International Journal of Community Medicine and Public Health
Gracia MD et al. Int J Community Med Public Health. 2024 Feb;11(2):717-724
http://www.ijcmph.com
pISSN 2394-6032 | eISSN 2394-6040

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20240259

Original Research Article

Emotional eating patterns in a sample of Mexican adolescents

Manuel de Gracia[1], Patricia Trujano[2]*, Carlos Nava[2], Núria Jiménez[1]

[1]Departamento de Psicología, Universidad de Gerona, Spain
[2]Carrera de Psicología, Universidad Nacional Autónoma de México, Campus Iztacala, México

Received: 06 December 2023
Accepted: 18 January 2024

***Correspondence:**
Dr. Patricia Trujano,
E-mail: trujano@unam.mx

ABSTRACT

Background: Eating patterns can be used to regulate emotions. Recent research has focused on emotional eating, aiming to determine the leading psychological causes of emotional eating based on the habits of a group of Mexican adolescent scholars that are between 15-17 years old (n=417).
Methods: Five mechanisms measured emotional aspects and eating patterns; they were analyzed with different statistical tools.
Results: There weren't significant gender differences in the feelings of emotional restlessness between boys and girls, nor the expected feelings of anxiety, anger, frustration, and depression. There weren't variations in the types of emotional eating between the *normal weight* (average weight) and overweight groups. Nevertheless, there was a significant relationship between emotional eating (negative feelings) and bulimic eating patterns, showing more dependency on eating after receiving stimuli related to eating, regardless of satiety and hunger. Negative moods and emotions appeared as a result of parents trying to have more control over eating. When having obesity, there was less oral intake control, which led to the risk of overweight/obesity. Finally, less parental control over eating slightly increased the risk of overweight/obesity. However, the most risk is associated to diet restrictions and worry about food caused by fear to be overweight.
Conclusions: Obesity in children and teenagers is a public health problem. Its prevention must be a priority; therefore, knowing and working on its risk factors is urgent.

Keywords: Adolescent, Teenagers, Emotional eating, Obesity, Eating disorders, Diet restrictions

INTRODUCTION

Emotional regulation is the extrinsic and intrinsic process through which individuals control, evaluate, and modify their emotions. It affects its intensity and duration to reach goals, adapt to a community context, or promote well-being inside and outside society.[1] According to the emotional regulation process model, the different strategies to handle emotions are classified as selecting and modifying situations, display of attention (either distraction or concentration), cognitive changes, and response control. Inside the conceptual frame, an essential amount of the investigation has focused on the last two forms of emotional regulation (cognitive and behavioral). The strategies that stand out are reevaluation, which is changing a situation's meaning to create an emotional impact, and they are more effective in lowering the unfavorable effect rather than suppressing emotions, reducing the expressive behavior of emotion while feeling concerned.[2]

The hypothesis about how eating can also regulate emotions is essential among the new theories about emotional eating. It is the basis of different psychotherapeutic approaches focused on treating eating disorders.[3] Emotional eating is defined as the dysfunctional coping of stressful situations that can increase or decrease the food intake as a response to

negative (e.g., depression, anger, anxiety) or positive emotions (e.g., excitement, happiness).[4] Food, then, can serve to auto regulate the mood. Evidence suggests that a maladaptive emotional regulation (ER) may develop the maintenance of eating disorders (ED).[5] People with Anorexia Nervosa (AN), the restrictive type, and Bulimia Nervosa (BN) have more difficulty regulating emotions, and they use more dysfunctional regulation strategies (e.g., suppression) rather than a functional system, such as reevaluation.[6]

According to this explanation of emotional regulation through eating, its deficit is related to eating disorders. Nevertheless, eating behavior significantly differs among the eating disorders. Both individuals with AN and BN show deficits when regulating their emotions, but their eating pathological patterns differ substantially. If deficiency in emotional regulation and eating behavior are related, both groups have a different relationship with emotions and eating.[7] Negative emotions can increase or decrease food consumption in response to negative emotions, and it is just an example of how emotions can influence eating behavior.[3] Apart from the need to differentiate when food consumption increases or decreases, it is crucial to determine the emotional states. For example, there is evidence based on experimental studies that refer to increased food intake as a response to positive emotions shown in non-clinical tests.[8] Most individuals in non-clinical trials show eating more when sad; they also admit eating less when angry or anxious.[9] Those specific effects that come from emotions, and affect food intake, have divergent correlations. For instance, eating more as a response to negative emotions is directly related to being overweight, while eating more as a response to positive emotions is related to less weight and to the symptomatology of eating disorders.[9]

