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Quantitative Original Article

Effect of a nutritional food education strategy on family consumption of local food in the village of El Cebollal, year 2022

Efecto de una estrategia de educación alimentaria nutricional en el consumo familiar de alimentos locales en la aldea El Cebollal, año 2022

Effet d'une stratégie d'éducation alimentaire nutritionnelle sur la consommation familiale d'aliments locaux dans le village D'el Cebollal, année 2022

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ABSTRACT

Introduction: Food consumption needs to be improved in most of the population in the department of Baja Verapaz, Guatemala, especially in homes in rural areas. Promoting healthy local foods is considered a strategy to promote health in this population. **Objective**: To evaluate the changes in households' food consumption in El Cebollal village after the nutritional food education intervention. **Method:** An intervention study was carried out with a before-after block. The mothers of the town at that time were interviewed. The operationalized variables were food consumption score and weekly frequency consumption of vegetables, fruits, meats, dairy products, and unhealthy food, using frequency distributions and Student's T for paired samples. **Results**: An educational intervention

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strategy that consisted of three academic sessions was developed, supported by the results of the pre-intervention evaluation. Before the intervention, for most households, the weekly frequency of consumption of fruits, vegetables, meats, and dairy products was zero, and the weekly frequency of consumption of unhealthy foods was very high. Post-intervention, the weekly frequency of fruit and vegetable consumption was very low; the weekly frequency of meat and dairy consumption was low, and the weekly frequency of consumption of unhealthy foods was very high. **Conclusions**: There were changes in the variables analyzed after the intervention, except for the frequency of consumption of unhealthy foods.

Keywords: food education, nutritional education, consumption of healthy foods, intervention strategy.

RESUMEN

Introducción*: el consumo de alimentos es inadecuado en una gran parte de esta población del departamento de Baja Verapaz, Guatemala; sobre todo en los hogares del área rural. La promoción del consumo de alimentos saludables locales se considera una estrategia para promover la salud en esta población.* ***Objetivo****: evaluar los cambios en el consumo de alimentos de los hogares de la aldea El Cebollal, después de realizar la intervención de educación alimentaria nutricional.* ***Método****: se realizó un estudio de intervención con bloque antes-después. Se entrevistó a las madres de familia de la aldea en esos tiempos. Las variables operacionalizadas fueron: puntaje de consumo de alimentos y frecuencias semanales de consumo de verduras, frutas, carnes, lácteos y alimentos no saludables; utilizándose distribuciones de frecuencias y T de Student para muestras pareadas.* ***Resultados****: se desarrolló una estrategia de intervención educativa que consistió en tres sesiones educativas, sustentadas en los resultados de la evaluación pre intervención. Previo a la intervención, para la mayoría de hogares la frecuencia semanal de consumo de frutas, verduras, carnes y lácteos fue nula y la frecuencia semanal de consumo de alimentos no saludables fue muy alta. Post intervención, la frecuencia semanal de consumo de frutas y verduras fue muy baja; la frecuencia semanal de consumo de carnes y lácteos fue baja; y la frecuencia semanal de consumo de alimentos no saludables fue muy alta.* ***Conclusiones****: hubo cambios en las variables analizadas posterior a la intervención, a excepción de la frecuencia de consumo de alimentos no saludables.*

Palabras clave: *educación alimentaria, educación nutricional, consumo de alimentos saludables, estrategia de intervención.*

RÉSUMÉ

Introduction*: la consommation alimentaire est insuffisante chez une grande partie de cette population dans le département de Baja Verapaz, Guatemala; surtout dans les maisons des zones rurales. La promotion de la consommation d'aliments locaux sains est considérée comme une stratégie visant à promouvoir la santé de cette population.* ***Objectif****: évaluer les changements dans la consommation alimentaire des ménages du village d'El Cebollal, après avoir réalisé l'intervention*

