

Self-Esteem and Nutritional Status of Preadolescent Schoolchildren from Two Populations of Indigenous Households in the Mezquital Valley, Mexico

Autoestima y Estado Nutricional de Escolares Preadolescentes de Dos Poblaciones de Hogares Indígenas del Valle del Mezquital, México

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Abstract:

This study aims to evaluate the relationship between self-esteem and nutritional status in preadolescent schoolchildren from indigenous households in the Mezquital Valley, Mexico. A quantitative, cross-sectional, and descriptive approach was conducted in a probabilistic sample of 309 children (aged 8–12 years). Participants were selected through school-grade stratified sampling in the municipalities of Tezontepec de Aldama and Ixmiquilpan during 2024. Sociodemographic and anthropometric data (weight, height, BMI) were collected using standardized protocols; self-esteem was measured with the Rosenberg Self-Esteem Scale, validated in Mexico. Statistical analysis included frequencies, percentages, measures of central tendency, and Pearson correlations. Results indicate that most children exhibited moderate self-esteem (44.6%), while 31.9% reported high self-esteem, with a small but significant correlation between self-esteem and BMI ($r^2=0.290$, $p<0.05$). Additionally, the prevalence of overweight and obesity in this population surpassed national averages, occurring in a context where awareness of body image and mental health remains limited. High self-esteem may promote positive dietary habits and emotional well-being, underscoring the need for culturally sensitive intervention strategies that strengthen self-esteem and foster a healthy body image in these children. This study contributes to the expansion of knowledge on the relationship between socioemotional factors and nutritional status in vulnerable indigenous populations.

Keywords:

Self-esteem, schoolchildren, preadolescents, nutritional status, indigenous, Mezquital Valley

Resumen:

El presente estudio tiene como objetivo evaluar la relación entre la autoestima y el estado nutricional en escolares preadolescentes de hogares indígenas del Valle del Mezquital, México. Se realizó un enfoque cuantitativo, transversal y descriptivo, en una muestra probabilística de 309 niños de entre 8 y 12 años, seleccionados mediante muestreo estratificado por grado escolar en los municipios de Tezontepec de Aldama e Ixmiquilpan durante 2024. Los datos sociodemográficos y antropométricos (peso, talla, IMC) se recolectaron siguiendo protocolos estandarizados; la autoestima se midió con la Escala de Autoestima de Rosenberg, validada en México. El análisis estadístico incluyó frecuencias, porcentajes, medidas de tendencia central y correlaciones de Pearson. Los resultados muestran que la mayoría de los niños presentan autoestima moderada (44.6%), y un 31.9% alta, con una baja correlación significativa entre autoestima e IMC ($r^2=0.290$, $p<0.05$). Además, se encontró que la prevalencia de sobrepeso y obesidad en esta población supera las medias nacionales, en un contexto donde la conciencia sobre la imagen corporal y la salud mental es aún limitada. Una autoestima saludable puede favorecer hábitos alimentarios positivos y el bienestar emocional, por lo que es imprescindible

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desarrollar estrategias de intervención culturalmente sensibles que fortalezcan la autoestima y promuevan una imagen corporal saludable en estos niños. Este estudio contribuye a ampliar el conocimiento en la relación entre factores socioemocionales y estado nutricional en poblaciones indígenas vulnerables.

Palabras Clave:

Autoestima, escolares, preadolescentes, estado nutricional, indígenas, Valle del Mezquital

INTRODUCTION

Preadolescence, often referred to as the "transitional years," spans the period between childhood and adolescence (typically defined as ages 8-12).¹ During this stage, preadolescent schoolchildren begin constructing their identity while undergoing multifaceted changes—physical, psychological, social, emotional, and cognitive—all of which are critical to holistic development. The physical transformations in preadolescence are particularly pronounced, yet individual developmental trajectories vary significantly based on multiple factors.²

Within this context, self-esteem emerges as a pivotal construct. Defined as "the perception of one's own worth, competence, and dignity—an internal attitude reflecting self-awareness and self-acceptance independent of achievements or capabilities," it constitutes a sense of dignity and belonging rooted in recognizing personal strengths and limitations.^{3,4} Healthy self-esteem arises when expectations align with attainable achievements, enabling individuals to pursue goals through positive self-perception.⁴ Contemporary threats to self-esteem development include body weight stigma, media influence, advertising, stereotypes, and bullying. These factors may trigger avoidant behaviors that compromise nutritional status, potentially leading to long-term health implications, impaired personal and social development, reduced self-confidence, and learning difficulties.^{4,6}

