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Artículos Científicos

Programa educativo nutricional en estudiantes universitarios

Nutritional educational program in university students

Programa de educação nutricional em estudantes universitários

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Resumen

Introducción: Una dieta saludable permite mantener un buen estado de salud, ya que aporta los nutrientes necesarios de acuerdo con los requerimientos de la persona según su sexo y edad. Diversos estudios clínicos y epidemiológicos demuestran que los cambios producidos en la dieta han provocado el aumento de personas con sobrepeso y obesidad, hipercolesterolemia, hipertensión arterial y diabetes mellitus.

Objetivo: Evaluar el impacto de un programa educativo y de alimentación saludable en el estado nutricional de estudiantes de bajo nivel socioeconómico de la Universidad Nacional de Barranca.

Material y método: Estudio de diseño cuasiexperimental con participación de 136 estudiantes seleccionados a través de la Ficha del Sistema de Focalización de Hogares (SISFOH). La evaluación antropométrica, perfil bioquímico, test de conocimientos, actitudes y prácticas alimentarias se estimaron antes y después de la intervención de un programa educativo nutricional. Este programa consistió en brindar desayuno y almuerzo saludable, además de talleres y sesiones demostrativas por un período de 16 semanas según cronograma.

Resultados: Antes de la intervención se detectaron 48 alumnos malnutridos, cifra que disminuyó a 30 después de aplicar el programa. Asimismo, luego de la intervención, los valores de hemoglobina fueron más elevados, de modo que hubo una recuperación en los casos de anemia leve y moderada. La glucosa, albúmina y globulinas también disminuyeron, mientras que en los triglicéridos y la bilirrubina no se observaron diferencias significativas.

Conclusiones: La intervención del programa educativo nutricional tuvo un impacto positivo en el estado nutricional de los estudiantes universitarios según la prueba Mc Nemar (P-valor = 0.000 < 0.05).

Palabras clave: alimento, comedor universitario, educación nutricional, estudiante universitario, dietética, nutrición.

Abstract

Introduction: A healthy diet allows to maintain a good state of health, hence it must provide the necessary nutrients according to the requirements of the person according to their sex and age. Various clinical and epidemiological studies show that changes in the diet have caused an increase in people who are overweight and obese, hypercholesterolemia, high blood pressure and diabetes mellitus.

Objective: To evaluate the impact of an educational program and healthy eating on the nutritional status of students of low socioeconomic status of the National University of Barranca.

Material and method: Quasi-experimental design study with participation of 136 students selected through the Household Focalization System Sheet (SISFOH). The anthropometric evaluation, biochemical profile, knowledge test, attitudes and eating practices were estimated before and after the intervention of a nutritional educational program. This program consisted of providing healthy breakfast and lunch, as well as workshops and demonstration sessions for a period of 16 weeks according to schedule.

Results: 48 malnourished students are observed before the intervention and only 30 students after malnutrition. Also, after the intervention hemoglobin values are higher, recovering cases of mild and moderate anemia. Glucose, albumin and globulins decreased and no significant difference was observed in triglycerides and bilirubin.

Conclusions: The intervention of the nutritional educational program has a positive impact on the nutritional status of university students according to the Mc Nemar Test, (P-value = 0.000 < 0.05).

Keywords: food, nutrition, university canteen, nutritional education, university student, dietetics.

Resumo

Introdução: Uma dieta saudável permite manter um bom estado de saúde, pois fornece os nutrientes necessários de acordo com os requisitos da pessoa, de acordo com o sexo e a idade. Vários estudos clínicos e epidemiológicos mostram que mudanças na dieta levaram ao aumento de pessoas com sobrepeso e obesidade, hipercolesterolemia, pressão alta e diabetes mellitus.

Objetivo: Avaliar o impacto de um programa educacional e de alimentação saudável no estado nutricional de estudantes de baixo nível socioeconômico da Universidade Nacional de Barranca.