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d'éducation alimentaire nutritionnelle. ***Méthode****: une étude interventionnelle a été réalisée avec un bloc avant-après. Les mères du village de l'époque ont été interrogées. Les variables opérationnalisées étaient: le score de consommation alimentaire et les fréquences hebdomadaires de consommation de légumes, de fruits, de viandes, de produits laitiers et d'aliments malsains; en utilisant les distributions de fréquences et le T de Student pour les échantillons appariés.* ***Résultats****: une stratégie d'intervention éducative a été développée qui comprenait trois séances éducatives, appuyées par les résultats de l'évaluation pré-intervention. Avant l'intervention, pour la majorité des ménages, la fréquence hebdomadaire de consommation de fruits, légumes, viandes et produits laitiers était nulle et la fréquence hebdomadaire de consommation d'aliments malsains était très élevée. Après l'intervention, la fréquence hebdomadaire de consommation de fruits et légumes était très faible; la fréquence hebdomadaire de consommation de viande et de produits laitiers était faible; et la fréquence hebdomadaire de consommation d'aliments malsains était très élevée.* ***Conclusions****: Il y a eu des changements dans les variables analysées après l'intervention, à l'exception de la fréquence de consommation d'aliments malsains.*

Mots clés: *éducation alimentaire, éducation nutritionnelle, consommation d'aliments sains, stratégie d'intervention.*

INTRODUCTION

Food availability in El Cebollal, Cubulco, Baja Verapaz is limited. Low local food production and crop failure in recent years due to climate change have reduced food availability in this village. Inadequate access and use of water, as well as monocultures, cause depletion and degradation of the soil to produce essential foods in homes. We can mention corn, beans, herbs, and fruit trees among these foods. [1]

Regarding access to food, it is essential to mention some relevant aspects of physical and economic access in the village. Concerning physical access, the town does not have a market. The markets closest to the village are the market in the urban area of Cubulco, Baja Verapaz, located 30 km from the town of El Cebollal. Market days are Thursday, Saturday, and Sunday, and the market in the urban area of the Canilla municipality, Quiché, located 30 km from the village of El Cebollal, is Saturday.

It is essential to mention that in the village of El Cebollal, many stores sell products from the basic basket and many processed and ultra-processed products with a high content of simple sugars, sodium, and saturated fats.

These stores do not sell fruits or vegetables. Regarding economic access to food, it is essential to mention that the primary means of life of the village population is subsistence and subsistence agriculture and migration to other regions of the country for the sale of labor (coffee farms). And sugar). The income of village households is generally less than the cost of the basic food basket. [2]

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Village households generally do not consume a varied or adequate diet according to their nutritional requirements. This increases the risk of acute and chronic malnutrition in the first years of life and overweight, obesity, and non-communicable diseases later on. The risk of suffering from micronutrient deficiencies (anemia, vitamin A deficiency, among others) is high, especially in the population of children under five years of age and women of childbearing age [3]

According to the results of the VI National Maternal and Child Health Survey (ENSMI) 2014-2015, at the national level, the prevalence of chronic malnutrition in children under five years of age is 46.5%. In Baja Verapaz, the majority of chronic malnutrition is 50.2%, which exceeds the national average. Various studies have proven that chronic malnutrition is one of the effects of food and nutritional insecurity. [3]

Food and nutrition education (EAN) are "educational strategies designed to provide information on individual eating behaviors related to nutrition, health, and well-being. These strategies are focused on the development of skills to make appropriate decisions regarding nutrition and the promotion of food consumption. Nutritional Food Education actions are developed at the individual, community, and political levels." [4]

Considering the current situation of the municipality of Cubulco, Baja Verapaz (poor physical and economic access to food and inadequate consumption), this research was carried out to evaluate the effect of an EAN strategy on the consumption of Food produced locally by the families of the village of El Cebollal, Cubulco, Baja Verapaz.

Most of the population of this village live in rural areas and need more access to markets, as they do not have a local market. Furthermore, the average income of the families that live in this village is less than the minimum agricultural wage, which limits economic access to food. Therefore, the need was seen to promote the consumption of healthy foods produced in the same village.

The EAN strategy was designed based on the availability of locally produced healthy foods in the village and the dietary customs and practices of the target population. The EAN intervention was expected to increase the consumption of healthy, locally produced foods to benefit the development of growing children and prevent malnutrition in the general population. The EAN strategy was expected to promote other healthy habits in the families of the El Cebollal village, such as reducing the consumption of unhealthy foods.

