Journal of Namibian Studies, 33 S2(2023): 3657–3668 ISSN: 2197-5523 (online)

DIETARY PRACTICES AND ITS INFLUENCE ON THE NUTRITIONAL STATUS OF A GROUP OF ADOLESCENTS FROM AN ANDEAN ZONE OF ECUADOR

Sarita Lucila Betancourt Ortiz[1], Mayra Alexandra Logroño Veloz[2], María de los Ángeles Rodríguez Cevallos[3], Janine Maribel Taco Vega[4]

[1]Carrera de Nutrición y Dietética. Facultad de Salud Pública, Escuela Superior Politécnica de Chimborazo. (ESPOCH), Riobamba, Ecuador, lbetancourt@espoch.edu.ec

[2]Carrera de Nutrición y Dietética. Facultad de Salud Pública, Escuela Superior Politécnica de Chimborazo. (ESPOCH), Riobamba, Ecuador, mlogrono@espoch.edu.ec

[3]Carrera de Nutrición y Dietética. Facultad de Salud Pública, Escuela Superior Politécnica de Chimborazo. (ESPOCH), Riobamba, Ecuador, maria.rodriguez@espoch.edu.ec

[4]State University of Bolivar. Faculty of Health Sciences, Guaranda Ecuador, jtaco@ueb.edu.ec

Abstract

Introduction: Food is a fundamental aspect of human health and well-being, especially during adolescence, a stage of rapid growth and physical and mental development, the feeding practices of adolescents directly influence their nutritional status and the health and well-being of this population group. Objective: to explore the feeding practices of a group of adolescents aged between 12 and 18 years, from Tisaleo canton, Ambato canton. Methods: descriptive descriptive qualitative cross-sectional study, through a self-administered online survey, using different platforms and social networks such as Facebook, Instagram, Twitter, WhatsApp, with closed multiple-choice questions , with a Non-probability convenience sampling of the type of uncontrolled instrument distribution, applied to 60 adolescent volunteers who agreed to participate and answer the survey Results: 66.66% are women while 33.33% men, women have lower values of weight, height and BMI than men, 63.33% of adolescents have a normal nutritional status, 23.33% underweight and 13.33% malnutrition due to excess (10% overweight and 3.33% obesity). Therewas a statistically significant relationship between physical activity and

nutritional status of young people, with a p-value of 0.02981 in the χ^2 test. Hay a significant correlation between the consumption of breakfast, lunch and snack with the nutritional status of the adolescents investigated Conclusions: this study offers a valuable insight into feeding practices and their influence on the nutritional status of adolescents in an Andean area of Ecuador. The results obtained highlight the need to address this problem in a comprehensive manner, involving the community, the health sector and other relevant actors in the promotion of a healthy and balanced diet for adolescents.

1. Introduction

Food practices are understood as performative actions that are carried out in the interaction between different materialities, abilities and senses, and that are grouped through the course of people's lives, being able to be transformed as a result of the change in said materialities, abilities or senses(1), the stage of adolescence, in addition to being a stage of transition and physiological changes, It has generated during the last decade a large number of investigations due to the notoriety and great social concern raised by many of the situations of this period and the vulnerability to threats to develop unhealthy food practices with lifelong risks(2)(3). In fact, unhealthy eating practices are one of the risk behaviors that are mostly observed during this period(4), because this age group tends to spend more time away from home, compared to schoolchildren or younger children and, therefore, are exposed to many foods that may not be the norm at home. which increases the risk of malnutrition(5). Numerous studies have examined adolescents' sedentary behaviors, especially in front of TV, computer and/or virtual games, and found that they were associated with less healthy activity (6). In Latin America, the current nutritional situation reflects the fact that most recent economic, cultural and demographic changes (7) have not impacted the population equally, resulting in a scenario where malnutrition (mainly chronic malnutrition) coexists with overweight and obesity, with micronutrient deficiencies in both conditions. In Latin America, stunting (height-for-age below -2 standard deviation) is the most common nutritional deficit in children aged 0–59 months (8), although it varies widely between countries with a prevalence of up to 48% in Guatemala, 27.2% in Ecuador, and as low as 1.8% in Chile (9) (10). , while, in the same region, 3 out of 10 children and adolescents, aged 5 to 19, live with overweight, Argentina, Bahamas, Chile and Mexico have the highest percentages of overweight among their population aged 5 to 12 years (prevalence above 30%) (11)while in Ecuador, 8.6% of children under 5 years of age are overweight, percentage that triples between 5 and 11 years of age (29.9%) and in the adolescent population (26%)(12).

