

Factors Assoced with Well-Being and School Health in Adolescents: Analysis of Habits, Physical Activity and Nutritional

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ABSTRACT:

In adolescence, it is essential to pay attention to healthy lifestyle and nutritional habits, as these can influence multiple aspects of adult life, such as various health-related conditions. The objective is to analyze the healthy lifestyle and nutritional habits associated with the well-being and health of 148 adolescents in the school environment. In the methodological field, the sociocritical paradigm, qualitative approach, and participatory action research design were implemented. Physical activity habits, nutrition, body perception, self-care, body mass index, blood glucose, cardiovascular parameters, physical endurance, and oxygenation thru oximetry were evaluated. The data analysis incorporates gender differences, trends according to academic level, and students' perceptions of physical activity and nutrition. The results show discrepancies between body perception and actual habits. The presence of sedentary behavior, insufficient consumption of fruits and vegetables, a recent increase in weight, limited physical endurance in part of the population, and a family history of diabetes were identified. In the Discussion, social, school, and family factors influence habits, highlighting the need to implement pedagogical strategies aimed at promoting healthy lifestyles in the adolescent population. These data are consistent with the results of other studies. It can be concluded that the school should establish itself as a critical, reflective, and participatory setting that promotes cultural transformations aimed at building healthy lifestyles in adolescence, thru pedagogical and community strategies..

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Introduction

Health during adolescence is an essential factor for the optimal physical, emotional and social development of the future adult. During this period, habits are established that can have a significant impact on physical activity, nutrition, and self-care. As stated by Rusillo et al. (2023),

nutritional, physical, and identity aspects constitute a fundamental indicator of healthy development in the school and adolescent community. From the sociocritical approach, health must be understood not only as an isolated and personal phenomenon, but as a set of social elements, influenced by cultural, family and

educational contexts, which configure the practices and meanings related to the body and well-being. In line with this perspective, Vera and Jara (2018) argue that people not only understand their realities, but also propose possible solutions to social problems and actively participate in the transformations required to face adversity.

Adolescence, which is usually characterized as a time of transition, is decisive for the formation of habits and the acquisition of social codes that are expected to shape actions and behaviors in adulthood (Esteban-Guitart et al., 2024). This research analyzes the eating and physical activity habits of school-age adolescents, with the purpose of identifying early warnings of possible chronic diseases. Through a bibliographic search, it was possible to show that the number of adolescents who have sedentary lifestyles characterized by little physical activity, high consumption of ultra-processed foods, and psychosocial difficulties is increasing (Vargas et al., 2023). These unhealthy habits are directly related to an increase in conditions related to chronic diseases, including obesity, cardiovascular problems, hypertension, diabetes and a large number of metabolic disorders. For Torres et al., (2019), obesity in the twenty-first century has one of the highest rates of diagnoses worldwide, with serious consequences on mental and physical health today. For his part, Mejía (2024) argues that the diagnosis of high blood pressure is becoming more common among adolescents; It poses a risk for future heart disorders, strokes, and kidney difficulties.

The current lifestyle of adolescents is identified by habits related to food, physical activity, and the consumption of toxins such as cigarettes, alcohol, psychoactive substances, among others (Pinzón et al., 2022). The constant use of these elements generates a high level of risk, mainly in the circulatory system, gradually developing an increase in blood pressure (HBP) and generating in some cases, endocrine and metabolic diseases, which include weight gain and blood carbohydrates, resulting in diabetes mellitus (Huerta et al., 2023). As can be seen, adolescence is a critical period in which determining factors

for the acquisition of metabolic, endocrine and vascular diseases can be generated (Duran et al., 2025). Currently, various studies argue that little physical activity and long periods of leisure are the main cause of unhealthy lifestyles (Prias & Contreras, 2019).

Consequently, the direct and indirect effects on the health of adolescents are caused by inappropriate habits and lifestyles, all due to actions and decisions that are based on individual and collective motivation to develop awareness of the importance of nutrition and physical activity (Rodríguez et al., 2023). For this reason, intervention is required from educational institutions through pedagogical actions that generate a significant impact. Likewise, the interaction between public policies and society in general is essential to analyze the psychosocial impact of students' physical and emotional health, promoting an adequate environment for well-being and care. In this sense, it is intended to identify the factors that determine the active and nutritional habits in young people in the educational stage. It is important to note that this type of practice is intertwined with social, family and educational conditions to which adolescents are constantly exposed. At the same time, the aim is to describe patterns of behavior in physical and eating activities that influence academic performance (Benítez-Sillero et al., 2025). Finally, it seeks to describe the influence that active lifestyles and nutrition have on the academic process of students (Torres et al., 2019), with the purpose of highlighting the importance of implementing and developing effective strategies to strengthen and consolidate healthy behaviors and practices, especially in relation to the regular practice of physical activity. conscious and balanced nutrition and the active and deliberate prevention of sedentary lifestyle and its adverse effects on general health (Nazar-Carter et al., 2022).

1.1 METHOD

This research is based on the sociocritical paradigm, which is based on the need to reflect on the social and educational conditions that determine the well-being and school health of

adolescents, beyond the description of habits and practices. From this perspective, research is an emancipatory practice, where students cease to be passive participants to become active builders of learning and transformers of reality in the face of healthy and eating habits (Coronado & Sáleme, 2024). In the field of education and school health, the socio-critical paradigm corresponds to participatory action research, research design for diagnosis, action and reflection to transform social reality. This methodology develops critical awareness and transforms life practices into real situations (Martínez-Rosales & Gross-Tur, 2024). This makes it possible to recognize not only physical and eating behaviors, but also the social, family, and school factors that sustain them. This makes it possible to design appropriate pedagogical strategies to promote healthy lifestyles (Loza et al., 2021).

From the perspective of Zapata and Rondan (2016), Participatory Action Research rests on three essential pillars: study, which promotes the diversity of methods to obtain knowledge; participation, based on democratic principles of equality between researchers and the community; and action, whose objective is to produce transformations that optimize people's quality of life. This method raises awareness and empowers, reinforcing the relationship between well-being, health and school. The action research process is cyclical and is composed of the stages of planning, action, observation and reflection. In

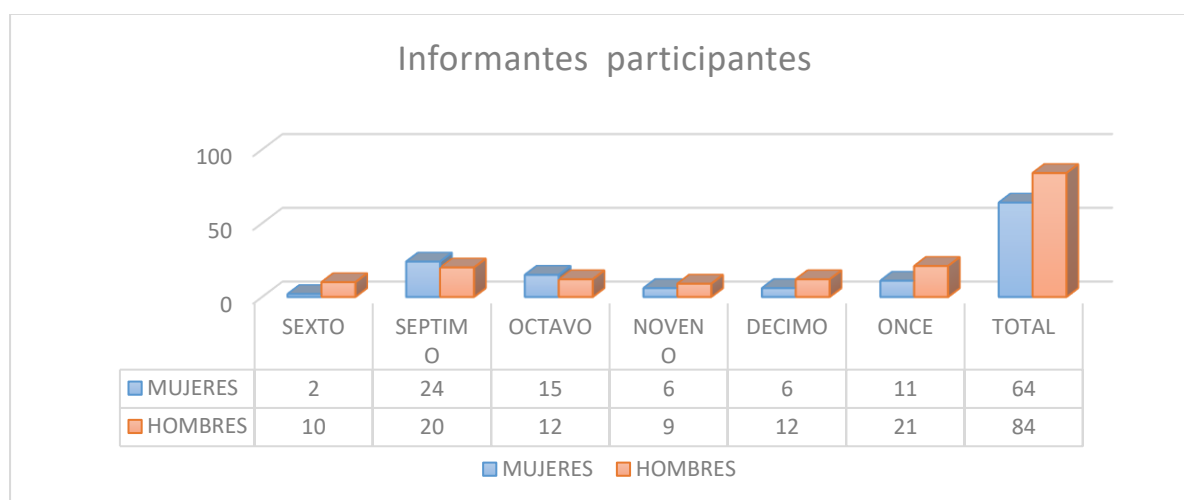
the same way, it allows the teacher and the educational community to analyze and improve educational practices. This spiral of inquiry, according to Izquierdo et al. (2020), encourages self-reflection and contextualized modifications in the school environment.

As Alvarado & Arroyo (2016) indicate, these spaces of inquiry encourage reflective criticism, questioning about what exists, and the creation of new ways of acting from a committed and ethical participation. In the research field, the design of Participatory Action Research (PAR) is suitable for this analysis, since both students and teachers are active actors in research and in the transformation of their practices. In this research, both teachers and students actively participate in analysis of habits, physical activity and nutrition.

1.2 PARTICIPANTS

A total of 148 key student informants belonging to the sixth, seventh, eighth, ninth, tenth and eleventh grades of a recognized educational institution participate in the development of this research work. The distribution of students was as follows: the sixth grade had a total of 12 students enrolled, the seventh grade had 44 students enrolled, the eighth grade had a figure of 27 students, the ninth grade registered 15 students, the tenth grade had an enrollment of 18 students, and the eleventh grade had a total of 32 students.

Figure 1 Participating informants-In original Spanish language



Procedure

The following stages were established for this research:

1. Design of the tests to be applied with the group of students, environmental leaders and teachers.
2. Application of physiological measurements: Blood pressure, pulse, blood oxygenation, blood glucose, body mass index (BMI) and physical endurance.
3. Application of the 14-question questionnaire on physical activity, eating and self-care habits.
4. Analysis of the results.

