

# PREVALENCE AND FACTORS ASSOCIATED WITH THE LOW CONSUMPTION OF FRUITS AND VEGETABLES IN STUDENTS OF THE PROFESSIONAL CAREER OF HUMAN MEDICINE OF THE NATIONAL UNIVERSITY HERMILIO VALDIZÁN. HUANUCO, JULY 2018.

PREVALENCIA Y FACTORES ASOCIADOS AL BAJO CONSUMO DE FRUTAS Y VERDURAS EN ESTUDIANTES DE LA CARRERA PROFESIONAL DE MEDICINA HUMANA DE LA UNIVERSIDAD NACIONAL HERMILIO VALDIZÁN. HUANUCO, JULIO 2018.

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## ABSTRACT

**Objective:** To determine the prevalence and factors associated with the low consumption of fruits and vegetables in students of the professional career of human medicine of the National University Hermilio Valdizán (UNHEVAL). **Methods:** Cross-sectional study. The population was constituted by 371 students of the professional career of Human Medicine who were enrolled and taking courses in July 2018. It was applied a self-administered questionnaire which allowed to obtain information about the consumption of fruits and vegetables. From the collected data it was obtained the prevalence and factors associated with low consumption of fruits and vegetables. **Results:** The prevalence of low consumption of fruits and vegetables was 60.1% (IC95%: 55.0% -65.2%). The main reasons for not consuming fruits and vegetables were that it is rare to get them in the cafeterias of the university (78.7%), insufficient time for their selection, purchase and preparation (73.6%) and living with one of the parents who were in charge for their feeding. (55.3%). The multivariate analysis found that the only factor associated with low consumption of fruits and vegetables was the insufficient time for selection, purchase and preparation; whereas, living with one of the parents constituted a factor protector. **Conclusion:** There is a high prevalence of low consumption of fruits and vegetables in students of the professional career of human medicine of the UNHEVAL. The insufficient time for the selection, purchase and preparation of fruits and vegetables is an associated factor and living with one of the parents constitutes a protector factor.

**Key words:** Fruits; Vegetables; Students of Medicine (source: MeSH NLM).

## RESUMEN

**Objetivo:** Determinar la prevalencia y factores asociados al bajo consumo de frutas y verduras en alumnos de la carrera profesional de medicina humana de la Universidad Nacional Hermilio Valdizán (UNHEVAL). **Métodos:** Estudio transversal. La población estuvo constituida por los 371 de alumnos de la carrera profesional de Medicina Humana que se encontraban matriculados y cursando estudios en julio de 2018. Se aplicó de un cuestionario autoadministrado el cual permitió obtener información del consumo de frutas y verduras. A partir de los datos recolectados obtuvo la prevalencia y factores asociados al bajo consumo de frutas y verduras. **Resultados:** La prevalencia de bajo consumo de frutas y verduras fue de 60,1% (IC95%: 55,0%-65,2%). Las principales razones para no consumir frutas y verduras fueron el considerar que es poco frecuente conseguirlas en los cafetines de la universidad (78,7%), el tiempo insuficiente para su selección, compra y preparación (73,6%) y el vivir con alguno de los padres que se encargaban de su alimentación (55,3%). El análisis multivariado encontró que el único factor asociado al bajo consumo de frutas y verduras fue el tiempo insuficiente para la selección, compra y preparación; mientras que, vivir con alguno de los padres constituyó factor protector. **Conclusión:** Existe una alta prevalencia de bajo consumo de frutas y verduras en alumnos de la carrera profesional de medicina humana de la UNHEVAL. El tiempo insuficiente para la selección, compra y preparación de frutas y verduras constituye factor asociado y vivir con alguno de los padres constituye factor protector.

