^2=4703.0$ (df=190; p<0.001), that allows us to reject the identity matrix hypothesis so that factorization of variables is possible. The eigenvalue-criterion (eigenvalues >1) as well as the screen-test suggested a 4-factor resolution to best fit the data. The first factor (dietary restraint; DR) was robust,

with an eigenvalue of 6.461, and it accounted for 32.3% of the variance in the data. Factor two (external eating; EX) had an eigenvalue of 4.527 and accounted for a further 22.6% of the variance. The eigenvalues for factors three (parental pressure to eat; PP) and four (emotional eating; EM) were 1.572 and 1.104 respectively, together accounting for a further 13.3% of the total variance. In total, the four factors explain 68.8% of the variance (Table 4).

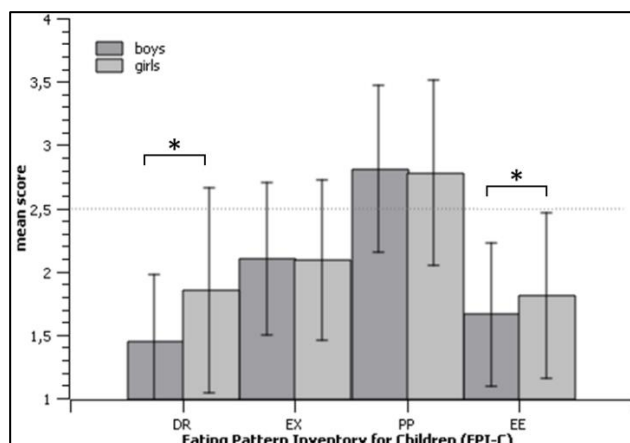


Figure 1: Mean scores, standard deviation, δ' value and confidence interval of the scales dieting restraint, external eating, parental pressure to eat and emotional eating by sex.

Note: * significant differences ($p < 0.01$). Error bars represent ± 1 SD. Dotted line represents the mean of the measurement scale.

The Cronbach's alpha reliability indexes, ordinal alpha and the omega coefficient were good (> 0.8) for the DR and EX factors, acceptable for the EM factor (> 0.7) and poor for the PP factor ($= 0.5$).

The factor 1 (DR) consisted of the 8 items that collect information about affective, cognitive and behavioral aspects of the dietary restriction. On the other hand, the factor 2 (EX) consisted of 6 items, including the 5 of the original scale that collect information related to the external eating like eating in response to stimuli related to food, plus an additional item (item 15 "cuando estoy solo como más") that was part of factor 3 (PP) of the original scale. Therefore, the factor 3 (PP) was reduced to the original 3 items remaining (items 3, 16, and 9). The factor 4 (EM) consisted of the original 3 items of the scale (items 12, 7 and 7).

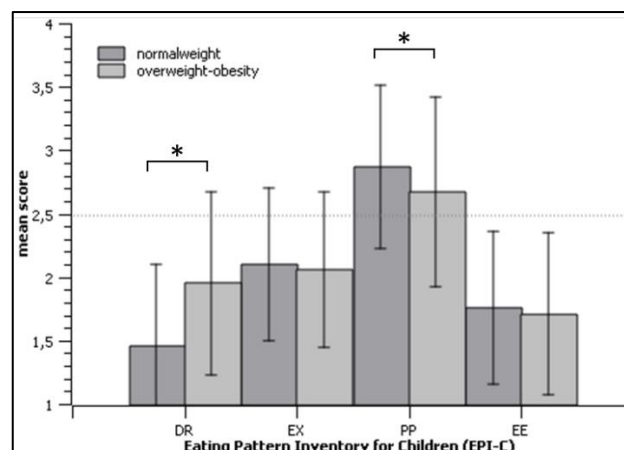


Figure 2: Average scores of the scales dieting restraint, external eating, parental pressure to eat and emotional eating by groups of normal weight, and overweight-obesity.

Note: * significant differences ($p < 0.01$). Error bars represent ± 1 SD. Dotted line represents the mean of the measurement scale.

