



Comparison of the Body Mass Index (BMI) and the Perception of Body Image in Adolescents from a Conurbation Municipality of Yucatán

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ABSTRACT

Adolescence is a time of important changes at all levels, and a vital stage for health prevention. The objective of the work is to analyze the concordance between the BMI and the perception of body image in students of a suburban community. Materials and methods. Quantitative, observational, cross-sectional study carried out on 120 students, 52.5% men and 47.5% women, aged between 12 and 16 years, from a suburban town in the City of Mérida. Self-administered questionnaire with the Stunkard pictogram, to record the perception of body image. To calculate the body mass index (BMI), anthropometric measurements of weight and height were recorded, updated at the school. Results. The findings, regarding the perception of body image, showed a non-significant discrepancy ($k = -.007$, $p = .876$); in women it was insignificant and not significant ($k = .051$, $p = .434$); As for men, non-significant discrepancy was observed ($k = -.056$, $p = .332$). Conclusions. When performing the Kappa analysis in a general way, no significant agreement was found in the sample. When analyzing by sex, only insignificant (poor) concordance and no statistical significance were found in women.

Keywords: Índice de masa corporal, Imagen corporal, Adolescencia, Yucatán.

INTRODUCTION

Adolescence is the part of the life cycle that corresponds to the transition from childhood to adulthood. For the WHO, this stage includes 10 years and up to 19 years. Adjustment stage that causes some uncertainty, which influences the way of feeling, thinking, self-esteem and also in learning for decision-making and relationships with others. their family, school and social environment (WHO 2022) [1].

Adolescent health becomes important for prevention, through strategies of comprehensive education, self-care so that the transition to adult life is carried out in the best conditions and care habits are strengthened. In terms of physical health and emotional well-being, eating and physical exercise play an important role in maintaining a healthy body and body image and giving them self-esteem in this changing stage.

Body image is associated with the risks of eating disorders such as anorexia nervosa and bulimia, health problems present in adolescents and can lead to physical, psychological and social problems (Castejón-Martínez et al 2016) [2].

Body image is a mental representation that may or may not correspond to the real physical appearance, being important the attitudes and evaluations that the person develops of his body. Thus, body image comprises various dimensions: perceptual (perception of the body in its entirety or in part); cognitive (assessments regarding the total or partial body); affective (includes feelings, total or partial attitudes towards the body) and behavioral (refers to actions or behaviors based on the assessment or perception of the body) (Vaquero-Cristóbal et al 2013 [3]; Serna de Pedro, 2004 [4]).

The 2018 National Health and Nutrition Survey reported that, in the group of adolescents, the main risky eating behaviors were: concern about gaining weight, eating too much and losing control over what is eaten. In men (12.6%), in women (12.4%) (Shamah-Levy et al 2020) [5].

Sámano et al (2015) [6] in their study of adolescent and adult population found that in 50% of the participants there was concordance between the self-perceived CI and the real BMI (Sámano, R; Rodríguez-Ventura A.L 2015) [6].

On the other hand, Pérez et al. (2020) [7], when studying two secondary schools in Yucatán, found that students from both municipalities who registered excess weight underestimated their BMI with ignorance as a health problem (Pérez-Izquierdo et al 2020) [7].

The objective of the study was to determine the concordance between BMI and the perception of body image in adolescents from a suburban population of the City of Mérida, with rapid population growth and high social marginalization.

MATERIALS AND METHODS

Quantitative, observational, cross-sectional study with a universe of 120 high school students, an amount that corresponds to the total number of students who met the criteria of being enrolled in the 2018-2019 cycle of a suburban community in Mérida, Yucatán, Mexico and would meet the requirements such as having an updated record of weight and height and the informed consent of parents and students.

The community was selected for being highly marginalized and being in a conurbation area. A self-administered questionnaire was applied to the students, with prior informed consent from the tutors, to collect general information and about the perception of body image with the Stunkard pictogram. Body image perception (BIP) was obtained by asking the participant to select the figure with which they currently perceive themselves, from among nine different numbered body figures for men and women. The selected silhouette was rated as follows: 1: as low weight; from 2 to 5: normal; from 6 to 7: overweight and from 8 to 9: obesity. For analysis purposes, BMI was categorized into four categories: underweight, normal, overweight, and obesity. The cut-off points were those established by the World Health Organization.

