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Descriptive study: assessment of perceived self-efficacy in the diet of university students

Estudio descriptivo: valoración de autoeficacia percibida en la alimentación de estudiantes universitarios

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Abstract

Introduction: Self-efficacy refers to the personal ability to control one's own behavior, being able to adopt a beneficial one and / or stop practicing one that would be harmful. Its assessment in the field of health is becoming increasingly important. The objective of this research was to assess in university students the perceived self-efficacy in eating behaviors considered healthy and to determine possible differences between careers. **Methods:** A psychometric test of food self-efficacy was used, validated and adapted to the Argentine food culture, with a response option according to the Likert scale (1: lack of capacity; 5: being very capable), corresponding to 4 categories: foods high in fat; sweet foods; healthy food and healthy drinks. 300 students participated, 80% women and 20% men, 21 ± 4 years old, from three careers: Biochemistry (BQ) and Bachelor's degrees in Biotechnology (LB) and Nutrition (LN). **Results:** The reliability of the instrument was 0.83 (Cronbach's Alpha). The healthy drinks category received the highest score, without observing statistical differences between races (4.47; 4, 37 and 4.37). The score obtained by LN corresponded with a greater sense of perceived self-efficacy than BQ and LB (respectively) in foods: high in fat (3.76 vs 3.31 and 3.50; p = 0.001); sweet (3.71 vs 3.53 and 3.55; p = 0.016) and healthy (4.23 vs 3.75 and 3.90 p = 0.003). **Conclusion:** The assessment of self-efficacy is an important predictor of the actions of individuals in various situations, this fact results a valuable tool for elucidate the particularities and promote nutritional food education in university students of different careers.

Keywords: self-efficacy, eating behavior, healthy diet, students, food and nutrition education.

Resumen

Introducción: La autoeficacia refiere a la capacidad personal de controlar la propia conducta, siendo capaz de adoptar una beneficiosa y/o dejar de practicar una que resultaría dañina. Su valoración en el ámbito de la salud cobra cada vez más importancia. El objetivo del trabajo fue valorar en universitarios la autoeficacia percibida en conductas alimentarias consideradas saludables y determinar posibles diferencias entre carreras. **Métodos**: Se empleó un test psicométrico de autoeficacia alimentaria, validado y adaptado a la cultura alimentaria argentina, con opción de respuesta según escala de Likert (1: ausencia de capacidad; 5: ser muy capaz), correspondientes a 4 categorías: alimentos altos en grasa; alimentos dulces; alimentos saludables y bebidas saludables. Participaron 300 estudiantes, 80% mujeres y 20% varones, de 21±4 años, de tres carreras: Bioquímica (BQ) y las Licenciaturas en Biotecnología (LB) y en Nutrición (LN). **Resultados**: La confiabilidad del instrumento fue 0,83 (Alfa de Cronbach). La categoría bebidas saludables recibió la mayor puntuación, sin observar diferencias estadísticas entre carreras (4,47; 4,37 y 4,37). La puntuación obtenida por LN se correspondió con un mayor sentido de autoeficacia percibida que BQ y LB (respectivamente) en alimentos: altos en grasa (3,76 vs 3,31 y 3,50; p= 0,001); dulces (3,71 vs 3,53 y 3,55; p= 0,016) y saludables (4,23 vs 3,75 y 3,90 p=0,003). **Conclusión**: Siendo la valoración de la autoeficacia un importante predictor de las acciones de los individuos frente a diversas situaciones, resulta una herramienta valiosa para dilucidar las particularidades y promover la educación alimentaria nutricional en universitarios de diferentes carreras.

Palabras clave: autoeficacia, conducta alimentaria, dieta saludable, estudiantes, educación alimentaria y nutricional.