The World Health Organization (WHO) reported in 2024 that 1 in 7 adolescents (14%) aged 10-19 experiences emotional disorders, with most cases inadequately addressed. This underscores the need for supportive environments in families, schools, and communities.⁷ Eating disorders (e.g., anorexia nervosa, bulimia)—affecting 0.1% of 10- to 14-year-olds, predominantly girls—manifest through abnormal eating patterns and obsessive concerns about weight and appearance.⁸ Affected adolescents frequently exhibit depression, anxiety, and substance use comorbidities.^{4,8} In Mexico, approximately 25% of adolescents experience eating disorders, often co-occurring with mental health conditions.⁹

Nutritional status and self-esteem are key factors for holistic development during childhood. In populations from indigenous households, this relationship takes on particular significance, given that factors such as economic conditions, cultural practices, and limited access to healthcare impact both eating patterns, body image perception, and identity formation.¹⁰ Consequently, studies aimed at analyzing these dynamics not only enrich the scientific understanding of the subject but also provide essential elements for the design of educational,

community-based, and public health strategies tailored to the needs and cultural characteristics of these communities.

While extensive research exists on adolescents and adults, data gaps persist regarding early-life manifestations.¹¹ This study, therefore, aims to evaluate the influence of self-esteem on nutritional status in two populations from indigenous households in the Mezquital Valley, Mexico.

METHODOLOGY

Study Design:

An applied quantitative study with a descriptive, cross-sectional design was conducted.

Population and Sample:

The target population consisted of 30,327 basic education students from the Mezquital Valley, Hidalgo. The fieldwork focused on the municipalities of Tezontepec de Aldama and Ixmiquilpan (April-July 2024), an area characterized by a high concentration of indigenous inhabitants, primarily from the Otomi-Hñähñu ethnolinguistic group. The identification of participants as belonging to an indigenous household was based on territorial affiliation to officially recognized indigenous communities, as well as the self-identification of the participants and their families regarding their belonging to their communal identity.^{10,12} Through stratified random sampling by grade level, 309 participants were selected. Recruitment was coordinated with school authorities.

Selection Criteria:

Inclusion: Fifth- and sixth-grade primary students (aged 8-12 years) who provided informed assent and whose parents or guardians provided written informed consent.

Exclusion: Students whose relatives or teachers reported that they were undergoing treatment for mental or neurodevelopmental disorders (e.g., attention deficit hyperactivity disorder or Autism Spectrum Disorder), those who presented a diagnostic summary issued by a specialist, those who declined to participate, or cases lacking parental consent.

Elimination Criteria: Participants were excluded if they a) did not complete the assessment instrument, b) withdrew from school during the data collection period, or c) were absent after the initiation of recruitment.

Variables and Instruments:

Sociodemographic variables: Age, sex, ethnic group (self-identification per INEGI categories), and academic grade.

Anthropometric variables:

Weight: Measured using calibrated SECA scale (Model 803)

Height: Measured with wall-mounted SECA stadiometer (Model 206)

BMI: Calculated as weight divided by height squared: BMI=weight kg/height m²). Nutritional status was categorized using age- and sex-specific BMI percentiles based on the WHO growth reference for children aged 5-19 years. Specifically, underweight was defined as BMI-for-age below the 5th percentile, normal weight as BMI-for-age ranging from the 5th to less than the 85th percentile; overweight as a BMI-for-age between the 85th and 95th percentiles; and obesity as BMI-for-age at or above the 95th percentile.

Standardized protocols were followed for all measurements.

Primary outcome variable (Self-esteem):

Instrument: Rosenberg Self-Esteem Scale (Spanish version validated in Mexico).¹³

Structure: 10 items (5 positively worded and 5 negatively worded statements)

Administration: Self-reported 4-point Likert scale

Scoring:

Items 1-5: 4=Strongly agree, 3=Agree, 2=Disagree, 1=Strongly disagree

Items 6-10: Reverse-scored (1=Strongly agree→4 points)

Interpretation:

30-40: High self-esteem

26-29: Moderate self-esteem

≤25: Low self-esteem

Psychometrics:

Current sample reliability: Cronbach's $\alpha=0.82$

Literature validity range: 0.76–0.87

Validity Note: Since this scale is widely recognized and internationally validated, with multiple studies supporting its validity and reliability across diverse populations, a factor analysis was deemed unnecessary for the present study.