To calculate the degree of concordance between the categorized BMI and the perception of body image, the Kappa Coefficient was calculated. The assessment of the kappa coefficient was analyzed based on the criteria of Landis and Koch (1977) [8]. To carry out the statistical processing of the information, the SPSS version 23 program was used.

RESULTS

120 high school students were studied. 52.5% were men and 47.5% women, aged between 12 and 16 years. At the time of the survey, 32.5% were between 12 and 13 years old, 65% between 14 and 15, and lastly, 2.5% were 16. The minimum height was 1.1m. and the maximum of 1.85m. with an average of 1.54 m; Regarding weight, the average was 53.6 kilos, with a minimum of 23 kilos and a maximum of 84 kilos. When categorizing the calculated BMI, 8% of the sample were underweight, 44% normal weight, followed by 30% overweight and 18% obese. In contrast, when analyzing the perception of body image, it was found that 44% of the sample perceived themselves as underweight, 45% as normal weight, followed by 10% as overweight and 1% as obese. In general, the young people studied underestimate overweight and obesity and overestimate underweight. (Table 1)

Table 1: Mass index and body image perception of a sample of high school students from a suburban community of Mérida, Yucatán

Body image perception	BMI					Kappa value	P value
	Under weight	Normal	Overweight	Obesity	Total		
Under weight	8	30	14	1	53 (44%)	.007	.876
Normal	1	21	19	13	54 (45%)		
Overweight	0	2	2	8	12 (10%)		
Obesity	0	0	1	0	1 (1%)		
Total	Total	53 (44%)	36 (30%)	22 (18%)	120		

When performing the Kappa analysis in a general way, no significant agreement was found in the sample. Analyzing by sex, it was observed that, according to the BMI calculated in men, 5% of the sample were underweight, 43% normal weight, followed by 28% overweight and 24% obese. However, according to their perception, 44% are underweight, 38% are normal weight, 16% are overweight, and 2% are obese. With regard to women, according to the calculated BMI, 10% were underweight, 46% normal weight, 32% overweight and 12% obese, while 44% of them perceived themselves as underweight, 53% saw themselves as normal weight, 3% overweight and none obese. Concordance analysis found negligible (poor) concordance and no statistical significance in women. (Tables 2 and 3)

Table 2: Comparison of BMI with Perception of Body Image in male high school students from a suburban community in Mérida, Yucatán

Body image perception	BMI					Kappa value	P value
	Under weight	Normal	Overweight	Obesity	Total		
Under weight	2	17	8	1	28 (44%)	.056	.332
Normal	1	9	8	6	24 (38%)		
Overweight	0	1	1	8	10 (16%)		
Obesity	0	0	1	0	1 (2%)		
Total	3 (5%)	27 (43%)	18 (28%)	15 (24%)	63		

Table 3: Comparison of BMI with Perception of Body Image in female high school students from a suburban community in Mérida, Yucatán

Body image perception	BMI					Kappa value	P value
	Under weight	Normal	Overweight	Obesity	Total		
Under weight	Under weight	13	6	0	25 (44%)	.051	.434
Normal	Normal	12	11	7	30 (53%)		
Overweight	Overweight	1	1	0	2 (3%)		
Obesidad	Obesity	0	0	0	0		
Total			18 (32%)	7 (12%)	57		

CONCLUSIONS AND DISCUSSION

In general, what was found in this study indicates a distortion of body image, since almost half (44%) perceived themselves as underweight, even though they had a normal weight and underestimated their status if they were overweight or obese.

By sex, the same trend was observed as that reported for the entire sample, although the underestimation of overweight or obesity was more marked in women.

These results agree with those reported by Vega-Medina et al in 2019 [9] in Yucatán, Mexico and partially with those observed by Oliva-Peña et al in 2016 [10] also in Yucatán.

The results, in terms of the kappa value, are similar to those found by Durán (2013) [11] and Araujo (2010) [12] regarding low concordance; as well as the tendency of young people, especially women, to underestimate obesity.