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Introduction

In Argentina, Chronic Noncommunicable Diseases (CNCD) represent a serious public health problem and the epidemic of overweight and obesity constitutes the most frequent form of malnutrition. Excess weight continues to increase steadily according to the 4th National Survey of Risk Factors (ENFR, 2018) (1) with a prevalence of 66.1% (significantly higher than the previous values) and in accordance with the 2nd Survey National Nutrition and Health (ENNyS, 2019) (2) which indicates a67.9% in adults aged 18 or over. Both also agree that approximately half of the overweight population is overweight and the other half obese. The 2nd ENNyS and the latest Dietary Guidelines for the Argentine Population (GAPA, 2016) (3) also indicate changes in food consumption patterns that follow the global trend and cross the entire social fabric, with an increase in food consumption industrialized to the detriment of the natural and traditional little manufactured, attributing them to cultural changes and in the accessibility of food. In particular, the GAPA highlight the need to increase the consumption of fruits, vegetables and fish, as well as to decrease the consumption of fats and sweets. In this regard, studies on sugar consumption indicate that it resembles and even exceeds (for example, in average daily intake) that of other Latin American countries (4,5).

Given how difficult it can be to motivate the adoption of behaviors that promote health or stop behaviors that are harmful to it, self-efficacy appears as an important factor. Self-efficacy is a central concept of the social cognitive theory introduced by Bandura, according to which both behavior and human motivation would be regulated by thought (6). Some authors define it as the personal

capacity of the individual to control their own behavior cognitively, while others describe it as the conviction that one has (or not) of having certain capacities to achieve the desired results (7,8,9). According to Bandura's theory, a person with high self-efficacy will stick with their healthy behaviors, even if the conditions are not ideal. In this way, the construct of self-efficacy plays a fundamental role in behavior change models, being a valuable tool in the field of health (8). Studies applying predictive models positively relate self-efficacy in food care, physical activity and the ability to address problems, with life satisfaction and healthy lifestyles (10,11,12,13, 14).

It is recognized that the university stage is associated with important changes in the lifestyle of young people, including diet. The little time available, the limited financial resources, the scarce variety in the food supply, as well as the lack of knowledge about healthy eating, are some of the factors that make it difficult to adopt adequate eating habits during university (15,16,17,18).

In rapidly changing contexts, the Universidad Nacional del Litoral (UNL, Santa Fe, Argentina) as a member of the Ibero-American Network of Health-Promoting Universities It has become an area that aims to promote healthy lifestyles and nutrition appears among the key points. As part of it, the Faculty of Biochemistry and Biological Sciences (FBCB-UNL) actively participates in research and health promotion processes. Negro et al. have shown that risk factors for CNCD are present in 75% of their Nutrition career students and excess weight in 12.4% (19). The influence that knowledge could have on Health referring to lifestyles in general and eating behaviors in particular, it is a subject open to debate in the students (professionals of tomorrow). In this regard, the research are not conclusive and can be divided into those that have found better results in students with knowledge of health and those that do not (20,21,22,23). Taking into account the curricular contents of food, nutrition and health taught in the careers of the FBCB-UNL a greater knowledge in the Bachelor of Nutrition, followed by Biochemistry and finally a Bachelor's Degree in Biotechnology (which does not have specific subjects on these topics). Previous studies by our group have investigated not only knowledge but also interest in healthy recommendations, patterns of food consumption and physical activity, demonstrating particularities between professionals' careers (24,25,26). In the context proposed, elucidate aspects of food self-efficacy in students of these three careers constitutes an alternative beneficial for understanding and being able to adequately motivate eating habits through appropriate nutrition education.

The objective of the research consisted of assessing perceived self-efficacy in relation to eating behaviors considered healthy and determining the possible differences between them.

Methods

A cross-sectional, descriptive and comparative study was carried out. The population was comprised of all students from Bachelor of Nutrition (LN), Biochemistry (BQ) and Bachelor of Biotechnology (LB) careers at the FBCB-UNL. The representativeness of the sample was calculated using the formula for finite populations.

A non-probability sampling technique was used for the application of a survey using a psychometric test of food self-efficacy, in the period between November 2019 and March 2020). As an inclusion criterion, it was considered to be student from the mentioned careers in the FBCB-UNL. They were excluded from the study students with incomplete data in their survey.

The sample was made up of 300 students (116 LN; 122 BQ and 62 LB), of both genders (240 women and 60 men), with an average age of 21 ± 4 years, who agreed to participate anonymously and voluntarily in the research.