Emotional eating is associated with a series of negative consequences in children and teenagers, including unhealthy eating behavior (e.g., food with high calories) and a high body mass index[10]. When having negative emotions, food with high sugar and fat levels is the response to negative emotions. The more delicious and tasty the food is, the more production of a hedonic pleasure and an instant answer to negative emotions, which helps avoid focusing on the emotion currently felt.[10] On the other hand, emotional eating is related to the high rates of mental disorders in teenage girls,[11] while boys have generally shown low levels of emotional eating.[12]

During adolescence, the emotional eating rates increase to 43% in girls and 16,5% in boys.[13] Overall, there is evidence that between 3,2% and 63% of boys show signs of emotional overeating (EOE).[14] There is also proof that emotional overeating in teenagers is related to eating loss of control symptoms (LOC) and binge eating disorder (BED). Evidence suggests that maladaptive emotional regulation is directly related to the maintenance of eating disorders[5], making it an essential factor in the obesity etiology. There are high infant obesity rates in developed and developing countries.[15]

In Mexico, the percentage of the population between the ages of 12 and 19 with overweight and obesity has gone from a combined prevalence of a 35,8% in women and 33,2% in men in 2012 to a combined majority in 2018 of 41,1% in women and 35,8 in men. This rate is 5 points higher in urban areas (39,7%) than in rural areas (34,6%).[16,17] Obesity prevention has become a priority in public health research, especially in the child-juvenile population, responding to the need to study the possible determiners in behavior that lead to weight increase in children and teenagers. The aim is to identify the different prevention methods. In this sense, emotional eating constitutes a suitable intervention method since it is a modifiable risk factor. Therefore, this study aimed to identify the specific psychological determiners of emotional eating in an adolescent-scholar sample. It is expected to find all emotional and mood states related to emotional eating and, as seen in adult studies, how girls tend to practice more emotional eating than boys.

METHODS

Study design and participants

Current study is observational, transversal, and analytical. The sample group had 417 teenagers between 15 and 17 years old. They were from secondary and high schools located in Mexico City. The reference population was 558,643 students from secondary and high public schools in Mexico City. The sample was determined by a proportion of 50%, considering a margin of error of 4% and a 96% reliability level. The participants were chosen through a two-stage sampling process, with possible proportions to the size of the units in the first stage (high schools). The average age was 15.40 years old (SD=0.787). In sex, there were 49.2% boys and 50.8% girls. Most teenagers come from families with at least one parent. Most participants were part of the IMC rank, which is divided in *normal weight* (56.4%), 40.5% overweight and obesity, and 3.1% underweight. Invitation letters containing information about the research were sent to school directors. Parents received information and consent papers. There were only teenagers that gave back their consent papers signed. Schools and participants did not receive any incentive. Questionnaires were anonymous, and participation was voluntary, data was confidential.

Exclusion criteria

Exclusion criteria were; if there was a critical medical condition; abnormal liver, kidney, or thyroid function; the use of medicine, which is well known they affect weight; more than 5 pounds (2.3 kilograms) of weight lost during the last three months; medical treatment to lose weight; if there was a psychiatric disorder that might interrupt the protocol compliance.

Instruments

Emotional eating scale adapted for children and adolescents EES-C.[18] The EES-C is a self-report scale that contains 25 items designed to evaluate eating behaviors in response to negative emotions in children and teenagers. The EES-C contains three subscales that show the need to eat in response to negative emotional states: Anger, anxiety, and frustration; Depressive symptoms; Feeling concerned. In the Spanish versions, the EEC-S has shown perfect internal consistency and good convergent validity and discrimination in children and teenagers from 8 to 17 years old in samples of Mexican and Spanish teenagers.[19] Respondents rate their eating desire according to each emotion on the Likert scale of 5 points. The highest punctuations show more passion for eating as a response to negative mood.

