

Impulsivity, disordered eating behavior and its relationship with food addiction in an Ecuadorian to food addiction in an Ecuadorian university population.

Impulsividad, conducta alimentaria desordenada y su relación con la adicción a la comida en población universitaria ecuatoriana

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Abstract

Background: Food addiction (FA) has been identified as a growing public health concern, associated with obesity and psychological distress. Factors such as inhibition and depression have been proposed as potential predictors of this behavior. **Objective:** The main objective of this study was to evaluate a predictive model of FA in the Ecuadorian population, considering inhibition, depression, and anxiety as key variables. **Methodology:** The study followed a quantitative approach with a non-experimental, cross-sectional, and correlational-causal design. The Executive Function Assessment Scale (EFECO), the Goldberg Anxiety and Depression Scale (GADS), and the Yale Food Addiction Scale (YFAS) were administered to 236 students from the Universidad Católica de Cuenca, selected through non-probabilistic convenience sampling. **Results:** Statistical analyzes revealed that inhibition was a significant predictor of AF, whereas depression did not have a direct effect. Anxiety showed a moderate correlation with FA, although its predictive impact was lower compared to inhibition. Additionally, 24.2% of participants exhibited signs of AF, with a higher prevalence in women. **Discussion:** The results highlighted the role of inhibition in FA, suggesting that deficits in impulse control may increase vulnerability to compulsive eating behaviors. These findings underscore the importance of developing interventions aimed at strengthening self-control as a strategy for prevention and treatment.

Keywords: Food addiction, inhibition, depression, emotional regulation, eating behavior.

Resumen

Antecedente: La adicción a la comida es un tema que ha ganado interés en los últimos años, pese a la existencia bibliográfica por investigaciones todavía existen muchos vacíos teóricos. En cuanto a población universitaria ecuatoriana, aún no ha sido un tema de estudio investigado a profundidad. **Objetivo:** El objetivo de este estudio es conocer

la relación de la impulsividad y la conducta alimentaria desordenada con la adicción a la comida en población universitaria ecuatoriana.

Metodología: Estudio de enfoque cuantitativo, diseño No experimental transversal, de alcance correlacional y explicativo. Las herramientas de evaluación incluyeron un cuestionario sociodemográfico, Escala de adicción a la comida de Yale YFAS, el Cuestionario de conducta alimentaria desordenada (DEBQ) y la Escala de Conducta Impulsiva UPPS-P. Se utilizó una muestra no probabilística de 278 estudiantes del programa de pregrado de la carrera de Psicología de la Universidad Católica de Cuenca.

Resultados: Los resultados demuestran que la impulsividad, conducta alimentaria desordenada y adicción a la comida se encuentran en mayor proporción en mujeres solteras y casadas, esto podría deberse a que la composición de la muestra no fue homogénea. Existe una correlación positiva estadísticamente significativa entre conducta alimentaria desordenada con la adicción a la comida, a diferencia de la impulsividad, la cual estadísticamente no es significativa con la adicción a la comida.

Discusión: La adicción a la comida mantiene una relación con la conducta alimentaria desordenada en mayor proporción que con la impulsividad, sin embargo, valores altos de impulsividad y una conducta alimentaria desordenada, contribuirá a valores altos en la adicción a la comida.

Palabras clave: impulsividad, adicción a la comida, conducta alimentaria desordenada, estudiantes universitarios, alimentos.

1. Introduction

The university stage is marked by some physical and psychological changes, part of these changes is the extent of autonomy that this population acquires in their eating habits. Disordered eating behavior is a negative eating style that puts human health at risk on a physical and mental level (Cavazos-Flores et al., 2023). The consumption of palatable foods and disordered eating behavior hinders people's health, generating a high probability of food addiction or an eating disorder (Morales-Basto et al., 2021). Consequently, bad eating habits produce psychological profile effects, such as impulsivity, disordered eating behavior, and food addiction, variables that have not yet been thoroughly explored in the Ecuadorian university population (Reivan -Ortiz et al., 2024).