Instrument

A psychometric food self-efficacy test designed and applied in Google Forms was used. In the header of the same, the purpose of the study was explained, inviting voluntary and anonymous participation. The instrument was based on the questionnaire validated by Palacios et al. for the Mexican population (9); which was adapted to the Argentine food culture by experts (Graduates in Nutrition). It was made up of a total of 20 items (Table1), with a response option according to the Likert scale that ranged between 1 (lack of ability) and 5 (being very capable), corresponding to 4 categories: foods high in fat (items 1 to 5); healthy foods (items 6 to 12); sweet foods (items 13 to 17); and healthy drinks (items 18 to 20). The adaptation of the questionnaire was evaluated prior to its application through a pilot test in university students and its reliability measured by Cronbach's Alpha was 0.83.

Ethics

The procedures followed were endorsed and approved by the Research Ethics and Security Advisory Committee (CAESI) of the FBCB-UNL, in accordance with the Declaration of Helsinki, according to minutes 05/16.

Statistical analysis

Descriptive statistics were used, mean ± standard deviation (SD), the absolute values and percentages. The ANOVA test was used to establish statistical differences between careers in the variables studied (supported by test of normality and homogeneity of variances) with subsequent Post Hoc Tukey test, using Minitab 17 software, considering a significance level of 0.05.

Results

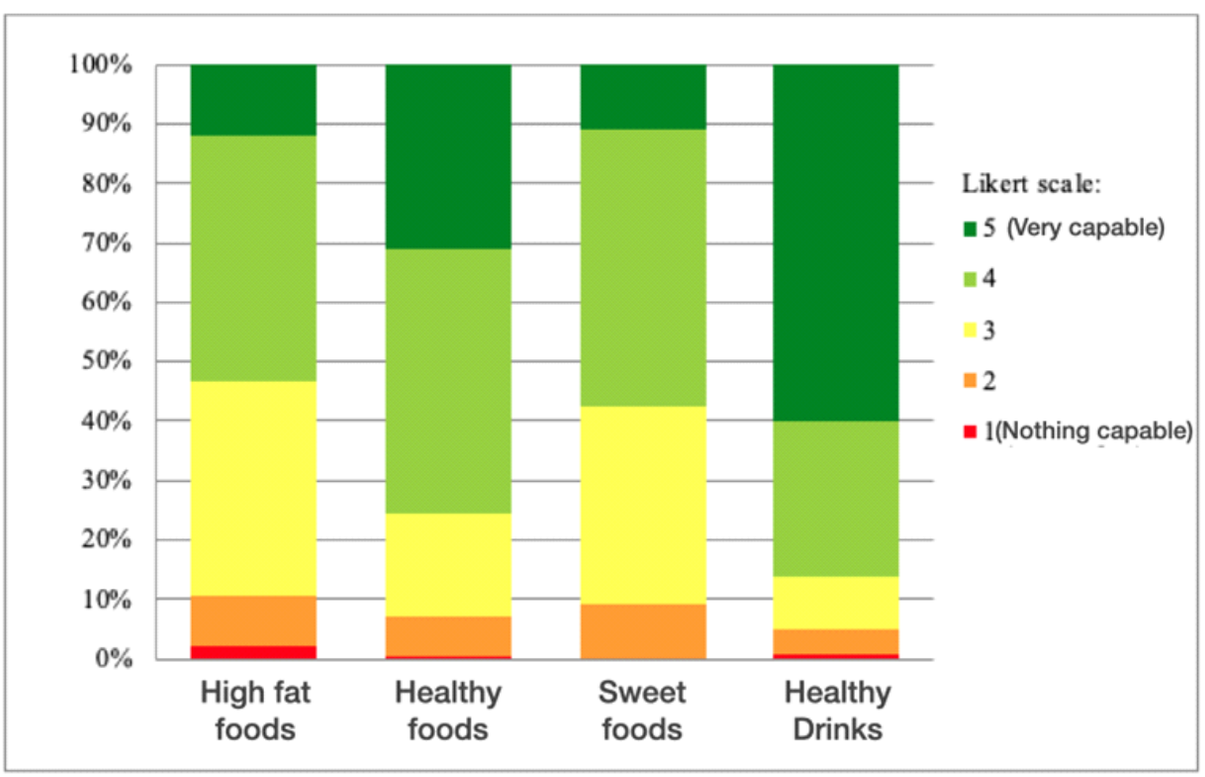
Characterization of the studied population

The sample was made up of 300 students and a predominance of the female gender in all careers. The average age was 21 ± 4 years, without showing differences. In the table 2 the distribution of the population according to career, gender and age is observed.