**Palabras clave:** Frutas; Verduras; Estudiantes de medicina (fuente: DeCS BIREME).

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**Cite as:** Luis Pérez-Cárdenas, Alan Huamancayo-Espíritu. Prevalence and factors associated with the low consumption of fruits and vegetables in students of the professional career of human medicine of a peruvian university. Rev. Fac. Med. Hum. January 2020; 20(1):123-129. DOI 10.25176/RFMH.v20i1.2660

## INTRODUCTION

Fruits and vegetables are an indispensable component of a healthy diet as they provide the main micronutrients, dietary fiber and other essential compounds; there is evidence that daily consumption of fruits and vegetables in adequate amounts is associated with reduced risk of developing various diseases. On the other hand, an increase in fruits and vegetables in the diet contributes to displacing foods rich in saturated fats, trans fats, sugars, or sodia<sup>(1-3)</sup>.

Fruits and vegetables are important sources of vitamins, minerals and carbohydrates, although concentrations of these compounds vary according to the fruit or vegetable consumed. They are also a source of fiber, which includes lignin and non-starchy polysaccharides, as well as active ingredients with antioxidant activity to which are attributed an anti-aging effect and an important role in the prevention of non-communicable diseases (NCDS). Another benefit is the feeling of fullness, which leads to a reduction in total calorie intake and a reduction in the likelihood of developing overweight and obesity<sup>(4-7)</sup>.

Nowadays, fruit and vegetable consumption varies from region to region (depending on the population analyzed) with an estimated 100 g/ day in low-income countries and approximately 450 g/ day in Western Europe. Insufficient intake of fruits and vegetables is responsible for about a fifth of gastrointestinal neoplasms, a third of ischemic heart disease, and a tenth of cerebrovascular disease. In this way, up to 1.7 million people could be saved each year if there were sufficient consumption of fruits and vegetables<sup>(1)</sup>.

Because of their role in preventing NCDS, The World Health Organization and the Food and Agriculture Organization of the United Nations (FAO) launched in 2003 an initiative known as the "global strategy on diet, physical activity and health" which they hoped to promote consumption by increasing fruit and vegetable production.<sup>6</sup> The main thrust of the initiative was to promote the consumption of at least five servings of these foods per day by the population through the strategy known as "five fruits and vegetables per day"<sup>(1,8)</sup>.

University education, while providing professional skills, can lead to changes in students' lifestyles that could affect their diet and nutritional status, which in turn would have repercussions on academic performance. Such modifications may occur due to the demand and competitiveness of university careers, which cause students to devote much time to them, neglecting certain healthy lifestyles that, if not the object of intervention, could remain beyond university life, affecting their risk of developing diseases in the future<sup>(9-12)</sup>.

In the case of the students' diet, one of the aspects that can be affected is the consumption of fruits and vegetables, which according to some studies could reach proportions lower than those reported in the general population. This is more relevant in the case of students of professional careers in health sciences who during their professional practice should promote healthy eating as well as other lifestyles oriented towards disease prevention<sup>(6,10,11)</sup>.

The National University Hermilio Valdizán (UNHEVAL) is a peruvian university located in the city of Huanuco, which is located in the central zone of the Andes at an altitude of 1894 masl. In 2018, the university had 14 faculties and 19 professional careers, the career of human medicine had 376 enrolled students.

This research aims to determine the prevalence and factors associated with low consumption of fruits and vegetables in students of the first and sixth year of the career of human medicine at UNHEVAL during July 2018.

## METHODS

Descriptive cross-sectional study. The population consisted of all students from the first to the sixth year of studies of the professional career of human medicine of UNHEVAL who were enrolled and studying in July 2018, excluding those who had booked registration, had withdrawn or did not agree to participate voluntarily in the study. No sampling was performed, we worked with the entire population of students of the professional career in human medicine who met the selection criteria for being small and accessible.