Impulsivity can be defined as hasty actions that occur in the moment, without reflection, and that create a high risk of harm to the individual, reflecting a desire for immediate rewards or the inability to delay gratification (Association, 2014). It can also be defined as the tendency to engage in risky behaviors with negative consequences, which generates the inability to stop a response or thought, with results that prevent the action from being carried out successfully (Flores et al., 2022).

In this sense, research reveals that Ecuadorian students suffer from overweight and obesity because they lack discipline in their eating habits due to the consumption of foods with low nutritional value and high salt, saturated fat, and sugar content. These components, when consumed in high levels, are associated with greater impulsivity in each individual, a psychological profile factor that is part of a personality trait. There are studies that indicate that impulsivity also increases the risk of food addiction (Reivan -Ortiz et al., 2024).

On the other hand, eating behavior is defined as the behavior related to eating habits, the selection of foods eaten, culinary preparations and the quantities ingested (Osorio et al., 2022). Eating behavior is a variable considered a risk factor, since it can generate inappropriate behaviors in relation to food due to the consumption of unhealthy foods, which harms the physical and psychological health of individuals (Ortiz and Vásquez, 2024). Therefore, disordered eating behavior (DBA) includes patterns of uncontrolled, restrictive or emotional intake, which plays a key role in the manifestation and maintenance of addiction to (Reivan -Ortiz et al., 2024).

Since the university stage involves significant changes in the lives of students on a psychological level, adapting to new environments, gaining greater independence and autonomy, social and academic pressures significantly influence their eating behavior, which in many cases is unhealthy, running the risk of developing eating disorders; which are related at the same time to various factors, such as a sedentary lifestyle and the progressive decline of healthy eating habits (Vargas, 2024).

Food addiction (FA) is defined as a highly palatable eating behavior, which generally has high percentages of sugar, salt, fat and flour in its composition and refers to specific behaviors related to food, characterized by excessive and unregulated consumption of unhealthy foods, it is characterized by the loss of control over food consumption, the inability to reduce consumption despite the desire to do so and continued consumption despite negative consequences (Escrivá et al., 2023). Research indicates that food addiction is regularly compared to substance addiction, since they consist of identical brain functioning mechanisms and psychological factors (for example, impulsivity) (Rojas et al., 2019). In this sense, AC is associated with the compulsive search and consumption of palatable foods despite their negative consequences, generating physiological changes in individuals, such as the presence of tolerance, withdrawal and activation in the same brain areas as substance addiction (Reivan -Ortiz et al., 2024).

There is research that mentions that young university students are more likely to show AC than older individuals, and this could be explained by the fact that the university stage involves many physiological and psychological changes that can increase vulnerability to environmental threats such as addictions, inappropriate eating habits or disorders that develop a psychological connection with food and difficulty managing their eating impulses. (Tous-Carrillo et al., 2024).

A study mentions that there are variables that are closely related to food addiction, such as impulsivity and inappropriate eating behavior, which trigger obesity, eating disorders and other mental health problems, due to prolonged exposure to a diet high in palatable foods that generate behaviors similar to those of individuals who suffer from addictions, such as impulsivity and addiction, in this case to food Reivan -Ortiz et al. (2024). In the academic field, there are students who develop inappropriate and impulsive eating behavior, which leads them to develop food addiction (Behar-Astudillo and Pomareda-Echeverría, 2021).

Based on the above, it could be said that food addiction is an increasingly prevalent disorder in today's society and is a real problem in the university context that has not been thoroughly investigated from a psychological perspective in Ecuadorian university students (impulsivity, disordered eating behavior, and food addiction). There is a significant lack of knowledge among Ecuadorian university students regarding the meaning of healthy eating and the physical and psychological consequences that occur when these foods are consumed inappropriately. Therefore, the objective of this study is to understand the relationship between impulsivity and disordered eating behavior with food addiction in the Ecuadorian university population.

2. Methodology

Study design

This was a research study with a quantitative approach, with a descriptive correlational design, non-experimental, cross-sectional (transversal), with correlational and explanatory scope (Hernández-Sampieri et al., 2014) .