At present, it is necessary to investigate feeding practices and their influence on the nutritional status of adolescents, because of the importance of having a good practice on feeding from an early age since it contributes to the prevention of diseases in adulthood and to improve their quality of life. Therefore, the purpose of this qualitative cross-sectional study was to explore the feeding practices of a group of adolescents aged between 12 and 18 years, from Tisaleo canton, Ambato canton and from the results, establish the need to implement comprehensive programs to promote healthy eating practices in this age group.

2. Materials and Methods:

Study Design: cross-sectional descriptive observational qualitative study. A self-administered online survey with closed-ended multiple-choice questions was used to collect data. Data collection was conducted between March and April 2020. At that time, confinement due to the COVID-19 pandemic in Ecuador was mandatory.

Participants and sampling: Adolescents of both sexes between 12 and 18 years old were invited to participate in the study. Non-probability convenience sampling of the type of uncontrolled distribution of instruments was used, a technique where participation is voluntary and self-selected(13). Invitations to participate in the study were sent through different platforms and social networks, including Facebook, Instagram, Twitter, WhatsApp. In total, 60 adolescent volunteers agreed to participate and answered the survey.

Inclusion criteria:

a) Adolescents between 12 and 18 years old, of both sexes, living in Tisaleo, Ambato Canton.

b) Teens, whose parents signed informed consent

c) Teenagers who have internet

Exclusion criteria:

a) Adolescents who have a metabolic, congenital or chronic disease.

b) Adolescents who at the time of data collection did not wish to participate in the study

c) Adolescents who had some barrier in communication or presented physical impairments that prevented the application of the questionnaire

Survey

A survey was developed in order to collect information on sociodemographic factors, anthropometric measurements (age, weight,

height) by sex, as well as level of physical activity, frequency of food consumption and food preferences during the day.

The self-administered online survey was validated in 20% of the population, after making the corrections, the survey was distributed through social networks using Google Forms. The survey had four sections: Section 1 included presentation, objectives, and informed consent form; Section 2 was intended to collect sociodemographic data, Section 3 questions on physical activity; and Section 4, included questions on frequency of food consumption and food preferences during the day.

Variables:

Dependent variable

Nutritional status: information on sex, age, weight and height was obtained in section 2 of the survey, with the information the muscle mass index (BMI) was calculated according to age and sex, complying with the recommendations of the World Health Organization (WHO) and classifying the nutritional status of the adolescents studied according to the z-score of BMI for age, using the ANTHRO-PLUS Program for children aged 5-19 years: establishing the categories as suggested by the technical standard(14):

Table 1. Classification criterion of the Nutritional Diagnosis according to BMI

Nutritional Diagnosis	Standard deviation (WHO)
Severe Obesity	35 ≥ + 3
Obesity	30 ≥ + 2 a + 2,9
Overweight or Risk of Obesity	25-30≥ + 1 a + 1,9
Eutrophy the Normal	20 -25 + 0,9 a- 0,9
Weight Deficit or Low Weight	19 ≤ - 1 a - 1,9
Malnutrition	15≤ - 2

Independent variable

Food practices: this information was obtained in section 4 of the survey, it was asked about the frequency of consumption of the three main meal times, i.e. breakfast, lunch and snack, with a frequency of daily, 2 or 3 times a week and occasionally, information was also obtained on the consumption of portions of vegetables and fruits and compared according to the recommendations of MyPlate tool created by the Department of Agriculture of the United States (USDA)

Intervening variable:

Physical activity: in section 3 information was collected on whether and how often you engage in physical activity, this information was classified into 4 categories: sedentary, light, moderate and intense; as

recommended by the Food and Agriculture Organization of the United Nations (FAO)(15)

Information analysis

The results were tabulated with the elaboration of descriptive analyses of the study population group and contingency tables with the chi-square statistic to observe if there is agreement between the frequencies of the study variables, for the purpose the statistical programof free version Jamovi projet 2022 Version 2.3 was used

3. Results and Discussion:

3.1 Anthropometric characteristics of young people from the Community of San Juan del Cantón Tisaleo-Ecuador.

Table 2. Descriptive anthropometric characteristics by gender of young people from the Community of San Juan del Cantón Tisaleo.

					95% Confidence Interval					Shapiro-Wilk	
	SEX	N	Media	EE	Inferior	Superior	OF	Minimal	Maximum	In	p
AGE	WOMAN	40	15.18	0.28	14.62	15.73	1.80	12.00	18.00	0.94	0.035311
	MAN	20	15.80	0.37	15.08	16.52	1.64	13.00	18.00	0.92	0.119152
WEIGHT	WOMAN	40	50.24	0.98	48.33	52.16	6.17	40.00	68.00	0.93	0.012767
	MAN	20	58.00	2.51	53.08	62.92	11.22	37.50	86.00	0.96	0.631473
SIZE	WOMAN	40	1.53	0.02	1.50	1.56	0.10	1.20	1.71	0.90	0.002012
	MAN	20	1.59	0.01	1.57	1.62	0.06	1.47	1.71	0.97	0.711082
IMC	WOMAN	40	21.66	0.54	20.59	22.72	3.44	15.66	31.60	0.93	0.017267
	MAN	20	22.56	0.90	20.80	24.32	4.02	14.60	32.77	0.96	0.633103

The table presents the anthropometric characteristics of young people from the Community of San Juan del Cantón Tisaleo, divided by sex. Results are shown for age, weight, height, and body mass index (BMI), and measures of central tendency and dispersion are included, as well as 95% confidence intervals. The result of the Shapiro-Wilk normality test is also shown for each variable according to sex. It is observed that, in general, women have lower values of weight, height and BMI than men, although the differences are not significant in all cases. Regarding the normality of the variables, all have p values higher than 0.05, which indicates that there is insufficient evidence to reject the hypothesis of normality.

3.2 Nutritional status

Diagram 1. Nutritional status with respect to the sex of young people from the Community of San Juan del Cantón Tisaleo.

The diagram shows the distribution of nutritional status according to BMI, of young people in the Community of San Juan del Cantón Tisaleo, according to sex. 66.66% correspond to women while 33.33% to men. The results indicate that the percentage of obesity is relatively low, with only 3.33% of adolescents classified as obese. Most adolescents (63.33%) are within the normal weight range, while 23.33% are underweight and 10% overweight.

These results suggest that attention needs to be paid to underweight adolescents, as it may indicate nutrition or general health problems. In addition, it is important to prevent the increase in the prevalence of overweight and obesity in the adolescent population. On the other hand, the high percentage of normal-weight adolescents is encouraging and suggests that some healthy eating practices may be present in this population.

3.3 Physical activity

Table 3 Correlation of physical activity and nutritional status of young people from the Community of San Juan del Cantón Tisaleo.

