

Food Market Research on The Nutritional Status and Physical Activity Levels of Students at The Technical University of Ambato

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Abstract: This study analysed the relationship between the food market, nutritional status and physical activity levels of students at the Technical University of Ambato, with the aim of proposing strategies to promote healthy habits and improve their quality of life. A quantitative approach was used, with a descriptive and correlational design, through the application of surveys to 376 students. The results showed that the majority of students consumed unhealthy foods both on and off campus, with a predominance of ultra-processed products and fast food. It will also be observed that the perception of nutritional status was mostly negative, associated with the limited supply of healthy options at the university. In terms of physical activity, a low frequency of exercise was identified among students, which, together with inadequate eating habits, could affect their overall well-being. In addition, food preferences were found to influence respondents' energy levels and physical performance. Based on these findings, it is suggested to improve the supply of healthy foods on campus and to encourage physical activity through institutional strategies. These measures would contribute to the adoption of more balanced lifestyles among university students.

Keywords: food market, university food, nutritional status, physical activity, healthy habits.

1. INTRODUCTION

University students' eating behavior is influenced by multiple cognitive and social factors, which can affect their nutritional status and levels of physical activity. According to the Theory of Planned Behavior, food-related decisions depend on personal attitudes, social pressure, and perceived behavioral control (Araujo et al., 2023). In this regard, if students perceive healthy eating as beneficial and have access to nutritious options, they are more likely to adopt appropriate habits (Alemán et al., 2022). However, when the university environment facilitates the consumption of ultra-processed and easily accessible foods, the intention to maintain a balanced diet may be hindered (Melo et al., 2022). This demonstrates that perceived control and social influence play a crucial role in shaping eating habits within the university setting.

In line with the above, changes in university students' dietary habits can be understood through the Theory of Nutritional Transition, which posits that globalization and urbanization have shifted consumption patterns toward diets high in fats and sugars (Godínez et al., 2024). In the university context, the availability of processed foods and limited time to prepare homemade meals have contributed to a transition toward unhealthier eating habits (Malicevic et al., 2022). Moreover, the influence of fast-food chains and the advertisement of high-calorie products have exacerbated these changes, promoting behaviors that may negatively impact students' nutritional status (Duarte et al., 2022). As a result, it is essential to analyze how these factors affect access to healthy food options at the Technical University of Ambato and their impact on students' quality of life.

Furthermore, the relationship between diet and physical activity can be explained through the Health Behavior Theory, which suggests that the perception of risk and the perceived benefits associated with a behavior influence its adoption (Fouilloux et al., 2021). In this sense, if students do not perceive inadequate nutrition and physical inactivity as significant health risks, they are unlikely to change their behavior (Gil, 2019). Additionally, limited access to nutritional information and a lack of motivation may

contribute to the persistence of unhealthy habits (Elizondo & Fonseca, 2018). Therefore, promoting strategies that enhance risk perception and encourage positive changes in dietary and physical activity behaviors is essential to improve student well-being.

Access to fast food on and around university campuses has been identified as a major determinant of students' health. According to López et al. (2021), the availability and low cost of such products promote their frequent consumption, which may lead to nutritional problems. The study also highlights that the lack of regulation regarding university food offerings contributes to rising rates of overweight and obesity among students (Araujo et al., 2023). In this context, it is crucial to analyze the influence of the local food market on the nutritional habits of students at the Technical University of Ambato.

Moreover, the relationship between nutrition and academic performance has been extensively documented. Martínez & Pérez (2019) found that students with balanced diets perform better academically than those who consume high-fat and high-sugar processed foods. Their study also notes that poor nutrition can affect concentration and cognitive performance (Arboix et al., 2022). Thus, understanding the impact of the food market on students' diets will help in proposing strategies to improve both health and academic performance at the Technical University of Ambato.