1.3 DATA COLLECTION TECHNIQUES AND INSTRUMENTS

In relation to the various techniques and instruments of data collection available, in the first instance, with the aim of obtaining an exhaustive diagnosis of healthy habits, both physical and nutritional, detailed tests of physiological measurements were carried out in adolescent students. These measurements included taking blood pressure, recording the pulse both before and after physical exercise, measuring blood oxygenation levels, assessing capillary glucose, calculating body mass index (BMI) and assessing physical endurance through the rope jump test. A questionnaire script was applied for data collection, which includes questions about students' physical activity habits, diet, self-care, and body self-image. The purpose of this questionnaire is to collect qualitative data that interpret the opinions and attitudes of the respondents on the topic. At the end of the process, reflection groups were carried out with the aim of carrying out a critical analysis of the information (PAR), which is considered a fundamental tool in the process of evaluating and understanding the data collected.

Data analysis

The detailed analyses of numerical data were carried out using exhaustive and detailed descriptive percentages, which allowed obtaining a more complete and accurate view of the information collected. The qualitative data

allowed the detailed classification of various categories related to active and nutritional lifestyle habits. These categories were based on eating habits, body perception, motivation for physical activity, institutional barriers, and self-care.

1.4. RESULTS AND DISCUSSION

Results and analysis of the instruments used:

Physical tests

The observation and initial activity aimed to show trends in physical habits and encourage student interaction in various physical tests. This phase not only involves obtaining quantitative data, but also helps to understand the social context in which students take the tests and how they interact with each other.

In this research, actions are carried out to make a physical diagnosis of the students, most of them leaders social and environmental mediators. Before performing the jumping rope activity, each student is measured and weighed to calculate their BMI. This measure is used to assess their initial nutritional status. A variety of additional tests are performed, including measuring the blood glucose level through a glucometer, as well as assessing blood pressure, pulse before and after jumping, and oximetry. These tests provide information about the student's physiological response to exercise, which can enrich the analysis.

Jump rope activity with counting and timing

After the initial measurements, each participant carried out the rope jumping activity. A rope is assigned and the number of jumps that are performed must be counted. In parallel, a group of social and environmental student leaders, together with the researcher, evaluate the total duration of the test where the number of jumps and duration of the execution are analyzed. The results obtained in the physical tests performed are presented below, which are used for intervention and analysis in order to identify trends in the different types of tests. The key informants, who are participating students, are distributed according to levels of schooling and

sex. A total of 148 students have been evaluated, of which 64 are women and 84 are men

Age-to-weight ratio test

The relationship between the age and weight of the informants facilitates the understanding of the body mass index (BMI) as a tool that transcends a simple numerical data, by providing an approximation of the nutritional status of adolescents in a stage characterized by significant physical and emotional changes. Body mass index (BMI) is calculated from the ratio of body weight

to height. Their interpretation takes into account age and sex, recognizing that growth and development do not occur uniformly (Hernández & Orlandis, 2020). The healthy weight rating indicates whether the student is underweight, normal weight, overweight, or obese. These conditions affect your well-being, self-esteem, and future health. In the field of education, this indicator serves not only to control, but also to reflect on strategies that promote self-care practices and healthy and conscious lifestyles. The results obtained are shown below:

Table 1 Distribution by age and weight in the participating informants

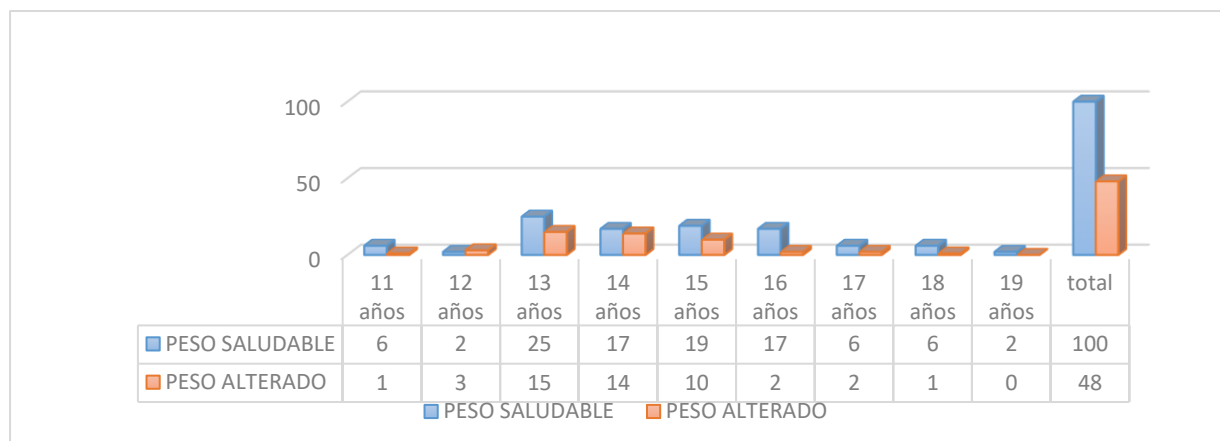
Age	Absolute Frequency		Relative frequency		Subtotal	
	Healthy weight	Weight Changed	Weight Healthy	Weight Changed	Absolute Frequency	Relative frequency
11 years	6	1	4%	0.67%	7	5
12 years	2	3	1.35%	2%	5	3
13 years	25	15	16.8%	10.1%	40	27
14 years	17	14	11.4%	9.45%	31	21
15 years	19	10	12.8%	6,8%	29	20
16 years	17	2	11.4%	1.35%	19	12
17 years old	6	2	4.05%	1.35%	8	6
18 years old	6	1	4.05%	0.67%	7	5
19 years	2	0	1.35%	0%	2	1
Total	100	48	67.2%	32.4%	148	100

The results show the age distribution of the students along with their BMI (body mass index). Of a total of 148 informants, 100 are at a healthy weight and 48 are underweight. The ages at which a greater alteration in BMI is observed are 13 and 14 years, grouping 66.5% of the total cases with altered weight. To define healthy weight, a range was used that relates weight to the height of the students, adjusted according to their age using standardized tables. Since the data are presented as percentages, it corresponds to a descriptive statistic, whose purpose is to summarize and organize the information without making

inferences beyond what has been studied and that lead to quantitative research.

The findings reveal not only a numerical distribution by age and BMI values, but also social and cultural implications on the nutritional status and developmental context of the students. These results are related to biological, social, or behavioral changes, suggesting the importance of interpreting these results beyond the statistical, not as indications of growth processes, self-care, body perception, or environmental influences.

Figure 2 Distribution according to age and BMI in the participating informants-In original Spanish language

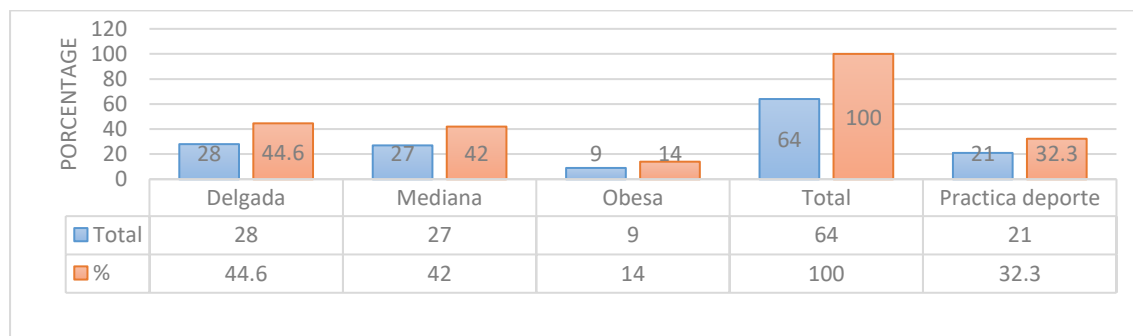


The results reveal a higher prevalence of healthy weight in students aged 12 to 15 years, reaching 66.5%, but this proportion tends to decrease in the higher grades. On the other hand, there are 48 participants (33.4% of the total) who have an alteration in weight, which suggests a significant concern about overweight and obesity in this group. From a qualitative-social perspective, this high percentage of students with altered weight indicates possible tensions in the school, family or community environment with respect to food, body self-image and lifestyles. It is likely that some adolescents are developing unhealthy habits or facing barriers to following a healthy lifestyle, which is reflected in these elevated levels of unhealthy weight.

Body perception test

The body perception test in adolescents allowed to determine the way they see and feel about their body during a period of social, physical and emotional transformations. The perception of the body that adolescents have does not always agree with their real physical state, as evidenced by the results; this reflects the influence of social body models and messages from school, family, and the media (Jiménez et al., 2022). In adolescents, body perception focuses on ideals of thinness and social acceptance; in men, in strength and physical performance. These insights can have an impact on decisions related to physical activity, eating, and self-care. In this sense, the percentages reflect important trends: a significant group is at risk of being overweight or obese, and most do not perform regular physical activity.