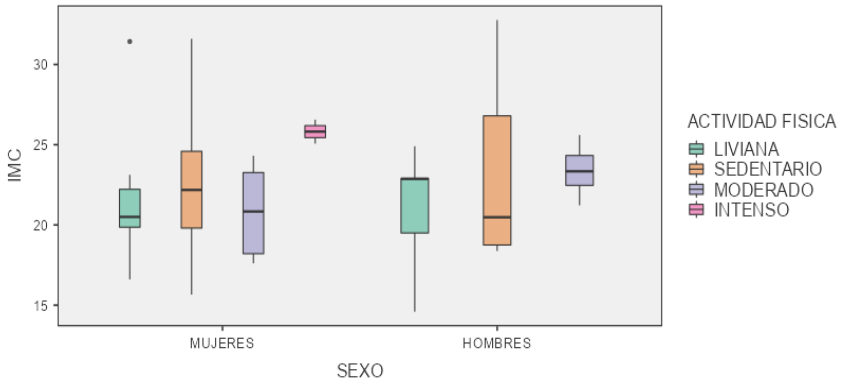
PHYSICAL ACTIVITY	Nutritional Diagnosis				Total χ^2 Tests GL 9
	OBESITY GRADE 1	NORMAL	LOW WEIGHT	OVERWEIGHT	
LIGHT	1	17	4	0	22 p-value:
SEDENTARY	1	8	6	5	20 0.02981
MODERATE	0	12	4	0	16
INTENSE	0	1	0	1	2
Total	2	38	14	6	60

Table 3 shows the correlation between physical activity and nutritional status of young people in the Community of San Juan del Cantón Tisaleo. It is observed that there is a statistically significant relationship between physical activity and nutritional status of young people, with a p-value of 0.02981 in the χ^2 test.

It can be noted that the highest percentage of young people with grade 1 obesity and overweight is in the sedentary physical activity groups. On the other hand, the group of young people with intense physical activity presents the lowest number of cases of grade 1 obesity and overweight.

These results suggest that greater physical activity may be associated with a lower risk of obesity and overweight in the young people investigated. Therefore, it is important to promote regular physical activity in young people as a strategy to prevent and treat obesity and overweight in this population.

Diagram 2. BMI with respect to sex and physical activity of young people from the Community of San Juan del Cantón Tisaleo



The diagram shows an important relationship between physical activity and BMI in young people from the Community of San Juan del Cantón Tisaleo. Themajority of the population investigated are sedentary and this could have negative implications on their health. In addition, it is interesting to note that women appear to be more physically active than men in terms of moderate and intense activity. This type of information can be useful for designing health and education programs in the community, to encourage more active and healthy lifestyles.

3.4 Frequency of food consumption

Table 4. Correlation of breakfast consumption with nutritional status

	Nutritional Diagnosis				
BREAKFAST CONSUMPTION	**OBESITY GRADE 1**	**NORMAL**	**LOW WEIGHT**	**OVERWEIGHT**	**Total χ^2 test GL: 6**
Daily	2	38	7	6	53 p-value:
2 or 3 times a week	0	0	6	0	6 2,191E-4
Occasionally	0	0	1	0	1
Total	2	38	14	6	60

Table 4 shows the correlation between breakfast consumption and the nutritional status of the young people investigated. The table shows four categories of nutritional diagnosis: obesity grade 1, normal,

underweight and overweight. In addition, three categories of breakfast consumption are presented: daily, 2 or 3 times a week and occasionally.

You can see that 53 young people consume breakfast daily, and of those young people, 38 have a normal nutritional status. The chi-square test indicates that there is a significant correlation between breakfast consumption and nutritional status of young people, with a p value of 2.191e-4, it is suggested that regular breakfast consumption may be associated with better nutritional status in young people in this community.

Table 5. Correlation of lunch consumption with nutritional status

	Nutritional Diagnosis				
LUNCH CONSUMPTION	**OBESITY GRADE 1**	**NORMAL**	**LOW WEIGHT**	**OVERWEIGHT**	**Total χ^2 test GL 6**
Daily	2	38	10	5	55 p-value:
2 or 3 times a week	0	0	1	1	2 0.01389
Occasionally	0	0	3	0	3
Total	2	38	14	6	60

Table 5 shows the correlation between lunch consumption and the nutritional status of young people in the Community of San Juan del Cantón Tisaleo. As in the previous table, four categories of nutritional diagnosis and three of lunch consumption are presented.

In the table, it can be seen that 55 young people consume lunch daily, and of those young people, 38 have a normal nutritional status. Of the 6 overweight youth, 1 consumes lunch 2 or 3 times a week. The chi-square test indicates that there is a significant correlation between lunch consumption and the nutritional status of young people, with a p value < 0.05. This suggests that regular lunch consumption may be associated with better nutritional status in young people in this community.