Likewise, university students' physical activity levels are closely related to their eating habits. Gómez et al. (2020) analyzed the relationship between caloric intake and physical activity, concluding that unbalanced diets are often associated with sedentary lifestyles. They also pointed out that the lack of healthy food options in academic settings negatively influences the adoption of exercise routines (Calvo et al., 2024). Therefore, evaluating the interaction between food availability, nutritional status, and physical activity at the Technical University of Ambato will support the development of health promotion policies and the prevention of diseases associated with sedentary behavior.

This article builds on previous research by evaluating the specific interaction between the local food market and physical activity levels in an Ecuadorian university context. It reports data on the availability of healthy food options at the Technical University of Ambato and their impact on students' nutritional status.

The research is guided by the following question: How does the food market influence the nutritional status and physical activity levels of students at the Technical University of Ambato? The general objective of this study is to analyze the relationship between the food market, nutritional status, and physical activity levels of students at the Technical University of Ambato, in order to propose strategies that encourage healthy habits and improve their quality of life.

We consider that implementing strategies to improve the food offerings at the Technical University of Ambato will contribute to healthier and more balanced student diets. This, in turn, will promote better nutritional status and optimal physical activity levels, fostering healthy lifestyles within the university community.

2. METHODS

Study Approach and Type

This study adopted a quantitative approach, as it involved measuring and analyzing the relationship between the food market, nutritional status, and physical activity levels of students using numerical data. It was a descriptive and correlational research, as it characterized the eating and physical activity habits of students at the Technical University of Ambato and determined the existing associations among these variables.

Population and Sample

The target population consisted of 18,400 students enrolled at the Technical University of Ambato. A simple random sampling method was used to select the sample, resulting in a total of 376 students, which ensured a 95% confidence level and a 5% margin of error. This sample size allowed for representative and generalizable results to the student population, ensuring the validity of the findings. The following formula was used:

$$n = \frac{N \cdot Z^2 \cdot p \cdot (1 - p)}{(N - 1) \cdot E^2 + Z^2 \cdot p \cdot (1 - p)}$$

Where:

n is the sample size

N is the population size (18,200)

Z is the Z-score corresponding to the confidence level (1.96 for a 95% confidence level)

p is the expected population proportion (0.5 if unknown)

E is the margin of error (0.05 for a 5% error margin)

Z-score for 95% confidence level: 1.96

Expected proportion (p): 0.5

Margin of error (E): 0.05 or 5%

$$n = \frac{18400 \cdot 1.96^2 \cdot 0.5 \cdot (1 - 0.5)}{(18400 - 1) \cdot 0.05^2 + 1.96^2 \cdot 0.05 \cdot (1 - 0.05)}$$

$$n = \frac{18400 \cdot 3.8416 \cdot 0.25}{(18399) \cdot 0.0025 + 3.8416 \cdot 0.25}$$

$$n = \frac{17652}{46.9579}$$

$n \approx 376.01$

Data Collection Instrument

To collect the required information, a structured survey with closed-ended questions and measurement scales was designed and administered to the selected students. The questionnaire included the following components:

- **Sociodemographic data** (age, gender, academic program, and educational level).
- **Eating habits** (frequency and types of foods consumed on and off campus).
- **Accessibility and perception of the food market** (cost, variety, and availability of healthy food options).
- **Nutritional status** (self-perceived body weight, frequency of processed food consumption, and overall nutritional balance).
- **Physical activity level** (weekly exercise frequency, types of physical activities performed, and barriers to physical activity).

Research Procedure

- Questionnaire design based on previous studies and adapted to the university context.
- Survey administration both online and in-person to the selected student sample.
- Data analysis through descriptive and correlational statistics to assess the relationships among the study variables.