Hence, the purpose of the research was to develop a food and nutritional educational intervention strategy and evaluate the effect of its implementation in said village.

METHOD

A community intervention study was carried out with before-after blocks. The research was conducted in El Cebollal, Cubulco, Baja Verapaz, from November to December 2022. According to the Community Development Council (COCODE), the village is made up of a total of 63 households.

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The universe of this study was the 33 mothers of families from the homes of the town El Cebollal, Cubulco, Baja Verapaz, whose COCODE referred to participate voluntarily in all phases of the study (52% of the total population).

The operationalized variables were food consumption score and weekly frequency consumption of vegetables, fruits, meats, dairy products, and unhealthy foods.

The ethical principles of non-maleficence, autonomy, justice, and beneficence developed the present study. No physical or psychological damage was caused to the mothers who participated voluntarily; the decisions and time were respected during the pre-and post-intervention interview and the process of the EAN sessions, respecting the culture and identity of the mothers and the data obtained. They were handled confidentially for each family in the village of El Cebollal, Cubulco, Baja Verapaz.

Before carrying out this research, authorization was requested from the Community Development Council (COCODE) members. The population that participated in the study was selected without discrimination. In addition, the participant was informed about the absence of possible risks during the investigation. The decision to participate was voluntary, maintaining good treatment if they decided to withdraw at any time from the research. The consent of the people was requested before carrying out the research process.

A measurement instrument was designed and validated to obtain the information. In the first section of the questionnaire, questions were included about household composition and the availability of land and inputs to grow food. The second section of the questionnaire consisted of a form to evaluate the Food Consumption Score (PCA).

The measurement instrument was validated using the modified Moriyama criteria used by three experts in community nutrition and a social worker. Satisfactory results were obtained (70% or more positive answers) for all questions. However, the additional observations provided by the experts were taken into account for the modification of the information collection form.

The PCA was calculated based on the methodology established by PMA. The cut-off points established for the interpretation of the PCA are poor food consumption (0 to 28 points), borderline food consumption (28.5 to 42 points), and acceptable food consumption (> 42 points). The frequency of consumption of healthy foods was evaluated based on the recommendations established in the Dietary Guidelines for Guatemala. (22) The cut-off points established for each of the healthy food groups were:

- Fruits and vegetables: zero consumption (0 days per week), very low consumption (1 to 3 days per week), low consumption (4 to 6 days per week), and adequate consumption (7 days per week).

- Meats: zero consumption (0 days a week), low consumption (1 day a week) and adequate consumption (2 to 7 days a week).

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- Dairy: zero consumption (0 days a week), low consumption (1-2 days a week), adequate consumption (3 to 7 days a week).

Because the Dietary Guidelines for Guatemala do not establish specific cut-off points for unhealthy foods, to evaluate the frequency of consumption of these foods, the following cut-off points explicitly based on the present study were used as a reference: adequate consumption of unhealthy foods healthy: (0 to 2 days per week), high consumption of unhealthy foods (3 to 4 days per week), very high consumption of unhealthy foods (5 to 7 days per week).

ANALYSIS AND DISCUSSION OF RESULTS

Among the most relevant results, a predominance of the following sociodemographic data was found: 44% of the households had between 5 and 6 family members. 64% of households had children under five years old. 94% of household heads were farmers, while 79% of households had a physical space for cultivation, which grows food for self-consumption.

Corn (82% of households) and beans (76%) are the foods most grown. 70% do not grow vegetables, but only 18% of households have surpluses of grown food for sale. Of the eight homes that sell food produced by themselves, corn and beans are sold the most. 70% of households sell animals for consumption. Chicken (97%) and pig (58%) are what is most raised for self-consumption and sale, followed by duck (42%).

No fruits or vegetables of any kind are sold in the village shops. The only source of this type of food for these households is the market in the municipality of Cubulco, Baja Verapaz. It is essential to mention that this market is located 31 km from the village of El Cebollal. 63% know about food packaging techniques, and none have refrigeration, nor do they use packaging techniques.

To improve the nutrition of the homes of the El Cebollal (healthy, varied, accessible, and nutritionally adequate), it was necessary to promote the consumption of locally produced foods, such as güisquil, ayote, macuy, pineapple, izote flower in season and foods of animal origin.

