

Body Image Self-Perception and Risky Eating Behaviors in Medicine Undergraduate Students in Xalapa, Veracruz, Mexico (2014)

Autopercepción de la imagen corporal y conductas alimentarias de riesgo en estudiantes universitarios de medicina en Xalapa, Veracruz, México (2014)

Autopercepção da imagem corporal e condutas alimentares de risco em estudantes universitários de medicina em Xalapa, Veracruz, México (2014)

Mauricio Fidel Mendoza González, MIC, PhD;^{1*}

Guadalupe Jacqueline Olalde Libreros, MSP, PhD.²

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Abstract

Introduction: The current beauty standard is associated with thinness, a situation that alters the body perception and can lead to the development of an eating disorder. **Objective:** To determine the relationship between the indexes of body image dissatisfaction and body image distortion and risky eating behaviors (REB) in a university population of medicine students in Veracruz, Mexico. **Materials and Methods:** Cross-sectional analytical study, with a sample of 187 students. A register was drawn up that included the SFS-test to evaluate the body image and to estimate the indices of dissatisfaction and distortion of the body image, the Brief Questionnaire of Risky Eating Behaviors validated in Mexican population, as well as social variables. A descriptive analysis was carried out with basic measures of

¹ Public Health Institute, University of Veracruz, Regional Hospital "Luis F. Nachón".

² Faculty of Nutrition. University of Veracruz.

* Corresponding author: mmendoza@uv.mx

frequency and dispersion, bivariate and multimodal analyses were performed too. *Results:* 43 % were female, and the average age was 21 (± 1.7) similar in both sexes. The prevalence of high risk of REB was 8.6%, higher in men (9.4% versus 7.4%) and medium risk (23.5%) with the distribution reversed by sex (28.4% in women and 19.8% in men). The dissatisfaction index was 59.4% covering those who perceived having a higher weight than they would like to have. Concerning the distortion of the own body image it was observed that 41.2% supposed to have a higher weight than what resulted from the anthropometric evaluation. *Discussion:* Dissatisfaction rates showed a positive correlation gradient with REBS, being this more evident in men.

Keywords: Risky eating behaviors, index of body image dissatisfaction, index of body image distortion, body image, university undergraduate students, Mexico.

Resumen

Introducción: el estándar de belleza actual se asocia con la delgadez, situación que puede alterar la percepción corporal y consecuentemente conducir al desarrollo de algún trastorno alimentario. *Objetivo:* determinar la relación de los índices de insatisfacción y distorsión de la imagen corporal y las conductas alimentarias de riesgo (CAR), en una población universitaria de estudiantes de medicina en Veracruz, México. *Materiales y métodos:* estudio transversal analítico en una población de 187 estudiantes. Se elaboró una cédula que incluyó el SFS-test para evaluar la imagen corporal y estimar los índices de insatisfacción y distorsión de la imagen corporal; el Cuestionario Breve de Conductas Alimentarias de Riesgo validado en población mexicana, así como variables sociales. Se realizó análisis descriptivo con medidas básicas de frecuencia y dispersión, bivariado y multimodal. *Resultados:* el 43% eran mujeres y la edad promedio 21 años (± 1.7) similar en ambos sexos. La prevalencia de alto riesgo de CAR fue de 8.6%, superior en los hombres (9.4% frente a 7.4%) y del mediano riesgo 23.5% con la distribución invertida por sexo (28.4% en las mujeres y 19.8% en los hombres). El índice de insatisfacción fue del 59.4%, quienes percibieron tener mayor peso del que les gustaría tener y en la distorsión de la imagen corporal se observó que un 41.2% suponía tener mayor peso que el arrojado por la evaluación antropométrica. *Conclusión:* los índices de insatisfacción mostraron gradiente de correlación positivo con las CAR, siendo más evidente en los hombres.

Palabras clave: conductas alimentarias de riesgo, índice de insatisfacción corporal, índice de distorsión corporal, imagen corporal, estudiantes universitarios, México.

Resumo

Introdução: o standard de beleza atual associa-se com a magreza, situação que pode alterar a percepção corporal e consequentemente conduzir ao desenvolvimento de algum transtorno alimentar. *Objetivo:* determinar a relação dos índices de insatisfação e distorção da imagem corporal e as Condutas Alimentares de Risco (CAR), em uma população universitária de estudantes de medicina em Veracruz, México. *Materiais e métodos:* estudo transversal analítico, em uma população de 187 estudantes. Elaborou-se uma cédula que incluiu o teste SFS para avaliar a imagem corporal e estimar os índices de insatisfação e distorção da imagem corporal; o Questionário Breve de Condutas Alimentares de Risco validado em população mexicana, assim como variáveis sociais. Se realizou a análise descritiva com medidas básicas de frequência e dispersão, bivariado e multimodal. *Resultados:* o 43% foram mulheres e a idade média 21 anos (± 1.7) similar em ambos os sexos. A prevalência de alto risco de CAR foi de 8.6%, superior nos homens (9.4% versus 7.4%) e do mediano risco 23.5% com a distribuição invertida por sexo (28.4% nas mulheres e 19.8% nos homens). O índice de insatisfação foi de 59.4%, quem percebera ter maior peso do que gostaria ter, e a distorção da imagem corporal observara-se que um 41.2%,