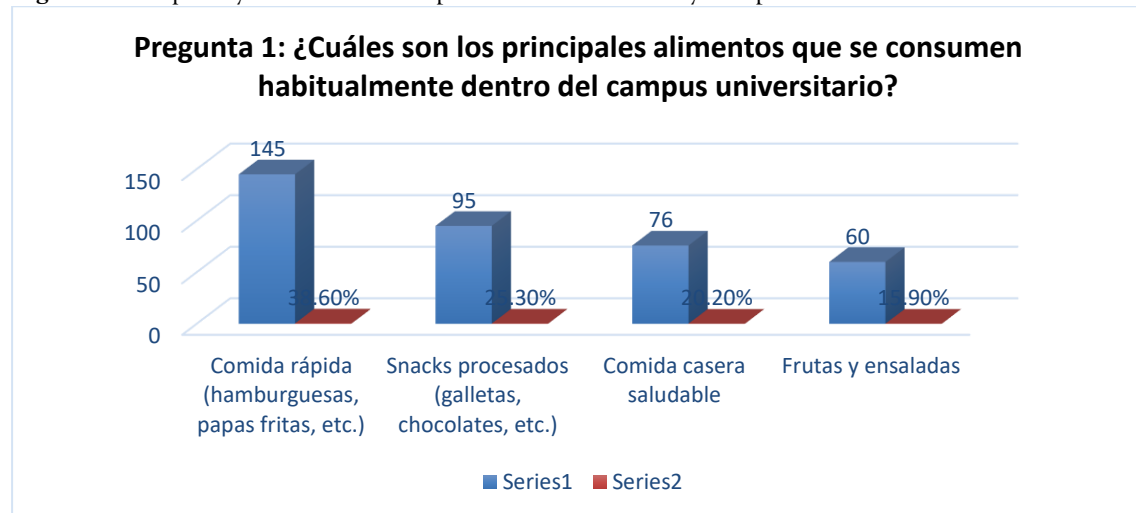
Data Analysis

The collected data were processed using statistical software (Excel) to calculate frequencies, percentages, and measures of central tendency. In addition, statistical tests were applied to determine the relationship between food availability, nutritional status, and levels of physical activity among students. This methodology allows for a comprehensive understanding of the students' nutritional and physical activity context, providing a scientific basis for developing strategies to promote healthy habits within the university community.

3. RESULTS

This study examines the relationship between the food market, nutritional status, and physical activity levels of students at the Technical University of Ambato. Through the application of surveys, it was identified that students' eating habits are not entirely healthy, with a predominant consumption of fast food and processed snacks on campus, as well as a high dependency on food purchased outside the university. Moreover, the results show that most students perceive their nutritional status as fair or poor and acknowledge that their eating habits negatively affect their physical activity. The main findings are presented in detail below.

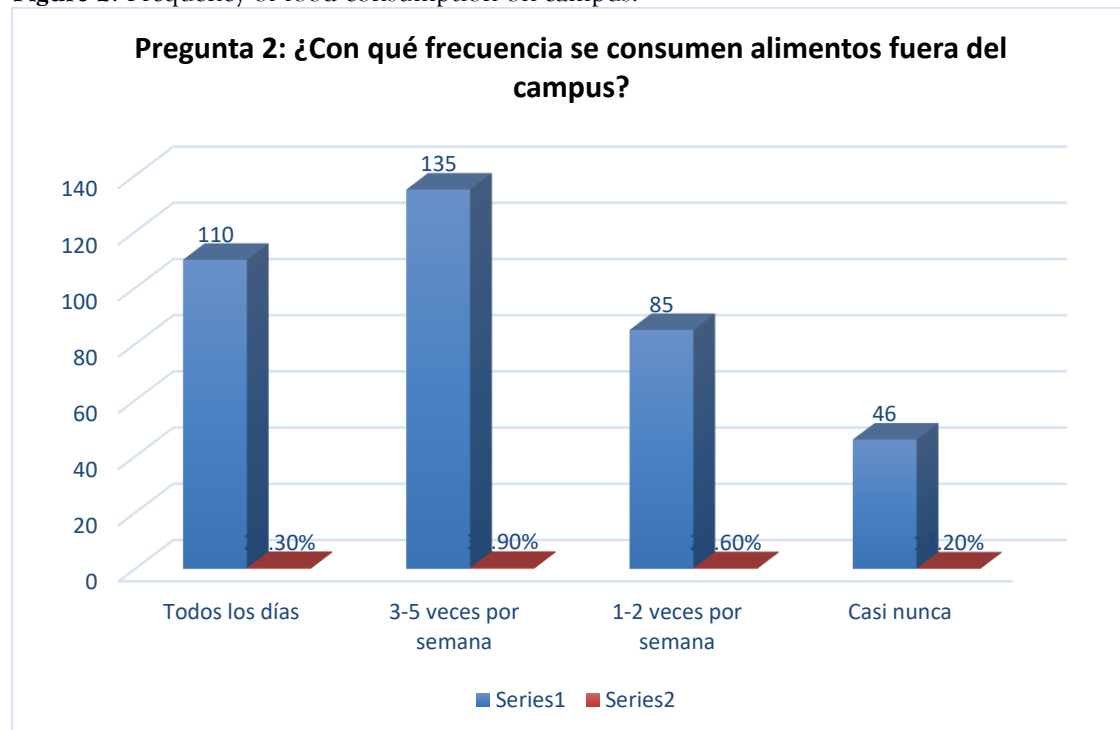
Figure 1: Frequency of food consumption on the university campus



