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Internal Validation Of A Documentary Instrument For Measuring Hygiene And Dietary Habits In Overweight Or Obese Patients.

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Abstract
Introduction: *ENSANUT 2022 reported that the prevalence of overweight and obesity in adolescents and young adults is approximately 40%. In addition, it has been reported that university life creates an environment that favors an increase in BMI, largely due to changes in hygiene and dietary habits.*
Objective: *To develop and validate internally a documentary-type instrument that can measure the variable of hygiene and dietary habits.*
Methodology: *Based on Supo's taxonomy, the instrument was validated internally, in which the variances of the items and the correlation between their scores and the final value of the instrument were obtained for construct validation. Finally, Cronbach's alpha test was used for reliability analysis.*
Results: *In the construct analysis, the items obtained values other than zero, and most of the correlations showed moderate to high agreement. Finally, the reliability yielded a value greater than 0.700, indicating acceptable validation.*
Conclusion: *The instrument was validated internally, which is highly relevant for more accurately measuring eating habits and assessing their impact on the nutritional status of university students.*

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I. Introduction

Overweight and obesity are among the most significant public health problems worldwide due to their growing prevalence in society, affecting adults as well as children and adolescents. The World Health Organization has classified them as “the epidemic of the 21st century” due to the increase in the frequency of cases across all age groups. (1)

The World Health Organization (WHO) defines it as the abnormal or excessive accumulation of adipose tissue in relation to weight that can be harmful to health. Excess adipose tissue is accompanied by mild chronic systemic inflammation and is recognized as a chronic, recurrent disease of multifactorial etiology, where an energy imbalance occurs due to a sedentary lifestyle, excessive energy consumption, or both. (2)

Obesity can increase the risk of developing type 2 diabetes and heart disease, affect bone health and reproduction, and increase the risk of certain types of cancer. It also influences aspects of quality of life such as sleep. Overweight and obesity are diagnosed by measuring a person's weight and height and calculating their body mass index (BMI): weight (kg)/height2 (m2). This index is an indirect marker of fat. (3)

When it comes to obesity, it is essential to take into account factors that cannot be modified (genetic-hereditary, geographical, etc.) and those that can be modified, such as diet and physical activity. The connection between obesity and nutrition is diet, which, together with physical activity, is one of the cornerstones of obesity. (4)

Eating habits are the actions by which we choose what we eat, leading us to select, prepare, and consume food; they are part of individual and group behavior influenced by sociocultural factors. Eating is a voluntary and social process by which nutrients and energy are provided for physical functions and metabolic processes. (5)

In recent years, there has been a drastic change in eating habits, attributed to the influence of economic, social, and family factors, population growth, work and school schedules, which limit easy access to the acquisition and maintenance of healthy eating habits, in addition to aspects such as cultural traditions, consumption of foods high in saturated fats and refined sugars, as well as unhealthy products. (5) (6)

Poor eating habits are a major factor in weight gain and excess body mass, hypertension, metabolic dysfunction, neurohumoral activation, and systemic inflammation. Epidemiological data suggest the need to

adopt healthy eating habits and take actions such as increasing physical activity, choosing healthy foods, and managing stress. (5) (6)

II. Objective

To determine the degree of association between healthy eating habits and overweight and/or obesity.

III. Methodology

Based on Supo's 2012 taxonomy, this is an observational, descriptive, analytical, prospective study with a relational research level. A 12-item instrument was developed to measure the dimensions of healthy dietary habits. After obtaining informed consent, it was applied to a sample of 333 students. To validate the Likert- type instrument, a construct and reliability analysis was performed. For the construct analysis, the variances of the items and their correlation were analyzed using Spearman's test; finally, Cronbach's alpha test was used to obtain the degree of reliability.

Frequencies and prevalences were used to describe the variables of sex, degree program, shift, and BMI. In the inferential analysis, Spearman's correlation test and correlation coefficient were used as a measure of association. A P-value equal to or less than 0.05 was considered statistically significant.

IV. Results

Overweight and obesity represent a public health problem affecting all age groups, including young university students, whose hygiene and dietary habits are modified by the demands of their activities. Out of a total sample of 333 students, 68.8% were female and 31.2% were male (Table 1).

Students from all degree programs offered by the faculty were interviewed, with the highest number of participants coming from psychology and nursing and the lowest from ecology and optometry (Table 2). The faculty has three shifts. Morning and afternoon shifts, and in the case of some courses, a mixed mode depending on the grade and modules, so this stratum was also quantified separately (Table 3). The highest prevalence was found among morning shift students. Finally, from the descriptive analysis, the participants' weight and height were taken to subsequently obtain their BMI and categorize it. From the latter, it was found that more than half of the students have a normal body mass index, however, it is noteworthy that more than 25% are overweight (Table 4).

As mentioned, the instrument was validated according to Supo's taxonomy, beginning with analysis of variance. Items one and two obtained the highest scores, while items four and nine had the lowest variability; however, they still have the necessary value to continue with the validation process (Table 5). For the second phase of construct validation, the correlation between the item scores and the final score was obtained using Spearman's correlation test and the correlation coefficient as a measure of association strength. This analysis showed that all items have a statistically significant P-value. Regarding their degree of correlation, items six, seven, and ten obtained a high correlation, while items two, five, and eleven obtained a low correlation (Table 6).

Finally, Cronbach's alpha test of 0.756 was used to measure the reliability of the study; therefore, the instrument has a 75.6% probability of measuring the hygienic- dietary habits variables with acceptable reliability (Table 7).

For the inferential analysis, the variables were correlated with the body mass index. None of the correlations obtained a degree of statistical significance; however, the dimensions related to dietary balance obtained the lowest score (Table 8).