Table 1: Tool used in the research

	Ítems	Categories
1	I can stop eating junk food (snacks, hamburgers, pizzas, biscuits or bills), even if I'm hungry.	High fat foods
2	I can stop eating fried foods.	
3	I am able to eat less fried or high-fat foods.	
4	I am able to refuse junk food when someone offers it to me.	
5	I am able to refuse invitations to eat foods rich in fat and carbohydrates such as pizzas, bakery products, cakes, etc.	
6	I am able to eat fruits and vegetables on a daily basis.	Healthy foods
7	I am able to eat salads four times a week.	
8	I am able to choose a fruit instead of cake / ice cream / sweet for dessert.	
9	I am able to eat fruits in front of people who are eating sweet foods.	
10	I can eat healthy foods when I am with friends.	
11	I can avoid eating candy or chocolate whenever I crave it.	
12	I am able to stop eating energy bars and eat a piece of fruit.	
13	I am able to stop eating bills or cookies.	Sweet foods
14	I can avoid eating fruits in syrup or processed (peach, pineapple, fruit cocktail) even if I crave it.	
15	I am able to stop eating jams or dulce de leche.	
16	I am able to eliminate sweets and chocolates from my diet.	
17	I can stop eating candy or chocolate when I feel nervous.	
18	I can stop drinking soda and drink plain water.	Healthy drinks
19	I can stop drinking flavored waters or juice sachets and drink plain water.	
20	I can stop drinking flavored waters or sachet juices and drink natural squeezed fruit juice.	

Figure 1: Percentage distribution of students' self-efficacy for each category analyzed



Self-efficacy perceived by the students

In the total population, the perceived self-efficacy scores for each of the categories analyzed were: high-fat foods (3.52 ± 1.29); healthy foods (3.97 ± 1.25); sweet foods (3.60 ± 1.36) and healthy drinks (4.41 ± 1.04).

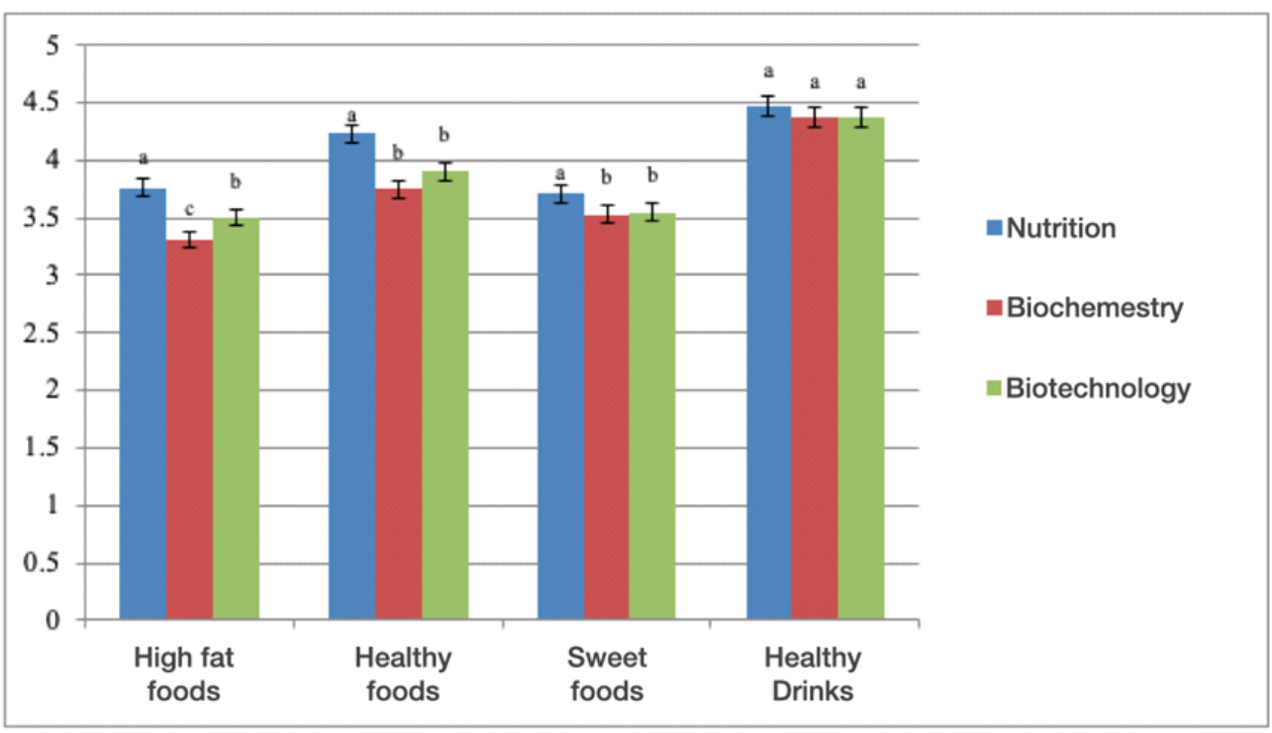
The profile of the responses obtained considering the agreed score for the valuation, from the absence of ability to being very capable (1 to 5), it is shown in Figure 2. It was possible to verify that the percentage of students with positive evaluations (considering scores 4 and 5 as such) for each category was: high food in fat (53%); healthy food (76%); sweet foods (58%) and healthy drinks (86%).