Figure 3 Female informants evaluated by physical appearance-In original Spanish language



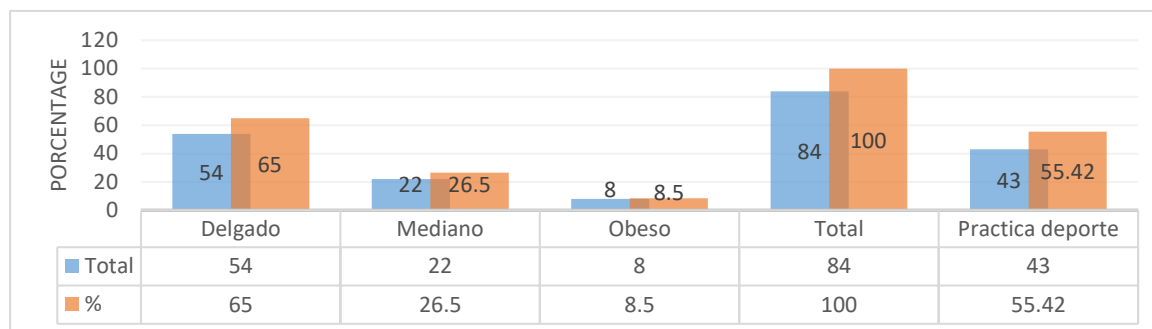
Among the 64 participating women, diversity was observed in the perception of their own body appearance: 28 (44.6%) consider themselves thin,

27 (42%) perceive their body as medium in appearance, and 9 (14%) perceive themselves as overweight or obese. However, only 21 of them

(32.3%) said they practiced sports regularly. From a qualitative perspective, these data suggest the need to explore how women interpret and experience their own corporality, how they value the practice of sport and what are the barriers or motivations that affect their relationship with

physical activity. This would allow a deeper understanding of the experiences and meanings behind the percentages, providing a comprehensive view of the phenomenon of overweight and obesity in this female group.

Figure 4 Male informants evaluated by physical appearance-In original Spanish language



In the group of 84 male participants, the majority perceived themselves as having a thin appearance: 54 individuals (65%), while 22 (26.5%) were described as having a medium appearance and 8 (8.5%) as having a thicker or more obese appearance. Regarding the practice of physical activity, 43 men (55.4%) stated that they performed sports regularly. When comparing these results with those of the female group, it is observed that, although men have a higher percentage of thin appearance and a greater participation in sports activities, women show a greater tendency to overweight and obesity, as well as a lower involvement in sports practice (32.3%). These findings suggest that experiences, perceptions, and practices related to corporeality and exercise differ between men and women. This approach allows us to understand not only the distribution of physical appearances, but also the meanings that each group gives to health, exercise and body image.

Body Mass Index Test

The examination of the body mass index (BMI) offered a first perspective on the

nutritional status of young people, using this indicator as a reference point to analyse the relationship between growth, height and weight during this phase. The BMI detected several body conditions in the group of students, from healthy ranges to circumstances that need attention, such as obesity or thinness. These findings show daily practices related to physical activity and nutrition, in addition to family and school environments that affect body care (Rodríguez et al., 2023). In the school context, BMI is beneficial if it is treated with respect, encouraging reflection on self-care and health without comparisons or stigmas and guiding preventive actions according to what adolescents require. The body mass index shows that, compared to men, women have a higher tendency to be overweight and obese; On the other hand, underweight is more common among men. These observations may affect decisions related to self-care, physical activity, and eating. The school must create spaces for reflection and critical conversation to redefine the body as a territory of health, diversity and well-being, above stereotypes and social demands.

Table 2 Body Mass Index (BMI)

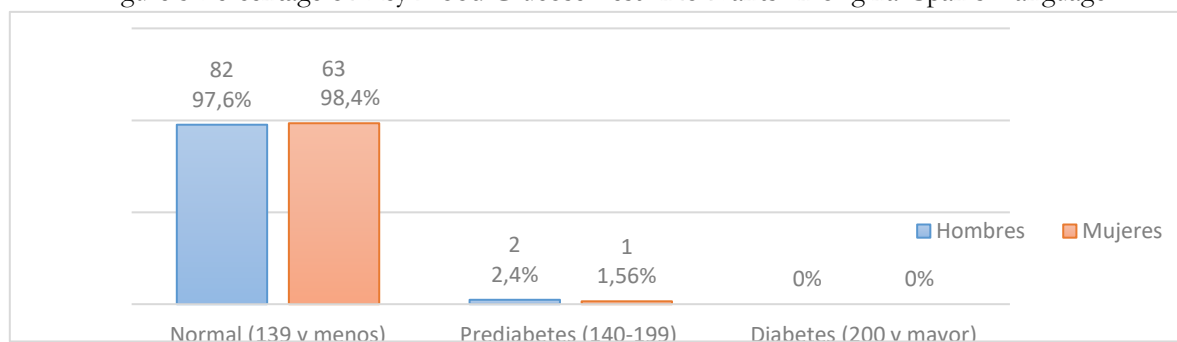
Gender	Healthy weight	Risk of being overweight	Overweight	Obesity	Low weight
Men (84)	66 (78,6 %)	8 (9,5 %)	2 (2,4 %)	5 (6 %)	3 (3,6 %)
Women (64)	34 (53,1 %)	18 (28,8 %)	3 (4,7 %)	7 (10,9 %)	2 (3,1 %)

Results according to BMI/age differed between men and women in the sample of 148 participants. Among males, 66 (78.6%) are normal weight, 8 (9.5%) are at risk of being overweight, 2 (2.4%) are overweight, 5 (6%) are obese, and 3 (3.6%) are underweight. While, in women, 34 (53.1%) are at a healthy weight, 18 (28.8%) are at risk of being overweight, 3 (4.7%) are overweight, 7 (10.9%) are obese, and 2 (3.1%) are underweight. From an interpretive perspective, these results not only show the differences in BMI distributions, but also indicate that it is important to investigate.

The meanings that the participants give to their own bodies and to food. In addition, cultural, social, and personal factors that affect health and eating habits must be considered. Numerical information provides a starting point, but understanding participants' opinions and experiences would help identify obstacles, motivations, and social interactions related to weight and health. The difference indicates that there are different risks according to gender and that specific prevention strategies are required.

In the blood glucose index test, blood glucose measurement allowed us to know the metabolic processes of adolescents, understanding this indicator as an early sign of the balance between diet, physical activity, and family history (Gygliola-Ormachea et al., 2020).

This test helped identify situations that invite prevention, especially in students with unhealthy eating practices or a family history of diabetes. The findings indicate that, although most adolescents are within adequate ranges, there are some cases that require additional follow-up. In the school environment, glucose measurement is presented as an educational opportunity to promote dialogue about self-care, conscious eating and the adoption of healthy habits from an early age, avoiding alarmist approaches. The blood glucose index is determined by a glucometer, and the results indicate that obesity is a significant risk factor for the development of type 2 diabetes mellitus. A high body mass index increases the probability of developing this disease; The greater the amount of adipose tissue, the greater the risk of developing this pathology.

Figure 5 Percentage of Key Blood Glucose Test Informants-In original Spanish language

In the group of 148 students tested, blood glucose levels before the jump rope test were mostly within normal ranges. In particular, 82 men (97.6%) and 63 women (98.4%) had normal values, while only 2 men (2.4%) and 1 woman (1.56%) showed levels corresponding to prediabetes.

Table 3 Blood glucose

Degree	Men	Women	Observations
6°	12 normal	0	All within normal values
7°	20 normal	24 normal	Normal values
8°	12 normal	15 normal	Normal values
9°	7 normal	6 normal	2 men with predisposition to prediabetes
10°	12 normal	6 normal	Normal values
11°	21 normal	10 normal	1 woman with predisposition to prediabetes

From a qualitative perspective, these findings demonstrate that most students maintain adequate glucose levels, it is important to consider how eating, physical activity, and lifestyle habits influence metabolic health. The presence of cases of prediabetes, although limited, points to the importance of inquiring about students' narratives about the prevention and care of diet and physical activity, as well as the barriers that could limit activities that promote healthy habits that reduce indicators of health problems

Blood pressure test

Measuring blood pressure in adolescents is a tool for assessing cardiovascular risk, since the initial alterations are related to cardiovascular events in

adulthood (La-Fontaine, 2021). Arterial hypertension in adolescence is considered an indicator of possible clinical problems in adult life, which is the basis for its inclusion in school health check-ups (Álvarez et al., 2022). Childhood and adolescent hypertension often marks a trend that can persist in people for much of their lives and can lead to adulthood with hypertension if left untreated. Periodically measuring blood pressure facilitates the identification of individuals at risk, which allows the implementation of activities such as regular exercise, the adoption of a balanced diet and the reduction of risk factors such as sedentary lifestyle and overweight. Here are the results of this test:

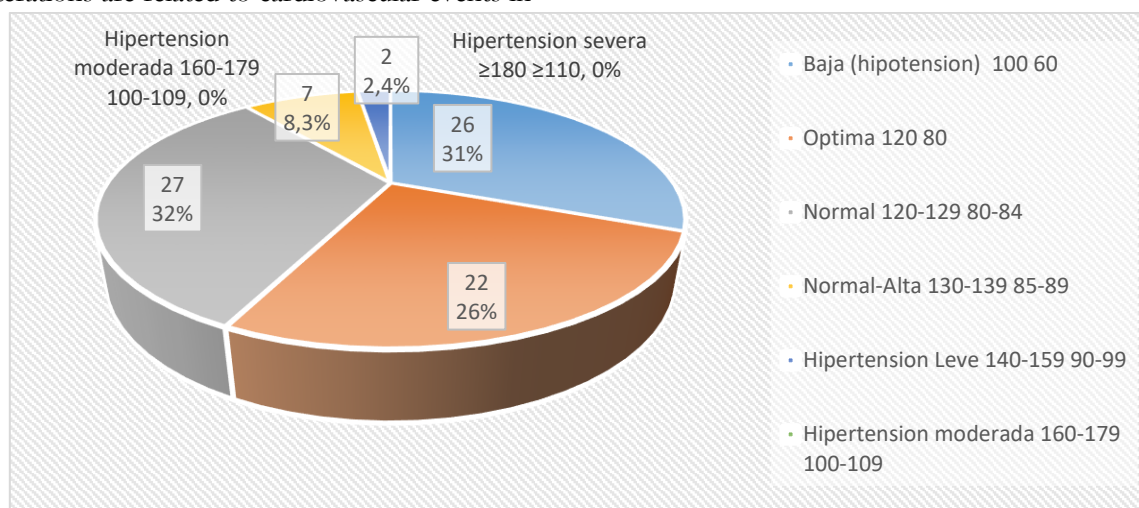


Figure 6. Percentage of blood pressure in participating informants-In original Spanish language

Among the 148 students observed, it was identified that 31% of men and 45% of women have a tendency to hypotension. Still, the majority of students fall within normal or optimal blood pressure ranges, accounting for 58% of men and

52% of women. From a qualitative perspective, these results suggest that, although most maintain adequate blood pressure, women have a higher risk factor associated with hypotension

This opens the door to investigating how lifestyles, diet, exercise, and other social or cultural factors modulate blood pressure. Knowing the trends and practices of students in relation to cardiovascular health could put these results into perspective and guide strategies to prevent and promote healthy habits in the population studied.