Participants

A non-probability sampling of incidental convenience selection was carried out, a voluntary population of 278 students from the Catholic University of Cuenca with easy access and willing to participate. The group of students from the undergraduate program of middle level (3rd to 6th cycle) of the Psychology career, with an approximate age between 19 and 24 years (mean age 20.1 years) was invited and only those who agreed to participate were evaluated. Of the participants, 221 (79.5%) were female and 57 (20.5%) were male, regarding their marital status it was obtained that, 261 (93.9%) of the participants were single, 16 (5.8%) married and 1 (0.4%) separated / divorced.

Tools

The Yale Food Addiction Scale 2.0 (YFAS 2.0) was used as the instrument. It is a 35-item self-report questionnaire used to measure addictive eating behaviors over the previous 12 months. The original instrument (YFAS) was based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR) substance dependence criteria (DSM-4, 2010) and adapted to the context of food consumption. The YFAS 2.0 is based on the DSM-5 (DSM-5, 2013) and assesses 11 symptoms. The score produces two measures: (a) a continuous symptom count score reflecting the number of diagnostic criteria met (ranging from 0 to 11) and (b) an AF

threshold based on the number of symptoms (at least 2) and self-reported clinically significant impairment or distress. This final measure allows for the binary classification of AF (present vs. absent). Furthermore, according to the revised DSM-5 taxonomy (DSM-5, 2013), it is possible to establish cutoff points for severity: mild (2-3 symptoms), moderate (4-5 symptoms), and severe (6-11 symptoms). AF risk groups were calculated according to a previous study (Munguía et al., 2022) as follows: absent AF, those who do not have any diagnostic criteria in the YFAS 2.0; probable AF, those who meet one diagnostic criterion and those who have two or more criteria, but do not present clinical deterioration; and present AF, those who have two diagnostic criteria and also present clinical deterioration. Thus, the probable AF group will correspond to the clinical concept of high or subthreshold risk, that is, patients who do not strictly meet the diagnostic criteria of the taxonomy, but who present symptoms. Subthreshold psychiatric symptoms do not meet full criteria for a particular disorder in a reference diagnostic taxonomy (such as Axis I disorders within the DSM) but do present significant clinical impairment. In some cases, subthreshold symptoms are more common than their respective Axis I disorders, and empirical research has suggested that these groups are associated with greater disability and many other negative consequences (Rai et al., 2010). The internal consistency of the YFAS 2.0 is $\alpha = 0.85$ in the Ecuadorian population.

For disordered eating behavior, the Dutch Eating Behavior Questionnaire [DEBQ; (Van, 1986)] was used. The English version of the DEBQ (Van et al., 2002) was used. The Dutch Eating Behavior Questionnaire (DEBQ) is a 33-item self-report questionnaire developed by Van Strien et al. (Van, 1986) to assess three distinct eating behaviors in adults: (1) emotional eating, (2) external eating, and (3) restrained eating. DEBQ items are scored from 1 (never) to 5 (very often), with higher scores indicating greater endorsement of the disordered eating behavior. The psychometric

properties of the DEBQ are sound, showing good internal consistency in samples with an alpha of 0.89 for the Ecuadorian population.

And, for Impulsivity, the UPPS-P Impulsive Behavior Scale (Lynam et al., 2007) was used, a 59-item scale designed to assess impulsivity, determined in five subscales: lack of deliberation, lack of perseverance, negative urgency, positive urgency, and sensation seeking. Items are rated from 1 (strongly agree) to 4 (strongly disagree). Internal consistency reliability estimates indicate that the overall scale and the subscales have an internal consistency >0.80 in the Ecuadorian population.

Procedure

Participants were recruited as volunteers, and all voluntarily signed informed consent. No compensation was provided for participating in the study; participants were required to have no prior eating disorder (ED) and no other medical or psychiatric problems. Students were assessed using a questionnaire adapted from the Structured Clinical Interview for Eating Disorders (SCID-5) of the DSM-5. In accordance with the Declaration of Helsinki, the study was approved by the local Ethics Committee of the Catholic University of Cuenca, with code UCACUE-UASB-P-CEISH-2022-096, under the regulations of the Ministry of Public Health of Ecuador.