A confirmatory factorial analysis (CFA) was carried out with LISREL 8 for all the sample.³⁰ The factor loadings were acceptable for all of the items (> 0.50) in the 4 factors, except the item 9 (< 0.50) of the parental pressure to eat factor (PP). The root mean square error of approximation (RMSEA=0.042) and the comparative fit index (CFI=0.98) were acceptable. Also the value of the standardized root mean square residual was good (SRMR=0.052). The value of the goodness of fit index (GFI=0.94) and the adjusted goodness of fit index; (AGFI=0.92) were also acceptable indicating a good fit of the model (Table 5).^{29,31}

Regarding the convergent validity of the EPIC, the dieting restraint subscale (DR) had a positive correlation and moderately high with the subscale dieting of the cheat-26 ($r_s=0.60$, $p < 0.01$). The subscales external eating (EX) ($r_s=0.50$, $p < 0.01$) and emotional eating (EM) ($r_s=0.46$, $p < 0.01$) were moderately and positively associated with the Bulimia subscale of the Cheat-26. The parental pressure to eat subscale had a positive and low association with the oral control subscale ($r_s=0.18$, $p < 0.01$) and Bulimia ($r_s=0.15$, $p < 0.01$) of the Cheat-26. The dieting restraint (DR) was moderately associated with the anxiety trait ($r_s=0.39$, $p < 0.01$) of the STAIC-T. Also the subscales external eating (EE) ($r_s=0.13$, $p < 0.01$) and emotional eating (EM) ($r_s=0.15$, $p < 0.01$) had a significant low and positive association with the anxiety trait (Table 6).

Table 4: Factor loadings and item characteristics of the adapted eating pattern inventory for children (EPI-C).

Items	Factor loading				Item characteristics				
	Dietary restraint	External eating	Parental pressure to eat	Emotional eating	M	SD	h^2	a^2/h^2	r_{it}
13-I'm always thinking that I weigh too much	0.930	0.011	-0.007	-0.021	1.597	0.922	0.749	0.999	0.667
6-While I eat, I'm always afraid of getting fat	0.905	0.064	-0.043	-0.009	1.474	0.808	0.680	0.992	0.780

Continued.

Items	Factor loading			Item characteristics					
	Dietary restraint	External eating	Parental pressure to eat	Emotional eating	M	SD	h ²	a ² /h ²	r _{it}
4-When I finish eating I worry that I have gained weight	0.888	0.029	-0.018	-0.060	1.568	0.882	0.629	0.993	0.805
10-I am very afraid of gaining weight	0.869	0.005	0.030	-0.010	1.649	0.91	0.571	0.998	0.772
14-To maintain my weight, I often eat less than I would like	0.866	-0.039	0.031	-0.097	1.496	0.772	0.580	0.984	0.840
19-I should try harder to lose weight	0.864	-0.016	-0.010	0.078	1.985	1.03	0.566	0.991	0.733
18-I try to eat very little so as not to gain weight	0.861	-0.061	0.107	0.054	1.496	0.766	0.576	0.976	0.733
2-I have tried at least a couple of times to eat less	0.762	-0.038	-0.078	0.041	1.988	0.872	0.347	0.984	0.776
8-When I'm with someone who eats a lot, I eat a lot too	0.031	0.837	-0.043	-0.165	2.00	0.969	0.533	0.958	0.531
17-If I see food, I want to eat, even if it is not the time to do so	-0.105	0.806	0.114	-0.020	2.098	0.859	0.454	0.963	0.583
1-When I see someone eat. I want to eat too	-0.115	0.760	0.026	-0.159	2.390	0.758	0.380	0.936	0.609
11-I often think of food during the day	-0.038	0.754	-0.038	0.035	2.086	0.821	0.327	0.992	0.511
15-When I'm alone I eat more	0.033	0.544	-0.029	0.152	1.892	0.896	0.103	0.922	0.663
20-I am often so hungry that I have to eat something immediately	0.140	0.495	-0.016	0.087	2.124	0.887	0.074	0.899	0.486
3-My parents always want me to finish everything I have on my plate	0.007	0.003	0.671	0.007	2.709	1.046	0.202	0.999	0.378
16-In my house. I have to eat what is on the table	0.061	0.027	0.531	0.143	2.777	0.966	0.094	0.918	0.274
9-In my house, I can leave the food that I do not like on my plate	-0.046	-0.015	0.468	-0.168	2.911	0.947	0.062	0.877	0.308
12-Like when i'm sad	-0.006	-0.019	-0.048	0.848	1.726	0.773	0.521	0.996	0.606
5-Eating helps me when I'm sad	-0.017	0.016	0.040	0.822	1.743	0.813	0.459	0.996	0.485
7-When I'm worried or distressed like something	-0.019	0.154	0.019	0.535	1.744	0.699	0.096	0.921	0.599
Eigenvalue	6.461	4.527	1.572	1.104					
% Variance explained	32.308	22.640	7.862	5.524					
Cumulative % variance explained	32.308	54.947	62.810	68.833					
Index of fit of factor scales (IFFS)	0.994	0.999	0.991	0.982					
Cronbach α	0.93	0.804	0.503	0.77					
Ordinal α	0.96	0.84	0.50	0.736					
McDonald'ω	0.932	0.808	0.518	0.742					

*h²: communalities; a²/h²: Amount of variance explained by the factor for each item, computed as squared factor loading on the assigned factor divided by item communality; r_{it}: corrected item-total-correlation.