The analysis of the scores obtained between careers showed significant differences in LN students compared with those of BQ and LB (respectively) for the following categories: high-fat foods (3.76 vs 3.31 and 3.50, p = 0.001); healthy foods (4.23 vs 3.75 and 3.90, p = 0.003) and sweet foods (3.71 vs 3.53 and 3.55, p = 0.016). The healthy drinks category received the highest score, without observing significant differences between careers (4.47, 4.37 and 4.37, p = 0.343). Figure 2.

Table 2: Characterization of the analyzed sample according to career, gender and age

Characteristic		Nutrition (LN)	Biochemistry (B)	Biotechnology (LB)	Total
Students (n)		116	122	62	300
Gender (%)	Female	84,5	82,8	66,1	80
	Male	15,5	17,2	33,9	20
Average age (years)		21,1±4,5	20,2±2,4	21,6±3,8	20,8±3,7

Figure 2: Perceived self-efficacy in the different categories discriminated by careers. The groups that do not share a superscript letter are statistically significant (p <0.005)



The Table 3 shows the results obtained for each of the propositions (items) evaluated in the three careers. The lowest score was observed in relation to the ability to "refuse invitations to eat foods rich in fats and carbohydrates" (item 5), mainly represented by bakery products. The highest scores were observed in relation to the ability to choose healthy drinks (items 18 to 20); although in particular for LN the ability to "eat fruits and vegetables daily" should also be noted (item 6).

Unlike BQ and LB, LN students perceived themselves as more capable of stopping eating junk food, even though they were hungry (item 1, p = 0.003), and sweet foods, such as bills or cookies (item 13, p = 0.000). At the same time, they showed significantly higher scores on items belonging to the healthy foods' category (items 8 to 10), showing greater self-confidence to choose fruits or healthy foods in tempting situations (p = 0.002, p = 0.021, p = 0.000, respectively).

Discussion

In this research the objective of assess the perception of

Table 3: Perceived self-efficacy for each item discriminated by career. The groups that do not share a superscript letter are statistically significant (p <0.005)