Statistical Analysis

An analysis was performed with the measure of mean central tendency ($\bar{x}$) and proportions according to each variable. In addition, descriptive graphs using histograms for the characterization of the scalar variables (impulsivity, disordered eating behavior and food addiction) with the marital status variable and dichotomous variable sex. The Pearson correlation coefficient (r) was evaluated, fulfilling the previous assumptions of normality and statistical power. A prediction model was consolidated using the parametric multiple linear regression test (R^2),

fulfilling the assumptions of: linearity, independence, homoscedasticity, normality and non-collinearity. Finally, the Kolmogorov-Smirnov (KS) normality test was used due to the criterion >30 observations and the parametric assumption was met ($p>0.05$).

Statistical analysis consisted of group difference, correlation, and regression tests. The hypothesis was tested and the relationship between impulsivity and disordered eating behaviors and food addiction was demonstrated.

3. Results

Analysis of results

Below, for the development of the first objective, the results obtained through the applied instruments are described:

In table N°1, the descriptive data detail that regarding the impulsiveness variable: singles have a higher proportion of women (206). In married people, there is a higher proportion of women (15), however, a higher average in men ($\bar{x}=28.0$). And in separated/divorced people, they have a high average in men ($\bar{x}=25.0$).

For the variable food addiction it is observed that: singles have a higher proportion of women (206). In married people, there is a higher proportion of women (15), consequently, a lower average in men ($\bar{x} = 30.0$). And in separated/divorced people, they have a high average in men ($\bar{x} = 27.0$).

Finally, for the variable disordered eating behavior we have that: singles present a higher proportion of women (206). In married people, there is a higher proportion of women (15), consequently, a lower average in men ($\bar{x}=60.0$). And in separated/divorced people, they present a high average in men ($\bar{x}=54.0$).

Table 1. Differences between sociodemographic characteristics and variables: Impulsivity, food addiction and disordered eating behavior.

Biological Sex Frequencies			
Biological sex	Frequencies	% of Total	% Accumulated
0	221	79.5 %	79.5 %
1	57	20.5 %	100.0 %

Descriptivas

	Marital status	Biological sex	N	Lost	Average	Median	DE	Minimum	Maximum
IMPULSIVENESS	1	0	206	0	25.8	27.0	8.01	6	42
		1	55	0	25.2	26	8.96	7	40
	2	0	15	0	17.2	18	8.60	6	34
		1	1	0	28.0	28	NaN	28	28
		0	0	0	NaN	NaN	NaN	NaN	NaN
	1	1	1	0	25.0	25	NaN	25	25
FOOD ADDICTION	1	0	206	0	45.2	47.0	13.54	15	64
		1	55	0	43.0	46	14.17	0	64
	2	0	15	0	36.1	31	14.28	17	58
		1	1	0	30.0	30	NaN	30	30
	4	0	0	0	NaN	NaN	NaN	NaN	NaN
		1	1	0	27.0	27	NaN	27	27

DISORDERED EATING BEHAVIOR	1	0	206	0	85.6	88.0	28.26	30	128
		1	55	0	83.7	86	29.00	0	128
	2	0	15	0	71.8	62	28.80	34	116
		1	1	0	60.0	60	NaN	60	60
	4	0	0	0	NaN	NaN	NaN	NaN	NaN
		1	1	0	54.0	54	NaN	54	54

Note. N: Number; SD: Standard Deviation; 1: Single; 2: Married; 4: Separated/divorced; 0: Female; 1: Male

