Disordered eating behaviors and psychological correlates. Data from the Ensanut 2018-19

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Unikel-Santoncini C, Bojorquez-Chapela I, Hernández-Serrato MI, Villalobos-Hernández A. Disordered eating behaviors and psychological correlates. Data from the Ensanut 2018-19. Salud Publica Mex. 2022;64:471-477.
https://doi.org/10.21149/13464

Abstract

Objective. To analyze the relationship between disordered eating behaviors (DEB) and depressive symptoms, suicide attempts, and alcohol and tobacco use in adolescents in a national survey in Mexico. **Materials and methods.** Data from the *Encuesta Nacional de Salud y Nutrición* 2018-19 were used. Three levels of DEB were established: no risk (DEB-NR), moderate risk (DEB-MR), and high risk (DEB-HR). An ordinal logistic regression model was performed with level of DEB risk as a dependent variable. **Results.** National prevalence of DEB-MR was 6.0% (95%CI: 5.6, 6.5), while that of DEB-HR was 1.3% (95%CI: 1.1, 1.6). Suicide attempt (OR= 1.82, 95%CI: 1.02,3.25) and depressive symptoms (OR= 2.6, 95%CI: 1.40,4.98) were associated with being at a higher risk of DEB. **Conclusion.** Since both depressive symptoms and suicide attempt are associated with DEB, prevention strategies should consider interventions that simultaneously address the various mental health problems present in adolescence.

Keywords: disordered eating behaviors; adolescence; Mexico; comorbidities; body mass index; mental health

Unikel-Santoncini C, Bojorquez-Chapela I, Hernández-Serrato MI, Villalobos-Hernández A. Conductas alimentarias de riesgo y correlatos psicológicos. Datos de la Ensanut 2018-19. Salud Publica Mex. 2022;64:471-477.
https://doi.org/10.21149/13464

Resumen

Objetivo. Analizar la relación entre las conductas alimentarias de riesgo (CAR) y síntomas depresivos, intentos de suicidio, y consumo de alcohol y tabaco en adolescentes en una encuesta nacional en México. **Material y métodos.** Se utilizó la información de la Encuesta Nacional de Salud y Nutrición 2018-19. Se establecieron tres niveles de CAR: sin riesgo (CAR-SR), con riesgo moderado (CAR-RM) y con alto riesgo (CAR-AR). Se realizó un modelo logístico ordinal con CAR como variable dependiente. **Resultados.** La prevalencia nacional de CAR-RM fue 6.0% (IC95%: 5.6, 6.5), mientras que para CAR-RA fue 1.3% (IC95%: 1.1, 1.6). Intento de suicidio (RM= 1.82, IC95%: 1.02,3.25) y síntomas depresivos (RM= 2.6, IC95%: 1.40,4.98) se asociaron con mayor probabilidad de presentar CAR. **Conclusión.** Dado que los síntomas depresivos y el intento de suicidio se asocian con CAR, las estrategias de prevención deben tener en cuenta intervenciones que consideren simultáneamente los diversos problemas de salud mental presentes en los adolescentes.

Palabras clave: conductas alimentarias de riesgo; adolescencia; México; comorbilidades; índice de masa corporal; salud mental

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Received on: November 29, 2021 • **Accepted on:** April 12, 2022 • **Published online:** August 19, 2022
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Disordered eating behaviors (DEB) are a set of altered eating- and weight-related behaviors and attitudes that do not meet the diagnostic criteria to be considered eating disorders (ED) but are similar to them. Examples of DEB include restrictive diets, binge eating, use of laxatives, enemas, diuretics or anorectics, excessive physical activity, and self-induced vomiting.[1] Although they occur with less frequency, intensity, and duration than in a well-established ED, these actions are harmful to health and, like ED, are associated with affective disorders,[2] addictions[3] and suicide attempts,[4] among other psychopathologies. Studies report that there is a two-way relationship between DEB and depression,[5] while other etiological factors such as anxiety are caused by DEB, since failure to achieve the ideals of beauty creates a negative impact.[6,7] The research literature indicates independent etiologies for DEB and substance use.[8] Greater susceptibility to sociocultural pressure to achieve thinness increases the latter, bringing about certain changes that involve the quest for new sensations, emotional reactivity, conflicts between parents and children, depression and anxiety, scant parental support, and immature coping mechanisms.[9]