Note: A high consumption of fast food on campus is observed.
Source: Own elaboration.

The results indicate that on-campus food consumption is not the healthiest. A total of 38.6% of students consume fast food, while 25.3% prefer processed snacks—together representing more than half of the sample. In contrast, only 15.9% choose fruits and salads. This reflects a food supply dominated by ultra-processed products with low nutritional value. The lack of healthy food options on campus may be influencing students' unbalanced eating habits, potentially leading to long-term health issues.

Figure 2: Frequency of food consumption off-campus.

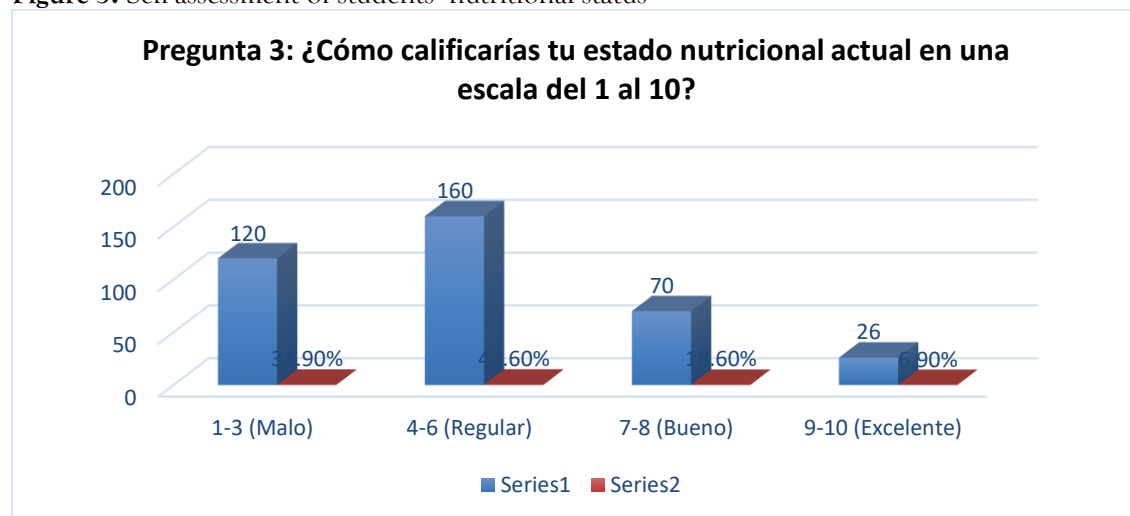


Note: A significant portion of students rely on food consumed off campus.
Source: Own elaboration.