Based on the results analyzed, three teaching guides and three posters were designed to teach each of the following topics: the family pot, healthy eating recipes, and food preservation methods. Three educational sessions were held, and a poster was given to each mother about the topic discussed. The designed teaching guides and posters are shown below.

DIDACTIC GUIDE DESIGNED AND USED TO TEACH "HEALTHY EATING RECIPE BOOK"

EAN topic: Healthy eating recipe book

Duration: 2 hours

Learning objectives

At the end of the EAN session, participants will have the ability to:

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1. Promote the consumption of foods available at home.
2. Implement new menus at home.
3. Prepare the recipe book at home for the family

Content

1. Intake of the following food groups: protein, carbohydrates, cereals, fruits, and vegetables
2. Varied foods and preparations in daily meals.
3. Nutritionally balanced and complete menu variability at home

Didactic resources

1. Preparation of a menu with the collaboration of the attending mothers.
2. Mothers make the menu nutritionally adapted to the needs of family members.
3. Educational poster on the topic "Healthy eating recipe book."

Assessment

During EAN, understanding of the content was assessed through the following activities:

1. An individualized evaluation was carried out in which each mother was asked to share her point of view about the menu
2. They were allowed to express their opinion on the food selection and the variety of proposed recipes.

DIDACTIC GUIDE DESIGNED AND USED TO TEACH THE TOPIC "FOOD PRESERVATION METHODS"

EAN Topic: Food preservation methods

Duration: 35 minutes

Learning objectives

At the end of the EAN session, participants will have the ability to:

1. Know food preservation methods.
2. Apply food conservation for family consumption.

Content

1. Food preservation methods.
2. Types of food preservation methods at home.

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Didactic resources

1. Didactic material during the exhibition.
2. Poster on "Food preservation methods"

Assessment

During EAN, understanding of the content was assessed through the following activities:

1. The understanding of each concept was evaluated through direct questions to ensure that the participants could distinguish the different methods of food preservation.
2. They were asked what food preservation method they could apply at home.

EDUCATIONAL POSTER ON "FOOD PRESERVATION METHODS"

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It is essential to mention that no previous studies in the country use the same methodology for evaluating weekly meat consumption. In other countries, no recent studies use the same method applied to the population of this research.

Table 1 shows the descriptive statistics of the PCA obtained in the evaluated homes before and after the EAN intervention and the consumption of unhealthy foods in them. Before the intervention, the average PCA for the entire sample was 38.6 (interpreted as a borderline PCA). After the intervention, the average PCA for the whole sample was 50.1 (interpreted as an acceptable PCA).

The majority of households, both in the pre-and post-intervention measurement, presented an acceptable PCA (43% and 79%, respectively), although much higher after the intervention. This coincides with the results of the GWP measurement carried out in the Emergency Food Security Assessment in 2019 (ESAE 2019), in which it was determined that the majority (83%) of Baja Verapaz households presented an acceptable GWP. [5]

This also agrees with the results of the 2017 Food and Nutritional Security Assessment (ESAE 2017), [6] in which it was determined that the majority (77%) of the country's households presented an acceptable GWP. In the present study, the percentages of households with a GWP at the limit and poor were reduced after the intervention: the percentage of households with a GWP at the limit was reduced from 36% to 21%, and the percentage of households with a GWP at the limit poor fell from 21% to 0%.

The p-value obtained from the *student's T analysis* (0.0000000106) shows that the PCA was significantly higher after the intervention.

Table 1. Descriptive statistics of the PCA and consumption of unhealthy foods in homes before and after implementing the EAN strategy.