Career	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
LN	3,69 ± 1,09^{a}	4,11 ± 1,12^{a}	4,47 ± 0,87^{a}	3,66 ± 1,29^{a}	2,85 ± 1,42^{a}	4,55 ± 0,94^{a}	4,53 ± 0,98^{a}	3,62 ± 1,25^{a}	4,17 ± 1,21^{a}	4,27 ± 1,06^{a}	3,59 ± 1,15^{a}	4,53 ± 0,81^{a}	3,65 ± 1,28^{a}	4,28 ± 1,11^{a}	3,14 ± 1,49^{a}	2,91 ± 1,42^{a}	3,79 ± 1,37^{a}	4,54 ± 0,94^{a}	4,44 ± 0,99^{a}	4,44 ± 1,08^{a}
B	3,21 ± 1,15^{b}	3,57 ± 1,28^{b}	4,09 ± 0,97^{b}	3,29 ± 1,25^{b}	2,38 ± 1,19^{b}	4,25 ± 1,01^{b}	4,06 ± 1,27^{b}	3,05 ± 1,37^{b}	3,75 ± 1,31^{b}	3,65 ±1,32^{b}	3,56 ± 1,20^{a}	4,19 ± 1,02^{b}	2,91 ± 1,28^{b}	4,32 ± 1,05^{a}	3,29 ± 1,41^{a}	2,89 ± 1,30^{a}	4,29 ± 1,39^{a}	4,29 ±1,23^{a}	4,38 ± 1,17^{a}	4,45 ± 0,89^{a}
LB	3,34 ± 1,09^{b}	3,95 ± 1,08^{a}	4,35 ± 0,72^{ab}	3,37 ± 1,06^{ab}	2,48 ± 1,11^{ab}	4,40 ±0,91^{ab}	4,39 ±0,91^{ab}	3,11 ± 1,27^{b}	3,77 ± 1,18^{b}	3,81 ±1,13^{b}	3,45 ± 1,19^{a}	4,42 ± 0,98^{ab}	3,26 ± 1,24^{b}	4,27 ± 1,62^{a}	3,34 ± 1,46^{a}	2,71 ± 1,33^{a}	3,39 ± 1,43^{a}	4,32 ± 1,04^{a}	4,50 ± 0,94^{a}	4,27 ± 1,01^{a}

self-efficacy in four relevant aspects of student intake, such as the ability to reduce the consumption of foods high in fat and sweets and increase the consumption of healthy foods, complemented with the ability to choose healthy drinks, constitute a valuable set for shed light on key aspects of your diet. The use of a validated and appropriately adapted psychometric scale instrument becomes a valuable tool (9) considering that the people with strong feelings of self-efficacy are more persistent in their challenges and self-confident, in addition to having greater academic success and leading a healthier life (12).

It has manifested in this group of students had a greater perception of self-efficacy in the beverage category than in those of solid foods, indicating having a greater capacity to abandon the consumption of carbonated and / or flavored beverages in favor of the consumption of water or natural juices. The 86% who expressed this capacity coincides with the 81% who stated that they drink water daily as part of their liquid intake in a similar population (26). The importance of safe water consumption is a recommendation of the GAPA (3) and widely disseminated by international organizations (27). A study that applied a similar questionnaire on health and eating habits in university students in Lima (Peru) indicated that around 50% drink 4 to 8 cups of water and do not consume artificial or sweet drinks more than 2 times a week (17). Studies in young Mexicans have shown the importance of assessing self-efficacy in the consumption of sweetened beverages that, as mentioned above, affects our country and all of Latin America. One of them that investigated the cognitive factors associated with the frequency of consumption of soft drinks identified low self-efficacy as the main one followed by intention (5), while another determined that in the students the self-efficacy and self-regulation are negatively related to the consumption of sweetened beverages (10). In the group of university students in this study, with an average value of self-efficacy that exceeds score 4, it can be considered that they have an adequate capacity that would allow them to regulate the consumption of less healthy beverages compared to water.

The lowest score of this group was registered in the ability to "decline invitations to eat foods high in fat and carbohydrates." The dimension of food as a social act is a recognized fact and the implications admit multiple and varied evaluations that exceed the objectives of the research. However, the situation is reflected in the lower percentages of students who manifest self-efficacy compared to the categories of foods rich in fat (53%) and sweets (58%). In a similar population we showed that 72.6% consumed pastry doughs and 51.8% snack products (such as salty sticks, packaged potato chips, etc.) frequently (5-7 times a week) (26). The high consumption of foods rich in fats and sugars in the diet of university students is widely recognized (28,29). Mexican students reported their preference for junk food, alluding to its economic accessibility, satiating capacity and for not seeing consequences in poor diet; additionally, the authors also observed an impeding family influence on food preparation and administration (11).