quem supunha ter maior peso que o obtido pela avaliação antropométrica. *Conclusão:* os índices de insatisfação mostraram gradiente de correlação positivo com as CAR, sendo mais evidente nos homens.

Palavras-chave: condutas alimentares de risco, índice de insatisfação corporal, índice de distorção corporal, imagem corporal, estudantes universitários, México.

Introduction

Risky eating behaviors (REBS) are a problem of public health at a global level, affecting mainly the younger population, predominantly women; they involve physical aspects of the body image, as well as aspects of mental health and psychosocial conflict. As a pathological entity, they are characterized by compensatory and inadequate dietary actions, including concerns of gaining weight, uncontrolled binge eating, restrictive, purging eating behaviors, and physical exercise, that have as almost sole purpose to lose weight (1, 2).

REBS are considered as early or predictive stages of the disorders of eating behavior (DEBS): anorexia, bulimia and binge eating disorder, therefore, for its interpretation it is assumed that these originate in a diversity of comprehensive components that are useful for establishing primary prevention measures for mental pathology. However, there is controversy over this proposal for being pathognomonic of mental illnesses, with a specific classification in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV), nevertheless, the behavioral precedent can be understood as having common features even though such conditions imply multifactorial problems that probably arise from a complex interaction among biological, psychological, and environmental variables (3, 4).

Regardless of their origins, the REBS show an increasing magnitude in the young population, a fact that is gradually extending to not so young populations. Prevalence in a university population analogous to this study was estimated at 10%, with registers reaching almost 20% in specific degree courses in arts, with risk factors registered to a larger extent in women, in body image dissatisfaction and with traits of apparent verbal violence, a scope that seems to be common in various studies conducted in Mexico (5).

The body image perception can be understood as an internalized vision of the physical appearance that influences thought and behavior, therefore, it establishes a form of social representation that achieves a new symbolic value, in different moments in life of people, with a characteristic evolving maturation process (6).

Body and body image have a social symbol that contributes to cultural and personal identity, the body perception each individual creates of him/herself can or cannot be conditioned by the beauty standards, which are imposed by the media, even by those media oriented towards modifying health risks (7).

For Raich, dissatisfaction with the body image can cause emotional problems, particularly in adolescence and the first youth, these combine with feelings of low self-esteem and insecurity, and in general with a negative self-assessment. This, in turn, is a conditioning for the development of the perception of body distortion (8).

Distortions in the perception of the body image belong to the manifestations of eating disorders. The greater distortion can be linked to psychological and social factors, in periods of personal crisis, as may occur in adolescence (6). Someone is considered to have a distortion of the body image when he/she is a normal or low weight for his/her height and considers him/herself to be overweight (9).

Family, and particularly the influence of parents, of the media, of the cultural body stereotypes, and a period of psychosocial vulnerability in the young person can be explicative elements of such a distancing from the body objective reality, and be cause or effect of the relation to the REBS. Simultaneously they can also be promoters of a higher susceptibility to a chronic pathology related to eating (10).

The present work was conducted with the purpose of knowing the characteristics of a potentially distorted self-perception of the body image, dissatisfaction with it and its relation to the REBS, in a population of young undergraduate medicine students, in the city of Xalapa, Veracruz, in Mexico, in 2014. These students were considered a vulnerable population who, even belonging to the health area, are not free from being subject of the social pressure of meeting social beauty standards.

Materials and Methods

Type of Study

An analytical, cross-sectional observational study was performed.

Participants

A statistically representative sample of 187 undergraduate medicine students of a public university in the state of Veracruz in the Mexican region of Xalapa was selected. All students enrolled and registered in the medicine degree course in its five annual cycles of formal education at the time when the study was conducted were considered eligible (n = 600).

In order to select the study population, the general sample size formula was used and applied to the students universe using a known prevalence of a previous study in the same university, with a confidence level of 95 %, 5 % tolerable error, adding 30 % of non-response or loss rate, obtaining a sample estimate of 184 students (5). A proportionate

stratified selection was made considering the distribution of each yearly course degree and subsequently a simple random sampling (11).