65.2% of students consume food outside the campus at least three times per week, and nearly 30% do so daily. This reveals a strong dependence on external food sources, which may be influenced by the quality and variety of food options available within the university. The lack of healthy choices on campus could

be prompting students to seek alternatives at restaurants or through delivery services—often involving less balanced meals.

Figure 3: Self-assessment of students' nutritional status

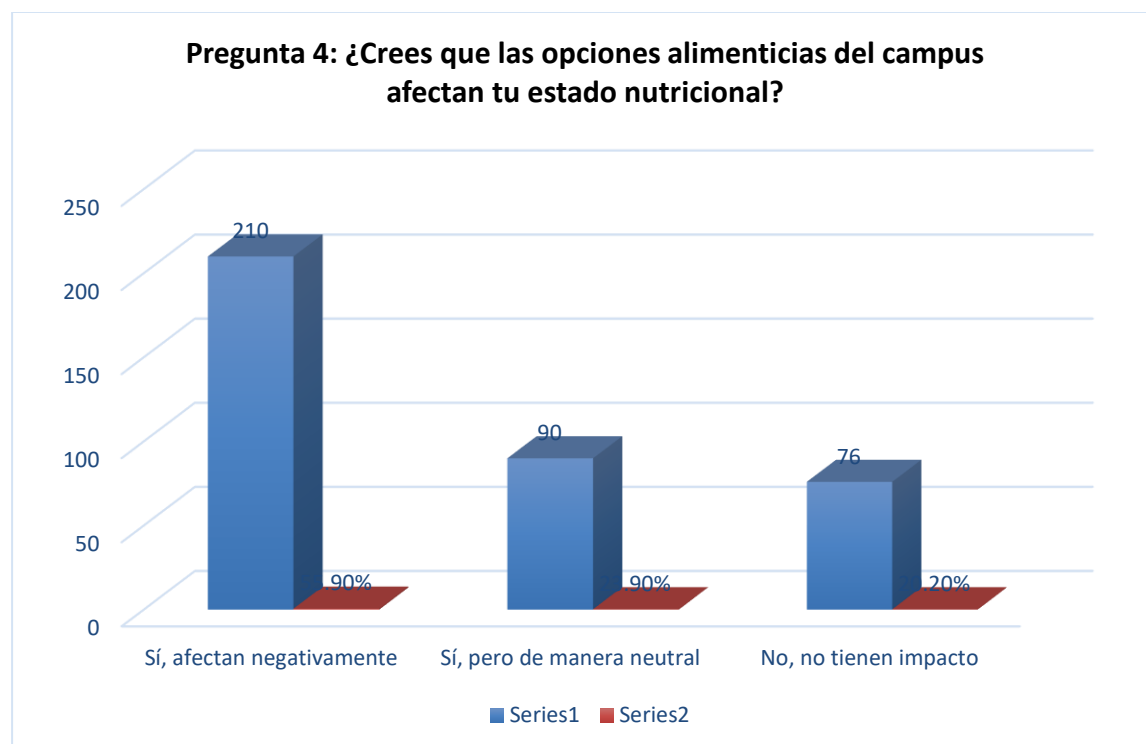


Note: Most students consider their nutritional status to be poor.

Source: Own elaboration.

74.5% of students perceive their nutritional status as poor or fair, reinforcing the hypothesis that their eating habits are not optimal. Only 6.9% consider their nutritional status to be excellent, suggesting a clear opportunity to improve the food options available on campus. The lack of nutritious food consumption and the excessive intake of fast food may be contributing to this negative self-perception of health.

Figure 4: Perception of the impact of food choices on nutritional status and eating habits.