In Mexico, the same instrument for assessing DEB in adolescents has been included in three consecutive editions of the *Encuesta Nacional de Salud y Nutrición* (Ensanut).[10-12] In the 2006 evaluation, the prevalence found was 0.7% (0.9% in girls and 0.4% in boys) in the high-risk category,[13] whereas in the 2018-19 evaluation, the prevalence of DEB was 1.3% (1.9% in girls and 0.8% in boys).[12] The increase in prevalence in surveys was observed in the prevalence of normative DEB (recommended for obesity prevention), which changed from 11.9% in 2006 to 15.7%, and the prevalence of non-normative DEB (not recommended, such as losing control, overeating, exercising excessively, using laxatives, drugs or pills to lose weight), which increased from 12.1 to 21.9%.[14] The increase in CAR reported over the years may be due to the greater dissemination and use of social networks among young people, in which there is a proliferation of information that encourages the achievement of the thin aesthetic ideal of beauty and the stigma of obesity.[14]

The association between DEB and affective disorders has been documented in numerous studies, including one by Santos and colleagues,[15] who reported that 10% of their sample of adolescents of both sexes in the United States met the risk criteria in the Depression Scale of the Center for Epidemiological Studies (CES-D)[16] and for DEB measured with the EAT-26.[17] The correlation between the two variables was significant in both women ($r=.53$; $p<.01$) and men ($r=.50$; $p<.01$). Adolescents (N= 1 265) of both sexes aged 13.5 to 19 years in Sweden were measured with the SCOFF questionnaire and divided by a cluster analysis into six levels of intensity of DEB symptoms. The findings showed that at the levels with the highest number of DEB indicators, CES-D scores were also higher —between 21.71 and 30.17—, compared to the mean of 13.79 for those without DEB.[18]

Using a structural equation model in a sample of adolescents of both sexes, Brausch and Gutiérrez[19] found that the relationship between DEB and suicide ideation was statistically significant ($p<.01$), as between depression and suicide ideation and between DEB and depression ($p<.001$). According to the study by Solmi and colleagues,[20] DEB were associated with suicide ideation or suicide attempts (OR= 2.5; 95%CI= 1.7,3.6; $p<0.0001$) in the general population aged 16 to 90 years in South London (N= 1 698).

At the same time, regarding the comorbidity of DEB with the use of psychoactive substances, Field and colleagues[21] found that adolescent girls with DEB are twice as likely to report alcohol abuse (43.0 vs. 20.8%) as those without DEB. The opposite is also true: teenage girls who report alcohol abuse (43.0 vs. 20.8%) are more likely to report recent eating problems. Although substance use is thought to be less common in individuals involved in calorie restriction (such as restrictive anorexia nervosa) compared with individuals who engage in binge-purging behaviors,[22] some research indicates that alcohol and illicit drug use is high in individuals who restrict their intake,[23] suggesting that the study of DEB should encompass the entire spectrum of body weight and DEB diagnoses.

Tobacco use is also more common in adolescents with DEB than in those without them (45.6 vs. 21.6%), and adolescent girls who currently smoke tobacco report DEB more often (43.3 vs. 20.0%).[24]

The purpose of this article is to analyze the relationship between DEB and depressive symptoms, suicide attempts, and alcohol and tobacco use, using population data collected by the Ensanut 2018-19. Based on the literature, a positive relationship between DEB and depressive symptoms, suicidal ideation and attempt and alcohol and tobacco use is expected.