Sex			
Frequency			Percentage
Valid	Female	229	68.8
	Male	104	31.2
	Total	333	100.0

Table 1. Percentage of male and female population surveyed.

Professional career

Frequency			Porcentage
Valid	Nursing	70	21.0
	Medicine	50	15.0
	Biology	65	19.5
	Psychology	97	29.1
	Optometry	5	1.5
	Ecology	3	.9
	Dentist	43	12.9
	Total	333	100.0

Table 2. Frequencies and percentages of the degree programs that participated in the study.

Shift			
Frequency			Porcentage
Valid	Morning	227	68.2
	Afternoon	75	22.5
	Mixed	30	9.0
	Total	333	100.0

Table 3. Frequencies and percentages of participants per shift.

BMI classification

Frequency			Porcentage
Valid	Underweig ht	18	5.4
	Normal	192	57.7
	Overweigh t	91	27.3
	Obese	32	9.6
	Total	333	100.0

Table 4. Prevalence and frequency of BMI levels among students.

Descriptive statistics	
	Variance
ITEM 1	2.122
ITEM 2	1.636
ITEM 3	.852
ITEM 4	.775
ITEM 5	1.055
ITEM 6	.842
ITEM 7	1.409
ITEM 8	1.383
ITEM 9	.608
ITEM 10	.864
ITEM 11	1.011
ITEM 12	.914
N valid (for list)	

Table 5. Analysis of variance of the items in the instrument.

Total habits				
Rho de Spearman	ITEM 1	Correlation coefficient	.518***	MODERATE
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 2	Correlation coefficient	.525***	MODERATE
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 2	Correlation coefficient	.398***	LOW
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 3	Correlation coefficient	.457***	MODERATE
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 4	Correlation coefficient	.442***	MODERATE
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 5	Correlation coefficient	.362***	LOW
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 6	Correlation coefficient	.650***	HIGH
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 7	Correlation coefficient	.645***	HIGH
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 8	Correlation coefficient	.404***	MODERATE
		Sig. (bilateral)	0.000	
		N	333	
	ITEM 9	Correlation coefficient	.575***	MODERATE
		Sig. (bilateral)	0.000	

	N	333	
ITEM 10	Correlation coefficient	.712***	HIGH
	Sig. (bilateral)	0.000	
	N	333	
ITEM 11	Correlation coefficient	.335***	LOW
	Sig. (bilateral)	0.000	
	N	333	
ITEM 12	Correlation coefficient	.449***	MODERATE
	Sig. (bilateral)	0.000	
	N	333	

Table 6. Correlation analysis of items with final score.

Reliability statistics	
Cronbach´s alpha	N of elements
.756	13

Table 7. Reliability analysis.

CORRELATION	P Value
Breakfast at home – BMI	0.177
Homemade lunch – BMI	0.696
Street food – BMI	0.385
Junk food consumption – BMI	0.248
Drinking water – BMI	0.563
Sweetened beverages – BMI	0.123
Complete meals – BMI	0.095
Fixed schedules – BMI	0.613
Fried foods – BMI	0.499
Fruits and vegetables – BMI	0.601
Balanced diet – BMI	0.091
Alcoholic beverages – BMI	0.850
Physical exercise – BMI	0.545

Table 8. Inferential correlation analysis between the dimensions of hygienic- dietary habits and body mass index.

V. Discussion

The objective of this study was to analyze the correlation between dietary hygiene habits. A total of 333 students were surveyed using an instrument to validate the twelve items of the instrument. The validation was carried out under Supo's taxonomy. (7)

First, the construct was validated using analysis of variance. In this process, all items obtained values far from 0.000, with the lowest result being 0.600. Although authors such as Martínez Lara and Moreno Martínez did not analyze their items with variance, the instrument showed that the items have sufficient variability. Other authors, such as Campos Uscanga, did analyze the instrument and obtained variances of less than 0.4. Although the value is significant, a correlation analysis was performed. (8)

In the correlation analysis between the item scores and the final score of the instrument, it was found that all items are statistically significant. However, when analyzing the strength of association, items 2, 5, and 11 showed a low correlation. These results show a higher correlation compared to those obtained by Campus Uscanga, where correlations of 0.190 were obtained. (8) (9)

Finally, the reliability analysis performed using Cronbach's alpha test yielded a value of 0.756, which is an acceptable level. These results coincide with those of some authors, mainly those obtained by Lera et al. (2015) and Martínez Lara (2025), where both studies showed an average value of 0.700 in both the dimensional analysis and the overall reliability of the instrument. (9) (10)

As the analysis shows, the instrument has the necessary elements to measure the variable of eating habits. Following this analysis, descriptive and inferential statistical analysis was performed. The descriptive analysis highlights the BMI level of the students. Although more than half were of normal weight, the prevalence of overweight and obesity reached 36%. This figure is close to that reported by the 2022 National Health and Nutrition Survey, where the prevalence of overweight and obesity in adolescents and adults is almost 40%. (11)

Regarding the correlation between hygiene and dietary habits and nutritional status as measured by the body mass index variable, no statistical significance was found; none of the dimensions related to eating habits showed a level of correlation, in contrast to other authors who did demonstrate such an association. (12) (13)

Likewise, physical activity did not influence the students' BMI. Therefore, other variables could be related to the students' nutritional status. Other authors, on the contrary, did find statistical significance in the

bivariate analysis, where dimensions such as frequency of activity showed the strongest relationship. (14) (15)

VI. Conclusion

The objective of this study was to validate a documentary-type instrument for measuring the variable of hygiene and dietary habits in university students. First, the instrument was validated by construct, where the variances of the items had values far from zero. Second, the correlation analysis showed significance, and the correlation coefficient of most items obtained moderate to high agreement. Finally, the reliability analysis obtained an acceptable value.

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