Eating Pattern Inventory for Children; EPI-C.[20] The EPI-C is an instrument that evaluates psychological dimensions of eating behavior in children, not only from TCA. It works in both clinical and non-clinical populations. The EPI-C is a self-reported inventory containing 20 items answered in Likert style; it is 4 points (1=no/nothing, 2=little, 3=mostly, 4=totally). It evaluates four factors: Dietary Restraint (DR), External Eating (EX), Parental Pressure to Eat (PP), and Emotional Eating (EM). The original version of EPI-C-C has a satisfactory consistency: 0.93 for dietary restraint, .80 for emotional eating, 0.74 for external eating, and 72 for parental pressure to eat.[20] It has recently established the factorial structure and reliability in a sample of Mexican tweens, with an explained variety of 64.8 percent and good intern consistency for three out of four scales of the EPI-C-C (α de Cronbach=0.73-0.92).[21] Assessment inventory of attitudes toward eating-ChEAT-26.[22] The ChEAT-26 is a version of a self-reported questionnaire used to evaluate eating disorders attitudes in children, it comes from the Children's Eating Attitudes (CHEAT [23]). It has 26 items that assess on a Likert Scale with six options to answer from: never, rarely, sometimes, often, usually, and always. The highest punctuation is 78: the more punctuation, the more possibility of having an eating disorder symptom. The original ChEAT-26 has three subscales: dieting, bulimia, eating anxiety, and oral control, with 13, 6, and 7 elements each. In this case, we used the Spanish adaptation of ChEAT-26.[24]

Children's depression inventory-CDI-S.[25] It is a self-reported questionnaire used to measure depression symptoms in children between 8 and 18 years old. The short version of the CDI-S has ten items; it is sensitive and brief.[26] The total punctuation goes between 0 and 20. The highest rates show more depressive symptoms, and having three as the limit to the short version is recommended. [27] For this study, we used the Spanish version of the CDI-S.[28] State-trait andiety inventory for children-STA-IC.[29] This scale was developed to measure children's traits and state of anxiety. It is the most popular self-reported instrument used to evaluate stress in children. The STAI-C provides high levels of reliability and validity. For the analysis in this work, it was only used the scale of trait and state anxiety contains 20 items and a scale of 3 points. The 3-point scale goes from 1 (rarely) to 3 (several times) that evaluates the individual's temporal anxiety status, which depends on their current situation. The scale was validated in a Spanish sample that evaluated children between 9 and 18 years old.[30] Body mass index-BMI. The height and weight of the child helped to determine the BMI of the child: BMI=weight (kg)/size (m)2. Children were classified into BMI categories: less than average weight, normal weight, and overweight/obesity, using the specific BMI limits of the age and gender given by the International Obesity Federation.[31] All children were evaluated without shoes.

Statistical analysis

One-way ANOVA tests were used to identify the statistically significant differences ($p<0.05$) in the emotional eating patterns between both sex, girls and boys, and rates of body mass *normal wight*/overweight. The effect size was obtained from the difference between the average of the sample by sex and the range of body mass divided by the combined standard deviation.[32] The convergent validity was evaluated through the Spearman's rank correlation coefficient between the subscales of the EES-C, the subscales of the ChEAT-26, the anxiety trait (STAI-T), the depressive symptomatology (CDI), and the subscales from EPI-C. A logistic regression model was used to calculate the probability of belonging to the group of children with *normal weight* or overweight/obesity, coming from the quantitative and qualitative predictor variables (sex). The statistical analysis used SPSS version 24.

RESULTS

In the (Table 1), there are descriptions of the variables of the study. The differences in the distributions of boys and girls between weight groups weren't significant. $X^2(2, N=417) =5.23$, $p=0.073$. There is a summary of the variance of analysis (ANOVA) by sex and normal weight and overweight/obesity groups dEPI-Cted in results. The group with underweight wasn't considered because of their reduced size in the case of the variables of subscales studies of EES-C Depression, Anger/Anxiety/Frustration, and Concern. There were shown significative statistical differences in the subscale of being concerned between boys (M=1.34; SD=0.43) and girls (M=1.26; SD=0.40) with a small size of the associated effect (Cohen's d=09) (Table 2). There weren't significant statistical differences between the punctuation average of the subscales of the EES-C between the normal weight and overweight/obesity group (Table 3). The intercorrelation between the subscales of EES-C showed a positive and moderately high correlation. Punctuations in Anxiety, Frustration, and Anger were strongly associated with the punctuations in the subscale

of Depression (r-s=0.768; p<0.01) and concern (r-s=0.74; p<0.01).