Missing Data Management: Cases with incomplete responses were excluded from the analysis to preserve data integrity.

Procedure:

Group administration during school hours (30-minute duration) by trained staff.

Ethical Considerations:

Approved by the Ethics Committee of Escuela Superior de Tlahuelilpan (Ref: 2024/I/P1; April 10, 2024). All procedures were conducted in compliance with:

- The Declaration of Helsinki.¹⁴
- The General Health Law on Health Research (Minimal Risk Clasification).¹⁵
- Guarantees of confidentiality and anonymity for all participants.
- Provision of psychological support for students identified with low self-esteem.

Data Analysis:

Data were processed using SPSS v.27. The following statistical methods were applied:

- Descriptive statistics, frequencies, percentages, and measures of central tendency and dispersion.
- Contingency tables.
- Pearson correlation analyses for variable associations

RESULTS

The descriptive results from our sample ($n = 309$) revealed that 52.8% of participants were 11 years old, with comparable distributions in the 10-year (23.3%) and 12-year (23.9%) age groups. A balanced sex distribution was observed, with females representing 49.2% and males 50.8% of the sample. Sixth-grade students predominated (56.3%) over their fifth-grade counterparts (43.7%). Regarding family composition, the median sibling count was 2 (IQR: 1-3), and the overwhelming majority (96.8%) did not self-identify as indigenous (Table 1).

Table 1. Sociodemographic Characteristics (n=309)

Age (years)	n	%
10	72	23.3
11	163	52.8
12	74	23.9
Sex		
Female	152	49.2
Male	157	50.8
School grade		
5th	135	43.7
6th	174	56.3
Ethnic group		
Indigenous	10	3.2
Non-Indigenous	299	96.8
Total	309	100

Abbreviations: n= frequency, %= percentage

Geographically, Tezontepec de Aldama contributed slightly more participants (51.5%) than Ixmiquilpan (48.5%), reflecting comparable representation from both municipalities (Table 2).

Table 2. Municipal Distribution (n=309)

Municipality	n	%
Tezontepec de Aldama	159	51.5
Ixmiquilpan	150	48.5
Total	309	100

Abbreviations: n= frequency, %= percentage

Nutritional status assessment showed that nearly half of the preadolescents (49.8%) fell within the normal BMI range. However, the combined prevalence of overweight and obesity reached 47.9% (overweight: 30.4%; obesity: 17.5%), while underweight affected only 2.3% of the sample (Table 3).

Table 3. Nutritional Status by BMI Category (n = 309)

BMI	n	%
Underweight	7	2.3
Normal weight	154	49.8
Overweight	94	30.4
Obesity	54	17.5
Total	309	100

Abbreviations: n = frequency, % = percentage

Self-evaluation using the Rosenberg Scale revealed moderate self-esteem in 44.6% of participants; furthermore, high and low self-esteem levels were observed in 31.9% and 23.5%, respectively (Table 4). Notably, Pearson correlation analysis demonstrated a significant, albeit low-magnitude relationship between self-esteem and nutritional status as measured by BMI ($r^2 = 0.290$, $p < 0.05$).

Table 4. Self-Esteem Levels Among Participants (n = 309)

Self-Esteem Level	n	%
Low Self-Esteem	73	23.5
Moderate Self-Esteem	138	44.6
High Self-Esteem	98	31.9
Total	309	100

Abbreviations: n= frequency, %= percentage

DISCUSSION

Consistent with the stated objective, this study examined the relationship between self-esteem and nutritional status among indigenous preadolescent schoolchildren in the Mezquital Valley, Mexico. To address this, validated surveys and questionnaires were administered to a representative sample, proportionally distributed across the participating municipalities. While pre-adolescence is generally defined as the period from ages 8 to 12 years¹, our sample focused on youth aged 10 to 12 years. This specific age range was selected to ensure the cognitive maturity necessary for accurate completion of the assessment instruments and questionnaires.