Material e método: Estudo de desenho quase-experimental com a participação de 136 alunos selecionados através da Folha do Sistema de Focalização do Agregado Familiar (SISFOH). A avaliação antropométrica, perfil bioquímico, teste de conhecimento, atitudes e práticas alimentares foram estimadas antes e após a intervenção de um programa educacional nutricional. Esse programa consistia em fornecer café da manhã e almoço saudáveis, além de oficinas e sessões de demonstração por um período de 16 semanas, de acordo com o cronograma.

Resultados: Antes da intervenção, 48 alunos desnutridos foram detectados, número que diminuiu para 30 após a aplicação do programa. Além disso, após a intervenção, os valores de hemoglobina foram mais altos, havendo recuperação nos casos de anemia leve e moderada. Glicose, albumina e globulinas também diminuíram, enquanto não foram observadas diferenças significativas nos triglicerídeos e bilirrubina.

Conclusões: A intervenção do programa educacional nutricional teve um impacto positivo no estado nutricional de universitários, segundo o teste de Mc Nemar (valor de P = 0,000 <0,05).

Palavras-chave: alimentação, cantina universitária, educação nutricional, estudante universitário, dietética, nutrição.

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Introduction

The World Health Organization (WHO) explains that "poor diet" (represented by malnutrition, undernourishment, and nutritional deficiencies) constitutes one of the fundamental causes of morbidity and mortality worldwide. In fact, unhealthy eating and sedentary living contribute to the presence of non-communicable diseases (NCDs), such as cardiometabolic diseases, strokes, diabetes, cancer, lithiasis, dental caries and osteoporosis (WHO, 2018a).

In this sense, the foods that people consume daily usually reflect the way they live, as well as the socioeconomic level to which they belong (Chávez, 2018). In addition, religious beliefs, advertising campaigns, educational level, health status and culinary culture also influence eating styles (United Nations Food and Agriculture Organizationa [FAO], 2017).

Now, in the specific case of university students, it can be said that their eating habits are characterized by a high intake of lipids, carbohydrates and continuous fasting (Salvador, Bruneau and Godoy, 2019), which affects the appearance of overweight , obesity and ENT in adult life (Crovetto, Figueroa, González, Jeria and Ramírez, 2015). The causes of malnutrition, in other words, are usually based on inadequate eating habits, hence it is necessary to promote healthy nutrition to contribute to the reduction of hunger, malnutrition, obesity and overweight (Moreno, 2017).

Globally, obesity and overweight are on the rise. According to the WHO reports, in 2016, 39% of people over 18 years of age were overweight and 13% suffered from obesity, data that shows that obesity has tripled since 1975 (WHO, 2018b). Similarly, FAO in 2018 reported that overweight is affecting all countries in the region. Chile, for example, has the highest figures in this regard, with 31% obesity in women and 24.9% in men.

Currently, healthy food and nutrition are on the national, regional and local agenda of several countries due to the impact they have on people's health and quality of life. In Peru, the Ministry of Health (MINSA), through the Health Strategy for Healthy Food and Nutrition, have been articulating strategies to promote healthy habits. This body, in fact, recognizes nutrition as a determining and conditioning factor of health, hence Law No. 30021 constitutes a great advance in this matter, since it seeks to promote the following objective:

> The promotion and effective protection of the right to public health to the proper growth and development of people, through educational actions, the strengthening and promotion of physical activity, the implementation of kiosks and healthy dining rooms, in educational institutions basic regulation and supervision of advertising and other practices related to food, non-alcoholic beverages aimed at children and adolescents to reduce and eliminate diseases linked to overweight, obesity and NCDs (Diario Oficial El Peruano, 2017, p. 1).

Young people - including college students - are at higher risk of not eating well due to estrangement from family, eating patterns, social influence, and the media. In this regard, Sánchez and Aguilar (2015) report that university students do not consume breakfast, especially on exam dates. For his part, Obradors, Ariza and Muntaner (2014) add that this happens because most of these students leave home to reside in homes close to educational centers.