Table 1: Descriptive statistics for study variables.

Parameters	Boys (n=205)	Girls (n=212)	Total (n=417)
BMI (%) frequency			
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)
Age (years)	**Mean**	**SD**	**95% CI**
	15.40	0.78	15.32-15.47
BMI	22.68	3.55	22.32-23.00
Emotional eating scale adapted for children and adolescents			
Depression	2.31	0.76	2.23-2.38
Anger/anxiety/frustration	2.10	0.71	2.03-2.17
Feeling unsettled	1.30	0.41	1.26-1.34
Eating pattern inventory for children			
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			
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	3.87	0.52	3.82-3.92
State-trait anxiety inventory for children	34.97	6.56	34.33-35.60

Table 2: ANOVA emotional eating scale adapted for children and adolescents subscale mean scores by sex.

Parameters	Boys (n=197)			Girls (n=207)			F (1.415)	[a]P value	δ [b]
EES-C Subscales	**M**	**SD**	**CI 95%**	**M**	**SD**	**CI 95%**			
Depression	2.36	0.79	2.24-2.47	2.24	0.72	2.14-2.34	2.448	0.118	0.1
Anger/anxiety/frustration	2.16	0.74	2.05-2.26	2.04	0.67	1.95-2.13	2.75	0.098	0.07
Feeling unsettled	1.34	0.43	1.28-1.40	1.26	0.40	1.20-1.31	4.08	0.044	0.1

M and SD scores are based on the mean item response coded 1=never want to eat and 5= I want to eat a lot", [a]p values derived from F One-way ANOVA test, [b]Effect sizes calculated Cohen's δ from F tests.

Table 3: ANOVA Emotional eating scale adapted for children and adolescent's subscale mean scores, standard deviations, and d' values with confidence interval by normal-weight and overweight-obesity groups.

Parameters	Normal weight (n=235)			Overweight-obesity (n=169)			F (1.402)	[a]P value	δ [b]
EES-C Subscales	**M**	**SD**	**CI 95%**	**M**	**SD**	**CI 95%**			
Depression	2.35	0.74	2.26-2.45	2.21	0.72	2.10-2.33	3.62	0.067	0.1
Anger/anxiety/frustration	2.14	0.73	2.05-2.24	2.03	0.67	1.93-2.13	2.59	0.108	0.1
Feeling unsettled	1.33	0.42	1.27-1.38	1.25	0.39	1.19-1.31	3.33	0.069	0.11

M and SD scores are based on the mean item response coded 1=never want to eat and 5= I want to eat a lot", [a]p values derived from F One-way ANOVA test, [b]Effect sizes calculated Cohen's δ from F tests.

On the other hand, punctuations in the subscale of Anxiety, Frustration, and Anger from EES-C and Depression are significantly and positively associated with the punctuations of the Bulimia subscale of the ChEAT-26 (r-s=0.237, p<0.01 and r-s=0.343, p<0.01; respectively). The Concern scale of the EES-C showed a positive and moderately low correlation to the Bulimia subscale of the ChEAT-26 (r-s=0.225, p<0.01). The subscales of Anxiety, Frustration, Anger, and Depression were positively and moderately associated with the subscale of External Eating (r-s=0.296, p<0.01 y r-s=0.457, p<0.01 respectively), Parental Pressure (r-s=0.282, p<0.01 and r-2=0.445, p<0.01 respectively) and Emotional Eating (r-s=0.297, p<0.01 and r-s=0.464, p<0.01 respectively) from EPI-C (Table 4).

Table 4: Spearman correlations between the study variables.