Taking into account the results obtained, it is important to keep in mind that student groups, especially adolescents, are a population at high risk for developing eating disorders and that these disorders are closely related to concern about their body image, which it affects their self-esteem, especially because they are inserted in a culture that favors stereotyped body image (Ocampo-Barrio and Pérez-Mejía 2010) [13].

It is necessary to implement educational and information strategies on image distortions and their relationship with risky eating disorders that are focused on the youth population, as well as physical activation and healthy eating programs.

References

- [1]. WHO. Adolescent health. Retrieved at: https://www.who.int/es/health-topics/adolescent-health#tab=tab_1: Access date: 01/21/2022.
- [2]. Castejón-Martínez, M.Á.; Berengüí-Gil, R.; Garcés de los Fayos-Ruiz, E. Relationship of body mass index, weight perception and variables related to eating behavior disorders in university students. *Clinical nutrition and hospital dietetics*, 2016, vol. 36, no 1, p. 54-63.

- [3]. Vaquero-Cristóbal R, Alacid F, Muyor J, López-Miñarro P. Body image. Bibliographic review. *Nutr Hosp.* 2013 Jan-Feb; 28(1):27-35.
- [4]. Serna de Pedro, Immaculate. "Introduction: alterations of body image." *Psychiatry Monographs* 16.2 (2004): 1-2.
- [5]. Shamah-Levy T, Vielma-Orozco E, Heredia-Hernández O, Romero-Martínez M, Mojica-Cuevas J, Cuevas-Nasu L, Santaella-Castell JA, Rivera-Dommarco J. National Health and Nutrition Survey 2018-19: National results. Cuernavaca, Mexico: National Institute of Public Health, 2020. Downloaded from: [Ensanut.insp.mx/encuestas/ensanut2018/doctos/informes/ensanut_2018_informe_final.pdf](https://ensanut.insp.mx/encuestas/ensanut2018/doctos/informes/ensanut_2018_informe_final.pdf)
- [6]. Samano, R; Rodriguez-Ventura A.L.; Sanchez-Jimenez, B; Estela Ytelina Godínez-Martínez, E.Y.; Norway, A; Marien-Garza, R.Z. and Grandson. J. Body image satisfaction in Mexican adolescents and adults and its relationship with body self-perception and real body mass index. *Nutr Hosp.* 2015;31(3):1082-1088.
- [7]. Pérez-Izquierdo O., Fernández-Caro M., Aranda-González I, Ávila-Escalante M. L., Cruz-Bojórquez R. M. Comparison between body perception and body mass index in high school students from two municipalities of Yucatán. *Hospital Horizon*, Vol 19; no.1 2020.
- [8]. Landis, J. RM and Koch, G. G. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*, 1977, p. 363-374.
- [9]. Vega-Medina M, Hoil-Santos J, Cambranes-Puc L, Oliva-Peña Y and Andueza-Pech, M. Body mass index, risky eating behaviors and body image perception in high school students in Yucatán , Mexico. *Journal of Health Sciences* September 2019 Vol.6 No.20 8-13.
- [10]. Oliva-Peña Y, Ordóñez-Luna M, Santana-Carvajal A, Marín-Cárdenas A, Andueza Pech G, Gómez Castillo I. Concordance of BMI and body image perception in adolescents from a suburban town in Yucatán. Vol. 27, No. 2, May-August 2016.
- [11]. Durán S, Rodríguez M, Record J, Barra R, Olivares R, Tapia A, et al Self-perception of body image in university students from Chile and Panama. *Rev Chile Nutr.* 2013 Mar, 40(1): 26-32.
- [12]. Araujo-Cora L; Dumith S, Menezes A, Hallal P. Measured weight, self-perceived weight, and associated factors in adolescents. *Rev Panam Public Health* 2010 May; 27(5):360-367.
- [13]. Ocampo-Barrio P, Pérez-Mejía AN. Beliefs and perceptions of obese people about obesity. *SEMERGEN-Family Medicine.* 2010 jul-jul; 36(6): 325-331.