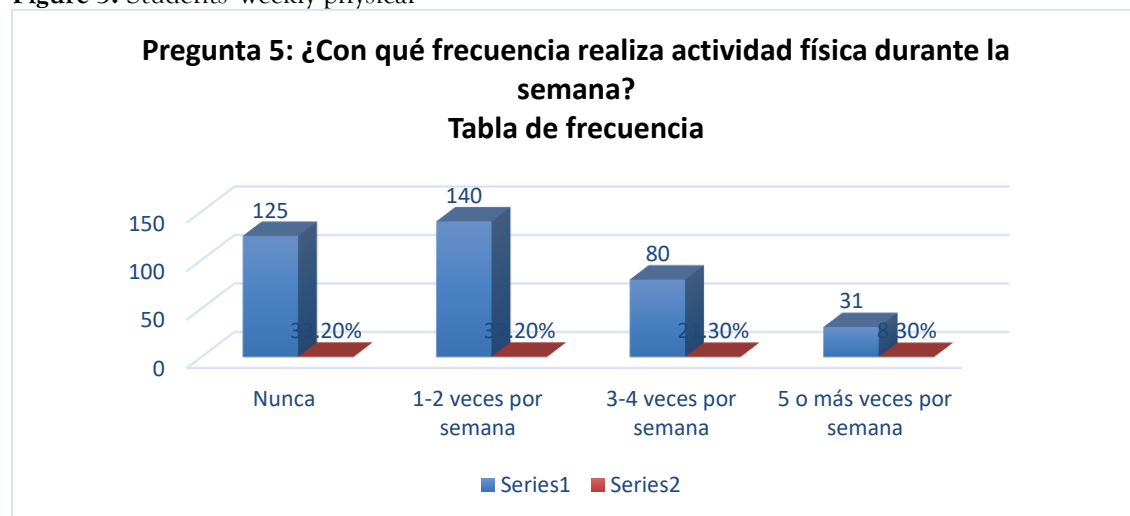
Note: Campus food is perceived to negatively impact students' nutrition.

Source: Own elaboration.

55.9% of students believe that the campus food offerings negatively affect their nutritional status. This suggests that the available options do not support healthy eating habits. While 23.9% consider the impact to be neutral, only 20.2% believe it has no influence at all. These findings indicate that the university

could implement strategies to improve the nutritional quality of campus food and raise awareness among students about the importance of healthy eating.