Table 6. Correlation of snack consumption with nutritional status

	Nutritional Diagnosis				
SNACK CONSUMPTION	**OBESITY GRADE 1**	**NORMAL**	**LOW WEIGHT**	**OVERWEIGHT**	**Total χ^2 Tests GL 6**
2 or 3 times a week	1	0	3	0	4 p-value:

	Nutritional Diagnosis				
SNACK CONSUMPTION	**OBESITY GRADE 1**	**NORMAL**	**LOW WEIGHT**	**OVERWEIGHT**	**Total** χ^2 Tests **GL 6**
Daily	1	38	10	5	54 0.003222
Occasionally	0	0	1	1	2
Total	2	38	14	6	60

Table 6 presents the correlation between snack consumption and nutritional status in the sample of young people from the Community of San Juan del Cantón Tisaleo, it can be seen that daily snack consumption is significantly related to a lower risk of obesity grade 1 and overweight, since of the 54 young people who consume snack daily, Only 1 is grade 1 obese and 5 are overweight. In addition, occasional snack consumption is significantly associated with an increased risk of underweight, since of the 2 young people who consume snacks occasionally, 1 is underweight.

In summary, the table suggests that daily snack consumption may be beneficial in maintaining healthy nutritional status in youth in the community, while occasional consumption may increase the risk of underweight. However, it is important to consider other factors such as the nutritional quality of the snacks consumed and the physical activity performed by young people.

4. Discussion:

The article addresses an issue of great importance today, especially in developing countries such as Ecuador. Adolescent nutrition is critical for their growth and development, as well as for preventing chronic noncommunicable diseases in adulthood. 63.33% of the adolescents investigated presented a normal nutritional status, this information is related to a study conducted in a rural area of the Peruvian Andes(16), where the sample also presents a high prevalence of normal weight (86.50%) in the same study the low weight was 4.7% while in ours 23.33%, Overweight in our study was higher (10% versus 8.2%) as well as obesity (3.33% versus 0.6%). However, the epidemiological profile of overweight and obesity is changing and today both nations with low economic development and those with high economic development have alarmingly high levels of overweight and obesity(17). It is important to note that these results are based on a specific sample of adolescents from an Andean area of Ecuador, so it cannot be generalized to the entire adolescent population of the country.

However, these findings may be useful to guide future research and public health policies focused on improving the nutritional status of adolescents.

Nowadays, the different benefits of performing frequent physical activity are known, which not only focus on physical health aspects, but also on psychological and social aspects(18). In Ecuador, morethan a third (34%) of adolescents are inactive, 38.1% are irregularly active and less than three out of ten are active(19), in our research, 33.33% of adolescents are sedentary while 36.67% practice light physical activity. In a study conducted in southeastern Mexico (20) it was found that most of those investigated were very inactive and that women had a higher proportion in this category. Our study coincides with this research, since it also presents the highest percentages of the population in this category, however, and contrary to the results of that study, women are those who register cases of intense physical activity.

5. Conclusions:

Nutrition education needs to be encouraged, so that young people learn to make nutritious and varied food choices. Cultural and socioeconomic factors influencing population feeding practices should also be considered.

Acknowledgements: the authors express their gratitude to the students of the career of Nutrition and Dietetics of the ESPOCH, for their collaboration in the collection of information

Conflict of interest:

The authors declare no conflicts of interest in relation to the preparation and publication of this article.