Physical endurance test

The physical endurance test showed how adolescents respond to exertion and the presence of physical activity in their daily lives. This test showed the differences between the students, associated with age, taste for physical activity and habits acquired during their school history.

Resistance is related to one's own abilities and the possibilities of the environment to move, play and exercise (Durán et al., 2025). This type of test represents an opportunity for reflection on the importance of keeping the body active, encouraging positive experiences with exercise and promoting practices that contribute to the well-being and health of adolescents, without reducing the evaluation to a logic of performance. The level of endurance is measured by jumping rope and their finding suggests a clear difference in physical endurance between men and women from an early age, which could be related to biological, motivational or socialization factors in the practice of physical activity. The results found are presented below:

Table 4. Physical endurance (jump rope)

Degree	Men	Women	Qualitative observations
6°	8	2	Men show greater resistance
7°	20	24	Men greater endurance; Group motivation influences
8°	12	15	Men greater endurance; Slight improvement in timing and jumps
9°	9	6	Men greater endurance; Progressive improvement in jumps
10°	12	6	Slight balance in resistance between genders
11°	21	11	Men greater endurance; Clear improvement in time and jumps

At the same time, a slight tendency to improve both in the time and in the number of jumps performed was identified, indicating an increase in the physical response of the students during the activity as they advance in level and age. The findings show that the differences in physical endurance between men and women are beginning to be less marked. In eleventh grade students, it was observed that the 21 men evaluated demonstrated greater endurance in the jump rope test compared to the 11 women in the same grade. In addition, it was identified that men showed progressive improvements in both the times and the number of jumps made,

evidencing a development of physical endurance through practice.

On the other hand, the pulse of the students is associated with physical and cardiac endurance, these data suggest that the experience of exercise and the physical response vary according to the history of physical activity, motivation, confidence and perception of one's own body. For example, some students may show greater resistance due to being used to regular physical activity, while others may experience greater effort due to a lack of healthy habits, motivation, or the family and school environment.

Table 5 Pulse in key informant students

Pulse in key informant students							
Gender	Before exercise				After exercise		
	Distribution	70-79	80-89	90-110	90-110	111-120	121-140 141-180
Men	84	28	19	37	21	13	18 32
Women	64	12	22	30	25	7	12 20

Total	148	40	41	67	46	20	30	52
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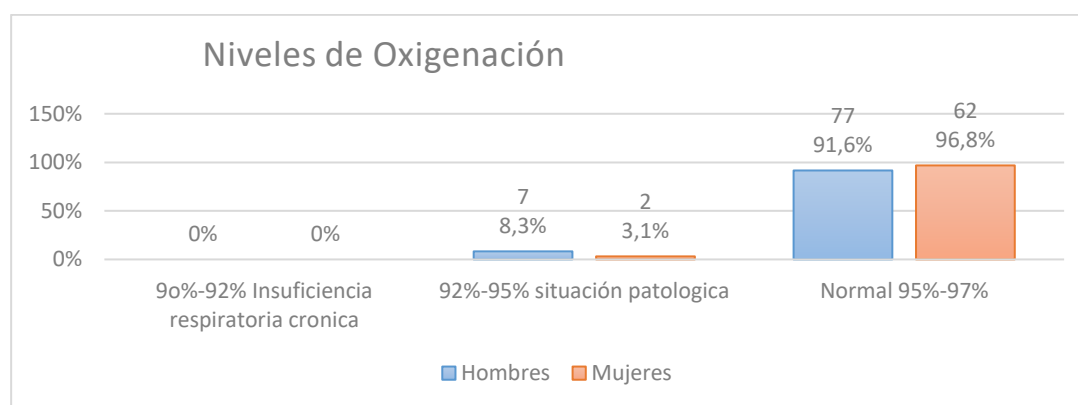
In the 148 students observed, it was found that before performing the jump rope exercise, more than half had a normal pulse (70–90 bpm), while less than half showed an elevated pulse (90–110 bpm). This not only reflects physiological differences, but also daily habits and lifestyles, as a high resting pulse can be related to low habitual physical activity, stress, or emotional factors. After the exercise, the results show a significant diversity: 46 students maintain a low pulse (90–110 bpm), which denotes good endurance and physical capacity; 50 students have a normal range (111–140 bpm), reflecting adequate cardiovascular adaptation, and 52 students have a high pulse (141–180 bpm), indicating that their physical capacity and endurance require strengthening. In the students analyzed, before performing the jump rope exercise, most of them had a normal pulse (70–79 bpm). When disaggregated by gender: Men: 28 students and Women: 12 students. After exercise, an increase in heart rate is observed in 32 men and 20 women, reaching pulses between 141 and 180

bpm. These data show that men tend to have a higher heart rate and faster pulse during physical activity, while women maintain a relatively lower and less accelerated pulse. This difference not only reflects physiological variations, but also previous experiences, perception of exertion, and physical activity habits.

Blood oxygenation test

The blood oxygenation test shows how adolescents take advantage of oxygen in their daily functioning, relating health status to physical endurance. This measurement helped to understand how habits, physical exertion and the environment influence breathing and body well-being. Evaluating oxygenation in the school space allows students to talk about the importance of breathing well, staying active and taking care of the body, promoting health based on self-care. Blood oxygenation shows the pulmonary capacity to perform vital functions and physical activity (Martínez-Sedas, 2024).

Figure 7 Oxygenation in students as a percentage-In original Spanish language



In the 148 students analyzed, the measurement of oxygenation by means of an oximeter showed the following: normal oxygenation was found in men: 77 students (91.6 %) and women: 62 students (96.8 %). In addition, a pathological situation or low oxygenation is related in men: 7 students (8.3 %) and women: 2 students (3.1 %). These data show that the vast majority of students maintain adequate levels of oxygenation, which reflects good respiratory and cardiovascular function at rest. However, a small group has pathological

levels, which may be associated with respiratory problems, reduced physical condition or environmental factors.

Summary of physiological indicators

Physiological indicators show a diverse picture of the physical condition and health of adolescents. The post-exercise pulse showed that students respond differently to physical effort, reflecting different levels of endurance and showing that a group needs to strengthen their physical

condition. Blood oxygenation values in men and women indicate good respiratory function, suggesting that most adolescents have an adequate condition. The glucose test showed a low metabolic risk, but some cases with high values indicate the importance of constant monitoring of eating habits and prevention from

an early age. The increase in weight in sixth grade students indicates a disturbing trend that demands reflection on habits and lifestyles throughout the school stage. The relevance of promoting self-care behaviors and healthy routines at school for the complete development of adolescents is highlighted by these results.

Table 6. Summary of physiological indicators

Indicator	Overall result	Interpretation
Post-exercise pulse	46 (90–110); 50 (111–140); 52 (141–180)	Variety of resistance; 52 need improvement
Oxygenation	91.6% men; 96.8% female	Adequate respiratory condition
Glucose	3 students with prediabetes	Current low risk
Weight gain	91% in 6th grade; 46% in other grades	Worrying growing trend

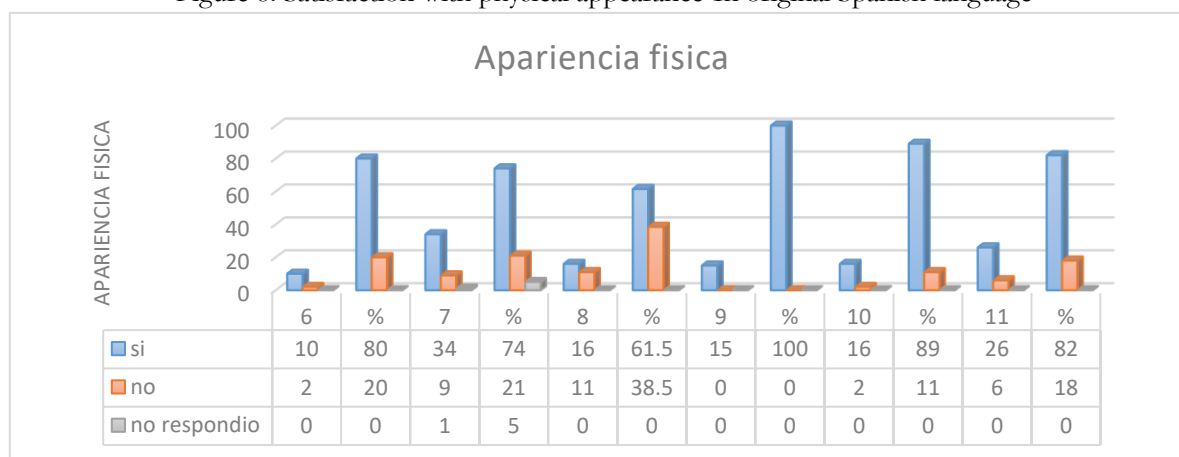
Results and analysis of the instruments used - Questionnaire

The second instrument for collecting data was a questionnaire containing 14 questions. It was designed with the aim of achieving a deep understanding of adolescents' perceptions and daily practices regarding their bodies and lifestyles. It focused on factors such as weight, overweight and personal hygiene, as well as physical activity, eating habits and cleaning routines. This instrument made it possible to obtain data from the narratives by the students, which allows the identification of behaviors, beliefs and experiences in the family and school context. Its implementation made it possible to understand more broadly how adolescents

interpret their health and well-being, adding physiological information and providing relevant elements for the sociocritical analysis of the study. This questionnaire facilitated the collection of data directly from the students' perspective, identifying their experiences, convictions, and behaviors in the school and family environment. Its implementation allowed a more extensive understanding of the interpretation that adolescents have of their well-being and health, complementing the physiological data and providing pertinent elements for the sociocritical analysis of the study.