On the other hand, San Román et al. (2018), in a study on the Mediterranean diet of Spanish university students, found that 77.6% of them had an optimal diet, 63.8% lived at home and 29.5% did so outside the home. In fact, 25% of them came from other cities like Ceuta and Melilla and had a non-optimal diet, so they had to improve their eating habits and lifestyles.

Likewise, in another investigation with university students to assess the impact on knowledge about balanced nutrition, Sánchez, Aguilar, González, Esquius and Vaqué (2017) carried out educational sessions using various learning strategies, including auditory and kinesthetic. The results showed that 69.2% had to improve their eating habits; Likewise, it was determined that the students who received intervention with auditory and kinesthetic strategies obtained higher knowledge on the subject. In other words, the authors concluded that the educational sessions manage to improve the knowledge in nutrition and feeding, which is why they are considered positive strategies for the transfer of knowledge.

In other research, Moreno (2017) found as risk factors for this phenomenon the lack of physical activity and the inadequate diet in university students, which is usually encouraged due to the lack of time to perform some physical activity. In this work it was also reported that, unlike university students, older women are those who exercise. Similarly, and in terms of food, red meat, snacks, sweets and butters were the most consumed compared to vegetables and fruits.

Despite what was stated in the previous paragraphs, it can be said that interest in diet and health-related topics has begun to grow nowadays, as people seek to lead a healthy lifestyle through exercise and exercise. feeding. In this scenario, the university constitutes one of the environments that has been considered adequate for the development of health promotion activities, carrying out activities that improve knowledge, practices and positive attitudes towards healthy eating.

Therefore, the objective of this study was to evaluate the impact of an educational and healthy eating program on the nutritional status of students of low socioeconomic status at the National University of Barranca (Peru).

Methodology

Type of study and population

This was a quasi-experimental investigation, with a pre-group and post-test evaluation of a single group. The sample size was made up of 136 students of low socioeconomic status, selected through simple random sampling. The nutritional education program considered the actions aimed at achieving a good diet and nutrition for the students. Nutritional status is defined as the relationship between nutritional needs and the use of nutrients in food, and was evaluated through the body mass index (BMI).

Data collection techniques and instruments

To select students with low socioeconomic status, the household targeting system sheet (SISFOH) was used, which is used by the Ministry of Development and Social Inclusion (MIDIS), which provides information on the situation of poverty or vulnerability. Likewise, for the other variables the following instruments were used:

1- Assessment of nutritional status

Anthropometric measurement: Nutritional diagnosis was made through BMI before and after the intervention. BMI is an anthropometric index that reflects the relationship between weight in kilograms and height in meters squared (WHO, 2018c). It is classified as thin (<16 to ≥ 17), normal (≥ 18.5), overweight (≥ 25) and obesity (≥ 30 a ≥ 40) (OMS, 2000).

Biochemical samples: Analysis of biochemical parameters of glucose, hemoglobin, lipid profile and liver profile were performed before and after the intervention.

2- Nutritional educational program

Educational program: Carried out by nutrition and nursing professionals for a period of 16 weeks in the university canteen settings. They were subdivided into 4 groups of students who attended 2 hours, 3 times a week and various workshops and demonstration sessions were held on nutrition and physical activity.

Healthy eating: It was offered for 16 weeks, and consisted of breakfast and lunch with the following characteristics: the menus were programmed and supervised by the nutritionist, in such a way that the quantity and quality of the preparations covered the total caloric value at breakfast and lunch within a balanced diet of carbohydrates, fats and proteins aimed at a university audience. The caloric value of breakfast provided between 450-550 kcal and lunch between 900 to 1100 kcal per day, of which between 15% and 20% were from proteins, between 55% and 60% from carbohydrates and between 25% and 30 % of fats. In addition, vitamin and mineral requirements were covered. The daily energy requirement (MINSA) for the Peruvian population from 18 to 29 years of age in the urban area is 2620 kcal for men and 2003 kcal for women, 25% is covered at breakfast and 40% at lunch (National Institute of Health [INS], 2012). Breakfast consisted of 1 drink of Andean cereal, 1 bread with complement and 1 fruit or fruit juice. Soup (30 g prey, 40 g cereals / tuber / stew and 30 g vegetables) was served at lunch. Starter: 100 g vegetables, main course (1 option) combination by food group (cereal, stew, meat, vegetables, tuber). Beverage (fruit / infusion) 250 ml natural fruit, without colors or flavors and dessert or fruit between 100 g and 120 g. The fruit was fresh, whole or chopped with optimal organoleptic characteristics.