Bibliography

1. Nutr RC. Food practices, a multilevel phenomenon. 2022;49(2):263–7.
2. Alcaraz S, Velázquez P. Feeding practices and nutritional status in adolescents of a subsidized private educational center in the city of Luque in August 2019. Rev scientific health sciences. 2021;3(2):26–38.
3. Mwaka1 NPSMLNNM, Affiliations: Nutrition knowledge , attitudes and practices o f primary school children in Tshwane. African J Prim Heal Care Fam Med. 2019;1–7.
4. Pajuelo SR, Saintila J, Vásquez MR, Calizaya-Milla YE, Javier-Aliaga DJ. Knowledge, attitudes and practices of healthy eating and body mass index in Peruvian adolescents: A cross-sectional study. Rev Esp Nutr Humana y Diet. 2021;25(1):87–94.
5. Wrottesley S V., Pedro TM, Fall CH, Norris SA. A review of adolescent nutrition in South Africa: transforming adolescent lives through nutrition

initiative. South African J Clin Nutr [Internet]. 2020;33(4):94–132. Available from: https://doi.org/10.1080/16070658.2019.1607481

6. Okeyo AP, Seekoe E, de Villiers A, Faber M, Nel JH, Steyn NP. Dietary practices and adolescent obesity in secondary school learners at disadvantaged schools in south africa: Urban–rural and gender differences. Int J Environ Res Public Health. 2020;17(16):1–18.
7. Economic Commission for Latin America and the Caribbean (ECLAC). Demographic Observatory, 2019: Population Projections. 2020.
8. Kroker-Lobos MF, Pedroza-Tobias A, Pedraza LS, Rivera JA. The double burden of undernutrition and excess body weight in Mexico. Am J Clin Nutr. 2014;100(6):1652S-1658S.
9. UNICEF. Chronic child malnutrition. 2021;
10. Corvalán C, Garmendia ML, Jones-Smith J, Lutter CK, Miranda JJ, Pedraza LS, et al. Nutrition status of children in Latin America. Obes Rev. 2017;18(July):7–18.
11. Gonzalvo GO. Prevalence of overweight and obesity in immigrant adolescents. Pediatr Aten Primaria. 2018;20(77):27–32.
12. Véliz P, Tolentino-Mayo L (INSP), Barquera S (INSP). United Nations Children's Fund, Overweight in Childhood: A Call for Prevention in Latin America and the Caribbean [Internet]. 2021. Available from: www.unicef.org/lac
13. Schonlau M, Fricker RD, Elliott MN. RAND_MR1480.pdf [Internet]. 2002. p. 143. Available from: https://www.rand.org/pubs/monograph_reports/MR1480.html
14. Ministry of Health. Standard for the Nutritional Evaluation of Children and Adolescents from 5 years to 19 years of age Undersecretariat of Public Health Division of Healthy Public Policies and Promotion Department of Nutrition and Food. 2016; Available from: https://www.previenesalud.cl/assets/PDF/normas/2016-norma-evaluacion-nutricional.pdf
15. FAO. CRITERIA FOR CLASSIFYING NUTRITIONAL STATUS ACCORDING TO SEX, AGE AND PHYSICAL ACTIVITY. Modul Nutr and HEALTH. 2018;73–99.
16. Paretas CB, Toledo SL, Pérez PE, Corrons ÓV, Sans JC, Val VA. Nutritional status of schoolchildren in a rural area of extreme poverty in Ccorca, Peru. INCOS Project. Arch Latinoam Nutr. 2017;67(1):23–31.
17. Vinueza-Veloz AF, Tapia-Veloz EC, Tapia-Veloz G, Nicolalde CTM, Carpio-Arias TV. Hospital Nutrition Original work. Nutr Hosp [Internet]. 2022;39(3):537–46. Available from: https://scielo.isciii.es/pdf/nh/v39n3/0212-1611-nh-39-3-537.pdf
18. Betancourt-Ocampo, D; Jaime-Reyes, A. L.; Tellez-Vasquez, M. H.; Rubio-Sosa H, I.; González-González A. Physical activity, sedentary lifestyle and preferences in sports practice in children: current panorama in Mexico. 2022;22(46):100–15.
19. Ministry of Public Health and National Institute of Statistics and Censuses Quto - Ecuador. National Health and Nutrition Survey,. Volume 1. 2014.
20. Rivas Acuña V, García Hernández N, Guevara Valtier MC, García Falconi R. Physical activity and nutritional status in schoolchildren in southeastern Mexico. Horiz Sanit. 2020;19(3):453–9.