Question 1. Are you happy or feeling good about your physical appearance?

Figure 8. Satisfaction with physical appearance-In original Spanish language



Most of the students expressed feeling good about their physical appearance, reflecting a high level of overall body satisfaction. However, a percentage of less than 20% indicated that they were not satisfied with their appearance, showing that there is a group with possible concerns about their image. The case of grade 8 stands out, where dissatisfaction increases to 38.5%, which could be related to the physical and emotional changes of adolescence. Likewise, in grade 7, there was a case

of non-response, equivalent to 5%, which suggests that some students may feel uncomfortable or insecure when expressing their perception of their body. These results show that, although most maintain a positive perception of their appearance, certain groups require attention in terms of self-esteem, body acceptance and social accompaniment.

Question 2. Do you do physical activity?

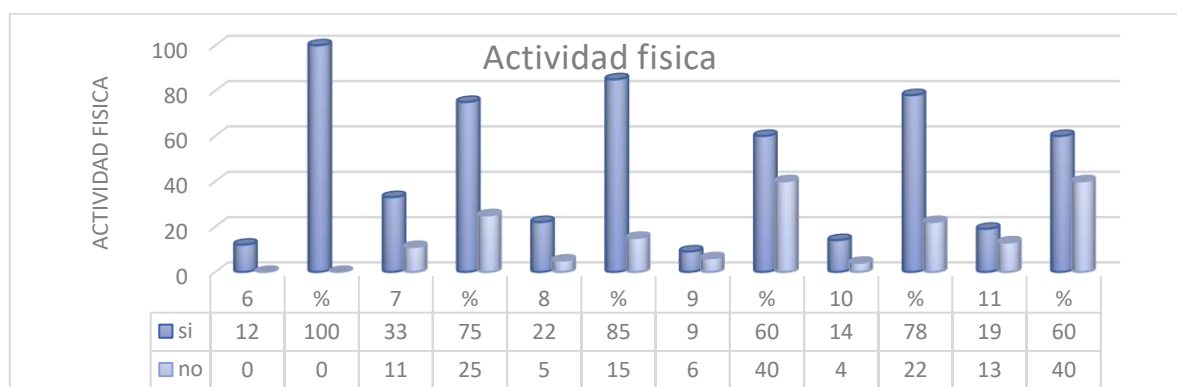


Figure 9. Physical activity-In original Spanish language

A high percentage of students reported regular physical activity, which reflects healthy habits in a large part of the student population. However, 25% indicated that they did not participate in any type of physical activity, this situation being especially relevant in grades 9 and 11, where 40% of students reported not doing any exercise. These data suggest that, as the educational process progresses, some students may decrease their level of physical activity, probably due to factors such as academic load, motivation, perception of the importance of exercise or influence of the social environment. This highlights the need for strategies that encourage physical activity, motivation, and the incorporation of healthy habits, especially in grades with lower participation. According to the students, the days when they do the most physical activity are Tuesdays, Wednesdays and Thursdays, showing a marked preference for these days of the week. This could be related to the organization of school hours, availability of free time and group habits, since students usually coordinate for sports activities during the week. The concentration of physical activity these days

also reflects social and motivational patterns that influence regular exercise, highlighting the importance of considering these factors when planning school physical activity programs.

Question 3. Do you consider that you are provided with spaces for recreation and sports in the institution? Most students consider that the educational institution satisfactorily provides spaces for recreation and sports, which contributes to promoting physical activity and healthy lifestyles. However, it is important to note that, when carefully analyzing the results obtained in grades 7, 8 and 9, it can be observed that a considerable percentage of negative responses exceed the threshold of 13%. This suggests that certain students may be experiencing obstacles in terms of accessibility to such environments or the provision of planned activities. These first findings reveal the need to evaluate and strengthen the infrastructure and sports programs existing in the educational institution so that all enrolled students have access to opportunities for physical exercise and recreation and can develop integrally.

Question 4. Do you receive training on these topics at the institution?

In relation to training in physical activity and healthy habits, students show significant differences according to grade. Only seventh grade (65.7%) and ninth grade (53.3%) students indicate that they receive training, while the majority of sixth grade (63%), eighth grade (61.5%), and tenth grade (66.7%) students say that they do not receive training. These results show inequalities in access to training and guidance programs on physical activity, which can influence motivation, knowledge about healthy habits and participation in sports. The situation indicates the need to implement coherent and equitable training strategies throughout the institution, in order to ensure that all students acquire the necessary tools for their physical well-being and healthy development.

In relation to training in healthy lifestyle habits, students present significant differences according to the grade. Students in seventh grade (42.8%) and ninth grade (20%) indicate that they receive guidance, mainly in the area of physical education. In contrast, in the other grades, most students say they do not receive training in these topics. This shows that training in healthy habits is not distributed equitably, which can restrict knowledge and adoption of practices that are beneficial to health and well-being. The situation highlights the need to develop more coherent and equitable training programmes, covering all levels of education and ensuring that students have the tools they need to maintain healthy lifestyles.

Question 5. What kind of food or diet do students from sixth to eleventh grades receive?

Table 7. Eating habits by grade

Degree	Fruit and vegetable consumption	Fat consumption	Students who do not consume vegetables
6°	High	Medium	0
7°	Medium	Medium-high	6
8°	Medium	High	4
9°	Medium	High	4
10°	Low	Very high	10
11°	Medium	High	0

6th grade students report moderate or low consumption of flours, carbohydrates, sugars, fats, fruits, and vegetables, suggesting unbalanced eating patterns. Seven of the 12 students consume an abundance of fruits, indicating a positive disposition towards healthy foods. These results show the need to reinforce nutritional education and promote balanced eating habits from an early age, combining awareness of the benefits of a healthy diet with strategies that favor regular physical activity. 7th grade students report consuming flours, carbohydrates, sugars, fats, fruits and vegetables in varying amounts: a lot, medium and little. It can be noted that 6 students do not consume vegetables, which demonstrates failures in feeding and reinforces the need to improve nutritional education. These findings

suggest that, although there is consumption of essential foods, it is essential to promote balanced habits, encouraging adequate intake of vegetables and fruits to ensure a healthy diet that complements students' physical activity and well-being.

In 8th grade, 27 informant students report consuming flours, carbohydrates, fats, and vegetables in varying amounts, evidencing heterogeneous eating habits. 4 students who do not consume vegetables are identified, which highlights areas for improvement in nutrition. These results point to the need to strengthen nutritional education and promote healthy eating habits, encouraging the consumption of vegetables and fruits as part of a healthy lifestyle complementary to physical activity and the well-

being of students. In 9th grade, 15 key student informants report consuming flours, carbohydrates, fats, and vegetables in varying amounts. Four students do not consume vegetables, evidencing deficiencies in the diet. These findings indicate the need to reinforce nutrition education and promote balanced eating habits, especially the intake of vegetables and fruits, as part of a healthy lifestyle that supports physical activity and students' well-being. In 10th grade, 18 students report consuming flours, carbohydrates, fats, fruits and vegetables in medium or low amounts, showing a trend towards moderate intake. An unbalanced eating pattern stands out in a significant proportion of the group.

These results underscore the need to reinforce nutritional education and promote balanced eating habits, reducing fat consumption and increasing the intake of fruits, vegetables and healthy carbohydrates to promote well-being and complement students' physical activity. In 11th grade, 32 students report consuming flours, carbohydrates, fats, and vegetables in varying amounts, showing heterogeneous eating patterns. A preference for flours, sugars and fats is evident, which indicates unbalanced eating habits that could affect the health of students. These

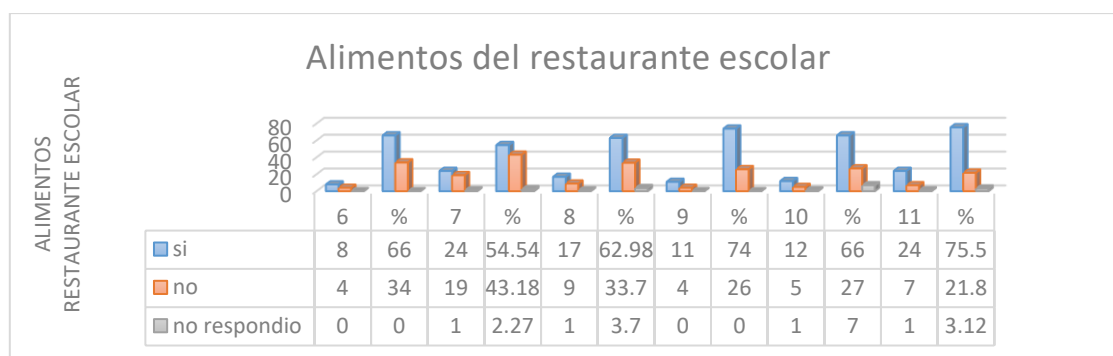
findings highlight the need to implement nutrition education strategies that reduce the consumption of flours, sugars, and fats, and promote the intake of fruits and vegetables, complementing physical activity and a healthy lifestyle.