Figures

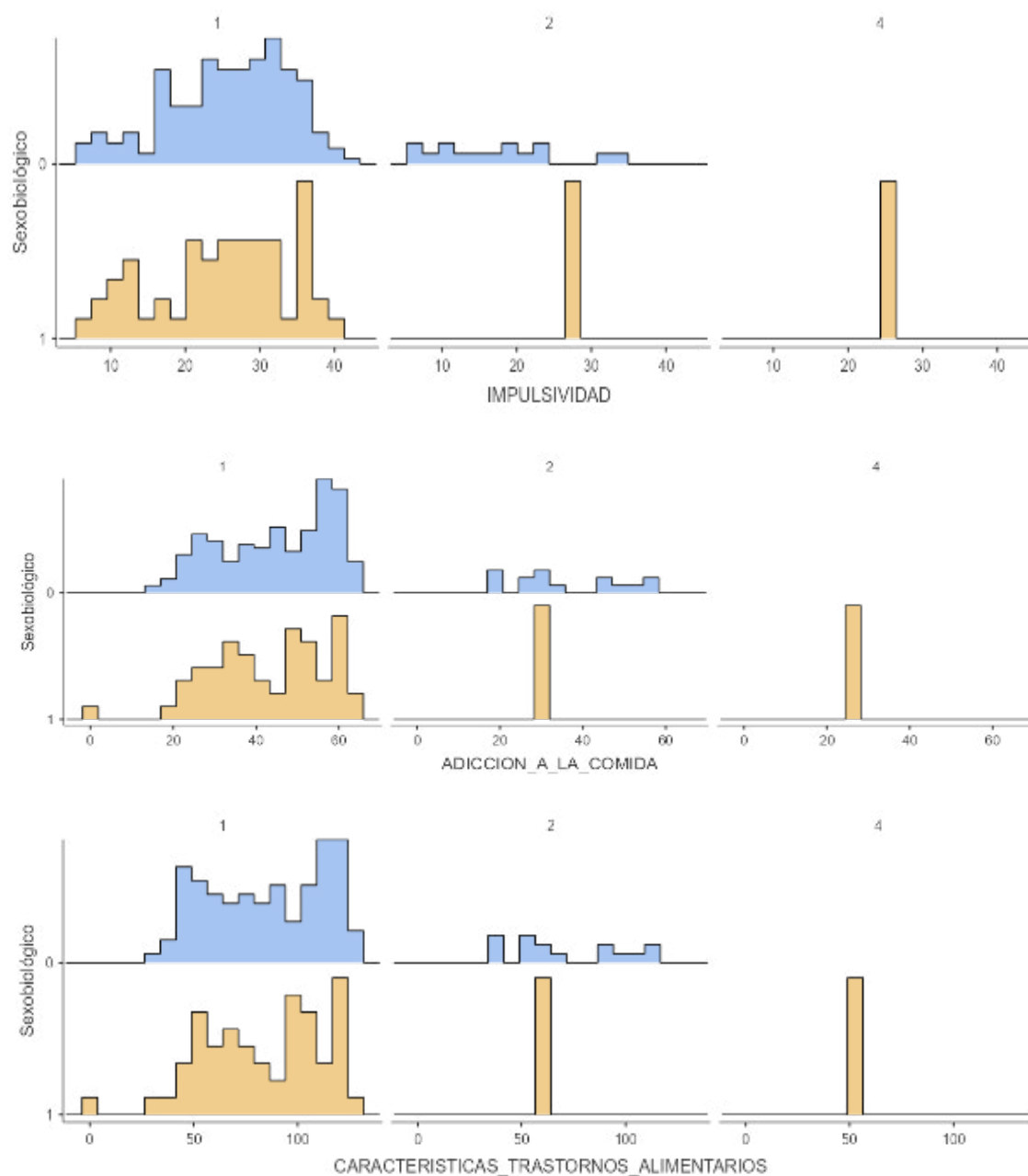
In developing Objective 2, according to Figure 1, the results show that among single women, impulsivity rates are higher compared to married and separated/divorced women. These rates are similar for men.

Continuing with Figure 2, the results show that among single women, food addiction rates are higher compared to married and separated/divorced women. These rates are similar among men.

Finally, Figure 3 shows that among single women, disordered eating behaviors are higher than among married and separated/divorced women. These rates are similar for men.

