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# 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 implemented in a probabilistic sample of 309 children aged 8–12 years, 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 exceeded national averages, occurring in a context where awareness about body image and mental health remains limited. Healthy self-esteem may promote positive eating habits and emotional well-being, underscoring the need to develop culturally sensitive intervention strategies that strengthen self-esteem and foster healthy body image in these children. This study contributes to expanding 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

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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 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 (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 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/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 10–14-year-olds, predominantly girls—manifest through abnormal eating patterns and obsessive concerns about weight/appearance.8 Affected adolescents frequently exhibit depression, anxiety, and substance use comorbidities.[4,8] In Mexico, ~25% of adolescents experience eating disorders, often co-occurring with mental health conditions.[9]

Nutritional status and self-esteem are key factors for comprehensive development during childhood. In the case of populations from indigenous households, this relationship takes on particular significance, as aspects such as economic conditions, cultural practices, and limited access to healthcare services impact both eating patterns and body image perception, as well as 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 that respond to the needs and cultural characteristics of these communities.

While extensive research exists on adolescents/adults, data gaps persist regarding early-life manifestations.[11] This study therefore aims to evaluate the influence of self-esteem on nutritional status from two populations of 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 30327 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 classified as having a high concentration of indigenous population, primarily from the Otomi-Hñähñu group. The identification of this population as belonging to an indigenous household was based on territorial affiliation to communities officially recognized as indigenous, as well as the self-perception of the participants and their families regarding their belonging to this communal identity.[10,12] Through a stratified random sampling by grade level, 309 participants were selected. Recruitment was coordinated with school authorities.

**Selection Criteria:**

Inclusion: Fifth/sixth-grade primary students (8-12 years) providing informed assent with parental/tutor written consent.

Exclusion: Individuals whose relatives or teachers reported that they were undergoing treatment for mental disorders (e.g., Attention Deficit Hyperactivity Disorder, Autism Spectrum Disorder) or who presented a diagnostic summary issued by a specialist., those declining participation, or cases without parental consent.

Elimination: Participants who a) Did not complete the instrument, b) Withdrew from school during data collection, c) Were absent post-recruitment initiation.

**Variables and Instruments:**

Sociodemographic variables: Age, sex, ethnic group (self-identification per INEGI categories), 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/height² (kg/m²). Nutritional status categories were determined 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 between the 5th and 85th percentiles, overweight as BMI-for-age between the 85th and 95th percentiles, and obesity as BMI-for-age above the 95th percentile.

Standardized protocols followed for all measurements.

**Primary outcome variable (Self-esteem):**

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

Structure: 10 items (5 positive, 5 negative)

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 α=0.82

Literature validity range: 0.76–0.87

Since this scale is widely recognized and internationally applied, with multiple studies supporting its validity and reliability across diverse populations, a factor analysis was deemed unnecessary in this study.

With respect to missing data management, cases with incomplete responses were excluded from the analysis in order to preserve data integrity.

**Procedure:**

Group administration during school hours (duration: 30 min) by trained staff.

**Ethical Considerations:**

Approved by the Ethics Committee of Escuela Superior de Tlahuelilpan (Ref: 2024/I/P1; 10-Apr-2024). Compliance maintained with:

Declaration of Helsinki.[14]

General Health Law on Health Research (Minimal Risk Classification).[15]

Confidentiality, anonymity, and psychological support access were guaranteed for participants with low self-esteem.

**Data Analysis:**

Data were processed in SPSS v.27 using:

Descriptive statistics (frequencies, percentages, central tendency/dispersion measures)

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. We observed balanced sex distribution, with females representing 49.2% and males 50.8% of the sample. Sixth-grade students predominated (56.3%) over 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 (51.1%) 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 nearly half of 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 | 154 | 49.8 |
| Overweight | 94 | 30.4 |
| Obesity | 54 | 17.5 |
| Total | 309 | 100 |

Abbreviations: n= frequency, %= percentage

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

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

| **Self-Esteem** | *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, %= percentaje

## DISCUSSION

As stated in the objective, the relationship between self-esteem and nutritional status among indigenous preadolescent schoolchildren in Mexico's Mezquital Valley was examined. To achieve this objective, validated surveys and questionnaires were administered to a representative sample proportionally distributed across municipalities. Pre-adolescence is defined as ages 8 to 12 years[1]; however, the sample we obtained included youth aged 10 to 12 years, considering that younger children might not be able to respond appropriately to the instruments and questions administered.