Question 6. Are you looking for an appropriate and balanced diet for your age?

Regarding the overall perception of students regarding the adoption of healthy habits and participation in activities, it is evident that negative responses are more significant in grade 10, which suggests that a considerable percentage of students at this level could exhibit a less favorable motivation or perception towards these behaviors. In contrast, positive responses predominate in the 6th grade, which indicates a greater predisposition and commitment to healthy practices. At the other levels of education, responses are more evenly distributed, with an average of 40 to 50 per cent of positive and negative responses. This shows the diversity in the perception and behavior of students in relation to nutrition, physical activity and healthy lifestyle habits.

Question 7. In the restaurant, when you consume food, do you think it is nutritious?

Figure 10. Nutrition perception of school restaurant food-In original Spanish language



More than 54.5% of the participants maintain that the food eaten in the school restaurant is nutritious, which shows a favorable perception regarding the nutritional quality provided by the educational institution. However, this index also indicates that about half of the students may not interpret food as completely nutritious, which hints at the need to strengthen nutrition

education and encourage informed eating behaviors, which facilitate them to make more informed decisions about their diet both in the school context and in the external context.

Question 8. Do you identify the difference between overweight and obesity?

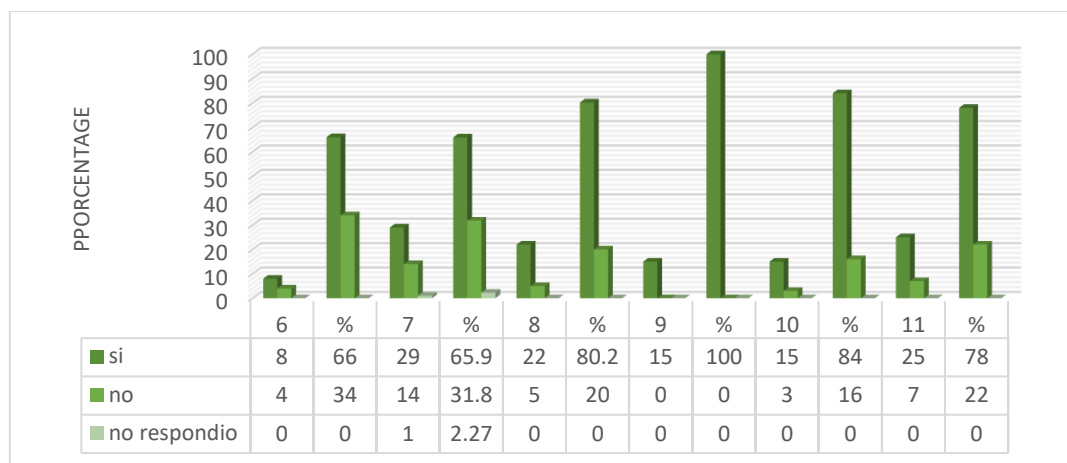


Figure 11. Difference Between Overweight and Obesity-In original Spanish language

According to 65.9% of the students, it is found that the majority recognize and distinguish the difference between overweight and obesity in the different grades, which demonstrates an adequate level of knowledge about fundamental concepts of nutrition and health. This finding suggests that students have some awareness of the risks associated with excess weight and the importance of maintaining healthy habits, which constitutes a favorable basis for implementing educational strategies that reinforce obesity prevention and promote a balanced lifestyle.

Question 9. Are there family members or people with diabetes or blood sugar?

According to the student informants, risk factors related to diabetes or high blood glucose occur more frequently in their grandparents and uncles. This shows the influence of family history on the perception of risk and health of students. These data reaffirm the importance of preventive

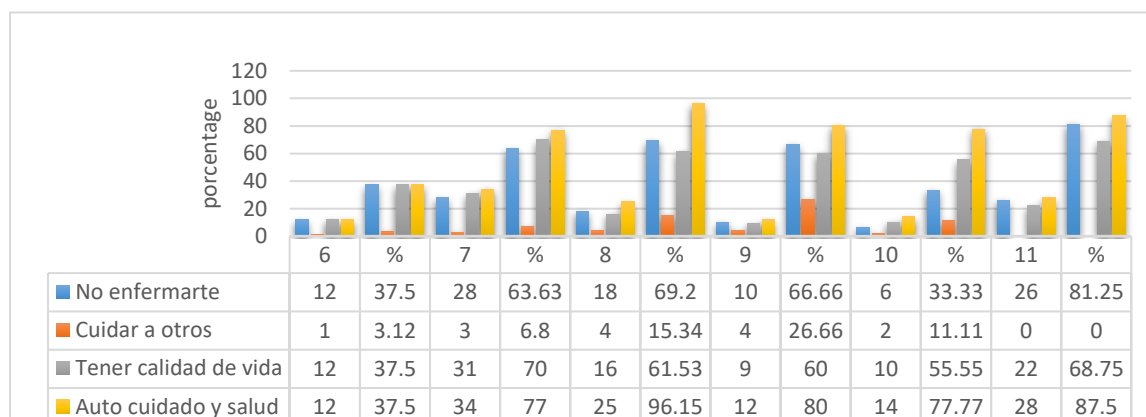
education and self-care from an early age, with the promotion of healthy eating habits and physical activity, especially in students with a family history of metabolic disease.

Question 10. In recent months have you gained weight?

According to the answers provided by the students, in sixth grade, 91% of students indicate that they have experienced weight gain in the last few months. In the other grades, approximately 46% of students also report an increase in their weight during the same period. Data show that overweight is on the rise, especially in the early stages of secondary education. This reinforces the need to promote healthy lifestyles, with a balanced diet and regular physical activity, to prevent risks related to overweight and obesity.

Question 11. Do good healthy lifestyle habits and physical activity help you?

Figure 12. Healthy lifestyle habits and physical activity-In original Spanish language

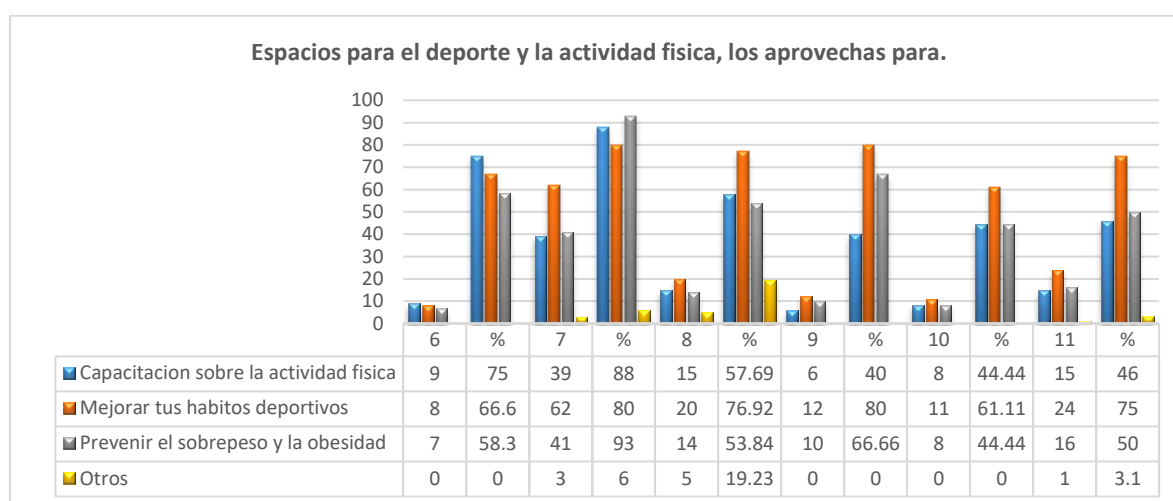


The key student informants maintain that the adoption of healthy lifestyle habits and the practice of physical activity contribute significantly to the prevention of diseases, the promotion of self-care and the improvement of quality of life. This perception shows that students recognize the relationship between their physical well-being and the adoption of healthy behaviors. They also show the relevance of a balanced diet, hygiene, exercise and personal

responsibility in the promotion of health. These findings underscore the importance of continuing to implement educational programs and activities that promote these habits, with the aim of consolidating a culture of comprehensive health from childhood and adolescence.

Question 12. Does the institution provide spaces for sports and physical activity, do you take advantage of them to?