Aspect evaluated in the PCA	**Before the intervention**	**After the intervention**
Sample size (n)	33	33
Average GWP	38.6	50.1
Standard deviation	9.7	10.9
Confidence interval	[35.3-41.9]	[46.4-53.9]
Households with acceptable consumption	14 (43%)	26 (79%)
Homes with PCA at the limit	12 (36%)	7 (21%)
Households with poor GWP	7 (21%)	0 (0%)
P value, one-tailed	0.0000000106	
Evaluated aspect in the consumption of unhealthy foods	**Before the intervention**	**After the intervention**
Sample size (N)	33	33
Weekly average of unhealthy foods	6.7	6.7
Standard deviation	1.26	1.41

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Confidence interval	[6.26, 7.12]	[6.18, 7.14]
Households that presented an adequate frequency of consumption of unhealthy foods	1 (3%)	1 (3%)
H households that had a high frequency of consumption of unhealthy foods	1 (3%)	1 (3%)
Households that had a very high frequency of consumption of unhealthy foods	31 (94%)	31 (94%)
P value, one-tailed	0.162406356825549	

Regarding the weekly frequency of consumption of unhealthy foods such as artificial condiments, sausages, dehydrated soups, artificial juices, and soft drinks, among others, obtained in the evaluated homes before and after the EAN intervention, it can be seen that the average frequency of consumption of unhealthy foods for the entire group was 6.7 times per week, both before and after the intervention.

The majority of households, both in the pre-and post-intervention measurement, presented a very high consumption of unhealthy foods (94% at both times). Even though the Food Guides for Guatemala do not establish specific recommendations for consuming unhealthy foods. The World Health Organization (WHO) suggests that the frequency of consumption of this type of food be zero or very low. Therefore, the daily consumption of unhealthy foods was classified as very high in both stages of the research.

However, the results of this study coincide with the study carried out by Hernández, S. in 2015, in which it was concluded that students at the University of San Carlos of Guatemala have a high daily consumption of sugar from processed foods, exceeding the maximum amount recommended by the WHO. (7)

The p-value obtained from the *student's T analysis* (0.162406356825549) shows no significant differences between the weekly frequency of unhealthy food consumption after the intervention. This could be because the EAN intervention focused on promoting healthy foods and not reducing the consumption of unhealthy foods.

Table 2 shows the weekly frequency of fruit consumption obtained in the evaluated households before and after the EAN intervention. Before the intervention, the average fruit consumption was 0.5 times per week (interpreted as zero fruit consumption). After the intervention, the intermediate weekly frequency of fruit consumption was 1.5 times per week (interpreted as deficient fruit consumption). However, despite the low level, a level of consumption other than zero was observed.

In the pre-intervention measurement, most households presented a zero frequency of fruit consumption (61%), while after the intervention, the majority presented a very low frequency of fruit consumption (88%). Although weekly fruit consumption increased after the intervention, it remains low to the recommendations established in the Dietary Guides for Guatemala, which show that fruits should be consumed every day (7 times per week). (8)

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The results of this study do not coincide with the results of the ESAE 2019, in which it was determined that the majority of members of rural households in the country (51%) did consume some fruit the day before the interview. [5] The p-value obtained from the *student's T analysis* (0.0000000045) shows that the weekly frequency of fruit consumption was significantly higher after the intervention than before it.

Table 2. Weekly frequency of fruit and vegetable consumption in households before and after implementing the EAN strategy.

Evaluated aspect in fruit consumption	**Before the intervention**	**After the intervention**
Sample size (N)	33	33
Average weekly fruit consumption	0.5	1.5
Standard deviation	0.79	0.90
Confidence interval	[0.27-0.82]	[1.15-1.76]
Households that had zero frequency of fruit consumption	20 (61%)	4 (12%)
Households that had a very low frequency of fruit consumption	13 (39%)	29 (88%)
Households that had a low frequency of fruit consumption	0 (0%)	0 (0%)
Households that presented an adequate frequency of fruit consumption	0 (0%)	0 (0%)
P value, one-tailed	0.0000000045	
Evaluated aspect in the consumption of vegetables	**Before the intervention**	**After the intervention**
Sample size (N)	33	33
Weekly average of vegetables	0.8	2.4
Standard deviation	0.97	1.41
Confidence interval	[0.43-1.09]	[1.88-2.84]
Households that had a zero frequency of vegetable consumption	19 (58%)	0 (%)
Households that had a very low frequency of vegetable consumption	14 (42%)	27 (82%)
Households that had a low frequency of vegetable consumption	0 (0%)	5 (15%)
Households that presented an adequate frequency of vegetable consumption	0 (0%)	1 (3%)
P value, one-tailed	0.0000000166	