Preadolescence represents a critical transitional period between childhood and adolescence.[7] During this developmental stage, children begin constructing their identity while experiencing multifaceted changes-physical, psychological, social, emotional, and cognitive. Our findings indicate that most participants exhibited moderate self-esteem (44.6%), reflecting balanced self-perception, while others demonstrated challenges in self-valuation (23.5% low self-esteem).

This life phase involves significant bodily transformations driven by hormonal changes. These physical developments profoundly impact youths' self-perception, particularly when their appearance diverges from socially accepted beauty standards. Such misalignment often generates body dissatisfaction that undermines self-esteem.[16] The powerful need for social acceptance exposes preadolescents to constant physical comparisons, and those failing to meet societal expectations frequently develop negative self-images that further diminish self-worth.[6,17]

Considering these interconnected dynamics, body image perception and self-esteem emerge as malleable constructs that can be positively cultivated. As preadolescents mature, they progressively establish identity foundations, learning to accept their strengths and limitations. This developmental process fosters healthier self-esteem that manifests through improved body image.[18,19]

Notably, we observed a statistically significant yet low-magnitude correlation between self-esteem and BMI nutritional status ($r^2$=0.290, $p<0.05$). This finding represents a novel contribution since no direct precedents exist for this relationship within indigenous populations. Previous research at an indigenous children's shelter in Ixmiquilpan, Hidalgo found only 5.6% of 7-11-year-olds exhibited high self-esteem.[20] By contrast, our study revealed substantially higher levels (31.9%), suggesting that despite socioeconomic and nutritional vulnerabilities, these children demonstrate emotional resilience and positive self-perception.[21] Although the correlation between self-esteem and nutritional status was statistically significant but of low magnitude, its clinical relevance should not be underestimated. In vulnerable populations, such as the one studied, small associations can translate into real and meaningful impacts on community health and well-being. This underscores the importance of incorporating psychosocial variables, such as self-esteem, into the design of comprehensive interventions that address both the nutritional and emotional components, thereby enhancing the prevention and treatment of overweight and obesity.

Indigenous people can be identified in different ways: for example, when they speak an indigenous language, when they recognize themselves as indigenous (self-identification), or through the concept of the indigenous household. This latter approach is not limited solely to those who speak the

language; it also considers as indigenous all individuals living in a household where the head, the spouse, or an ascendant—such as mother, father, grandparents, or in-laws—speaks an indigenous language. In this way, by analyzing the population from the household unit, it is possible to include a greater number of people who, although they do not speak the language, share and reproduce community norms, values, and traditions transmitted by their relatives.[22]

The choice of populations from indigenous households as the subject of study, is particularly relevant, as these groups face social, economic, and health vulnerabilities that directly impact their nutritional status and the development of self-esteem. In the case of populations from indigenous households in the Mezquital Valley, structural factors such as poverty, food insecurity, and limited access to mental and nutritional health services persist.[23]

Moreover, self-esteem in indigenous contexts is constructed not only from individual perception but also from community belonging, the valuing 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 way children perceive their bodies and develop eating habits.[10]

Therefore, studying the interaction between self-esteem and nutritional status in this 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 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 community in which they reside is 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, or lack of recognition or appreciation of their own cultural identity within the community. These factors influence that subjective perception of identity does not necessarily coincide with the ethnic-linguistic 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 a demographic and linguistic standpoint, 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, emphasizing the need for interventions that take into account both self-perception and sociocultural contexts to foster comprehensive emotional well-being in these communities.

This investigation provides valuable evidence about protective factors supporting 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/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 for more conclusive findings, while incorporating additional mental health dimensions (happiness perception, anger, depression, anxiety) that frequently coexist with low self-esteem. These results should inform interventions promoting healthy body image and positive self-esteem within comprehensive nutritional improvement frameworks.

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

## LIMITATIONS

This study has limitations that should be considered when interpreting the results. First, in this study, nutritional status was determined using the BMI calculated from weight and height, and categorized through age- and sex-adjusted BMI percentiles according to the WHO standards for children 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, thereby allowing a more appropriate and comparable interpretation of nutritional status.[24] Nonetheless, it is important to note that, although these percentile-based categories were applied, some inherent limitations of international references may persist, given that local genetic and environmental characteristics can influence the growth 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 through 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 eating habits, or environmental and familial factors—were not explored.

## CONCLUSIONS

This study demonstrates a 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 difficulties were identified that may influence dietary behaviors and overall well-being. The alarming prevalence of overweight/obesity (47.9%) substantially exceeds national averages for rural populations, underscoring the critical need for integrated interventions addressing 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
- 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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## AUTHORS CONTRIBUTION

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## CONFLICT OF INTEREST

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

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