Materials and methods

Sample characteristics

Information from Ensanut 2018-19 was used for this article. This survey has national and state representation, based on a stratified, multi-stage, probabilistic cluster design, in which information was obtained from 44 069 household interviews, with a response rate of 87% for households and 98% for individuals.

Procedure

The methodological details and ethical aspects of Ensanut have been described above.[7] The survey was approved by the Ethics, Research and Biosafety commissions of the *Instituto Nacional de Salud Pública* (INSP) and adhered to the Declaration of Helsinki. Written informed consent was requested from the adolescents and their parents or guardians, together with consent from under-age subjects. Data collection was conducted from July 2018 to February 2019.[7] The final dataset contains data from 17 925 adolescents, representing more than 22 million people ages 10 to 19.

Definition of variables

DEB. DEB were measured using the Brief Questionnaire for Disordered Eating Behaviors (BQDEB).[25] This instrument comprises 10 questions measuring concern about weight gain, binge eating, restrictive (fasting, dieting, use of weight loss pills) and purging behaviors (use of diuretics, laxatives, and self-induced vomiting) in the three months prior to the evaluation, on a scale with four answer options: never or almost never, sometimes, frequently (twice a week), and very frequently (more than twice a week). A higher score implies more DEB. The scores were classified into three categories: 1) no risk (DEB-NR), score <7; 2) moderate risk (DEB-MR), score between 7 and 10; and 3) high risk (DEB- HR), score 10.[26] The cutoff >10 has sensitivity and specificity values of 0.81 and 0.78, respectively, for the identification of ED, with a positive predictive value of 0.38 and a negative predictive value of 0.96, and a Cronbach's alpha reliability of 0.83 in women from Mexico City.[25]

Depressive symptoms. Depressive symptoms were assessed with the short form of the Depression Scale of the Center for Epidemiological Studies (CESD-7), which has been used in the 2012 and 2018-19 Ensanut. [27] A score of nine or more was used as a cut-off value for the presence of depressive symptomatology.

Lifetime suicide attempts. This was constructed using the following question: Have you ever purposely injured, cut, intoxicated, or harmed yourself in order to kill yourself? The answer options were: "Yes, once", "Yes, twice or more", and "Never." A dichotomous variable was constructed: Yes=1 (if they answered "Yes, once," or "Yes twice or more") and No=0 (if they answered "never").

Alcohol and tobacco use. Current tobacco use (yes/no), current alcohol consumption (yes/no).

Other variables

We considered the following potential confounding variables: sex (male, female), age (10-11, 12-14, and 15-19 years), and body mass index (BMI). BMI (BMI=kg/m²) was calculated from weight and height measurements, and the Z score by age was obtained according to the reference standard of the World Health Organization.[28] Adolescents with Z scores above +1 and up to +2 standard deviations were classified as overweight, and those over +2 standard deviations, as obese. BMI between -5.0 and +5.0 Z scores were considered valid. BMI values outside the range of 10 and 58 were eliminated, as were all cases in which the height/age Z score was outside the acceptable limits (<-6 and>+6). Adolescent girls who reported being pregnant were also eliminated from the analysis.

Statistical analysis

A descriptive analysis of the frequencies of the variables of interest was conducted, from which the proportions and 95%CI were obtained. A bivariate analysis was subsequently performed using the Wald statistic to evaluate the independence between the categorical variables. Based on the bivariate analysis, those with a p value below 0.25 were selected as candidate variables for the ordinal logistic regression model, in addition to the theoretically important variables. An ordinal logistic regression model was conducted with the DEB level as the dependent variable, and depressive symptoms, suicide ideation and attempts, and alcohol and tobacco use as independent variables, controlling for confounding variables. The analysis considered the probabilistic sample design of the Ensanut and was conducted using Stata 14.0.*

Results

Table I shows that, in 2018-19, the national prevalence of DEB-MR was 6.0% (95%CI: 5.6, 6.5), and that of DEB-HR, 1.3% (95%CI: 1.1, 1.6). A higher prevalence of DEB-MR (6.8%, 95%CI: 6.1, 7.5) and DEB-HR (1.9%, 95%CI: 1.6, 2.4) was observed in girls. The prevalence of DEB-HR was higher in the higher age groups, with the highest being observed in adolescents aged 15 to 19 years (1.9%, 95%CI: 1.5, 2.3). DEB were also associated with BMI, and in adolescents with obesity, the prevalence of DEB-MR was 11.9% (95%CI: 9.7, 14.6), and that of DEB-HR, 3.0% (95%CI: 1.8, 4.8).