The positive perception respect to the choice of healthy food reached ¾ of the students. If it is considered that the propositions embodied in its contents correspond to the ability to choose fruits and vegetables, the results are, to say the least, challenging. In contrast to the perceptions expressed in this group, previous publications have shown that the consumption of fruits and vegetables is low and corresponds to the least fulfilled recommendation of the GAPA (25,26), in line with patterns of the general Argentine population that consume 1.9 of the 5 servings daily (1,2). Coincidentally, another research in Argentine medical students showed that only the 12.8% consumed the recommended portions (20), a result even lower than the from students in Lima (Peru) where found that 29.6% frequently or always consume all 5 servings (17). From this perspective, it could be thought that there are underlying factors that intervene between the capacity manifested by students and the very act of choosing these foods that deserve to be elucidated in future researches.

The comparative analysis between careers demonstrated greater self-efficacy of LN students, in relation to their peers from BQ and B, in three of the four categories investigated (sweet foods, high-fat foods, and healthy foods); however, this difference is not shown in healthy drinks.

Particularly on the categories that showed lower valuation, the students of B and LB were considered less capable of avoiding or rejecting high-fat foods in different situations or emotions; observing a different behavior from the LN students, who stated that they had less confidence in stopping consuming sweet foods. Both types of food (sweet and rich in fat) are included in the GAPA in the same group called "optional", advising to limit their consumption (message 5). The difference found between the careers would require more studies on aspects that can clarify issues related to food selection in the face of different circumstances or emotions. It has been shown that the possible common temptations in the general population can be linked to preferences, food cravings, emotional states and social events, among others (29). In university students of different careers, other factors could be added, such as different pressures of academic life and lack of time among the most outgoing (11,30).

In coincidence with this research, many previous researches where we compare different aspects of healthy eating on these three careers, as well as associations between knowledge and careers, has been found that LN students show in some aspects better dietary profile than

B and LB, however this is not a constant in all the variables studied (25.26).In the present research, although the academic training of the LN itself could favor the perceptions found, Noseda et al. (24) demonstrated high knowledge and interest in students of entering this career who have not yet received specific instruction, pointing out that other possibilities such as motivation could be into play.

Regarding the limitations of the research, it should be mentioned that the female predominance (characteristic in the studied population) could be a factor in the assessed behaviors that should be taken into account in future studies that assess differences by gender. Either any special dietary conditions considered (diets, intolerances, vegetarianism, etc.), however these situations were registered only 6% according to a recent study by our group in a similar population (26).

It can be concluded that the results obtained make it clear particularities in self-efficacy assessments in students of three careers between which the academic training in food, nutrition and health. The scores demonstrated that not in all evaluations LN differed significantly from careers with less (B) or practically no (LB) instruction in the subject.

The research broadens and deepens the knowledge in little-explored aspects concerning the capacity from these university students facing various situations that promote a favorable change contributing to the objectives of interest for the promotion of health in the Healthy Universities. The use of an instrument appropriate to one's own culture it constitutes a valuable tool to be implemented prior to nutritional food education programs and that can be extended to other groups of people. Thus, the assessment of perceived self-efficacy would allow the development of multidisciplinary strategies (nutrition-psychology-medicine) to focus effort, increase motivation and strengthen groups or individuals in the face of obstacles or temptations, enhancing the possibilities of achievements.

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Conflict of interest

The authors declare that they have no conflicts of interest.

Data and contribution of the authors to the manuscript

Valentina María Degrave: Research Initiation Fellow, National University of the Litoral (UNL), carried out the field work, data acquisition, analysis and interpretation of the same and wrote the draft of the manuscript.

Bachelor of Nutrition Matías Rodrigo Vargas: co-director of the Scholarship, contributed in the design of the study, analysis and interpretation of data, intellectual content and revision of the manuscript.

Doctor in Biological Sciences María Alejandra Fortino: director of the CAI + D Project, director of the Grant, carried out the conception and design of the study, the critical review in the interpretation of data, intellectual content, and the final approval of the version to be presents.

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