Instruments

A questionnaire that included three sections was designed: the first section dealt with the visual self-assessment of the body image and included the use of the modified Standard Figural-Stimuli (SFS), which is a test widely used in epidemiological researches for approaching this issue. It comprises nine figures for women and men (range: 1 = very thin up to 9 = very obese), in an ordinal distribution, where participants select the silhouette they think was the best representation of their present silhouette, then they identify the ideal silhouette, this being necessary to integrate the Index of Body Image Dissatisfaction (IBIDSS) and the comparative perception performed in contrast to the Body Mass Index (BMI) in order to estimate the Index of Body Image Distortion (IBIDT) (12).

Section number two of the instrument incorporated the assessment of sociodemographic data, school identification and basic anthropometry, needed to estimate the BMI ($=\text{weight}(\text{kg})/\text{height}^2[\text{m}]$) and the abdominal girth (AG), according to the standard measure criteria, in centimeters, for the Mexican population, these were compared with the tables used in the Health System in Mexico that are useful in determining diagnoses of overweight, obesity and presumptive cardiovascular risk due to central obesity according to the abdominal referent (13).

Body measurements were taken before breakfast and a calibrated scale with a fixed stadimeter and measuring tape for measuring abdominal circumference were used. All measurements were performed by experienced and trained personnel, who were single-blind concerning the questionnaire. The classification considerations for the present work, according to the BMI parameters, classified the study participants in underweight ($\text{BMI} < 18.5$), normal weight ($\text{BMI} = 18.5\text{-}24.99$), overweight ($\text{BMI} \geq 25$) and obese ($\text{BMI} \geq 30$). For the condition of obesity and risk based on the abdominal circumference, participants were classified as high risk (men ≥ 90 cm and women ≥ 80 cm) and low risk (men < 90 cm and women < 80).

The study asked about the parent's achieved degree of formal education and the state of nutritional health each student perceived of his/her parents, as well as the self-perceived condition of state of health and of nutritional health, the behavioral habits concerning having breakfast at home before going to school or performing daily activities, extracurricular sporting or artistic recreation activities, and also the time they spent watching tv and using the computer.

For assessing the REBS, the Brief Questionnaire of Risky Eating Behaviors (CBCAR, for its initials in Spanish), validated in the Mexican population, with a Cronbach alpha internal

consistency value of 0.83, a cut-off point of ≥ 10 for determining risk, with a sensitivity of 0.81 and a specificity of 0.78, was used (14). This includes ten Likert-type scale questions, that use for measurement purposes four qualitative ordinal dimensions of the studied action, namely “never or rarely” (= 0), “sometimes” (= 1), “often, twice a week” (= 2), and “very often, more than twice a week” (= 3), which compose three integral factors: binge or purging, compensatory measures and restrictive measures. Scores for assessing the presence of risk of developing REBS were from 0 to 6, low risk or absence of risk; from 7 to 10, medium-risk, and over 10, high risk (15).

Data Analysis

A descriptive analysis was conducted using measurements of central trend, frequency and dispersion; the prevalence calculation as a proportion was interpreted for each hundred students; for the bivariate analysis, the odds ratio (OR) for prevalence (pOR) was used as association measure; and for the multivariate analysis a multimodal model controlled by the variable gender. An analysis of mean difference was conducted to assess the estimated indexes. A *p* value less than or equal to 0.05 was considered a significant value. The analysis was carried out using SPSS Statistics version 23 software.

Ethical Concerns

The present work was evaluated and approved for realization by the Research and Ethics in Research Committee of the Xalapa Regional Hospital “Dr. Luis. F. Nachón” of the Veracruz Health Services in Mexico; and was assigned the registration number JSV/HRLFN/2014/3. It was considered to be an observational study with no risk for the research participants, even so, previous to the interview, a document of informed consent, *ex profeso* written, was read, as well as an explanation was made on the condition of trustworthiness of the personal data, the use of data exclusively for scientific purposes, and of the possibility of not accepting the personal data inclusion in the study and of withdrawing from the study at the moment the participant wished to.

Results

Information was obtained from 187 medicine undergraduate students, homogenously and proportionally selected from five degrees of one-year duration. 43.3% were female, and average age was 21 years old ($\pm 1.7/R=18-27$), analogous in both genders ($P > 0.05$).