3- Food knowledge, practices and attitudes test: This instrument consists of 36 items and was applied before and after the intervention. The reliability of the knowledge test was calculated with the Kuder Richardson coefficient (80.72%), while the Cronbach alpha coefficient was applied for the attitude and eating practices test. (0.822 y 0.812).

Ethical considerations

The students were summoned and brought together in order to explain the purpose of the investigation. Those who agreed to participate signed the informed consent. This document was previously approved by the Research Ethics Committee of the university.

Statistic analysis

The statistical analysis was processed with the SPSS software (version 21.0) and with a significance level of $p < 0.05$ where the means and standard deviation were calculated. The statistical test of Mac Nemar was used to evaluate the impact of the educational intervention and healthy eating, and the coefficient of variation was used to compare the data obtained on nutritional knowledge, practices and attitudes.

Results

Tabla 1. Estado nutricional y grado de anemia en estudiantes universitarios antes y después de la intervención del programa educativo nutricional

Estado nutricional	Antes		Después	
	Frecuencia	Porcentaje %	Frecuencia	Porcentaje %
Normal	88	64.7	105	77.2
Delgadez	2	1.5	0	0.0
Obesidad	9	6.6	6	4.4
Sobrepeso	37	27.2	25	18.4
Total	136	100	136	100
Grado de anemia				
Anemia leve	1	0.7	0	0.0
Anemia moderada	3	2.2	0	0.0
Anemia severa	0	0.0	0	0.0
Sin anemia	132	97.1	136	100.0
Total	136	100.0	136	100.0

Fuente: Elaboración propia

Table 1 shows changes in the values of nutritional status and anemia after the intervention of the nutritional education program. In fact, 77.2% of students had normal nutritional status, decreased obesity, and were overweight. Likewise, after the intervention, 100% did not present anemia.

Tabla 2. Estadísticos descriptivos del perfil bioquímico de estudiantes universitarios antes y después de la intervención del programa educativo nutricional

	Antes				Después				Estadístico	P Valor
	Min	Max	Media	Desv.	Min	Max.	Media	Desv.		
Hemoglobina	8.3	16.4	13.46	1.44	11.25	16.94	14.24	1.37	t= -7.301	0.000
Glucosa	64	108	82.74	8.42	66	109	78.80	6.39	t= 4.643	0.000
Colesterol	85	347	151.79	32.62	103	234	162.91	28.38	Z= -4.910	0.000
Triglicéridos	48	614	94.13	57.16	42	272	94.72	41.28	Z= -1.586	0.113
Bilirrubina	0.18	2.32	0.77	0.49	0.36	2.3	0.69	0.23	Z= -0.238	0.812
Albumina	4.2	5.76	5.18	0.28	3.8	4.49	5.39	5.91	Z= -8.599	0.000
Globulina	2.22	4.58	3.04	0.35	2.2	3.5	2.83	0.21	Z= -5.472	0.000

Fuente: Elaboración propia

After the intervention of the nutritional education program, there was a significant change in the mean levels of hemoglobin and glucose (P <0.05). A significant increase (P <0.05) in cholesterol levels is observed, unlike albumin and globulin, which had lower levels (P <0.05). Regarding triglycerides and bilirubin, no significant difference (P> 0.05) was observed in the mean levels before and after the intervention of the educational program.