* StataCorp. Stata Statistical Software: Release 14. College Station, TX: StataCorp LP, 2015.

At the same time, the results show that 17.9% (95%CI: 15.2, 21.0) of adolescents with depressive symptoms exhibited DEB-MR, and 9.1% (95%CI: 6.9,12.0), DEB-HR. Regarding suicide attempts in the past year, it was observed that 12.5% (95%CI: 8.6,17.8) of adolescents with suicide attempt presented DEB-MR, and 8.3% (95%CI: 5.0,13.6), DEB-HR. With respect to tobacco use, 7.7% (95%CI: 5.7, 10.4) of the adolescents who were current smokers, and 7.5% (95%CI: 5.7, 9.9) of those who currently consumed alcohol exhibited DEB-MR, and 1.6% (95%CI: 0.8, 3.2) and 2.3% (95%CI: 1.2, 4.2) presented DEB-HR (table II).

According to the regression models controlling for confounding variables (table III), having attempted suicide (OR= 1.82, 95%CI: 1.02,3.25), and presenting depressive symptoms (OR= 2.6, 95%CI: 1.40,4.98) were associated with an increased likelihood of presenting DEB.

Table I

Prevalence of disordered eating behaviors, by variables of interest. Mexico, Ensanut 2018-19

Variable	*Disordered eating behaviors*									
	No risk			*Moderate risk*			*High risk*			*Total*
	*Frequency**	*%*	*95%CI*	*Frequency**	*%*	*95%CI*	*Frequency**	*%*	*95%CI*	*Frequency**
Total	21 207.1	92.7	92.1, 93.2	1 375.5	6.0	5.6, 6.5	302.9	1.3	1.1, 1.6	22 885.5
Sex‡										
Male	10 885.7	94.0	93.3, 94.6	610.7	5.3	4.7, 5.9	83.6	0.7	0.5, 1.0	1 1580
Female	10 321.3	91.3	90.5, 92.1	764.9	6.8	6.1, 7.5	219.2	1.9	1.6, 2.4	11 305.4
Age group (years)‡										
10-11	4 509	95.7	94.8, 96.5	185.4	3.9	3.2, 4.8	16.6	0.4	0.2, 0.6	4711
12-14	6 636.3	94.5	93.6, 95.2	311.4	4.4	3.8, 5.2	76	1.1	0.7, 1.6	7 023.7
15-19	10 061.8	90.2	89.3, 91.1	878.8	7.9	7.1, 8.7	210.2	1.9	1.5, 2.3	11 150.8
Type of locality of residence‡										
Urban	1 5748.9	91.9	91.2, 92.5	1 144.7	6.7	6.1, 7.3	240.6	1.4	1.1, 1.7	17 134.1
Rural	5 458.2	94.9	94.1, 95.6	230.9	4.0	3.4, 4.7	62.3	1.1	0.7, 1.7	5 751.3
Socioeconomic status‡										
Low	7 302.2	94.9	94.2, 95.6	308.7	4.0	3.5, 4.7	82.6	1.1	0.8, 1.5	7 693.5
Medium	7 093.1	91.8	90.8, 92.7	531.5	6.9	6.1, 7.8	102.5	1.3	1.0, 1.8	7 727
High	6 811.8	91.2	90.2, 92.2	535.4	7.2	6.3, 8.1	117.8	1.6	1.2, 2.1	7 465
BMI‡										
Severe thinness	15	96.8	79.4, 99.6	0.5	3.2	0.4, 20.6	-	-	-	15.5
Thinness	99.7	98.1	92.0, 99.6	1.9	1.9	0.4, 8.0	-	-	-	101.7
Normal	4 897.2	96.0	95.0, 96.7	174.3	3.4	2.8, 4.2	32.2	0.6	0.3, 1.2	5 103.8
Overweight	1 976.3	90.0	87.8, 91.8	177.2	8.1	6.5, 10.0	43.5	2.0	1.2, 3.4	2 197
Obesity	1 385.8	85.1	82.2, 87.6	194.3	11.9	9.7, 14.6	48.3	3.0	1.8, 4.8	1 628.5