Parameters		EES-C		CHEAT-26						EPI-C			
		Depression	Anxiety Anger Frustration	Concern	Diet	Oral Control	Bulimia	CDI	STAI Trait	Diet Restriction	External Eating	Parental Pressure	Emotional Eating
EES-C	Depression	1.000	-	-	-	-	-	-	-	-	-	-	-
	Anxiety Anger Frustration	0.768**	1.000	-	-	-	-	-	-	-	-	-	-
	Concern	0.654**	0.745**	1.00	-	-	-	-	-	-	-	-	-
	Diet	-0.074	-0.082	-0.051	1.00	-	-	-	-	-	-	-	-
CHEAT-26	Oral Control	-0.001	0.038	-0.037	0.171**	1.00	-	-	-	-	-	-	-
	Bulimia	0.343**	0.237**	0.225**	0.199**	0.192**	1.00	-	-	-	-	-	-
	CDI	0.027	0.011	0.00	0.003	-0.014	-0.055	1.00	-	-	-	-	-
	STAI Trait	-0.082	-0.047	-0.059	0.245**	0.212**	0.214**	-0.154**	1.00	-	-	-	-
	Diet Restriction	-0.070	-0.090	-0.090	0.610**	0.130**	0.129**	-0.070	0.365**	1.00	-	-	-
EPI-C	External Eating	0.457**	0.296**	0.310**	0.041	0.054	0.499**	-0.053	0.137**	0.036	1.000	-	-
	Parental Pressure	0.445**	0.282**	0.250**	0.051	0.074	0.450**	0.00	00.190**	00.098*	00.657**	100	-
	Emotional Eating	0.464**	0.297**	0.261**	0.036	0.059	0.411**	0.021	000.171**	000.111*	000.660**	000.495**	1.00

Table 5: Logistic regression model.

Parameters		β	Wald	Gl	Sig.	OR	95% CI	
							Lower	Superior
EES-C	Depression	-0.086	0.098	1	0.754	0.918	0.537	1.570
	Anxiety Anger Frustration	0.103	0.123	1	0.725	1.109	0.624	1.969
	Concern	-0.246	0.336	1	0.562	0.782	0.340	1.797
CHEAT-26	Diet	-0.543	1.297	1	0.255	0.581	0.228	1.480
	Oral Control	-0.858	6.233	1	0.013	0.424	0.216	0.832
	Bulimia	-0.753	1.897	1	0.168	0.471	0.161	1.375
CDI		-0.079	0.133	1	0.716	0.924	0.602	1.416
STAI trait		0.004	0.058	1	0.809	1.004	0.970	1.040
EPI-C	Diet restriction	1.389	30.866	1	0.000	4.012	2.458	6.550
	External Eating	0.154	0.346	1	0.557	1.166	0.699	1.946
	Parental Pressure	-0.337	4.134	1	0.042	0.714	0.516	0.988
	Emotional Eating	-0.158	0.459	1	0.498	0.854	0.541	1.348

In the multivariate analysis of logistic regression, the dependent variant was the belonging group of BMI ("0" normal weight and "1" overweight/obesity). They included as predictor variables sex, Depression, Anxiety, Anger, Frustration, and Concern from the EES-C. The variables include Diet, Oral Control, and Bulimia from ChEAT-26. The CDI scale and STA-IC trait. The subscales of EPI-C Diet Restriction, External Eating, Parental Pressure, and Emotional Eating. The regression model presented values to the ranges of goodness in adjustment that confirmed the validity of the model (-2 Log Likelihood and Goodness of fit. $p>0.05$ and Model Chisquare and Improvement, $p<0.05$). Similar to the rest of the variables, a less oral control in the intake slightly increases the risk of overweight/obesity in 0.5 times (OR=0.42) approximately. The restrictions in diet highly increase the risk of overweight/obesity times 4 (OR= 4.02). The less pressure from parents over the intake slightly increases the risk of overweight/obesity by 0.7 times. The (Table 5) shows the model results; the significant variables were Oral Control from ChEAT-26, Diet Restriction, and Parental Pressure from EPI-C.