Table 1. Anthropometric characteristics, healthy habits and self-perception of state of health and of nutrition, by gender. Medicine undergraduate students in Xalapa, Veracruz, Mexico, 2014

Individual Characteristic of the Student	Dimension	Gender					
		Women		Men		Total	
		Number	%	Number	%	Number	%
Body Mass Index	Underweight (< 18.5)	5	6.2	7	6.6	12	6.4
	Normal (18.5-24.99)	51	63.0	65	61.3	116	62.0
	Overweight (≥ 25)	18	22.2	22	20.8	40	21.4
	Obesity (≥ 30)	7	8.6	12	11.3	19	10.2
	Total	81	100.0	106	100.0	187	100.0
Abdominal Circumference	Low risk	49	60.5	71	67.0	120	64.2
	High risk	32	39.5	35	33.0	67	35.8
	Total	81	100.0	106	100.0	187	100.0
Breakfast before Going to School	YES	51	63.0	64	60.4	115	61.5
	NO	30	37.0	42	39.6	72	38.5
	Total	81	100.0	106	100.0	187	100.0
Complementary Physical Activity	YES	33	40.7	62	58.5	95	50.8
	NO	48	59.3	44	41.5	92	49.2
	Total	81	100.0	106	100.0	187	100.0
Self-Perception of State of Health	Excellent	4	4.9	10	9.4	14	7.5
	Very good	13	16.0	25	23.6	38	20.3
	Good	33	40.7	44	41.5	77	41.2
	Fair	31	38.3	24	22.6	55	29.4
	Poor	0	0.0	3	2.8	3	1.6
	Total	81	100.0	106	100.0	187	100.0
Self-Perception of the State of Nutrition	Undernourished	4	4.9	7	6.6	11	5.9
	Normal	62	76.5	71	67.0	133	71.1
	Obese	15	18.5	28	26.4	43	23.0
	Total	81	100.0	106	100.0	187	100.0

Note: Body Mass Index (weight [kg]/height² [m]): Underweight [<18.5], normal [18.5-24.99], overweight [25-29.9], obese [≥ 30]. Abdominal circumference: high risk: men ≥ 90 cm, women ≥ 80 cm.

Based on the BMI, 6.4% were classified as underweight; 21.4% as overweight; and 10.2% as obese, the latter was higher in men. The abdominal circumference catalogued as high risk was higher in women. Concerning the lack of habits considered to be healthy, 38.5% of the interviewed students are not used to have breakfast before going to school or starting daily activities. An even higher percentage (49.2%) reached the lack of physical activity, which was greater in women (59.3% versus 41.5%).

The condition “self-perceived health” registered 31% of the students in a fair or poor state of health, a percentage that in the item “fair” was 69% higher in women, in contrast to the item “poor” where only men registered their self-perception of state of health. 26% of the men in this cohort perceived themselves as obese, in contrast to 18.5% in the women, a percentage that in the men is also higher in the item malnutrition (table 1).

Based on what was referred by the students, 64.7% of the parents of this student community were registered in the higher schooling levels of undergraduate and postgraduate degrees, and within these entries, mothers reached higher figures in complete undergraduate degrees, but fathers in postgraduate degrees, even if it was frequent that information about the father was referred as being unknown or the student was not living with him, a fact that is not frequent concerning the mother.

As to the factor state of nutritional health of the parents perceived by the students, about half of them were considered overweight or obese, presenting a higher frequency in the case of the mothers (50.3 versus 46.5 of the fathers), with almost homogeneous perceptions depending on whether it was expressed by a woman or a man. There were differences in the situation perceived of the father, since this is of 53.1% if a woman refers it, and 41.5% if it is a man who expresses his perception (table 2).

Prevalence of Risky Eating Behaviors (PREB) in the investigated student’s population was of 8.6 for each 100 students for the item high-risk, and 23.5 for medium risk, a proportion that was higher in men for the former (9.4 versus 7.4%), and in the women for the latter (28.4 versus 19.8%), with a pondered prevalence ratio 22% higher in women (table 3).

The prevalence analysis for dichotomic variables by the item potential risk for developing REB showed, for BMI, higher values in the item malnutrition for high-risk and similar in the medium risk, an analogue pattern observed in male and female students, respectively. The existence of abdominal obesity concentrated higher prevalence values in high and medium risk for the population at large, in women, and in men only in the item medium risk for REB.

Table 2. Perceived or known characteristics of schooling and nutritional state of parents. Medicine undergraduate students. Xalapa, Veracruz, Mexico, 2014