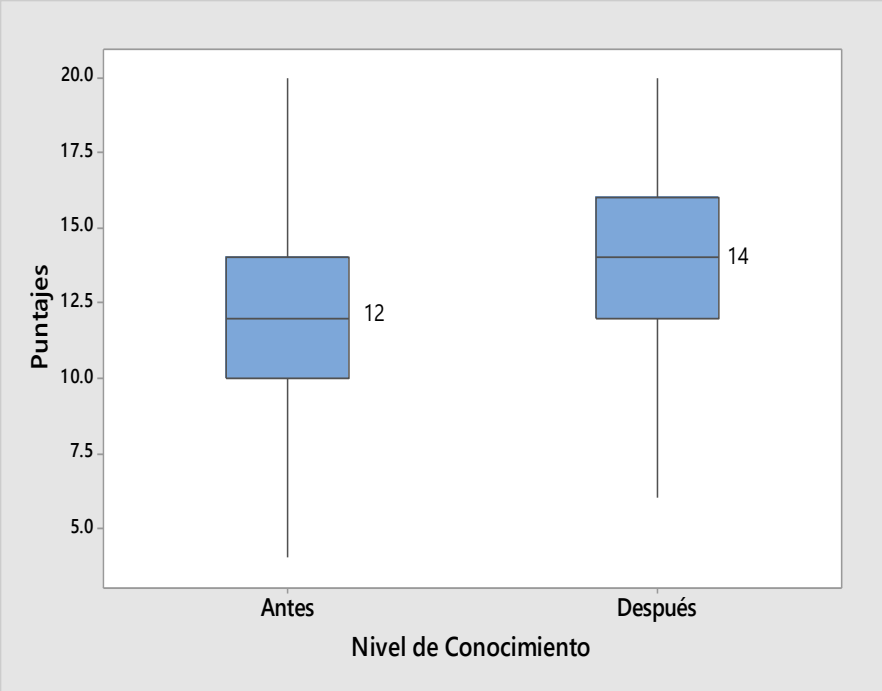
Tabla 3. Diagnóstico nutricional antes y después de la intervención de un programa nutricional

Antes	**Después**		**Total**
	Malnutrido	**Normal**	
Malnutrido	30	18	48
Normal	1	87	88
Total	31	105	136

Fuente: Elaboración propia

Before the nutritional education program intervention, 48 students were malnourished, while after the intervention only 30 students were malnourished. According to the Mac Nemar test (P = 0.000a), we can affirm that the intervention of the nutritional education program had a significant positive impact on nutritional status.

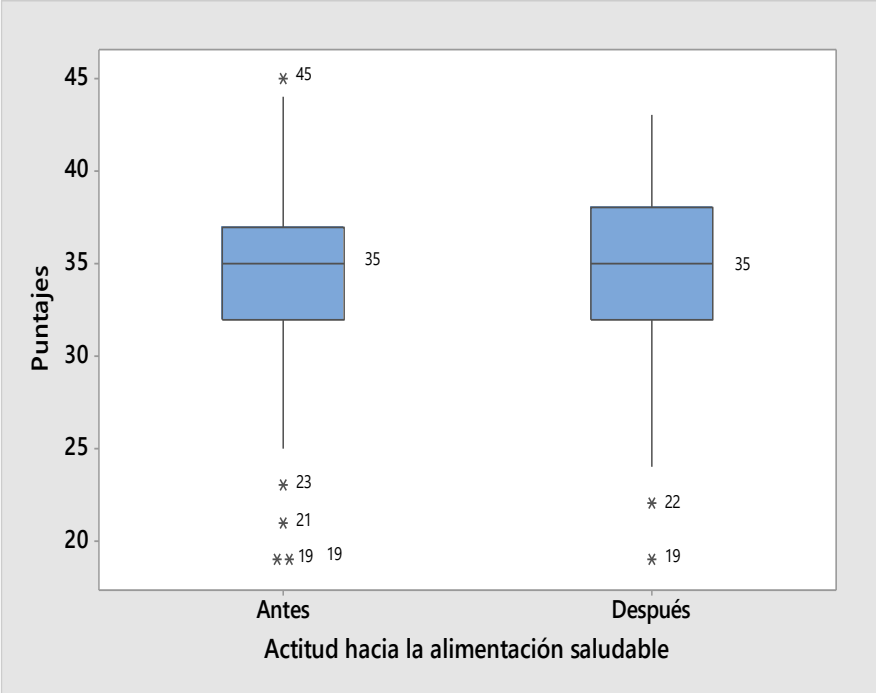
Figura 1. Diagrama de cajas y bigotes de los puntajes del test de conocimientos antes y después del programa educativo nutricional