* Frequency in thousands
‡ Value $p<0.05$, Wald test
BMI: Body mass index
95%CI: Confidence Interval to 95%
Ensanut 2018-19: *Encuesta Nacional de Salud y Nutrición* 2018-19

Table II
PREVALENCE OF DISORDERED EATING BEHAVIORS IN ADOLESCENTS BY RISKY BEHAVIORS AND MENTAL HEALTH INDICATORS. MEXICO, ENSANUT 2018-19

Variable	*Disordered eating behaviors*								
	No risk			*Moderate risk*			*High risk*		
	*Frequency**	*%*	*95%CI*	*Frequency**	*%*	*95%CI*	*Frequency**	*%*	*95%CI*
Currently smokes									
No	20 024	92.8	92.3, 93.3	1275	5.9	5.5, 6.4	282.4	1.3	1.1, 1.6
Yes	1 183.1	90.7	87.9, 93.0	100.5	7.7	5.7, 10.4	20.5	1.6	0.8, 3.2
Current consumes alcohol‡									
No	4 363.6	88.1	86.7, 89.3	466.4	9.4	8.3, 10.7	125.3	2.5	1.9, 3.3
Yes	1 369.1	90.2	87.4, 92.4	114.5	7.5	5.7, 9.9	34.4	2.3	1.2, 4.2
Depressive symptomatology (last week)‡									
No	20 188.6	93.9	93.4, 94.4	1 125.3	5.2	4.8, 5.7	175.3	0.8	0.6, 1.0
Yes	1 018.5	72.9	69.2, 76.4	250.2	17.9	15.2, 21.0	127.6	9.1	6.9, 12.0
Lifetime suicide attempt‡									
No	20 509.9	93.3	92.7, 93.8	1 241.3	5.6	5.2, 6.1	238.8	1.1	0.9, 1.3
Yes	697.1	77.9	73.6, 81.6	134.3	15	12.0, 18.6	64.1	7.2	4.9, 10.3

* Frequency in thousands
‡ Value $p<0.05$, Wald test
95%IC: Confidence Interval to 95%
Ensanut 2018-19: *Encuesta Nacional de Salud y Nutrición* 2018-19

Table III
ORDINAL LOGISTIC REGRESSION MODEL. MEXICO, ENSANUT 2018-19

Variable	*aOR**	*p*	*95%CI*
Sex			
Male	1.00		
Female	2.68	<0.001	1.77, 4.05
Currently consumes alcohol			
No	1.00		
Yes	1.11	0.666	0.70, 1.74
Currently smokes			
No	1.00		
Yes	1.07	0.857	0.52, 2.17
Lifetime suicide attempts			
No	1.00		
Yes	1.82	0.043	1.02, 3.25
Depressive symptoms			
No	1.00		
Yes	2.64	0.003	1.40, 4.98

aOR: Adjusted odds ratios
95%IC: Confidence Interval to 95%
Ensanut 2018-19: *Encuesta Nacional de Salud y Nutrición* 2018-19
*Adjusted for age, body mass index, type of residence locality and household socioeconomic status

Discussion

The main findings of the present study indicate that DEB is more prevalent in girls than in boys, in both the moderate and high-risk category. Likewise, DEB occur in a higher proportion in adolescents with obesity, compared to those in the overweight, normal weight, and underweight BMI categories. Adolescents with depressive symptoms and suicide attempts in the past year exhibited higher percentages of moderate and high DEB. Regarding tobacco use, DEB percentages were higher in those with current use in both DEB categories. Conversely, in subjects with current alcohol use, the results indicated that prevalence in both DEB categories is higher when alcohol is not currently consumed.