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The average weekly consumption of vegetables was 0.8 times per week, with an SD of 0.97 and a CI of 0.43 to 1.09. times a week. After the intervention, the average vegetable consumption was 2.4, with an SD equal to 1.41 and a CI of 1.88 to 2.84. In the pre-intervention measurement, most households presented a zero frequency of vegetable consumption (58%). In contrast, after the intervention, most families showed a very low frequency of vegetable consumption (82%). Although the weekly consumption of vegetables increased after the intervention, it is still low concerning the recommendations established in the Dietary Guides for Guatemala, which show that vegetables should be consumed daily (7 times per week). [8]

The results of this study do not coincide with the results of the ESAE 2019, in which it was determined that most of the country's rural households (56%) consumed some vegetables the day before the interview. [5] The p-value obtained from the *student's T analysis* (0.0000000166) shows that the weekly frequency of vegetable consumption was significantly higher after the intervention.

Table 3 shows that the average meat consumption was 0.2 times per week; After the intervention, the average was 0.7. In the pre-intervention measurement, most households presented a zero frequency of meat consumption (79%), while after the intervention, the majority presented a low frequency of meat consumption (58%). However, although weekly meat consumption increased after the intervention, it remains low concerning the recommendations established in the Dietary Guides for Guatemala, which show that meat should be consumed at least twice per week. [8]

The results of this study do not coincide with the results of the ESAE 2019, in which it was determined that 36% of the members of rural households in the country consumed some meat the day before the interview. [9] The p-value obtained from the student's T analysis (0.000218) shows that the weekly frequency of meat consumption was significantly higher after the intervention.

Table 3. Weekly frequency of meat and dairy consumption in homes before and after implementing the EAN strategy.

Evaluated aspect in meat consumption	Before the intervention	After the intervention
Sample size (N)	33	33
Weekly average of meats	0.2	0.7
Standard deviation	0.42	0.60
Confidence interval	[0.07-0.35]	[0.46-0.87]
Households that had a zero frequency of meat consumption	26 (79%)	13 (39%)
Households that had a low frequency of meat consumption	7 (21%)	19 (58%)
Households that presented an adequate frequency of meat consumption	0 (0%)	1 (3%)
P value, one-tailed	0.000218	

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Evaluated aspect in dairy consumption	Before the intervention	After the intervention
Sample size (N)	33	33
Weekly average dairy	0.2	0.7
Standard deviation	0.75	0.65
Confidence interval	[0.01-0.50]	[0.45-0.89]
Households that had zero frequency of dairy consumption	29 (88%)	13 (39%)
Households that had a low frequency of dairy consumption	4 (12%)	20 (61%)
Households that had an adequate frequency of dairy consumption	0 (0%)	0 (0%)
P value, one-tailed	0.00857	

Before the intervention, the average dairy consumption was 0.2 times per week. After the intervention, the average dairy consumption for the entire sample was 0.7. In the pre-intervention measurement, most households presented a zero frequency of dairy consumption (88%), while after the intervention, the majority presented a low frequency of dairy consumption (61%). Although weekly dairy consumption increased after the intervention, it remains low to the recommendations established in the Dietary Guidelines for Guatemala, which show that dairy products should be consumed at least three times per week. [7]

The results of this study do not coincide with the results of the ESAE 2019, in which it was determined that 39% of the members of rural households in the country consumed some dairy the day before the interview. [5] The p-value obtained from the *student's T analysis* (0.00857) shows that the weekly frequency of dairy consumption was significantly higher after the intervention.

The EAN is focused on developing people's skills to make appropriate diet decisions and promoting better nutrition knowledge. This is achieved when people, groups, and communities sustainably improve their eating practices and behaviors, allowing for lasting social change. [10]

There are different methods to evaluate food consumption at the population level. Among these, we can mention The Household Dietary Diversity Score (HDDS), Household Hunger Score (HHS), and Food Consumption Score (PCA), among others. The PCA was used in the present investigation.