Data collection was based on the application of a self-administered questionnaire to students, which provided information on sociodemographic variables, fruit and vegetable consumption variables and possible factors variables associated with the consumption of these:

- Sociodemographic components: age, sex, year of study.
- Consumption of fruits and vegetables: consumption of at least 5 portions daily, average number of fruits and vegetables consumed daily.
- Factors associated with low consumption of fruits and vegetables: desire to have enough money to buy them, lack of availability of fruits and vegetables on campus, insufficient time to purchase fruits and vegetables, exposure to media messages recommending the consumption of fruits and vegetables.

The questionnaire was applied at the end of a class scheduled after coordination with the delegates of the year of study and course verifying the correct

completion of the items prior to receipt. A second date was scheduled for the application of the instrument in order to capture the students who were not present in the first application of the questionnaire. The questionnaire was validated through expert judgment, obtaining the agreement index and undergoing a pilot test to verify the behavior of the instrument in the field as well as the comprehensibility of the items by the students.

With the data collected from each student, we obtained the prevalence of low consumption of fruits and vegetables in the students as well as the factors associated with low consumption.

Data processing was performed using the statistical program SPSS version 23.0 for Windows. Descriptive statistics were performed based on obtaining frequencies, percentages, measures of central tendency (mean, median) and dispersion (standard deviation). For the bivariate analysis we used Pearson's chi-square test and for the multivariate analysis we used a binary logistic regression model obtaining the

odds ratio or adjusted odds ratio (ORAJ). Calculations were performed with a 95% confidence level.

The project was approved by the Ethics Committee of the University Research Directorate of UNHEVAL (Resolution N° 0200-2018-UNHEVAL-FM-D). The confidentiality of the information obtained was ensured and ethical principles were respected in accordance with the Declaration of Helsinki. Prior to the application of the questionnaire, each participant signed an informed consent form.

## RESULTS

Of a total of 373 students enrolled who agreed to participate in the research, two students in the third year of studies did not complete the questionnaire so that 371 students were available for analysis.

Of the 371 students participating in the research, 52.6% were women and 47.4% were men; In addition, the highest frequency of students was in the third year of studies (28.6%). The average age was  $23.8 \pm 4.3$  years (median 24 years), ranging from 16 to 46 years of age. The general characteristics of the students are shown in table 1.

**Table 1.** General characteristics of the students of the professional career of Human Medicine at UNHEVAL.

Characteris-tic	Frecuency	%
Age		
15-19 years	66	17.8
20-24 years	160	43.1
25-29 years	114	30.7
30-34 years	27	7.3
35-39 years	2	0.5
40-44 years	1	0.3
45-49 years	1	0.3
Sex		
Female	195	52.6
Male	178	47.4
Year of studies		
First year	60	16.2
Second year	92	24.8
Third year	106	28.6
Fourth year	45	12.1
Fifth year	33	8.9
Sixth year	35	9.4

**Table 2.** Prevalence of low consumption of fruits and vegetables by year of study students of the professional career of Human Medicine at UNHEVAL.

Year of studies	Prevalence (%)	Confidence interval 95%
First year	46.7	33.2 – 60.1
Second year	63.0	52.6 – 73.5
Third year	66.7	57.3 – 76.0
Fourth year	62.2	46.9 – 77.5
Fifth year	57.6	39.2 – 76.0
Sixth year	51.4	33.4 – 69.4
First to Sixth year	60.1	55.0 – 65.2

The main reasons for not consuming fruits and vegetables by the students were the fact that it is rare to get them in college cafeterias (78.7%), insufficient time for selection, purchase and preparation (73.6%) and living with one of the parents who are responsible for feeding the student (55.3%). This is shown in table 3.