Preadolescence is a critical developmental transition between childhood and adolescence.⁷ During this stage, children begin

to construct their identity while undergoing multifaceted physical, psychological, social, emotional, and cognitive changes. Our findings indicate that the majority of participants exhibited moderate self-esteem (44.6%), reflecting a relatively balanced self-perception. Conversely, a significant portion of the sample demonstrated challenges in self-valuation, with 23.5% reporting low self-esteem levels.

This developmental phase is characterized by significant physical transformations driven by hormonal shifts. These physiological developments profoundly impact youths' self-perception, particularly when their physical appearance diverges from socially idealized beauty standards. Such misalignment frequently generates body dissatisfaction, which subsequently undermines self-esteem.¹⁶ Furthermore, the acute need for social acceptance exposes preadolescents to constant peer comparisons; those who perceive themselves as failing to meet these societal expectations often develop negative self-images, further diminishing their global self-worth.^{6,17}

Given these interconnected dynamics, body image perception and self-esteem emerge as malleable constructs that can be positively cultivated. As preadolescents mature, they progressively establish the foundations of their identity, learning to integrate their individual strengths and limitations. This developmental trajectory fosters a more resilient self-esteem, which subsequently manifests as an improved body image.^{18,19}

Notably, a statistically significant, albeit low-magnitude, correlation was observed between self-esteem and nutritional status as measured by BMI ($r^2 = 0.290$, $p < 0.05$). This finding represents a novel contribution to the field, as no direct precedents currently exist regarding this relationship within indigenous populations. In contrast, previous research conducted at an indigenous children's shelter in Ixmiquilpan, Hidalgo reported that only 5.6% of children aged 7-11 years exhibited high self-esteem.²⁰ Our study revealed a substantially higher prevalence (31.9%), suggesting that despite socioeconomic and nutritional vulnerabilities, these children demonstrate significant emotional resilience and positive self-perception.²¹ Although the correlation between self-esteem and nutritional status was statistically significant albeit of low magnitude, its clinical relevance warrants careful consideration. In vulnerable populations, such as the one examined in this study, even modest associations can translate into meaningful impacts on community health and overall well-being. These findings underscore the necessity of integrating psychosocial variables, such as self-esteem, into the design of comprehensive health interventions. Such programs should address both nutritional and emotional components, thereby enhancing the prevention and treatment strategies for overweight and obesity. Indigenous identity can be operationalized through various criteria, including linguistic proficiency, self-identification, or the concept of the "indigenous household." This latter approach extends beyond language speakers to include all individuals residing in a household where the head, the spouse, or an

ascendant—such as parent, grandparent, or in-laws—speaks an indigenous language. By analyzing the population through the household unit, it is possible to encompass a broader demographic that, despite lacking indigenous language fluency, continues to share and reproduce the community norms, values, and traditions transmitted across generations.²²

Focusing on populations from indigenous households is particularly salient, as these groups face systemic social, economic, and health vulnerabilities that directly impact both nutritional status and self-esteem development. Within the indigenous households of the Mezquital Valley, structural factors—including persistent poverty, food insecurity, and marginalized access to mental health and nutritional services—continue to prevail.²³

Moreover, self-esteem in indigenous contexts is constructed not only from individual perception but also from a sense of community belonging, the valuation of language and traditions, and the experience of cultural discrimination. These elements can act as both protective factors (identity pride, cultural resilience) and risk factors (social stigmatization, educational exclusion), influencing the manner in which children perceive their bodies and develop dietary habits.¹⁰

Therefore, studying the interaction between self-esteem and nutritional status in these populations provides essential evidence for designing culturally relevant intervention strategies that acknowledge and strengthen existing community resources.

An important aspect to consider in this study is the discrepancy observed between the participants' self-identification as indigenous and the official definition of an indigenous population established by the National Institute of Statistics and Geography (INEGI). Although 96.8% of the schoolchildren did not self-identify as indigenous in the applied survey, the communities in which they reside are officially recognized as indigenous based on the number of speakers of native languages other than Spanish reported by INEGI for the Mezquital Valley region. This difference can be explained by complex sociocultural processes such as acculturation, social stigma associated with indigenous status, and a lack of recognition or appreciation of cultural identity within the community. These factors influence subjective perception of identity, ensuring they do not necessarily coincide with the ethnolinguistic categorizations used by official institutions.