Figure 1.

Characteristics of psychological variables based on sociodemographic variables. A: Impulsivity. B: Disordered eating behavior. C: Food addiction.



Note. 1: Single; 2: Married; 4: Separated/divorced

Table 2, in the development of objective three, analyses indicate statistically non-significant positive correlations between impulsivity and food addiction and disordered eating behavior. And a statistically significant positive correlation between disordered eating behavior and food addiction. These data indicate that high values in impulsivity and disordered eating behavior will contribute to high values in food addiction.

Table 2.

Correlation between Impulsivity, Food Addiction and Disordered Eating Behavior.

		IMPULSIVENESS	FOOD ADDICTION	DISORDERED EATING BEHAVIOR
IMPULSIVENESS	Pearson's R	—		
	gl	—		
	p-value	—		
FOOD ADDICTION	Pearson's R	0.074	—	
	gl	276	—	
	p-value	0.217	—	
DISORDERED EATING BEHAVIOR	Pearson's R	0.086	0.856	—
	gl	276	276	—
	p-value	0.155	< .001	—

Note. gl : degrees of freedom; p: value; Significance level: $p < .001$

Table 3, in the result of objective four, the regression model indicates an R^2 of 0.733, indicating that the model is explaining a greater proportion of variability in the dependent variable (food addiction). However, in the Beta analysis, only the independent variable of disordered eating behavior is statistically significant in the model. Therefore, it would explain that

disordered eating behavior must exist for a food addiction to originate, and impulsivity must not be integrated.

Table 3. Level of prediction of impulsivity and disordered eating behavior on food addiction.

Model	R	R ²
1	0.856	0.733

Model Coefficients – FOOD ADDICTION				
Predictor	Estimator	EE	t	p
Constant	9.08195	1.7960	5.0568	< .001
IMPULSIVENESS	0.00165	0.0515	0.0321	0.974
DISORDERED EATING BEHAVIOR	0.41568	0.0152	27.3698	< .001

Note. R: Regression; SE: Standard Error; t: Distribution; p: Value

4. Discussion

The general objective of this study was to understand the relationship between impulsivity and disordered eating behavior and food addiction in an Ecuadorian university population. The results indicate a non-significant relationship between impulsivity and food addiction, unlike disordered eating behavior and food addiction, which do maintain a statistically significant relationship. These results regarding impulsivity differ from those of a study conducted with emerging adults between 19 and 23 years of age, which determined that impulsivity is significantly

related to food addiction (Minhas et al., 2021). Likewise, a study conducted with an adolescent population indicates that food addiction is associated with impulsivity, especially when there are high levels of impulsivity (Kidd & Loxton, 2021).

The results of the first objective indicated that variables based on sex and marital status are related to impulsivity, disordered eating behavior, and food addiction in a greater proportion of single and married women than men. This could be due to the fact that the sample was not homogeneous; it is also important to note that there was a high mean in separated/divorced men. In accordance with a study conducted with male and female students from the city of Nuevo León, Mexico, the results indicate that women present greater disordered eating behavior and greater food addiction than men (Guevara et al., 2020).

The second objective proposed to characterize the psychological variables impulsivity, disordered eating behavior, and food addiction in the Ecuadorian university population, based on marital status and sex. The results obtained in this objective demonstrate that in the variables impulsivity, disordered eating behavior, and food addiction, there are higher values in the group of single women compared to married and separated/divorced women; and that similar values are present in men in these three variables. These results are consistent with a study conducted with university students in Kuwait, which reports that regarding disordered eating behavior there are higher values in single women (Alkazemi et al., 2018).

Few studies have explored the level of relationship between impulsivity, consumption of unhealthy foods with food addiction in a specific population, some of them show that positive associations were found between impulsivity and intake of unhealthy foods with food addiction (Bernard et al., 2019). The severity of food addiction (FA) is directly associated with a worse eating style profile and higher levels of impulsivity (Munguía et al., 2022).