*Fuente: Elaboración propia

Before the intervention, the maximum score was 20 points and the minimum 4; the mean was 12.1 with a standard deviation of 3.3 points. After the educational program, the maximum score was 20 points and the minimum 6; the mean of 13.51 and a standard deviation of 3.1 points. It can be seen that after the educational intervention the average increased with respect to the average before the intervention. It is interesting to know that the coefficient of variation after the intervention (CV = 22.7%) decreased with respect to that obtained before the educational intervention (CV = 27.5%), indicating that the students obtained a more homogeneous performance after the intervention. . Likewise, it is appreciated that before the intervention of the educational program, 50% of the students had a minimum score of 12 points, while after the educational intervention the minimum score increased to 14 points.

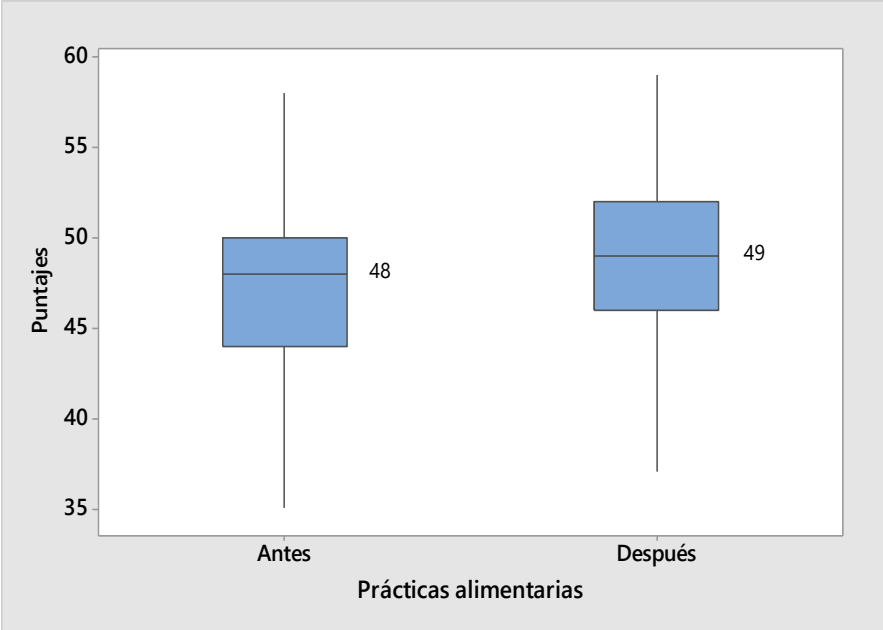
Figura 2. Diagrama de cajas y bigotes de los puntajes del test de actitud antes y después del programa educativo nutricional



Fuente: Elaboración propia

Before the intervention of the educational program, the maximum score was 45 points and the minimum 19; the mean 34.4 with a standard deviation of 4.4 points. After the intervention of the educational program, it is observed that the maximum score was 43 and the minimum 19 points, with a mean of 34.7 and a standard deviation of 4.5 points. As we can see, after the intervention the average had a slight increase with respect to that obtained before the educational intervention. The coefficient of variation after the intervention (CV = 13.4%) increased with respect to that obtained before the educational intervention (CV = 12.8%), which indicates that the students obtained a more heterogeneous score after the intervention. Likewise, it is appreciated that before and after the intervention of the educational program, 50% of the students obtained a score higher than 35 points, which indicates that half of the students did not manage to exceed a higher score after the intervention.

