

ORIGINAL

Weight-specific quality of life and nutritional status of adolescents in northeastern of Mexico

Calidad de vida específica del peso y estado nutricio de adolescentes del noreste de México

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ABSTRACT

Introduction: overweight and obesity in adolescents are related to psychological consequences, so it is important to explore the variable of weight-specific quality of life in this population.

Objective: to examine the differences in the weight-specific quality of life of adolescents according to their nutritional status in northeastern Mexico.

Method: 104 adolescents participated. Participants completed a self-administered questionnaire that included measures of weight-specific quality of life. Height, weight and body mass index (BMI) were measured.

Results: 53,8 % of the participants were male (n=56), 16,34 % (n=17) were overweight and 31,7 % (n=33) had some degree of obesity. Of the overweight-obese adolescents, 56,7 % reported a lower quality of life with respect to their weight (Cramer's V = 0,142, p = 0,352). In general, it was found that adolescents more frequently reported a lower quality of life (73,2 %) with respect to their weight.

Conclusions: in his sample Mexican adolescents, overweight and obesity was associated with significantly lower weight-specific quality of life. Interventions that integrate strategies for emotional self-care related to body weight are recommended.

Keywords: Quality of Life; Overweight; Obesity; Body Weight; Adolescents.

RESUMEN

Introducción: el sobrepeso y obesidad (SP-OB) en adolescentes se encuentran relacionados con manifestar consecuencias psicológicas, por lo que resulta importante explorar la variable de calidad de vida específicamente del peso en esta población.

Objetivo: examinar las diferencias de la calidad de vida específica del peso de adolescentes de acuerdo con su estado nutricio, en el noreste de México.

Método: participaron 104 adolescentes. Los participantes completaron un cuestionario autoadministrado que incluía medidas de calidad de vida específica de peso. Se midieron la altura, el peso y se determinó el índice de masa corporal (IMC).

Resultados: el 53,8 % de los participantes pertenecía al sexo masculino (n = 56), el 16,34 % (n = 17) tenía SP y el 31,7 % (n = 33) algún grado de obesidad. El 56,7 % de los adolescentes con SP-OB refirió una menor calidad de vida con respecto a su peso (V de Cramer = 0,142, p = 0,352). En general, se encontró que los adolescentes

mostraron más frecuente una menor calidad de vida (73,2 %) con respecto al peso.

Conclusiones: en esta muestra adolescentes mexicanos, el SP-OB se asoció con una calidad de vida específica del peso significativamente menor. Se recomiendan intervenciones que integren estrategias para el autocuidado emocional, relacionadas con el peso corporal.

Palabras claves: Calidad de Vida; Sobrepeso; Obesidad; Peso Corporal; Adolescentes.

INTRODUCTION

The high incidence of overweight (OW) and obesity (OB) in adolescents represents one of the main public health challenges in Mexico, as more than a third of them, approximately 41,1 % of adolescents between the ages of 10 and 19, suffer from these conditions.⁽¹⁾ An adolescent with OP has a higher chance of developing obesity in adulthood, which translates into a higher risk of morbidity and premature mortality,⁽²⁾ because obesity is a significant risk factor for the development of cardiometabolic diseases such as type 2 diabetes and coronary heart disease.⁽³⁾ In addition, insulin resistance, dyslipidemia, and hypertension, which are predictors of chronic noncommunicable diseases, are more common in adolescents with PCOS-OB.⁽⁴⁾

The adolescent stage, spanning from ages 10 to 19, involves not only significant physical changes but also psychological, behavioral, and emotional development, influenced by the social and cultural pressures and expectations that accompany the transition to adulthood.⁽⁵⁾ The changes in lifestyle and diet that occur during this stage often lead to a progressive increase in the prevalence of SP-OB, which, in addition to having physical repercussions, has significant psychosocial consequences that impair the adolescent's quality of life.⁽⁶⁾

Scientific evidence shows that the association between psychosocial factors, specifically quality of life and nutritional status, such as dissatisfaction with body shape, concerns about weight, and the use of unhealthy behaviors for weight control, increases the risk among adolescents.^(7,8) In addition to the above, adolescents with obesity consistently report a lower quality of life,^(9,10) which has been found to improve with weight loss.^(11,12) These studies emphasize the importance of weight-specific quality of life (WSQOL) as a valid tool for evaluating the relationship between SP-OB status and psychosocial factors. By definition, WPQ refers to how weight can positively or negatively affect adolescents' perceptions of their psychological and emotional well-being, self-esteem, body image, social relationships, and access to their environment.