Therefore, although self-identification does not predominantly support indigenous status, the analysis and interpretation of the results remain relevant, as they focus on a population that—from demographic and linguistic standpoints—belongs to a vulnerable indigenous group. The observed discrepancy between indigenous self-identification and official classification highlights the importance of recognizing cultural identity as a fundamental psychosocial factor influencing self-esteem. This underscores the need for interventions that account for both self-perception and sociocultural contexts to foster

comprehensive emotional well-being within these communities.

This investigation provides valuable evidence regarding protective factors that support emotional well-being within indigenous cultural contexts, highlighting the necessity of culturally sensitive approaches to nutritional and mental health. Nevertheless, nutritional outcomes remain concerning; the combined overweight and obesity prevalence (47.9%) is higher than Mexico's rural average (37.3%), signaling an urgent public health challenge.^{21,22} We recommend expanding future research to larger populations to yield more conclusive findings, while incorporating additional mental health dimensions—such as happiness perception, anger, depression, and anxiety—that frequently coexist with low self-esteem. These results should inform interventions aimed at promoting a healthy body image and positive self-esteem within comprehensive nutritional improvement frameworks.

It is important to note that other variables—including personal, social, psychological, and environmental factors—may be influenced by those addressed in this work. Examples of such variables include body image disorders, weight-related stigma, dietary habits, health and wellness literacy, and self-care practices. These areas can serve as a starting point for future research aiming to better understand the complex dynamics between nutritional status and self-esteem.

LIMITATIONS

This study has limitations that should be considered when interpreting the results. First, nutritional status was determined using Body Mass Index (BMI), calculated from weight and height, and categorized through age- and sex-adjusted BMI percentiles according to the World Health Organization (WHO) standards for children and adolescents aged 5 to 19 years. This methodology, based on BMI-for-age percentiles or z-scores, is essential for accurately assessing nutritional status in children and preadolescents, as it accounts for the natural variations in growth and development associated with age and sex; this allows for a more appropriate and comparable interpretation of nutritional status.²⁴ Nonetheless, it is important to note that despite the application of these percentile-based categories, some inherent limitations of international references may persist, as local genetic and environmental characteristics can influence the growth patterns of this indigenous population. Therefore, future research could benefit from validating or complementing these references with regional or population-specific standards, thereby enhancing the accuracy of nutritional risk identification and the development of culturally sensitive intervention strategies. Second, the sample was limited to 309 preadolescents from two specific municipalities in the Mezquital Valley, which restricts the generalizability of the findings to broader indigenous or rural populations in Mexico or other contexts. Third, the cross-sectional design prevents establishing causal relationships between nutritional status and self-esteem; only correlational associations were

identified. Fourth, self-esteem was measured using the Rosenberg Self-Esteem Scale via self-report, which may be subject to social desirability bias or subjective interpretation. Additionally, other relevant psychological or social variables that could influence the analyzed relationship—such as body image, social stigma, specific dietary habits, or environmental and familial factors—were not explored.

CONCLUSIONS

This study demonstrates a statistically significant, yet modest, correlation between self-esteem and nutritional status among indigenous preadolescent schoolchildren in Mexico's Mezquital Valley. While a substantial proportion exhibited moderate self-esteem and signs of emotional resilience, concerning levels of self-evaluative challenges were identified, which may influence dietary behaviors and overall well-being. The alarming prevalence of overweight and obesity (47.9%) substantially exceeds national averages for rural populations, underscoring the critical need for integrated interventions that address both nutritional improvement and mental health promotion. Our findings highlight the essential role of culturally responsive frameworks in developing preventive health strategies. Future initiatives must prioritize context-specific approaches that:

- Foster positive body image through culturally grounded methodologies;
- Strengthen protective factors for self-esteem development;
- Address nutritional challenges while respecting indigenous food systems; and
- Create supportive environments that reconcile traditional values with contemporary health demands

The coexistence of nutritional vulnerability and psychological resilience in this population calls for intersectoral action that bridges public health nutrition, educational psychology, and community-based mental health support—ultimately empowering preadolescents to navigate their developmental journey with robust self-perception and nutritional well-being.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest in the publication of this article.

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