Figure 13 Making use of spaces for sport and physical activity -In original Spanish language

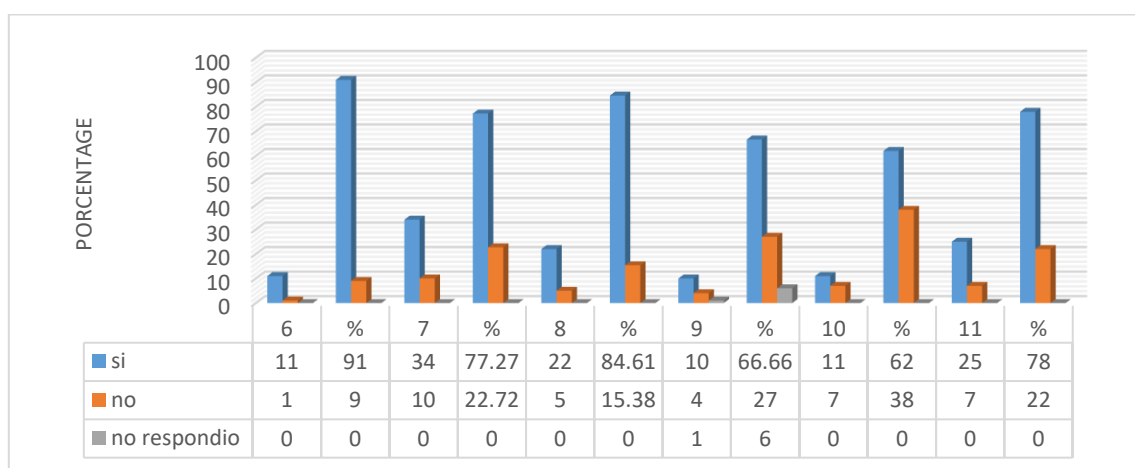


The students indicate that the educational institution offers them spaces for the practice of sports and physical activities, which are mainly used in the sixth grade. In the seventh to eleventh grades, these spaces are also used for training in physical activity, with the purpose of improving sports habits and preventing overweight and obesity. This perception shows that institutional spaces not only facilitate physical activity, but also

play an educational role in the formation of healthy habits, promoting the adoption of behaviors that favor the health and integral well-being of students throughout their school career.

Question 13. Your lifestyle habits affect your academic and behavioral activities in the classroom

Figure 14. lifestyle habits affect academic and behavioral activities-In original Spanish language



From a significant percentage of 62% of students, it can be seen that the vast majority recognize and admit that the lifestyle habits they maintain have a direct and palpable impact on their academic performance and behavior within the school environment, specifically in the classroom. This perception clearly shows that students are fully aware of the close relationship between their eating habits and routines, their personal hygiene practices, the level of physical activity they perform and their academic performance, covering aspects such as the ability to concentrate, energy levels and their general attitude in the school environment. Recent findings suggest that implementing effective strategies to promote healthy habits not only has a positive impact on students' physical and mental health, but has also been shown to significantly influence academic performance and the interpersonal dynamics that develop in the educational environment.

1.5. Discussion and reflection

The comprehensive analysis of the health and physical condition of the 148 students in secondary and middle school reveals a complex interaction between physiological factors, lifestyle habits, subjective perceptions and family, school and sociocultural contexts. The results on Body Mass Index (BMI) show marked differences by gender: men have a higher proportion of healthy weight (78.6%) and a lower tendency to overweight and obesity, while women exhibit a higher prevalence of these states.

This behavior coincides with previous research that indicates that eating habits in adolescents can be affected by stress, lack of time, and a preference for ultra-processed and energy-dense foods (Sánchez et al., 2015). Likewise, body image distortion, especially common in women, is related to weight control behaviors and possible eating disorders (Durán, 2013).

The results of blood glucose and blood pressure confirm this multiplicity of determinants: although most of the students have normal values, cases of predisposition to prediabetes were identified, and a higher percentage of

women (45%) than men (31%) showed a tendency to hypotension. Most students maintain an adequate metabolic balance. The cases of prediabetes identified highlight the importance of early preventive strategies. The differences in the cardiovascular response to exercise, with a greater acceleration of the pulse in men and a more controlled rhythm in women, suggest that physical activity, daily habits, motivation and the perception of effort directly influence cardiorespiratory health, data that agree with what was stated by Rodríguez et al., (2023).

In relation to physical activity, the jump rope test shows that men register better endurance indices in most grades, but the difference decreases in the higher grades. Progressive improvement shows that constant practice and individual and group motivation directly influence performance. Students perceive that confidence, group competence, and perseverance significantly impact their physical performance. However, gender differences decrease with progressive practice, indicating that systematic training can balance early skills and improve performance. This pattern dialogues with the literature that points to gender differences in physical activity and its relationship with weight control (Lema, 2009; Henchoz & Zufferey, 2013; Yáñez et al., 2014). In addition, the study reveals that a significant percentage of students, especially in grades 9 and 11, do not practice regular physical activity, which may be related to academic loads, lack of free time or decreased interest in sports at older ages.

Regarding food, frequent consumption of flours, carbohydrates and fats was observed, while the intake of fruits and vegetables is less constant. The 6th grade stands out positively in this aspect, but in other grades patterns persist that could lead to overweight and obesity. The perception of the school restaurant is, in general, positive (54.5% consider the food to be nutritious and 60% perceive it as hygienic), which may make it a strategic ally for the promotion of healthy eating practices, as suggested by Browne et al., (2020) when highlighting the role of participatory

approaches in the understanding of dietary behaviors.

On a subjective level, students recognize that their habits influence their academic performance and behavior in the classroom, which shows a critical understanding of the relationship between well-being and school performance. However, tensions also emerge, such as levels of body dissatisfaction, especially noticeable in grade 8, which reflect sociocultural pressures, aesthetic models and transformations typical of adolescence. Additionally, according to Ávila, (2025) self-compassion protects against developing body image and eating behavior problems.

From an institutional perspective, students express that they have spaces for physical activity, although formal training in healthy habits is uneven between grades. This suggests the need to strengthen cross-cutting programs that guarantee continuity at all educational levels. Interventions based on community participation such as those proposed by Salinas et al. (2014) can contribute to modifying food environments, improving school provision, and empowering families, teachers, and students.

The socio-critical approach and Participatory Action Research (PAR) made it possible to show that health does not depend only on individual decisions, but is mediated by family conditions, school structures, cultural gender norms, access to healthy food and availability of sports spaces. The active participation of the students favored the identification of alternatives for change such as active breaks, cooperative games, nutrition workshops and improvements in the institutional menu. This is in line with what was proposed by Lizandra et al., (2025), who point out that PAR transforms educational practices and community contexts through reflective and collaborative processes.

In summary, although physiological indicators do not show an immediate metabolic risk, the trends detected sedentary lifestyle, weight gain, low vegetable intake and high fat consumption could become significant problems in the future if they are not comprehensively addressed. The findings

underscore the need to implement playful-pedagogical strategies that integrate physical activity, nutritional education, emotional development and strengthening of self-esteem, under a critical approach that considers the multiple dimensions that mediate the well-being of adolescents.

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multiple dimensions that mediate the well-being of adolescents.

1.6. Conclusions and recommendations

The results of this research reveal that adolescents are aware of taking care of their health, since they know that physical activity, diet and self-care prevent diseases that threaten their health. This attitude represents a good starting point for the field of education. However, there are some worrying situations, such as that physical activity decreases as the school grades progress, being more worrying in ninth and eleventh grades, where many students abandon the practice of exercise. Many times this is due to the academic load, lack of time or lack of motivation. Added to this are unhealthy eating patterns, with a high consumption of flours, sugars and fats and a low consumption of fruits and vegetables. This is evidenced by the increase

in weight of students, especially those in sixth grade, who are more vulnerable in the first years of secondary school. Although most students value the school restaurant positively, there is still some mistrust in some cases, so communication and participation about these services must be strengthened. A family history of diabetes influences how teens perceive their health risks and how concerned they are about taking care of their bodies. In addition, most are aware that their lifestyles directly impact their school performance and behavior at school, demonstrating that well-being and learning are interconnected. It is here that the educational institution must persevere with more effort in all grades to strengthen the processes of formation of healthy habits. Take advantage of sports spaces and everyday situations to strengthen the institution as a main promoter of healthy lifestyles, from participation and awareness.

BIBLIOGRAPHIC REFERENCES

- Álvarez, J., Aguilar, F., & Lurbe, E. (2022). Measuring blood pressure in children and adolescents: A key element in the evaluation of arterial hypertension. *Annals of Pediatrics*, 96(6), 536.e1-536.e7. <https://doi.org/10.1016/j.anpedi.2022.04.015>.
- Arrivillaga, M., Salazar, I., Correa, D. (2003) Beliefs about health and their relationship with risk or protection practices in young university students. Colombia, Medellín.2003; 34:186-
http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000119&pid=S0124-4108201500010000400009&lng=en
- Arroyo, A. & Alvarado V. (2016). Knowledge in co-collaboration: reflections and possibilities For the construction of peace. *Universitos: Revista de Ciencias Sociales y Humanas*, 14(25), 121-148. <https://dialnet.unirioja.es/servlet/articulo?codigo=5968448>
- Ávila-Ortiz, M. N., Núñez-Rocha, G. M., Castro-Sánchez, A. E., Martínez-Rodríguez, A., Cano-Verdugo, G. & Hernández-Ruiz, K. J. (2025). Distortion of body image and eating practices in adolescents in northwestern Mexico. *RESPYN Journal of Public Health and Nutrition*, 24(3), 56–66. DOI: 10.29105/respyn24.3-874.
- Benítez-Sillero, J., Castejón-Riber, C., Portela-Pino, I., & Raya-González, J. (2025). Influence of the type of sports practiced by Spanish adolescents on their self-concept, self-esteem, and physical fitness. *Retos*, 66(12), 361-373. <https://doi.org/10.47197/retos.v66.111569>
- Browne, S., Barron, C., Staines, A. & Sweeney, M. R. (2020). Participatory approaches to Understand the dietary behaviors of adolescents in the secondary school setting. *Nutrients*, 12(12), 3761. DOI: 10.3390/nu12123761 URL: <https://www.mdpi.com/2072-6643/12/12/3761>.
- Cooke, R., Papadaki, A. (2014) The use of nutrition labels mediates the relationship A positive study between nutritional knowledge and attitudes towards healthy eating with diet quality among university students in the UK. *Appetite*. 2014;83:297-303. http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000129&pid=S0124-4108201500010000400014&lng=en.
- Coronado, E., & Saleme, Y. (2024). Sociocritical techniques of participatory action research: Tools for community transformation and emancipation. *Collectivus, Journal of Social Sciences*, 11(2). <https://doi.org/10.15648/Collectivus.vol11num2.2024.4236>
- Durán, A., Rodríguez M., Record C., Barra R., Olivares H., Tapia A., et al. (2013) Self-perception of body image in university students from Chile and Panama. *Rev Chil Nutr*. 2013;40:26-32.