Characteristics Perceived in the Parents	Dimension	Student's Gender					
		Women		Men		Total	
		Number	%	Number	%	Number	%
Achieved Schooling Degree of the Father	No schooling degree	2	2.5	2	1.9	4	2.1
	Complete primary school	1	1.2	7	6.6	8	4.3
	Complete secondary school	7	8.6	6	5.7	13	7.0
	Complete high school	9	11.1	13	12.3	22	11.8
	Complete undergraduate degree	36	44.4	52	49.1	88	47.1
	Postgraduate degree	15	18.5	20	18.9	35	18.7
	Don't know	1	1.2	0	0.0	1	0.5
	I don't live with my father	8	9.9	4	3.8	12	6.4
	My father is dead	2	2.5	2	1.9	4	2.1
	Total	81	100	106	100	187	100
Achieved Schooling Degree of the Mother	No schooling	0	0.0	1	0.9	1	0.5
	Complete primary school	2	2.5	7	6.6	9	4.8
	Complete secondary school	6	7.4	13	12.3	19	10.2
	Complete high school	19	23.5	17	16.0	36	19.3
	Complete undergraduate degree	45	55.6	49	46.2	94	50.3
	Postgraduate degree	9	11.1	18	17.0	27	14.4
	Don't know	0	0.0	0	0.0	0	0.0
	I don't live with my mother	0	0.0	1	0.9	1	0.5
	My mother is dead	0	0.0	0	0.0	0	0.0
	Total	81	100	106	100	187	100
(Perceived) State of Nutrition of the Father	Normal	30	37.0	53	50.0	83	44.4
	Overweight	30	37.0	31	29.2	61	32.6
	Obese	11	13.6	11	10.4	22	11.8
	Very obese	2	2.5	2	1.9	4	2.1
	I don't know	8	9.9	9	8.5	17	9.1
	Total	81	100	106	100	187	100

(continue)

Characteristics Perceived in the Parents	Dimension	Student's Gender					
		Women		Men		Total	
		Number	%	Number	%	Number	%
(Perceived) Nutritional State of the Mother	Normal	41	50.6	50	47.2	91	48.7
	Overweight	26	32.1	45	42.5	71	38.0
	Obese	13	16.0	8	7.5	21	11.2
	Very obese	1	1.2	1	0.9	2	1.1
	I don't know	0	0.0	2	1.9	2	1.1
Total	81	100	106	100	187	100	

Table 3. Prevalence of risky eating behaviors based on predisposing conditions, by gender. Undergraduate medicine students in Xalapa, Veracruz, Mexico (2014)

Potential Risk Conditions for REB	Dichotomous Dimensions	Gender of the Student								
		Woman			Man			Total		
		<i>Prevalence of Risky Eating Behaviors by Sector</i>								
		High	Medium	Low	High	Medium	Low	High	Medium	Low
Body Mass Index	Malnutrition	10.0	30.0	60.0	17.1	19.5	63.4	14.1	23.9	62.0
	Normal	5.9	27.5	66.7	4.6	20.0	75.4	5.2	23.3	71.6
Abdominal Obesity	Positive	9.4	31.3	59.4	8.6	28.6	62.9	9.0	29.9	61.2
	Negative	6.1	26.5	67.3	9.9	15.5	74.6	8.3	20.0	71.7
Achieved Schooling Degree of the Father	Undergraduate and higher degrees	7.8	27.5	64.7	11.1	22.2	66.7	9.8	24.4	65.9
	Lower than undergraduate	5.3	26.3	68.4	0.0	14.3	85.7	2.1	19.1	78.7
Achieved Schooling Degree of the Mother	Undergraduate and higher degrees	5.6	35.2	59.3	14.9	23.9	61.2	10.7	28.9	60.3
	Lower than undergraduate	11.1	14.8	74.1	0.0	13.2	86.8	4.6	13.8	81.5
Breakfast before Going to School	NO	10.0	26.7	63.3	7.1	23.8	69.0	8.3	25.0	66.7
	YES	5.9	29.4	64.7	10.9	17.2	71.9	8.7	22.6	68.7
Complementary Physical Activity	NO	4.2	27.1	68.8	0.0	9.1	90.9	2.2	18.5	79.3
	YES	12.1	30.3	57.6	16.1	27.4	56.5	14.7	28.4	56.8
(Perceived) State of Nutrition of the Father	Malnutrition	11.6	34.9	53.5	11.4	20.5	68.2	11.5	27.6	60.9
	Normal	0.0	20.0	80.0	5.7	20.8	73.6	3.6	20.5	75.9

(continue)

Potential Risk Conditions for REB	Dichotomous Dimensions	Gender of the Student								
		Woman			Man			Total		
		<i>Prevalence of Risky Eating Behaviors by Sector</i>								
		High	Medium	Low	High	Medium	Low	High	Medium	Low
(Perceived) State of Nutrition of the Mother	Malnutrition	7.5	37.5	55.0	11.1	18.5	70.4	9.6	26.6	63.8
	Normal	7.3	19.5	73.2	8.0	22.0	70.0	7.7	20.9	71.4
Self-Perception of the State of Health	Regular to fair	9.7	35.5	54.8	7.4	22.2	70.4	8.6	29.3	62.1
	Good to excellent	6.0	24.0	70.0	10.1	19.0	70.9	8.5	20.9	70.5
Self-Perception of the State of Nutrition	Malnutrition	5.3	42.1	52.6	14.3	20.0	65.7	11.1	27.8	61.1
	Normal	8.1	24.2	67.7	7.0	19.7	73.2	7.5	21.8	70.7
Total Prevalence (/100 Students)		7.4	28.4	64.2	9.4	19.8	70.8	8.6	23.5	67.9

Note: Body Mass Index = Malnutrition (Overweight = BMI 25-29.9 + Obesity = BMI ≥ 30), normal (Normal < 25); abdominal obesity = positive (high risk, men ≥ 90 cm, women ≥ 80 cm).