Figure 5: Students' weekly physical

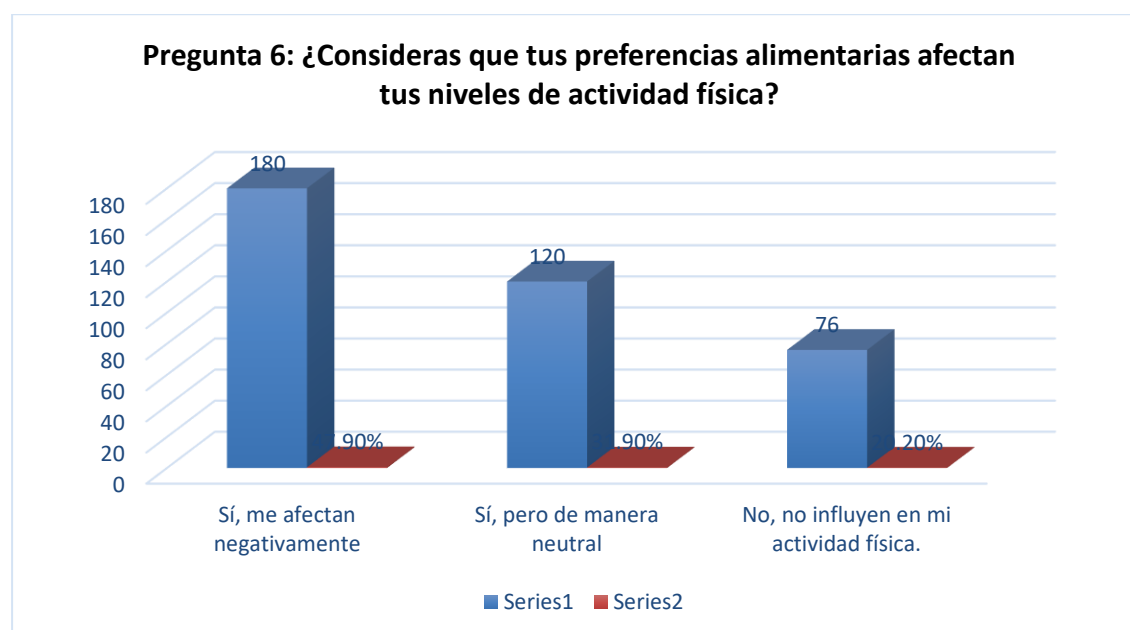


Note: A high percentage of students engage in little physical activity.

Source: Own elaboration.

The data show that most students do not engage in physical activity regularly. A concerning 33.2% do not exercise at all, and another 37.2% do so only 1 to 2 times per week, indicating low levels of physical activity. This outcome may be influenced by lack of time, interest, or adequate infrastructure on campus. Only 8.3% exercise more than five times per week, revealing that only a small minority maintain an active lifestyle.

Figure 6: Perception of the impact of food preferences on physical activity levels

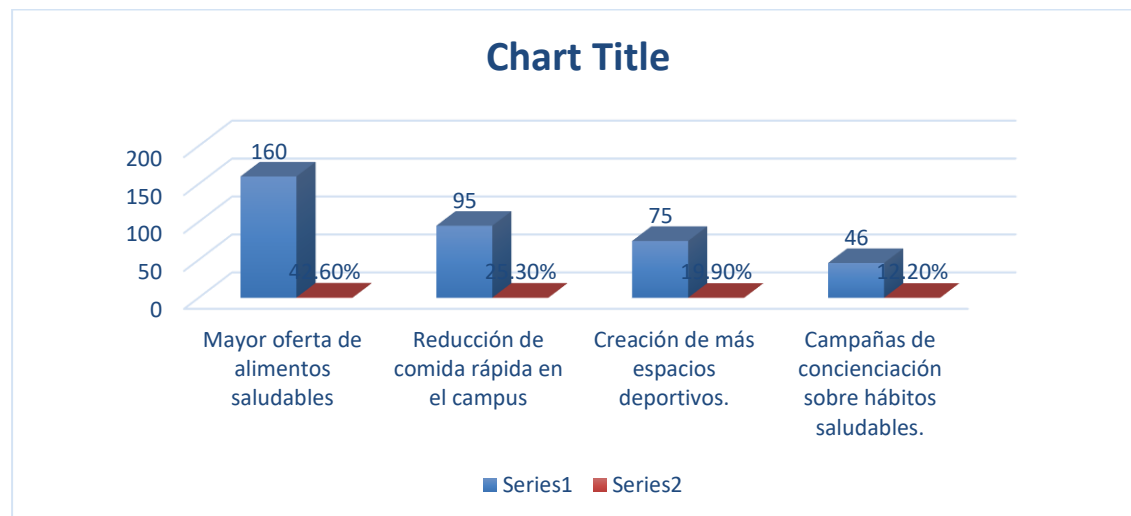


Note: Many students believe their diet affects their physical performance.

Source: Own elaboration.

The results indicate that nearly half of the students (47.9%) believe their diet negatively impacts their level of physical activity. This may be due to a diet high in fats and sugars, which reduces energy levels and physical performance. About 31.9% think their diet has neither a positive nor negative impact, while only 20.2% believe their eating habits do not influence their physical activity at all. This suggests that improving students' nutrition could be an effective strategy to increase physical activity levels.

Figure 7: Suggestions for improving food options and promoting physical activity on campus.



Note: The need to improve food offerings and sports infrastructure on campus is evident.
Source: Own elaboration.

Students clearly express the need to enhance the availability of nutritious food options on campus, with 42.6% suggesting the inclusion of healthier alternatives and 25.3% recommending a reduction in fast food offerings. Furthermore, 19.9% emphasize the importance of having more sports facilities within the university, highlighting infrastructure as a key factor in promoting physical activity. Finally, 12.2% believe that awareness campaigns could serve as an effective strategy to improve both dietary and exercise habits.