In this regard, research on the relationship between quality of life specifically related to body weight among adolescents has lagged behind that of adults.^(13,14) A review of the literature⁽¹⁵⁾ examined the association between body weight and quality of life in three specific psychosocial domains: 1) sense of self, 2) social life, and 3) environmental factors, and reports extensive evidence of the relationship between these psychosocial factors and obesity, providing explanations of the possible behavioral and pathophysiological mechanisms underlying this association.^(16,17,18,19,20)

Although studies have linked body mass index (BMI) to quality of life in adolescents, in Mexico, the evidence is limited and does not explicitly address weight-related quality of life from a psychosocial perspective. This gap makes it challenging to design contextualized interventions that address both physical aspects and emotional and social well-being. In particular, in northeastern Mexico, a convergence of sociocultural factors is evident that could strengthen this relationship: a strong food culture based on diets high in meat and processed foods, rapid urbanization accompanied by reduced physical activity, and socioeconomic inequalities that impact body image and health. These characteristics make it particularly relevant to analyze the relationship between nutritional status and CVEP in adolescents in this region, as there may be dynamics that differ from those reported in other parts of the country.

Within this framework, the study aimed to investigate differences in CVEP among adolescents aged 13 to 16 years, based on their nutritional status, in northeastern Mexico.

METHOD

A cross-sectional study was conducted. The population consisted of adolescents enrolled in public secondary schools in Monterrey, Nuevo León, from May to September 2024. The institutions were selected from the list of secondary schools provided by the Ministry of Public Education in the central area of the city. Three schools were chosen at random, and the institution that granted the corresponding authorization was finally included in the study.

The adolescents were selected using non-probability convenience sampling.⁽²⁰⁾ This type of sampling was used due to the logistical and administrative restrictions inherent in accessing educational institutions, as well as the need to obtain authorization from administrators and guardians during a specific data collection period. It is acknowledged that this strategy limits the external validity and generalizability of the findings; however, it was the most feasible approach given the field conditions, allowing for a sufficient sample size to meet the

exploratory objectives of the study.

The sample size reached was 104 adolescents. The statistical power calculation was based on a significance level of 0,05, a power of 80 %, and a medium effect size, which indicated that a minimum of 102 participants were required to detect significant differences between groups. Therefore, the sample obtained was adequate for the study objectives.

The CVEP questionnaire was self-administered in a classroom designated by the school authorities. It was administered in groups, in the presence of previously trained nursing staff, who provided general instructions and answered questions during the administration. The average response time was 20 to 25 minutes. To ensure understanding of the items, a prior explanation of the response format was provided, and it was verified that the adolescents understood the scales before beginning the application.

Inclusion criteria

- Adolescents who stated that they were participating voluntarily
- Adolescents of both sexes
- Adolescents between 12 and 15 years of age

Exclusion criteria

- Adolescents with chronic diseases that could alter their growth or body weight (diabetes, high blood pressure, thyroid problems, cancer).

Measurements

Weight-related quality of life was assessed using the Youth Quality of Life-Weight (YQOL-W) instrument ⁽²²⁾, which consists of 21 items with three domain scores (sense of self, social life, and environmental factors) and a total score. The instrument was developed through qualitative work with a multicultural sample of young people with SP-OB in the US and Mexico. Additionally, it has demonstrated measurement properties, including construct validity, internal consistency, test-retest reliability, and responsiveness to change. ^(22,23) All items were administered using an 11-point response scale ranging from 0 to 10. Items were scored on a scale of 10, with 10 indicating the best outcome. The items were scored on a scale of ten, with ten indicating the best quality of life. The measures for each of the three domains and the total score of the instrument were dichotomized into “higher quality of life” (above the 50th percentile) and “lower quality of life” (below the 50th percentile).