Figura 3. Diagrama de cajas y bigotes de los puntajes del test de prácticas alimentarias antes y después del programa educativo nutricional



Fuente: Elaboración propia

Before the intervention of the educational program, the maximum score was 58 points and the minimum 35 points; the mean was 47.4 with a standard deviation of 4.8 points. After the intervention of the educational program, it is observed that the maximum score was 59 and the minimum was 37 points, with a mean of 49.16 and a standard deviation of 4.5 points. After the educational intervention, the average increased with respect to the average obtained before the intervention. It is striking to see that the coefficient of variation after the intervention (CV = 9.2%) decreased with respect to that obtained before the educational intervention (CV = 10.0%), indicating that the students obtained a more homogeneous score after the intervention. educational. It can also be seen that before the intervention of the educational program, 50% of the students had a minimum score of 48 points, while later the minimum score was increased to 49 points.

Discussion

Most university students from any institution must adapt to the changes that this new academic challenge imposes on daily life. In that task, however, many stop consuming essential nutrients to promote better academic performance and maintain physical and mental health. Therefore, it must be taken into account that a healthy breakfast provides the essential energy and nutritional content to stimulate the physical and intellectual performance of each new day, essential aspects to make the most of study days. A healthy diet, therefore, should be assumed as a task that avoids multiple health problems (eg, obesity, thinness, gastritis, anemia and malnutrition) (WHO, 2015).

Now, in the case of the educational program proposed in this study, it can be said that this allowed to change the consumption of unhealthy foods for a balanced diet, which had a positive impact on the decrease of overweight and obese students. This is a favorable result due to the fact that in recent years the prevalence of obesity has increased, a disease that must be faced responsibly, since it is impossible to promote the progress of a nation if it does not have a healthy population that performs effectively. and efficiency in their work (Moreira, Dueñas and Moré, 2018).

Indeed, various studies show that inadequate nutritional status influences the academic performance of university students (Fleitas, García and Zambrano, 2015; Landeros, Gómez, Rimoldi, Parada and Núñez, 2018), and that overweight students perform between fair and bad. Likewise, the regression slope (–0.268) indicates that for each unit that increases BMI, academic performance decreases by 0.268 points.

In this regard, there are multiple works that demonstrate how this type of illness usually occurs in university students. For example, Menecier and Lomaglio (2018) reveal in their investigation that 72.2% of university students had a normal nutritional state, although 6% were underweight, 16.5% were overweight and 5.3% were obese. Likewise, Becerra and Vargas (2015), as well as Fajardo, Camargo, Buitrago, Peña and Rodríguez (2016) found a higher percentage of students classified as normal, while the rest were overweight.

Pi, Vidal, Brassesco, Viola y Aballay (2015) they also carried out a study on nutritional status in university students and found high BMI figures, as well as excess body fat and waist circumference; in other words, 50% of the students were overweight and 40% high body fat,

which is accentuated over time, since with increasing age BMI increases and physical activity decreases.

On the other hand, it can be indicated that after the intervention of the present educational and healthy eating program, the participants improved their nutritional status and did not present anemia. These data are similar to those found by Ortega et al. (2018), since in their investigation they reported that only 10% of the participating medical students presented anemia, while, in the study by Lozano, Vela and Quiñones (2013), 24.66% of the evaluated students presented this clinical picture.

In the case of the present intervention, it is worth observing that the biochemical profile of the students achieved various variations after the intervention. Hemoglobin, the oxygen-carrying protein (the minimum value of 11.25g / dl and maximum of 16.94g / dl), achieved normal levels because, possibly, the students received a balanced diet rich in iron in the program and in the home. In glucose, the values were also within the normal limits for an adult person with ranges between 66 mg / dl and 109 mg / dl, data that reflects that students responsibly assume what it means to have glucose in normal values such as main source of energy.