Although DEB is present in boys, the prevalence of high DEB is half that of girls, and in the moderate category, the prevalence, although lower than that of girls, is 5.3%, whereas in girls it is 6.8%. As is know, ED and DEB in boys is a topic that has recently been more studied. The study by Coelho and colleagues[29] shows that the age of onset of ED is lower in boys, while the BMI is higher at the time they are admitted for treatment; boys have a lower prevalence of anorexia nervosa and bulimia nervosa and a higher presence of other atypical dietary diagnoses, and despite the smaller weight loss, the medical consequences are significant.

The age group in which the presence of DEB predominates in the sample studied is 15 to 19 years in both the moderate and high-risk group, in comparison with younger adolescents. These results coincide with those found in previous surveys conducted in Mexico, so no change was observed in this regard.[10-13]

It was found in this study that both depressive symptoms and suicide attempts were associated with DEB. This is consistent with the findings of Swanson and colleagues,[30] according to which most subjects in their study met the criteria for at least one comorbid disorder; 33% of participants with subthreshold anorexia nervosa classified as having a mood disorder, while 23.3% classified as having subthreshold binge eating. Hudson and colleagues[31] reported that 63.6% of those with a subthreshold binge eating disorder and 76.5% with any type of binge disorder met the criteria for at least one DSM-IV comorbid diagnosis. According to the findings of Santos and colleagues[15] there is an association between DEB and depression in both men and women. Ten per cent were classified with depressive symptoms and DEB –a percentage lower than that found in the present study (17.9% for the moderate risk group), but similar to that of the high– risk group (9.1%). Other authors[32] found an association between depressive symptoms and attitudes that compromise health, such as an unsuitable diet and concerns over body weight that lead to DEB.

Goldschmidt and colleagues[33] report that DEB and depression symptoms increase in adolescence and are associated with harmful physical and psychological effects, anxiety, mood disorders, personality disorders, self-harm, and substance abuse. The dual path model of bulimic pathology[34] postulates that there are shared risk factors for DEB and negative affect.

In girls, DEB were significantly associated with suicide attempts (OR 2.53, 95%CI: 1.53,4.18), even after adjusting for demographic data and depressive symptoms (OR 2.41; 95%CI: 1.43,4.07), whereas no association was found in boys. Brausch and Gutiérrez[19] found higher DEB scores in adolescents of both sexes with suicide attempts and self-injury behaviors (X=61.93+-26.48) than in those without these behaviors (X=47.85+-12.77). Likewise, the presence of DEB predicts suicide attempts five years later, regardless of whether or not the adolescents exhibit depressive symptoms.[35]

By way of a conclusion, due to the absence in Mexico of surveys that may lead to an ED diagnosis, Ensanut has become a benchmark for the follow-up of these behaviors in the adolescent population. A higher prevalence in girls is confirmed, but it is also present in boys, in adolescents aged 15 to 19 years, and in urban areas; in addition, DEB is associated with depressive symptoms, a high BMI, and suicide attempts. The data shown highlight the importance of continuing to perform population studies of DEB in adolescents over time.[13] Public policies should include DEB prevention from a socioecological perspective encompassing individual, relational, community, and social aspects.[36] They should also consider a gender perspective to transform social systems towards equity, with an emphasis on the body as a seat of rights, agency and freedom.[37] The limitations of the study are related to the temporality of cross-sectional studies, which does not allow observing causality between the variables, and the fact that data are self-reported. However, this source of information provides an overview of population data, and, given the association between DEB and other mental health problems, prevention strategies should consider interventions may simultaneously address the various mental health problems present in adolescence.

Declaration of conflict of interests. The authors declare that they have no conflict of interests.

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