**Table 3.** Reasons for non-consumption of fruits and vegetables by the students of the Human Medicine career.

Variable	Frecuency	%
Considers that the price of fruits and vege-tables is high, which is a condition for not consuming them	160	43.1
Finds it rare to get fruits and/or vegetables from college cafeterias	292	78.7
Insufficient time for selection, purchase and preparation of fruits and vegetables	273	73.6
Exposure to media messages that recom-mend eating fruits and vegetables	181	48.8
Living with one of the parents responsible for feeding the student	205	55.3

Bivariate analysis was performed with Pearson's chi square test and found that insufficient time for the selection, purchase and preparation of fruits and vegetables as well as living with one of the parents were significantly associated with low consumption of fruits and vegetables. Age less than or equal to 20 years, sex, considering that the price of fruits and

vegetables is high, studying in the first three years of the professional career, considering that it is rare to get fruits and/or vegetables in college cafeterias and exposure to messages in the media that recommend consuming fruits and vegetables were not significantly associated with low consumption of fruits and vegetables. This is shown in table 4.

**Table 4.** Bivariate analysis using the chi square test for possible risk factors for low fruit and vegetable intake in UNHEVAL students.

Variable	Low consumption of fruits and vegetables (%)	P value
Considers that the price of fruits and vegetables is high, which is a condition for not consuming them		
Yes	104 (65.0%)	0.075
No	119 (55.9%)	
Finds it rare to get fruits and/or vegetables from college cafeterias		
Yes	176 (60.3%)	0.715
No	47 (58.0)	
Insufficient time for selection, purchase and preparation of fruits and vegetables		
Yes	172 (63.0%)	0.036
No	51 (51.0%)	
Exposure to media messages that recommend eating fruits and vegetables		
Yes	106 (58.6%)	0.640
No	117 (60.9%)	
Living with one of the parents responsible for feeding the student		
Yes	115 (55.1%)	0.042
No	110 (65.5%)	
Age less than or equal to 20 years		
Yes	47 (53.4%)	0.159
No	175 (61.8%)	
First years of study		
Yes	158 (60.8%)	0.557
No	65(57.5%)	

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Variables that obtained a  $p \leq 0.10$  were entered into a logistic regression model for multivariate analysis and found that the only factor associated with low fruit and vegetable intake was insufficient time for selection,

purchase, and preparation of fruits and vegetables; While, living with one of the parents who are responsible for feeding the student was a protective factor for the low consumption of fruits and vegetables (see table 5).

**Table 5.** Multivariate analysis of possible factors associated with low consumption of fruits and vegetables of the students of the professional career of Human Medicine at UNHEVAL.

Variable	P value	ORaj	Confidence interval 95%
Insufficient time for selection, purchase and preparation of fruits and vegetables	0.038	1.6	1.027 – 2.604
Living with one of the parents who take care of the student's feeding	0.044	0.6	0.424 – 0.989
Considers that the price of fruits and vegetables is high, which is a condition for not consuming them	0.221	1.3	0.848 – 2.044

## DISCUSSION

This research shows that a high frequency of the students of the professional career of Human Medicine at UNHEVAL have low consumption of fruits and vegetables; In addition, the only factor associated with low consumption was insufficient time for selection, purchase and preparation of fruits and vegetables; While, living with one of the parents of the student is a protective factor because they are responsible for feeding the student.

Regarding the prevalence of low fruit and vegetable intake, it was observed that overall, six out of ten students had this risk factor; However, the prevalence found is lower than that reported by the National Institute of Statistics and Informatics<sup>(13)</sup> in the Demographic and Family Health Survey (ENDES 2017) for the general population of Peru aged 15 years or more, where the low consumption of fruits and vegetables reached 89.1%. This indicates that it is possible that the curriculum contents of the medical career have a positive effect on the consumption of a fraction of students, particularly contents oriented towards nutrition and prevention of NCDs. Contrary to expectations, there was no trend in consumption according to years of study.

When assessing the factors associated with low consumption of fruits and vegetables, multivariate analysis identified insufficient time for selection, purchase and preparation of fruits and vegetables as the only factor, this has been linked in other publications to the academic load of the course, represented by class hours and study hours<sup>(14-17)</sup>. This is in line with what was found by Olivares<sup>(15)</sup> in a study conducted with students from the University of Chile, who identified lack of time as the second main barrier to adequate fruit and vegetable consumption. Unlike the students of the University of Chile, the lack of time for the selection, purchase and preparation of fruits and vegetables in the students of National University Hermilio Valdizán was significantly higher (63.0% versus 33.4%), which could be explained by the high demand of the medical career in comparison with the other professional careers that comprised the sample of the Olivares study, which included non-medical health careers. As well as careers in social sciences and exact sciences.