Anthropometric measurements

Anthropometric measurements were taken by nursing staff who were trained to perform these procedures. Weight and height measurements were taken for the adolescents. Weight was measured using a SECA model 813 electronic scale, with an accuracy of 0,1 kilograms. Height was measured using a conventional SECA 213 stadiometer. The adolescent's weight and height data were used to calculate their BMI and classify them into percentiles according to the WHO guidelines for malnutrition (BMI < 3 percentile), underweight (BMI ≥ three and < 15, normal weight BMI ≥15 and <85, SP BMI in the percentile ≥ 85 and <97, and OB BMI ≥ 97 percentile. They were then grouped into three categories: 1) underweight (malnutrition and underweight); 2) normal weight (normal weight); and 3) SP-OB (overweight-obesity), which was considered the gold standard.

Procedure

Subsequently, adolescents were invited to participate in the study, and those who met the inclusion criteria were informed that their participation would involve completing a questionnaire and having their weight and height measured.

A meeting was then convened with the parents or guardians of the adolescents who expressed interest in participating to explain the purpose of the research and the procedures to be carried out, as well as to obtain their signature of consent and assent.

After the informed consent and assent forms were signed, the questionnaires were administered, and anthropometric measurements were taken of the adolescents at the location assigned by the school administrators, at times that did not interfere with school activities.

Statistical analysis

A descriptive analysis of the sociodemographic variables and the CVEP scores was performed. The Chi-square test was used to evaluate the association between nutritional status (classified by BMI) and dichotomized CVEP (high/low according to the 50th percentile). To compare the continuous mean scores of the CVEP domains (sense of self, social life, and environmental factors) and the total score between the different BMI groups, a one-way ANOVA test was applied. A p-value <0,05 was considered statistically significant. The analysis was performed using SPSS version 25.

Ethical considerations

The study was approved by the Ethics and Research Committee of the Faculty of Nursing at the Autonomous University of Nuevo León (approval number FAEN-D-2018). Authorization was requested from the secondary school administration, and informational meetings were held with the rest of the educational institution's staff. All adolescents who signed the informed consent form and submitted it, along with a form signed by their parent or guardian, were included.

RESULTS

53,8 % of the participants were male ($n = 56$) and the average age was 14,19 years ($SD = 0,573$). Regarding nutritional status, 43,26 % ($n = 45$) of adolescents were found to be of normal weight, 16,34 % ($n = 17$) were overweight, and 31,7 % ($n = 33$) were obese to some degree. A significantly higher proportion of male participants had SP-OB (27,88 %) compared to female participants (20,19 %).

Subsequently, we investigated whether there was a relationship between nutritional status and weight-specific quality of life (WSQL) in adolescents. Of the adolescents with SP-OB, 34,6 % reported a lower quality of life; likewise, adolescents who were underweight and of normal weight perceived a lower quality of life (5,8 % and 33,7 %, respectively). A contingency table was constructed, and no significant association was found ($\chi^2 = 2,09$, $gl = 2$, $p = 0,352$). Cramer's V value was 0,142, indicating a weak association between the two variables. The information is shown in table 1.

Table 1. Association between adolescent nutritional status and weight-specific quality of life			
Gold standard	Weight-specific quality of life		Total
	Lower	Higher	
Underweight	6 (5,8 %)	3 (2,9 %)	9 (8,7 %)
Normal weight	35 (33,7 %)	8 (7,7 %)	43 (41,3 %)
SP-OB	36 (34,6 %)	16 (15,4 %)	52 (50 %)
Total	77 (74 %)	27 (26 %)	104 (100 %)

Next, to describe weight-specific quality of life, the average values for each of the dimensions were calculated according to nutritional status classification, checked for normal distribution, and the F-test was applied to verify whether the means were different. The information is presented in table 2.

Table 2. Descriptive statistics of the dimensions of weight-specific quality of life according to the nutritional status of adolescents								
Dimensions	Gold standard						F	P
	Underweight		Normal weight		SP-OB			
	Average	DE	Average	DE	Average	DE		
I	28,89	32,95	35,11	34,06	41,51	34,03	0,491	0,689
Social	29,44	30,44	28,24	28,08	31,79	30,63	0,151	0,929
Environment	32,89	34,77	25,82	28,61	33,23	28,87	1,159	0,329

Subsequently, based on the average values for adolescents, they were classified as lower quality and higher quality. It was found that adolescents more frequently reported a lower quality of life (73,2 %) with respect to weight; the information is presented in table 3.