DISCUSSION

This study aimed to identify the specific psychological that determine emotional eating in a teenage scholar sample. It was expected to find a relationship between negative emotional status and mood with emotional eating patterns, and to prove, as in studies done with adults, that girls tend to be affected by emotional eating patterns more than boys do. Contrary to this hypothesis, there were only significant differences statistically significant in gender when referring to being emotionally concerned, and it was more in boys than in girls. In contrast, the expected gender differences in anxiety, anger, frustration, and depression emotions didn't appear.

In the variable emotional eating, there weren't found differences between the *normal weight* and overweight/obesity groups. Nevertheless, other research has established that children with overweight present higher emotional eating indicators.[33] Therefore, emotional eating can significantly impact overweight and obesity, which justifies a deeper investigation of emotional eating with the purpose of obesity prevention. Besides the sample group, significant associations between emotional eating (negative mood) and bulimic intake patterns were seen, pointing to a higher dependency on eating as a response to stimuli related to eating, apart from the intern status, such as satiety and hunger. Negative moods in appetite were also associated with higher parental control over eating.

Regarding obesity, as expected, less oral control in the intake increases the overweight/obesity risk. Conversely, less parental control slightly increased the risk of overweight/obesity; the highest risk was associated with diet restriction, being worried about food, and the fear of being overweight. It can result from parental pressure to promote a healthy diet, which teenagers can perceive as an imposition on their eating. It is necessary to mention the different emotions/moods related to emotional eating in boys and girls. Emotional eating in boys follows a diffuse and confused feeling (concern). In contrast, in girls, emotional eating comes from a group of similar psychological status, such as stress, problems, and strain/anxiety. Therefore, interventions may need to be adapted to the sex. It can indicate that efforts to reduce stress may work as helpful intervention methods to reduce food excess, specifically in girls.

At the same time, the strategies increase the understanding of the situations that can be more useful for boys. Although it was expected to find out that emotional eating is associated with depression and fatigue, it isn't. A possible explanation can be that the previous studies that support this hypothesis have worked with adults. The specific negative effect that leads to emotional eating may differ during adolescence. It could be that teenagers suffer more stress and confusion, while adults tend to suffer more depression and fatigue.[34] Then, a recent systematic revision showed heterogeneous findings with the associations between emotions (negative and positive) and stress related to eating in children and teenagers.[35] The last authors found that some studies inform about the associations between negative emotions (e.g., being bored, worried, loneliness, assertive tension) and eating (e.g., more candy intake, having an unhealthy diet, binge thoughts, control loss over eating).[36] At the same time, others reported that negative spontaneous emotions did not precede the eating control loss.[37] Some researchers found higher energy levels (vitality) associated with sweet drinks, but others did not observe a relationship between positive emotions (spontaneous and variable) and dietetic eating.[38]

While the reduced momentary capacity to face stress has predicted a higher intake of sweet food, some researchers have not found associations between sporadic stress and eating; it is, control loss when eating or intaking food and beverages.[38,39] When it comes to the limitations of this study, there is the transversal character that only allows us to determine which emotions or moods were experienced before emotional eating. Nevertheless, the nature of the emotional eating scale implies the direction of the association. Ecological Momentary Assessment (EMA) could help determine whether emotional eating episodes directly follow specific moods. The EMA allows the measure of events/factors as they happen.[40]

Nowadays, obesity represents a public health problem in many countries worldwide, mainly in the children-teenager population. It increased after the COVID-19 pandemic. Developing this type of research, which aims to know more about the possible behavior determiners that lead to the increase in weight, allows the identification of more efficient prevention mechanisms. Tackling emotional eating constitutes a valuable resource since it is a susceptible risk factor of modification from

the context, and parents, educators, and even individuals, which also opens different study areas.