Regarding cholesterol, there was a slight increase, while in triglycerides there were no significant differences, which could be due to the type of food received. However, we know that cholesterol tends to increase from the age of 20, hence it is convenient to carry out periodic examinations as a preventive measure of cardiovascular diseases. With albumin and globulin the levels were within the normal values of 3.2-4.5 g / dl and 2.3-3.4g / dl. These proteins are nutritional evaluation parameters.

These results are different from those found in a study carried out by Menecier and Lomaglio (2018) with 26 university students, since 24% had high cholesterol and triglycerides, of which 13.5% were male and 23.5% female. These authors concluded that overweight students have cholesterolemia and, to a lesser extent, hyperglycemia, hypertension and hypertriglyceridemia. Gonzáles, Díaz, Mendizábal, Medina and Morales (2014) found similar results in university students between 18 and 24 years of age, who presented excess weight and cholesterol levels, as well as elevated plasma lipids. Therefore, it is necessary to promote preventive measures through good eating habits and physical activity. In this work, it is highlighted that 10% of the population had elevated triglycerides, 0.4% altered glycemia and more than 50% LDL-c above normal.

Promoting healthy food and nutrition must be a great social responsibility, a task in which the university plays a very important role, so it can be affirmed that this project has had a positive impact on the nutritional status of students. The WHO maintains that malnutrition, either due to lack or excess of nutrients, affects the healthy life of the person (WHO, 2017).

Another investigation that obtained similar results to those presented in this work was carried out by Castiblanco (2017), who evaluated the effectiveness of the Healthy University plan in students, teachers and administrative personnel of a university. After said plan, significant changes were observed in the attitude towards healthy eating, since it went from 45% in the pretest to 70% in the posttest. This shows that eating practices can change when relevant activities are carried out.

In the knowledge, practices and attitudes towards food, it is evident that there are improvements after the intervention of the educational program. Currently, lifestyles, especially eating behaviors, are highly relevant to preserve the health of the population. Various studies have reported the prevalence of inadequate eating habits in different age groups and social strata similar to those reported in this study. The food culture in the university population is not adequate and may be determined by different factors, such as greater academic training in the health area, the family environment, food availability, customs and beliefs.

The results are similar to a study on the eating practices of adolescents (Chávez, 2018), who prefer a daily diet of industrialized products and well-known brands instead of traditional products.

Moreira et al. (2018) also carried out a study with young people between 18 and 21 years old, and found that 33.75% of the participants were overweight and their eating practices were unhealthy, since they preferred sweets, pizzas and breads. Similarly, Yaguachi, Reyes and Poveda (2018) found weight gain related to inadequate soda-based and fast-food eating practices.

Pinto (2019) also detected in a study with students of the Nutrition degree that 63.3% of the participants have regular eating habits, although only 12.22% consumed fruits, while 8.89% included vegetables in their dishes. Likewise, the BMI greater than 40.3 kg / m2 occurs in students who consume junk food every day, unlike those who consume sporadically. Finally, the work of Rodríguez, Restrepo and Deossa (2015), who found that 85.3% of the participants included fruits, meats and vegetables in their nutritional plan, could be mentioned.

Conclusions

The intervention of this nutritional education program that included healthy eating, education and exercise had a positive impact on the participants not only because changes in their nutritional states and biochemical values have been evidenced, but also because their knowledge, practices and attitudes towards the healthy alimentation. This shows that food health still constitutes a challenge for public health, hence the importance of promoting healthy nutrition practices, since in this way health can be maintained and diseases avoided in adulthood.

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Software	No aplica
Validación	Silvia Reyes (principal), María Oyola (apoyo)
Análisis formal	Silvia Reyes (principal), María Oyola (apoyo)
Investigación	Silvia Reyes y María Oyola (iguales)
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Visualización	Silvia Reyes y María Oyola (iguales)
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