The only protective factor identified by this research was the fact that the student lived with one of his parents because they were responsible for feeding. This would be explained by what has been established by some publications that consider that the family

would influence the way students eat, being positive the teaching given by their parents, favoring a healthy diet by acquiring foods with these characteristics<sup>(17-19)</sup>. This is in line with what was reported by Papadaki and col.<sup>(18)</sup> who found in a sample of university students in Greece that students living outside the home had developed more unfavorable eating habits than those living in the family home with one of their parents, indicating that moving away from the family home and taking responsibility for preparing and purchasing food affected the eating habits of students.

The study carried out with students of the UNHEVAL has identified the factors associated with low consumption of fruits and vegetables in students, which is the first step in the design of an educational intervention specifically aimed at students that allows the improvement of food by students as well as intervention on unhealthy lifestyles. Such an intervention should consider promoting the sale of fruits and vegetables by university food suppliers which would have a positive effect on NCD prevention and habits of future health professionals. While it is true that the results obtained can be extrapolated from the statistical point of view only to students of the faculty of human medicine of UNHEVAL, it is possible that the reality of the students is similar in other universities so the results obtained could contribute with other universities to the design of future preventive interventions.

A limitation of the present research is that it did not address differences in fruit and vegetable intake according to students' socioeconomic status, unlike other researchs<sup>(20)</sup>. However, it is possible that this has not significantly affected the results obtained due to the fact that the perception of the price of fruits and vegetables by the students was considered within the factors under study, which in turn would influence their consumption.

Another limitation is the number of students participating in the study. Thus, the estimate of prevalence according to years of study is in some cases affected by the low number of students which is reflected in the confidence intervals of the estimates which are extended for students in the fifth and sixth year. This is not the case for the overall estimate for students in the first to sixth year where the number of students does not significantly affect the low consumption estimate. It should be taken into account that the research considered almost all enrolled students so there was no significant loss of students and that these are the limitations of working with preformed groups.

## CONCLUSION

The prevalence of low consumption of fruits and vegetables in students of the professional career of human medicine of the National University Hermilio Valdizán was 60.1%. Insufficient time for selection, purchase and preparation of fruits and vegetables is a factor associated with low consumption; while, living with one of the parents is a protective factor.