The HDDS is a commonly used method that indicates the quality of food consumption and, to a lesser extent, the quantity. Household dietary diversity measures the number of different food groups that are consumed during the last 24 hours in households. It is an indirect indicator (proxy) with a simple method with relatively easy answer questions. The HDDS uses a set of 12 food groups. [11]

The HHS is a method developed by the Food and Nutrition Technical Assistance Project (FANTA) based on perceptions of food insecurity at the household level. It is a scale of food deprivation in the

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home, based on the idea that the experience of it provokes predictable reactions that can be captured through a survey and summarized in a scale. (12)

The HHS is an indicator that measures household hunger by asking whether or not a specific condition associated with the experience of food insecurity occurred through a series of questions. After recording the response options for each question, the total score obtained serves to categorize the level of hunger in the household as a household without hunger or with a low incidence of hunger, a household with a moderate incidence of hunger, or a household with severe hunger. (12)

In the rural area, they are dedicated to producing annual crops such as coffee, snow peas, and French green beans. Most of the municipality's population lives in rural areas. However, due to inadequate municipal planning, communities grow without an adequate territorial order to properly manage categories and subcategories. Due to the topography and climate variability of the municipality, most people have overused the land or have not used it correctly, thus affecting the degradation of it and natural resources and the conservation of bodies of water that influence tourism and fishing practices. (13)

The Integrated Phase Classification (ICF¬) is a set of protocols (tools and procedures) that classify the severity and identify the causes of food insecurity through knowledge management and consolidation of information of various types. In the CIF acute food and nutritional situation analysis report carried out for the 22 departments of Guatemala in June 2022, it was concluded that 20% (3.5 million inhabitants) live in a crisis or emergency, 46% have marked food insecurity, and only 34% are in phase 1 (minimal food insecurity). (14,15)

The department of Baja Verapaz was classified in phase 3 (crisis). The critical factors analyzed are the consequences of the COVID-19 pandemic and the variability and rise in prices of the basic basket that includes basic grains. At the beginning of the rainy season, there is an 80% probability of El Niño phenomenon in a substrate of "seasonal hunger" and multidimensional poverty. (14)

Therefore, the results may be due to the limitations of the population in terms of other determinants of food insecurity that were not evaluated in this study, such as poor availability and physical and economic access to food. This study could be an example of developing community projects to promote the consumption of local foods for families in rural areas of other municipalities and the country.

CONCLUSIONS

Before EAN's intervention, the PCA was acceptable in most homes in El Cebollal. At that same time, the weekly frequency of consumption of fruits, vegetables, meats, and dairy products was zero in most homes, and the frequency of consumption of unhealthy foods was very high.

A food and nutritional education strategy was implemented aimed at mothers of families in the village, based on the results of the initial measurement of food consumption. This strategy consisted

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of the planning and execution of 3 EAN sessions aimed at promoting the preparation, consumption, and conservation of healthy foods produced in El Cebollal.

After the EAN intervention, the PCA was acceptable in most households in the village. At that same stage, the weekly frequency of fruit and vegetable consumption rose very low. The weekly frequency of meat and dairy consumption also increased within the low level, and the frequency of consumption of unhealthy foods remained unchanged.

It was determined that there were significant changes in most of the variables analyzed after the intervention (the PCA and weekly frequencies of consumption of fruits, vegetables, meat, and dairy products increased).

The EAN intervention did significantly and positively affect the consumption of healthy foods; However, it remains below the recommendations established in the Food Guides for Guatemala.

FINANCING

No funding was received for the development of this study.

CONFLICTS OF INTEREST

No conflicts of interest are declared.

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Annex with the posters

EDUCATIONAL POSTER ON "FAMILY POT"

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EDUCATIONAL POSTER ON THEME "HEALTHY EATING RECIPE BOOK"

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To the editorial committee of the Journal of Medical and Life Sciences

Title of the article: EFFECT OF A NUTRITIONAL FOOD EDUCATION STRATEGY ON FAMILY CONSUMPTION OF LOCAL FOOD IN THE VILLAGE OF EL CEBOLLAL, YEAR 2022

Name of the author(s): Amalia Rosayda Chubajá-Calo, Ana María García-Solórzano

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Conflict of interests

No conflicts of interest are declared. (If there is any conflict of interest, they must explain it.)

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