4. DISCUSSION

The results of the study reveal that students at the Technical University of Ambato exhibit unhealthy eating habits, with a high consumption of ultra-processed foods both on and off campus. Moreover, the majority of respondents rated their nutritional status as fair or poor, suggesting a potential deficiency in their daily diet. Previous studies have demonstrated that the availability of healthy food options in educational settings significantly influences students' eating behaviors (González et al., 2024). Similarly, Moreno et al. (2016) emphasize that a balanced diet is essential for improving health and academic performance.

Regarding the relationship between the campus food supply and nutritional status, most students perceive that the available options do not promote a balanced diet. This suggests that the university environment plays a critical role in shaping eating habits. Similar research in Latin American universities has pointed out that the lack of healthy options in university cafeterias increases the consumption of fast food among students (Lirola & Spray, 2021). On the other hand, a study by Ruiz et al. (2016) indicates that institutional policies can influence preferences toward more nutritious foods, highlighting the importance of implementing strategies within universities to enhance food offerings.

Physical activity levels among students were also found to be low, which could be related to poor dietary habits. It has been shown that a diet high in processed and calorie-dense foods can decrease energy levels and negatively affect physical performance (Schmidt et al., 2018). Furthermore, the American Arboix (2022) emphasizes that regular exercise should be accompanied by adequate nutrition in order to optimize health and well-being. This suggests that improving the campus food environment could indirectly help promote higher levels of physical activity among students.

Another relevant finding is that many students believe their dietary preferences impact their level of physical activity, reinforcing the importance of nutritional education within the university context. According to a study by Ruiz et al. (2010), when young people are more informed about the effects of diet on physical performance, they tend to make healthier choices. Similarly, Melo (2022) suggests that

universities should promote educational programs that integrate information on both nutrition and physical activity to improve students' habits.

The implications of these results highlight the need to design strategies that promote better nutrition and physical activity at the Technical University of Ambato. One possible intervention would be the implementation of a healthy food program on campus, similar to models adopted by other universities that have reported significant improvements in students' quality of life (Schmidt et al., 2018). Additionally, including mandatory recreational and sports activities could contribute to enhancing the physical and mental well-being of students (Trigueros et al., 2019).

Finally, this study opens new questions for future research. For instance, it would be interesting to analyze in greater depth the relationship between the consumption of ultra-processed foods and academic performance. Likewise, the effectiveness of educational campaigns within the campus could be assessed to improve students' nutrition and physical activity. Research in this area could provide a stronger foundation for the development of university policies aimed at fostering healthy habits within the student community (Montalt et al., 2024).

5. CONCLUSIONS

T Students at the Technical University of Ambato exhibit poor dietary habits, characterized by a high intake of ultra-processed foods and low-nutritional-value options both on and off campus. This highlights the urgent need to improve the availability of healthy food choices within university spaces in order to promote more balanced eating behaviors.

There is a widespread perception that the food options available on campus negatively affect students' diets. This suggests that the lack of variety and limited access to nutritious foods may be contributing to the poor nutritional status observed in the student population.

Findings also show that most students do not engage in physical activity regularly. When combined with inadequate nutrition, this sedentary behavior may increase the risk of long-term health issues. Therefore, it is essential to promote exercise through initiatives that encourage students to adopt a more active lifestyle.

Students acknowledge that their dietary choices influence their energy levels and physical performance. However, the lack of nutritional education limits their ability to make informed decisions. This underlines the importance of implementing awareness programs that address the connection between nutrition and physical performance.

The findings of this study underscore the urgency of developing policies and strategies aimed at fostering healthy habits within the university context. Enhancing the availability of nutritious foods and promoting physical activity through appropriate infrastructure and comprehensive wellness programs could have a positive impact on students' overall quality of life

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