Table 5: Model fit indices.

Absolute fit indices	Relative Chi-square χ^2/df	RMSEA	CFI	SRMR	CFI	AGFI
Chi-square χ^2 271.24; df=157 (p=0.00)	1.727	0.042 (0.033-0.050)	0.98	0.052	0.98	0.92

Table 6: Spearman correlations between the study variables.

	EPIC		Cheat-26				CDI-C	
	DR	EX	PP	EE	Dieting	Oral control		Bulimia
DR	1.00							
EE	0.032	1.00						
PP	-0.085	0.155**	1.00					
EM	0.097	0.519**	0.095	1.00				
Dieting	0.605**	0.054	-0.056	0.051	1.00			
Oral control	0.144**	0.057	0.183**	0.069	0.175**	1.00		
Bulimia	0.122*	0.506**	0.152**	0.465**	0.207**	0.166**	1.00	
CDI-C	-0.052	-0.053	-0.024	-0.002	0.003	-0.010	-0.052	1.00
STAIC trait	0.392**	0.137**	0.061	0.152**	0.247**	0.217**	0.225**	-0.154**

DISCUSSION

The purpose of this study was to adapt and validate the Spanish version of the eating pattern inventory for children (EPI-C) in a sample of Mexican adolescents. The EPI-C is an inventory of 20 items which evaluates the dietary restraint, the external influences in the eating behavior, the parental pressure to eat, and the emotional eating. The characteristics of the items of the adapted version, the factorial solution and the observed reliability indexes provide evidence of some highly satisfactory psychometrical properties of the adapted inventory and equivalents to the original scale, so it can be very useful in Latino American and Spanish-speaking scenarios. As a whole and from the point of view of the Spanish adaptation, the results of this study, as well as the experiences during the data collection, demonstrate that careful evaluation of the comprehension and evaluation of the psychometrical properties are critical elements when using self-report questionnaires, both in children and in adolescents.

Furthermore, the differences in the language and in the cultural environment are equally critical in the adaptation process.⁷ Not only is it insufficient to translate the items but also it is necessary to adequate the questions and to adjust the adjectives and expressions of moods to the cultural context of reference.³² In this study the item 15 (“*cuando estoy solo, como más*”) which in the original scale belongs to the factor parental pressure to eat has demonstrated a greater factorial loading in the factor external eat.

This change of factor of the item 15 can be interpreted as though the absence in the parental control may facilitate a greater receptivity to external stimuli of food. In this sense it is possible to hypothesize that some predominant characteristics of the Mexican family model may have a slightly particular role as for maintaining a markedly asymmetric structure in the parent-child relationships and over the control of the daily activities such as eating.³³

As initial evidence of validity for the EPI-C the eating behavior was associated with body weight in adolescents.

The higher the relative body weight of the adolescents, the higher the restriction in the observed diet a fact that may demonstrate dissatisfaction with body weight. Besides overweight adolescents showed lower levels of parental pressure to eat in comparison with normal-weight adolescents, a fact that may reflect parental reaction to their children being overweight. As it has been described in other investigations restrictive diets are an important factor in the eating behavior of preadolescents and adolescents.³⁴ In this study, such restrictive diets proved to be related to overweight conditions. This maybe shows a deliberate weight-loss strategy. This hypothesis would signify that the diet efforts of the adolescents with overweight are unsuccessful, or at least they do not remain successful.³⁵ According to some investigations, the restrictive diets by themselves may not only be inefficient for body weight control in overweight adolescents, but also they could have a counter effect increasing body weight.³⁶ The hypothesis of the dietary restriction as a factor of risk not only for eating disorders but also for being overweight has not yet been rejected.

Consistent with previous findings, adolescent women showed higher levels of restrictive diet and in emotional eating.^{37,38} On the other hand, it was observed that there was an association between the restrictive diet, the external eating and the emotional eating with an anxious state. Indeed, as the scientific evidence shows the highest levels of anxiety could lead to the use of dysfunctional strategies of emotional regulation.³⁹ As the stressful experiences and negative emotions increase young adults and adolescents have a greater need of an efficient emotional regulation.⁴⁰ Within the limitations we pointed out the adjusted range of age of our participants, and a sample population of urban character coming exclusively from the area of Mexico City, a fact that restricts the generalization of the obtained results. On the other hand, we believe that it is necessary to expand these findings with tests that include the reliability test-retest.

CONCLUSION

The scores of the subscales were associated with the body weight of the adolescents with normal weight and

overweight-obesity, with the level of the anxiety state, with the emotional eating and with the dietary restraints which suggests initial evidence of its validity and utility in Spanish speaking countries.

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