Parents’ schooling, when it was equal or higher to undergraduate degree, marked the pattern of higher prevalence values for high-risk REB, a similar condition for men and women concerning the father’s schooling, but not for the mother’s schooling, where this value was the opposite. REB prevalence related to the lack of the habit of having breakfast before going to school or starting daily activities was higher in men for medium risk and for high risk in women. The item “performing complementary physical activity” showed higher prevalence values when talking about carrying out this activity.

A malnutrition state perceived in the parents showed the highest high-risk REB prevalence in the population in general, with ostensible differences in men. The self-perception state of health and of nutrition showed a similar behavior of being higher when it was focused in the combined item of fair to poor and marked an heterogeneous pattern to the observed prevalence by gender (table 3).

Table 4. Risk for risky eating behaviors. Medicine undergraduate students in Xalapa, Veracruz, Mexico 2014

Variables	Dichotomous Risk Dimensions	reb		Statistical Analysis					
		Positive	Negative	por	ic 95%	P Value	P_Mult Value		
Body Mass Index	Malnutrition	27	44	1.54	0.83	-	2.89	NS	NS
	Normal	33	83						
Abdominal Obesity	High risk	26	41	1.60	0.85	-	3.02	NS	NS
	No risk	34	86						

(continue)

Variables	Dichotomous Risk Dimensions	reb		Statistical Analysis			
		Positive	Negative	pOR	IC 95 %	P Value	P_Mult Value
Achieved Schooling Degree of the Father	Undergraduate degree and higher	42	81	1.92	0.87 - 4.23	NS (0.07)	NS
	Lower than undergraduate degree	10	37				
Achieved Schooling Degree of the Mother	Undergraduate degree and higher	48	73	2.90	1.41 - 5.99	0.01	0.006
	Lower than undergraduate degree	12	53				
Breakfast before Going to School	NO	24	48	1.10	0.59 - 2.06	NS	NS
	YES	36	79				
Complementary Physical Activity	NO	19	73	0.34	0.18 - 0.66	0.001	0.001
	YES	41	54				
(Perceived) State of Nutrition of the Father	Malnutrition	34	53	2.02	1.04 - 3.92	0.02	0.03
	Normal	20	63				
(Perceived) State of Nutrition of the Mother	Malnutrition	34	60	1.42	0.76 - 2.63	NS	NS
	Normal	26	65				
Self-Perception of the State of Health	Fair or poor	22	36	1.46	0.76 - 2.81	NS	NS
	Good to excellent	38	91				
Self-Perception of the State of Nutrition	Malnourished	21	33	1.53	0.79 - 2.97	NS	NS
	Normal	39	94				

Note: POR = Prevalence odds ratio; IC95% = Interval by 95% reliability, Pvalue = statistical P value; P_Multi value = P value of the multivariate analysis controlled by the student's gender; REB = risky eating behaviors; positive REB = high and medium risk; negative REB = low REB risk; NS = not statistically significant.

The association of explicative variables for the existence of (high and medium risk) risky eating behaviors showed significant possibility values, increased almost threefold when the mother's schooling was equal or higher than undergraduate degree (OR 2.90; IC95% 1.41-5.99; P<0.05); twofold when there was a perception of malnutrition of the father in overweight and obesity (OR 2.02; IC95% 1.04-3.92; P<0.05); as well as the risk reduction in 66% when the student expressed not performing any complementary physical activity (OR 0.34; IC95% 0.18-0.66; P<0.05), variables that preserved the significance level after the multimodal logistic regression analysis adjusted by the student's gender (table 4).