The results of the third objective demonstrate statistically non-significant positive correlations between impulsivity with food addiction and disordered eating behavior. And, a statistically significant positive correlation of disordered eating behavior and food addiction, understanding that high values in impulsivity and disordered eating behavior will contribute to high values in food addiction. In accordance with the above, another study in university students shows that impulsivity is related to disordered eating behavior, these findings suggest that different facets of impulsivity are related to disordered eating attitudes and behaviors in this population (Lundahl et al., 2015). Contrasting the previous results, another study carried out with Ecuadorian university students shows that there is a low positive correlation between impulsivity and disordered eating behavior (Ortiz and Vásquez, 2024).

The results of the fourth objective, in the regression model indicate an R^2 of 0.733, which means that 73.3% of the variability in food addiction (dependent variable) can be explained by disordered eating behavior (independent variable), as it is a highly significant predictor ($p = 0.001$), indicating that as disordered eating behavior increases, food addiction increases. On the other hand, regarding impulsivity (independent variable), it is observed that it is not a significant predictor ($p = 0.974$) in food addiction, therefore, it does not influence food addiction within this model. This result, in terms of impulsivity, differs from a study carried out with female university students, which indicates that this variable does maintain a statistically significant positive correlation with disordered eating behavior and food addiction, because impulsivity influences impulsive decision-making (Noel and Van, 2022).

This research presented limiting factors, as the sample composition was not homogeneous in terms of marital status and sex, which could have influenced the results. The sample was predominantly composed of university students and focused solely on a specific age group. Other factors such as time, student availability, or any type of pathology must

also be taken into account. It is important to emphasize that the sample is a fundamental point in a research study, as it is the population with which the research will be carried out. In addition, there are procedures to obtain the number of sample components. (Chero, 2024).

In the future, it is recommended to work with a broader, homogeneous sample from other universities in all regions of Ecuador to obtain specific results for the university population. It is considered important to address other sociodemographic categories and psychological profiles linked to the proposed study model in future studies. Causal and longitudinal analyses could also be considered so that the results of the variables are as close to reality as possible for the Ecuadorian university population. It is important to emphasize the importance of using assessment scales that have been adequately validated for the general Ecuadorian population, including the university population.

It would be beneficial to examine the interactions between gender and various clinical variables with a larger sample. It would also be useful to collect samples with sufficient power to test for differences between genders and marital status. Furthermore, it would be important to conduct studies with a clinical sample of individuals with eating disorders, as well as with a sample of healthy individuals without problematic eating patterns.

Finally, it is hoped that this research will serve as a reference for future studies along the same lines, since the variables studied are linked to other clinical variables that are correlated with each other. The results of these types of studies should be considered when intervening with programs focused on the promotion and prevention of healthy eating in Ecuadorian university students, a situation that has already become a public health issue and requires support, information, education, and treatment, not only at the university stage but also at an early age, where sufficient elements are also taken into account to act from an integral perspective (García et al., 2024).

5. Conclusions

In conclusion, according to the results of this study, it is observed that impulsivity, disordered eating behavior, and food addiction are more prevalent in single and married women than in men. Likewise, a statistically significant positive correlation exists between disordered eating behavior and food addiction. Finally, the results also indicate statistically non-significant positive correlations between impulsivity and food addiction in the study population. Regarding the results, it is of great importance to be able to differentiate high-risk and moderate-risk students from those who are low-risk, in order to promote health and prevent physical injuries, psychological effects, and psychopathologies (Ertl et al., 2022).

6. Authors' contribution

SAPP: Introduction, methodology, data collection, results

GGRO: Analysis of results, discussion, conclusions, recommendations, final review of the article.

7. Acknowledgments (optional)

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8. Ethics committee approval and consent to participate in the study

In accordance with the Declaration of Helsinki, the study was approved by the local Ethics Committee of the Catholic University of Cuenca, with code UCACUE-UASB-P-CEISH-2022-096 under the regulations of the Ecuadorian Ministry of Public Health. Participants were recruited as volunteers, and all voluntarily signed informed consent.

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