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## BIBLIOGRAPHIC REFERENCES

- Organización Mundial de la Salud. Estrategia mundial sobre régimen alimentario, actividad física y salud. Ginebra: OMS; 2016. Obtenido de: <http://www.who.int/dietphysicalactivity/fruit/es/index1.html>.
- Miller V, Yusuf S, Chow C. Availability, affordability, and consumption of fruits and vegetables in 18 countries across income levels: findings from the Prospective Urban Rural Epidemiology (PURE) study. *Lancet Glob Health*. 2016;4(10):e695-e703.
- Jacoby E, Keller I. La promoción del consumo de frutas y verduras en América latina: buena oportunidad de acción intersectorial por una alimentación saludable. *Rev chil Nutr* 2006;33(Supl. 1):226-31.
- Centers for Disease Control and Prevention. Can eating fruits and vegetables help people to manage their weight? Atlanta: Research to Practice Series N° 1; 2005. Disponible en: [http://www.cdc.gov/nccddphp/dnpa/nutrition/pdf/rtp\\_practitioner\\_10\\_07.pdf](http://www.cdc.gov/nccddphp/dnpa/nutrition/pdf/rtp_practitioner_10_07.pdf).
- Aune D, Greenwood DC. Dietary fibre, whole grains, and risk of colorectal cancer: systematic review and dose-response meta-analysis of prospective studies. *BMJ* 2011;343:d6617.
- Acosta B. Promoción del consumo de frutas y verduras en grupos representativos de la Parroquia Nanegal, Provincia, Pichincha, Periodo Noviembre Diciembre del 2014. [Internet]. Pontificia de Universidad Católica del Ecuador; 2014.
- Correa A. Consumo de frutas y verduras y hortalizas en Adolescentes durante el ciclo secundario de enseñanza. Universidad Abierta Interamericana; 2005.
- Byers T, Nestle M, McTiernan A, Doyle C, Currie-Williams A, Gansler T, et al. American Cancer Society guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy choices and physical activity. *CA Cancer. J Clin.* 2002;52:92-119.
- Vargas M, Becerra F, Prieta E. Evaluación de la ingesta dietética en estudiantes universitarios. Bogotá, Colombia. *Rev Salud Pública*. 2010;12:116-25.
- Becerra-Bulla F, Vargas-Zárate M. Estado nutricional y consumo de alimentos de estudiantes universitarios admitidos a nutrición y dietética en la Universidad Nacional de Colombia. *Rev. salud pública*. 2015;17(5):762-75.
- Kongsbak IS, Nielsen BK, Ahlmann FK, Schaldemose H, Atkinson L, Wichmann M, et al. Increasing fruit and vegetable intake among male university students in an ad libitum buffet setting: A choice architectural nudge intervention. *Food Quality and Preference*. 2016;9: 183-8.
- Zazpe I, Marqués M, Sánchez-Tainta A, Rodríguez-Mourille A, Beunza JJ, Santiago S, et al. Hábitos alimentarios y actitudes hacia el cambio en alumnos y trabajadores universitarios españoles. *Nutr Hosp*. 2013;28(5):1673-1680
- Instituto Nacional de Estadística e Informática (INEI). Perú, Enfermedades no transmisibles y transmisibles, 2017. Lima: INEI, 2018. Disponible en: [https://www.inei.gob.pe/media/MenuRecursivo/publicaciones\\_digitales/Est/Lib1526/index.html](https://www.inei.gob.pe/media/MenuRecursivo/publicaciones_digitales/Est/Lib1526/index.html).
- Rosales Ramírez MF. Efectos de la publicidad presente en los medios de comunicación, en la alimentación de jóvenes universitarios. 2017. Tesis Doctoral. Concepción: Universidad Católica de la Santísima Concepción; 2017.
- Olivares S, Lera L, Bustos N. Etapas del cambio, beneficios y barreras en actividad física y consumo de frutas y verduras en estudiantes universitarios de Santiago de Chile. *Rev. chil. nutr.* 2008;35(1):25-35.
- Lema Soto LF, Salazar Torres IC, Varela Arévalo MT, Tamayo Cardona JA, Rubio Sarria A, Botero Polanco A. Comportamiento y salud de los jóvenes universitarios: satisfacción con el estilo de vida. *Pensamiento Psicológico* 2009;5(12):71-88.
- Troncoso C, Amaya JP. Factores sociales en las conductas alimentarias de estudiantes universitarios. *Rev. chil. nutr.* 2009;36(4):1090-7.
- Papadaki A, Hondros GA, Scott J, Kapsokefalou M. Eating habits of university students living at, or away from home in Greece. *Appetite* 2007;49(1):169-76.
- Ponce PG, Ruiz Esparza CJ, Magaña RM, Arizona AB, Mayagoitia WJ. Obesidad y factores de riesgo en estudiantes del área de la salud de la Universidad Autónoma de Baja California, Mexicali. *Rev Salud Pública Nutr.* 2011;12(4).
- Restrepo LF, Urango LA, Deossa GC. Conocimiento y factores asociados al consumo de frutas por estudiantes universitarios de la ciudad de Medellín, Colombia. *Rev Chil Nutr* 2014;41(3):236-42.