CONCLUSION

Obesity in children and teenagers is a public health problem. Its prevention must be a priority; therefore, knowing and working on its risk factors is urgent.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Thompson RA. Emotion Regulation: a theme in search of definition. Monogr Soc Res Child Dev. 1994;59(2-3):25-52.
2. Gross JJ. Emotion regulation: Taking stock and moving forward. Emotion. 2013;13(3):359-65.
3. Cofré A, Gallardo G, Maripillán L. Sepúlveda L, Parra M. Depresión, ansiedad y estado nutricional en adolescentes de la ciudad de Temuco. Revis Electrón Metodol Aplica. 2022;24(1):13-25.
4. Arbués E. Martínez B. Granada JM, Echaniz E, Pellicer B, Juárez R, Guerrero S, et al. Conducta alimentaria y su relación con el estrés, la ansiedad, la depresióny el insomnio en estudiantes universitarios. Nutr Hospital. 2019;36(6):1339-45.
5. Prefit AB, Cândea DM, Szentagotai-Tătar A. Emotion regulation across eating pathology: A meta-analysis. Appetite. 2019;143:104438.
6. Brockmeyer T, Skunde M, Wu M, Bresslein E, Rudofsky G, Herzog W, et al. Difficulties in emotion regulation across the spectrum of eating disorders. Compr Psychiatry. abril de 2014;55(3):565-71.
7. Dougherty EN, Murphy J, Hamlett S, George R, Badillo K, Johnson NK, et al. Emotion regulation flexibility and disordered eating. Eat Behav. 2020;39: 101428.
8. Evers C, Adriaanse M, de Ridder DTD, de Witt Huberts JC. Good mood food. Positive emotion as a neglected trigger for food intake. Appetite. 2013;68:1-7.
9. Meule A, Reichenberger J, Blechert J. Development and preliminary validation of the Salzburg Stress Eating Scale. Appetite. 2018;120:442-8.
10. Jalo E, Konttinen H, Vepsäläinen H, Chaput JP, Hu G, Maher C, et al. Emotional Eating, Health Behaviours, and Obesity in Children: A 12-Country Cross-Sectional Study. Nutrients. 2019;11(2):351.
11. Munkholm A, Olsen EM, Rask CU, Clemmensen L, Rimvall MK, Jeppesen P, et al. Eating behaviours in preadolescence are associated with body dissatisfaction and mental disorders – Results of the CCC2000 study. Appetite. 2016;101:46-54.
12. van Strien T, Oosterveld P. The children's DEBQ for assessment of restrained, emotional, and external eating in 7- to 12-year-old children. Int J Eat Disord. 2008;41(1):72-81.
13. Jääskeläinen A, Nevanperä N, Remes J, Rahkonen F, Järvelin MR, Laitinen J. Stress-related eating, obesity and associated behavioural traits in adolescents: a prospective population-based cohort study. BMC Public Health. 2014;14(1):321.
14. Messerli-Bürgy N, Stülb K, Kakebeeke TH, Arhab A, Zysset AE, Leeger-Aschmann CS, et al. Emotional eating is related with temperament but not with stress biomarkers in preschool children. Appetite. 2018;120:256-64.
15. Ng M, Fleming T, Robinson M, Thomson B, Graetz N, Margono C, et al. Global, regional, and national prevalence of overweight and obesity in children and adults during 1980-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2014;384(9945):766-81.
16. Encuesta Nacional de Saludy Nutrición 2018. 2019. Available at: https://www.inegi.org.mx/contenidos/programas/ensanut/2018/doc/ensanut_2018_presentacion_resultados.pdf. Accessed on 20 November 2023.
17. Ruvalcaba Ledezma JC. La obesidad, un verdadero problema de salud pública persistente en México. J Negat No Posit Results. 2018;(8):643-54.
18. Tanofsky-Kraff M, Theim KR, Yanovski SZ, Bassett AM, Burns NP, Ranzenhofer LM, et al. Validation of the emotional eating scale adapted for use in children and adolescents (EES-C). Int J Eat Disord. 2007;40(3):232-40.
19. Trujillo-Hernández PE, Flores-Peña Y, Gomez-Melasio DA, Angel-García J, Lara-Reyes BJ. Análisis de las Propiedades Psicométricas de la Escala de Comer Emocional (Emotional Eating Scale [EES-C]) en Adolescentes Mexicanos. Rev Esp Nutr Humana Dietética. 2021;25(1):58-68.
20. Schacht M, Richter-Appelt H, Schulte-Markwort M, Hebebrand J, Schimmelmann BG. Eating pattern inventory for children: A new self-rating questionnaire for preadolescents. J Clin Psychol. 2006;62(10):1259-73.
21. Trujano P, de Gracia M, Nava C, Thomas M. Adaptation, validation and reliability of the Spanish version of eating pattern inventory for children EPI-C-C in a sample of Mexican adolescents. Int J Community Med Public Health. 2021;8(11):5163.
22. Maloney MJ, Mcguire JB, Daniels SR. Reliability Testing of a Children's Version of the Eating Attitude Test. J Am Acad Child Adolesc Psychiatry. 1988;27(5):541-3.
23. Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The Eating Attitudes Test: psychometric features and clinical correlates. Psychol Med. 1982;12(4):871-8.
24. de Gracia M, Marcó M, Trujano P. Factors associated with eating behavior in pre-adolescents. Psicothema. 2007;19(4):646-53.
25. Kovacs M. Inventario de depresión infantil. Madrid: TEA Publishers; 2004.
26. Allgaier AK, Frühe B, Pietsch K, Saravo B, Baethmann M, Schulte-Körne G. Is the Children's