Table 3. Weight-specific quality of life of participating adolescents		
CDVJ-P	F	%
Lower quality	77	73,3
Higher quality	28	26,7

Subsequently, based on the average values for adolescents, they were classified as lower quality and higher quality. It was found that adolescents more frequently reported a lower quality of life (73,2 %) with respect to weight; the information is presented in table 3.

In the ANOVA analyses, although no statistically significant differences were observed in the mean scores of the QOL domains according to nutritional status, effect size measures were calculated. The eta-squared value (η^2) was less than 0,01 in all cases, which corresponds to a very small effect size, confirming the absence of relevant differences between groups.

To verify whether there were differences between weight-specific quality of life and BMI in adolescents, the ANOVA test was applied. It was found that the highest mean BMI was in adolescents who had a higher quality of life (mean = 2,48, SD = 0,70), $F = 0,400$, $p = 0,05$; the information is shown in table 4.

Table 4. Weight-specific quality of life and BMI of adolescents					
CDVJ-P	Adolescent BMI				
	n	Mean	SD	F	p
Lower quality	77	2,39	0,632	0,400	0,05
Higher quality	28	2,48	0,700		

DISCUSSION

The results of this study did not show statistically significant differences in QOL scores between nutritional status groups. This finding contrasts with several previous studies that have documented a lower quality of life in overweight or obese adolescents compared to their normal-weight peers.^(16,17,18,20) However, it is also consistent with research reporting that, in certain samples, differences in QOL may be small or not reach statistical significance due to sample size, participant heterogeneity, or sociocultural context.^(24,25,26)

Although no significant differences in QOL scores were identified, it was observed that, in descriptive terms, adolescents with SP-OB tended to report lower averages compared to those of normal weight. This trend, although weak, suggests that psychosocial factors, such as body dissatisfaction, stigma, and low self-esteem, may be influencing the perception of quality of life, even though the differences did not reach statistical significance. This pattern is consistent with previous evidence showing that obesity in adolescents is often associated with an increased risk of *bullying*, discrimination, and difficulties in social relationships, which negatively affects their emotional and social well-being.^(16,17,18,20)

On the other hand, it was also found that underweight or normal-weight adolescents had low scores on the CVEP, suggesting that both excessive and deficient weight can affect the perception of well-being. However, the consequences tend to be more pronounced in the context of SP-OB. This finding reinforces the idea that body image perception and social pressure regarding weight impact quality of life in adolescence, regardless of nutritional category.

The findings of this study should be interpreted with caution. The sample size was small and selected for convenience, which reduces statistical power and limits the generalizability of the results. With a larger and more representative sample, more apparent differences would be detected, as reported in other studies. Furthermore, the cross-sectional design prevents the establishment of causal relationships between nutritional status and CVEP.

Despite these limitations, this study provides initial evidence on PQOL in adolescents in Monterrey, a region with specific sociocultural characteristics (eating habits, rapid urbanization, and socioeconomic inequalities) that may influence the relationship between weight and quality of life. These findings have practical implications: even without significant differences, the high proportion of adolescents reporting low QOL underscores the need for school and community programs that integrate psychosocial components in addition to physiological ones to promote the overall well-being of young people.

Future research should explore WPQOL in larger, more representative samples, incorporate longitudinal designs, and utilize multivariate models that enable the analysis of interactions between nutritional, emotional, and social factors. This will allow the design of culturally adapted interventions that address the unique needs of adolescents in Mexico. This study has several strengths, including the use of a particular and validated instrument to measure weight-related quality of life in Mexican adolescents.⁽²²⁾ It also contributes to filling the knowledge gap on this topic in northeastern Mexico. It lays the foundation for further research that delves into the complex relationships between nutritional status and the psychosocial well-being of adolescents.

CONCLUSIONS

In conclusion, the results of this study are consistent with those of other studies, which have shown that adolescents with SP-OB predominantly experience a lower weight-specific quality of life. Furthermore, it reinforces the importance of comprehensive healthcare in improving the quality of life for adolescents, highlighting the need for a multidisciplinary approach that addresses not only nutritional status and body weight, but also the psychological and social factors that influence overall well-being. Intervention programs

that combine a psychosocial and physiological approach are needed to help combat the OB epidemic in Mexico.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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