- http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000155&pid=S0124-4108201500010000400027&lng=en.
- Durán, A., Ortiz-Zorrilla, F., & Taveras-Espinal, J. (2025). Evaluation of strength-endurance in students of the first cycle of secondary school. *Multidisciplinary Journal Voices of America and the Caribbean*, 2(2), 199-211. <https://doi.org/10.69821/REMUUVAC.v2i2.192>
- Esteban-Guitart, M., Sierralta, A., Searle, D., & Subero, D. (2024). Contributions of Bronfenbrenner's bioecological theory to educational research and intervention. *Educational Innovation*, 12(34), 56-89. <https://doi.org/10.15304/ie.34.9638>
- Gygliola-Ormachea, P., Tarquino-Flores, G., Chambi-Gutierrez, E., Averanga-Conde, K., & Salcedo-Ortiz, L. (2020). Glucose determination: The use of glucometers as a rapid test analysis. *Journal of the Selva Andina Research Society*, 11(1), 38-48. <https://www.redalyc.org/journal/3613/361362585005/html/>
- Henchoz, Y., Zufferey, P., (2013) Stages of change, benefits and barriers to physical activity. *Scandj Rheumatol.* 2013;42:136-45. http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000139&pid=S0124-4108201500010000400019&lng=en.
- Hernández, J., & Orlandis, N. (2020). Elevated body mass index and the prediction of dysglycemia. *Cuban Journal of Endocrinology*, 31(3). http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S1561-29532020000300011&lng=es&nrm=iso&tng=es.
- Huerta, M., Carranco, R. G., Gómez, T., Pérez, B., Campos, T., & Vega, M. (2023). Lifestyle and its association with sociodemographic variables in university students. *Ciencia Latina Revista Científica Multidisciplinar*, 7(2), 8915-8927. https://doi.org/10.37811/cl_rcm.v7i2.6003
- Izquierdo S., Aquino, M., Rodríguez R, Izquierdo S., Aquino, S., García, V., & Ramón, M. (2020). Action research and teacher development in Mexican teacher training schools. *Dialogues on education. Current Issues in Educational Research*, 11(21). <https://doi.org/10.32870/dse.v0i21.606>, <https://www.studocu.com/cl/u/13630086?sid=01763933835&page=3>.
- Jiménez, N., Martínez, D., García, A., Hernández, N., & Cordero, M. (2022). Perception of the body image in relation to body mass index in schoolchildren in Chiapas. *Revista española de nutrición comunitaria = Spanish journal of community nutrition*, 28(4), 2. <https://dialnet.unirioja.es/servlet/articulo?codigo=8841008>.
- La-Fontaine, J. (2021). Characterization of essential arterial hypertension in adolescents. *Revista Archivo Médico de Camagüey*, 25(2). http://scielo.sld.cu/scielo.php?script=sci_abstract&pid=S1025-02552021000200006&lng=es&nrm=iso&tng=es
- Lema, F., Salazar, I., Varela, M., Tamayo, J., Rubio, A., Botero, A. (2009). Behavior and health of young university students satisfaction with lifestyle. *Pensam Psicol.* 2009; 5:71-88. http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000123&pid=S0124-108201500010000400011&lng=en
- Lizandra, J., ValenciaPeris, A., Ferriz, R., & PeiróVelert, C. (2025). Use of researchParticipatory action to improve physical education interventions and promote active lifestyles in schools: study design and protocol. *Healthcare*, 13(18), 2362. DOI: 10.3390/healthcare13182362.
- Loza, R., Condori, J., Mamani, J., & Santos, F. (2021). Sociocritical paradigm in research. *PSIQUEMAG/ Digital Scientific Journal of Psychology*, 9(2), 30-39. <https://doi.org/10.18050/psiquemag.v9i2.2656>.
- Kemmis, S., & McTaggart, R. (2007). Participatory Action Research. In Denzin & Lincoln (Eds.), *The SAGE Handbook of Qualitative Research*.
- Martínez-Rosales, Y., & Gross-Tur, R. (2024). Socio-critical paradigm in scientific management-pedagogical care for students with special educational needs. *Revista Científica del Amazonas*, 7(13), 56-67. <https://doi.org/10.34069/RA/2024.13.06>
- Martínez-Sedas, G. (2024). The pulse oximeter: More information than we think. *Magazine Mexican Society of Anesthesiology*, 47(1), 30-34. <https://doi.org/10.35366/114094>.
- Nazar-Carter, G., Sáez-Delgado, F., Maldonado-Rojas, C., Mella-Norambuena, J., Stuardo-Álvarez, M., & Meza-Rodríguez, D. (2022). Interventions in childhood obesity. A systematic review of the literature. *Towards Health Promotion*, 27(1), 213-233. <https://doi.org/10.17151/hpsal.2022.27.1.15>.
- World Health Organization. (2020). Recommendations on physical activity and habits healthy teens. WHO.
- Pinzón, O., Guatibonza, M., Larrotta, P., Angulo, F., & Cortés, A. (2022). Comprehensive management of Childhood and adolescent overweight and obesity: A systematic review of the literature. *Revista española de nutrición comunitaria = Spanish journal of community nutrition*, 28(3), 12. <https://dialnet.unirioja.es/servlet/articulo?codigo=8587352>.

- Rodríguez, A., Martínez, J., & Núñez, M. (2023). Evaluation of the body mass index of the students of the Santa Rosa de Lima Educational Institution. *GADE: Scientific Journal*, 3(4), 210-232. <https://doi.org/10.63549/rg.v3i4.251>.
- Rodríguez, L., Becerra, Á., Villarreal, L., Gualdrón, J., Báez, N., & Pérez, C. (2023). Characterization of healthy habits and lifestyles in university students in the city of Tunja, Colombia. *Repertory of Medicine and Surgery*, 12(2), 45-67. <https://revistas.fucsalud.edu.co/index.php/repertorio/article/view/1418>.
- Rusillo, A., Suárez, S., Solas, J. L., & Ruiz, A. (2023). Association of a low level of fitness physical with excess weight in adolescents. *Challenges: New Perspectives on Physical Education, Sports and Recreation*, 47. https://openurl.ebsco.com/EPDB%3Aagd%3A3%3A24666291/detailv2?sid=ebsco%3Aplink%3Ascholar&id=ebsco%3Aagd%3A161426798&crl=c&link_origin=scholar.google.com.
- Saldaña, J. (2015). *The Coding Manual for Qualitative Researchers*. Sage. Sánchez, M., De Luna, E. (2015) Healthy lifestyle habits in the population university. *Nutr Hosp.* 2015;31:1910-9. http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000147&pid=S0124-4108201500010000400023&lng=en
- Salinas, C., González, G., Fretes, C., Montenegro, V. (2014). Theoretical basis methodological guidelines for a healthy eating education program in schools. *Rev Chil Nutr.* 2014;41:343-50. http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000161&pid=S0124-4108201500010000400030&lng=en.
- Torres, J., Contreras, S., Lippi, L., Huaiquimilla, M., & Leal, R. (2019). Healthy lifestyle habits as an indicator of personal and social development: Discourses and practices in schools. *Quality in Education Journal*, 12(50), 357-392. <https://doi.org/10.31619/caledu.n50.728>
- Yáñez, A., Hespanhol, J., Gómez, R., Cossio, M. (2014) Valuation of the activity Physics in school adolescents by means of a questionnaire. *Rev Chil Nutr.* 2014; 41:360- http://www.scielo.org.co/scielo.php?script=sci_nlinks&ref=000141&pid=S0124-4108201500010000400020&lng=en.
- Vargas, E., Nolasco, F., Menacho, J., & Luque, N. (2023). Physical exercises for a healthy active life in educational settings. | Encounters. *Journal of Human Sciences, Social Theory and Critical Thinking. Journal of Human Sciences, Social Theory and Critical Thinking*, 19(12), 170-189. <https://encuentros.unermb.web.ve/index.php/encuentros/article/view/561?articlesBySimilarityPage=2>.
- Vera, A., & Jara, P. (2018). The Socio-Critical Paradigm and its contribution to the Practicum in the Initial Teacher Training [Degree Project]. Catholic University of the Holy Conception. Concepción, Chile. <https://www.studocu.com/cl/document/universidad-de-chile/sociologia/vera-y-jara-2018-el-paradigma-socio-critico-y-su-contribucion-al-practicum-en-la/13630086>
- Zapata, F and Rondan, V. (2016) Participatory Action Research: Conceptual and methodological of the Mountain Institute. Lima: Instituto de Montaña. <https://mountain.pe/recursos/attachments/article/168/Investigacion-Accion-Participativa-IAP-Zapata-y-Ron>