Depression Inventory Short version a valid screening tool in pediatric care? A comparison to its full-length version. J Psychosom Res. 2012;73(5):369-74.
27. Miu AS, Yeager DS. Preventing Symptoms of Depression by Teaching Adolescents That People Can Change: Effects of a Brief Incremental Theory of Personality Intervention at 9-Month Follow-Up. Clin Psychol Sci. 2015;3(5):726-43.
28. del Barrio, V, Roa, M.L., Olmedo, M., Colodrón, F. Primera adaptación del CDI-S a población española. Rev Accion Psicológica. 2002;1(3):263-72.
29. Spielberger, Ch. Manual for the State-Trait Anxiety Inventory for Children. USA: Consulting Psychologists Press; 1973.
30. Buela-Casal, G., Guillén-Riquelme, A, Seisdedos, N. STAI, cuestionario de ansiedad estado-rasgo. Adaptación española. 8th ed. Madrid: TEA; 2011.
31. Cole TJ, Flegal KM, Nicholls D, Jackson AA. Body mass index cut offs to define thinness in children and adolescents: international survey. BMJ. 2007;335(7612):194.
32. Cohen J. Statistical Power Analysis. Curr Dir Psychol Sci. 1992;1(3):98-101.
33. Braet C, Claus L, Goossens L, Moens E, Van Vlierberghe L, Soetens B. Differences in Eating Style between Overweight and Normal-Weight Youngsters. J Health Psychol. 2008;13(6):733-43.
34. Peñate W, González-Loyola M, Oyanadel C. The Predictive Role of Affectivity, Self-Esteem and Social Support in Depression and Anxiety in Children and Adolescents. Int J Environ Res Public Health. 2020;17(19):6984.
35. Mason TB, Do B, Wang S, Dunton GF. Ecological momentary assessment of eating and dietary intake behaviors in children and adolescents: A systematic review of the literature. Appetite. 2020;144:104465.
36. Ranzenhofer LM, Engel SG, Crosby RD, Haigney M, Anderson M, McCaffery JM, et al. Real-time assessment of heart rate variability and loss of control eating in adolescent girls: A pilot study: Autonomic indices and loc eating in girls. Int J Eat Disord. 2016;49(2):197-201.
37. Goldschmidt AB, Smith KE, Crosby RD, Boyd HK, Dougherty E, Engel SG, et al. Ecological momentary assessment of maladaptive eating in children and adolescents with overweight or obesity. Int J Eat Disord. 2018;51(6):549-57.
38. Mason TB, O'Connor SG, Schembre SM, Huh J, Chu D, Dunton GF. Momentary affect, stress coping, and food intake in mother-child dyads. Health Psychol. 2019;38(3):238-47.
39. Dunton GF, Dzubur E, Huh J, Belcher BR, Maher JP, O'Connor S, et al. Daily Associations of Stress and Eating in Mother-Child Dyads. Health Educ Behav. 2017;44(3):365-9.
40. Shiffman S, Stone AA, Hufford MR. Ecological Momentary Assessment. Annu Rev Clin Psychol. 2008;4(1):1-32.

Cite this article as: Gracia MD, Trujano P, Nava C, Jiménez N. Emotional eating patterns in a sample of Mexican adolescents. Int J Community Med Public Health 2024;11:717-24.