Table 5. Frequency of the analytical dimensions of the Index of Body Image Dissatisfaction (IBIDss) and the Index of Body Image Distortion (IBIDt), according to the risk for the risk for eating behaviors. Undergraduate medicine students in Xalapa, Veracruz, Mexico (2014)

Analytical Dimensions of Indices of Body Image Dissatisfaction and Body Image Distortion		Risky Eating Behaviors							
		High Risk		Medium Risk		Low Risk		Total	
		Num-ber	Fre-quency	Num-ber	Fre-quency	Num-ber	Fre-quency	Num-ber	Fre-quency
Index of Body Image Dissat- isfaction	Being lower weight than he/she really is	0	0.0	1	2.3	28	22.0	29	15.5
	Without body image dis-satisfaction	1	6.3	9	20.5	37	29.1	47	25.1
	Being higher weight than desired	15	93.8	34	77.3	62	48.8	111	59.4
	Total	16	100	44	100	127	100	187	100
Index of Body Image Distor- tion	Being higher weight than he/she supposed to be	7	43.8	17	38.6	53	41.7	77	41.2
	Without body image dis-tortion	2	12.5	13	29.5	31	24.4	46	24.6
	Being lower weight than he/she supposed to	7	43.8	14	31.8	43	33.9	64	34.2
	Total	16	100	44	100	127	100	187	100
Total Frequency		8.6		23.5		67.9		100.0	

Through frequency analyses of the IBIDSS and the IBIDT it was established that concerning the former six out of ten students perceive being a higher weight than they would like to be (59.4%), showing an increase gradient as the risk for REB (48.8%, 77.3% and 93.8%) grows, this is more evident in female students; 15.5% perceive being a lower weight than they would like to be.

Regarding the body image distortion, 41.2% were established to be a higher weight than they supposed to be according to the BMI anthropometric assessment, a value that keeps higher in the items of low and medium risk (41.7% and 38.6%). For this distortion condition in those classified in high-risk there was an increased bimodal frequency, when they perceived they were a higher weight than they supposed they were; and, at the other end, when they observed themselves as being a lower weight than they supposed they were; however, this condition was more common in those men with high risk for REB, where it reached 60%. The opposite was established with the indicator for women where the greater frequency was reached when they thought being a lower weight than they actually were (66.7%) or suppose to be, related to the anthropometric confirmation, a percentage that was 34.2% in the general population (table 5).

Concerns about gaining weight, together with diets and exercise trying to lose weight composed the integral dimension of restrictive measures that jointly showed the highest frequency, concerning practices carried out by the medicine students in this respect. The prevalence of this dimension was 30.5 % in practices conducted frequently and very frequently. Regarding the measures of binge eating or purging, the indicator for over-eating or binge eating registered the highest frequency (27.3 %). This population showed low values in the compensatory measures, where the intake of weight-loss pills by 5.9 % of the interviewees was evidenced, as well as the use of diuretics by 1.6 %, and the use of laxatives by 0.5 % (data not presented).

Discussion

The present work was carried out with the purpose of establishing the characteristics of the potentially distorted self-perception of the body image, the dissatisfaction with the body weight and the relation these traits may have with REBS, these can include altered behaviors in the food intake with actions intended to lose body weight. Almost all of them are harmful to health and are currently considered an increasing problem of public health affecting mainly the adolescent and young population (16).

Perception of the health state, the body image or those traits of distortion or dissatisfaction that suggest a higher weight could have a determinant incidence in life styles that are operationally linked to unhealthy weight loss actions, as long as the body imaginary remains bound to a thin silhouette according to stereotype-based standards of our time; a condition that implies the connection with increased, and further growing, prevalence values in such a vulnerable sector of the population as the adolescent and young people are (17).

Prevalence of high-risk REB (>10 CBCAR points) esteemed in this study (8.6 %) was higher than the figures of the National Health and Nutrition Survey 2012 that was targeted to the adolescent population (10 to 19 years old) and presented a prevalence value of 3.1 %. However, the discrepancy in the analyzed population age and its nation representativity are analogue to the REB individual explicative components, such as concerns about gaining weight, overeating and losing control of what one eats, as well as practicing exercise in order to lose weight that were evidenced in this study (18).

Most studies carried out to identify REBS have focused on populations younger than the population in the present work and present low prevalence values, although with an increase behavior in women over time (16). Avila Sanchez et al. carried out a study in young people, aged between 15 and 27 years old, living in the Mexican state Nuevo

Leon, that used some components of the CBCAR and allowed obtaining indicators close to risky eating behaviors. The prevalence esteemed by them reached 38.2 %, this figure is similar to the integrated components of high (8.6 %) and medium (23.5 %) risk, in this work it was 32.1 % (1).

In the last years the concern has been also related to assess older populations in order to establish the REB diagnosis. Studies conducted in populations similar to the population of the present study show prevalence values lower than those presented in this work, that has a particular connotation since a relevant lack of healthy practices in connection with physical exercise and eating habits was observed precisely in medicine students; analogous to what has been observed in the study by Reynaga-Ornelas et al. in university students enrolled in health sciences in Yucatan, Mexico, where additionally other complementary risk practices were evidenced (19).

A comprehensive central point of this work lies in the self-perception of the body image, the representation and primacy of social belonging for human beings, a factor that has presently contributed to a greater concern about the physical appearance and achieving the current sociocultural body ideal. Within this framework it is obvious to consider adolescence and youth as a critical period where healthy eating habits and life styles are developed. Attention should be drawn to discrepancy facts in this population sector where poor eating habits, low physical activity and unfavorably life styles can coexist with altered patterns of the own self-perception, thus favoring the vulnerability of practicing REB (20).

In the genesis of the REBS as part of the DBA the body image dissatisfaction has been mentioned as a preponderant criterion. Body image dissatisfaction is recurrent since the representation of the own body is negative, even if the body figure does not fall into the category of overweight. A large percentage of women perceive themselves as having a higher body weight than they would desire to have, and this body image dissatisfaction is frequently the first step in developing an eating pathology, a condition that has been evidenced in other studies and that has presently reached values close to 60 %, with an increase gradient as the REB prevalence grew, a finding that in other series has been considered to have also a direct connection with the effect of an interiorization of the aesthetic ideal (21, 22).

In this study overweight and obesity prevalence was estimated in 31.6 % of the evaluated students, parallel to a risk abdominal circumference of 35.8 %. Higher risk conditions for REB were found in men in relation to the BMI, and in women when the measure was connected to an abdominal circumference of high cardiovascular risk: values similar to what has been reported by other studies conducted in Mexican university students (23).

Practicing physical activity in adolescence seems to be a factor that runs in tandem with a raised self-esteem, and, at the same time, is a protecting factor for risky eating behaviors. Beato-Fernandez et al. ascertained a protective effect of the positive self-esteem on body image dissatisfaction (24). For its part, Hausenblas and Fallon proved that a negative image is a relevant component and predictor of a range of health problems, eating disorders among them (25). In our study, the proportion of young people who don't practice any kind of physical activity is close to 50%; additional to a self-perception of the state of health defined as fair or poor in 31 %, which reached in women values 38 %. Likewise, a study reported that in active women there was a high self-esteem prevalence (70.2 %) and less dissatisfaction with the own body image (26).

The habit of not having breakfast leads to an inadequate diet, as it has been proved in other studies; this practice has been particularly observed in university students, combined with the practice of weight loss diets and the use of diuretics. Here we estimate that four out of ten students do not have breakfast before starting their daily activities, a value similar to the reported data of a comparative study performed with young people in Mexico City and in the state of Michoacan (20). On the other hand, following weight loss diets and practicing exercise with the purpose of losing weight were proved to be the integral dimension of restrictive measures that together showed the highest frequency (27).

The composition of the family environment plays a substantial role in the possibility of developing risky eating behaviors; schooling undergraduate degree or higher degrees and the perception of obese parents showed in the present study an increase in risk, particularly the mother's achieved schooling degree and the father's state of nutrition are of importance. However, additionally to this fact, there are conditions or habits that can be considered healthy and can help, such as the custom of having breakfast or practicing physical exercise, but not as a restrictive activity; and family circumstances that in other studies are assumed to be positive and healthy for the social dynamics (28).

The pressure of the body image, particularly in women, starts in the early ages and fear to obesity is more than a health problem, it is expressed as an evaluative dimension that must be learned in infancy, it is an information produced and primarily given by the mother, who, in addition, is very often directly responsible of feeding the family, by consolidating expressions focused on the body image at the time of selecting healthier food, by choosing those "non-fattening" products (29).

With findings analogous to other scientific reports, it was evidenced that a significantly larger proportion of women with risk of eating disorder showed a high level of dissatisfaction with the body image (9). Undergraduate students enrolled in health sciences, with an inadequate body self-perception and following a diet, presented a larger possibility of being in eating disorder risk ($P < 0.01$). In those who did not have breakfast

nor refreshments in breaks, prevalence of risk for eating disorders reached 41.1 % and 36.1 %, respectively ($P < 0.05$) (30).

The relationships between body dissatisfaction and distortion, anthropometric indicators and risk practices, and the highest frequency or the probability of being carriers of REB in the present study are evident, as they are also observed in other works: a study conducted in Brazil with 743 nutrition students and dietitians showed that over 50 % were dissatisfied with their body image, although severe dissatisfaction was observed only in 26.7 %. Overweight women were more likely to be dissatisfied with their body image (31).

This study can be considered an exploratory work, in a line of research relatively new for Mexico, with a vastness of studies that revolve around studying behavior eating disorders, particularly around the REBS in young populations, specifically in university students enrolled in health sciences, but that contrast with aspects of the body image perception, a condition that can presently be understood as a problem of global public health of particular relevance due to its growing magnitude, its condition as an effect or a cause of various disorders that are facilitators of morbidity, disability and potential premature mortality.

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