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Disorders in eating habits in children and adolescents during confinement in Ecuador, 2021: online survey

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Abstract

Introduction: It has been reported that home confinement due to the COVID 19 pandemic has caused essential changes in the eating habits of children and adolescents worldwide, compromising their nutritional status due to the increased prevalence of malnutrition and obesity. This study aimed to identify eating habits disorders in children and adolescents during confinement in Ecuador.

Methodology: This cross-sectional study included 1,446 parents or primary caregivers of Ecuadorian children and adolescents. A validated survey was carried out with a probabilistic sample. A descriptive and inferential analysis of the study variables was performed with the statistical software SPSS Version 25.

Results: In confinement, 67.8% (n= 981) of respondents did not make changes to their diet. 79.8% (n=791) of people already maintained healthy habits during confinement, and 20.2% (n=200) changed their habits from healthy to unhealthy. 67.5% (n=307) did not have healthy eating habits and continued this practice; 32.5% (n=148) went from having unhealthy to healthy habits. The presence of "healthy habits" was associated with biparental families (OR 1.29, 95% CI 1.04-1.61, P < 0.05), 1 to 2 people living in the house (OR 0.56, 95% CI 0.34-0.93, P < 0.05), with face-to-face work (OR 0.69, 95% CI 0.55-0.86, P<0.05), dependent work (OR 0.62, 95% CI 0.48-0.80, P <0.05), and compliance with quarantine (OR 1.55, CI 95% 1.21-1.98, P<0.05).

Conclusion: Children and adolescents in Ecuador, for the most part, did not present changes in eating habits, being these healthy.

Keywords:

MESH: Adolescent; Child; Diet; Diet, Healthy; Child Nutrition; Food and Nutrition Security; Coronavirus Infections; Controlled Confinement.

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Introduction

Food is the entry of food into the body to meet its physiological needs; this act is linked to satisfying hunger and generating pleasure; however, the quality of the diet responds to eating habits and the quality of food consumed. Eating habits are created through repetitive behaviors and customs related to which foods to consume and how to do it. In the case of children and adolescents, these habits depend on their learning in the family and school nucleus, added to the intervention of cultural and social factors [1].

Based on the influence of multiple biological, social and cultural factors on eating habits, the consumption of a healthy diet is considered a favorable factor for adequate nutritional status, optimal growth, and development, as well as the prevention of chronic noncommunicable diseases in the adulthood population [2].

For this reason, the World Health Organization (WHO) establishes that healthy eating habits should be established in the first years of life, with school age being a crucial stage for the configuration of healthy eating habits that will persist until adulthood and old age [3].

Scientific evidence has established that during holidays, children perform less physical activity, spend more time in front of screens, develop irregular sleep patterns and consume inadequate diets, which generates weight gain and decreased cardiorespiratory capacity. However, given the particular situation that occurred in 2020 due to the declaration of a pandemic due to the new disease called COVID-19, it forced children and adolescents to remain in confinement (with suspended outdoor activities and no interaction with friends), increasing these previously known adverse effects [4].

In the face of the state of a health emergency, through the local government, Ecuador established the beginning of home confinement and reduction of human mobility in March 2020.

This strategy remained in force on a mandatory basis for children, adolescents, and adults for six months; later, social distancing measures and partial home confinement effective from September 2020 were accepted. With this new normality, economic activity was affected and per se disruption of supply chains, giving rise to new dynamics that have had a ripple effect with profound implications for food security, nutrition, and food systems in the country [5].

Home confinement has also generated a greater consumption of food with greater frequency, quantity, and unhealthy, a situation associated with states of anxiety or boredom [6]. With this, families have invested more time in food preparation without improving the quality of food [7]. In addition, changes in the consumption habits of the population around the world have been motivated, increasing the consumption of less nutritious, less fresh, and cheaper diets; these events are explained by a decrease in family income and the restrictions on mobility imposed on preventing the spread of SARS-COV-2 [8]. According to the nutritional map of the National School Aid and Scholarship Board (JUNAEB) 2020 carried out in Chile, they compare the nutritional status of schoolchildren during confinement and before it; the prevalence of malnutrition (1.8%) and obesity (23.5%) varied in this period in 2020 from 2.6% and 25.4%, respectively, and the consumption of ultra-processed foods and sedentary lifestyle was evidenced in cases of obesity [9].

Scientific evidence has established that malnutrition and obesity are related to health complications, registering a higher risk of death in any serious health event, even more so if COVID-19 is associated with the presence of obesity, compared to subjects free from these nutritional problems [10].

With all this, there is a need for continuous surveillance of nutritional and psychological aspects in developing these outbreaks, adopting specific interventions to detect risk cases [11].

The objective of the present study was to identify eating disorders in a population of children and adolescents in Ecuador during the COVID-19 confinement.

Population and methods

Design of the investigation

The design is a cross-sectional observational study.

Scenery

The study was conducted in the Postgraduate Department of the Faculty of Medicine of the Pontificia Universidad Católica del Ecuador. The study period was from October 18, 2012, to December 31, 2020.

Inclusion criteria

Parents and guardians of legal age with children between the ages of 5 and 17 who remained in home confinement due to the COVID-19 pandemic entered the study. Those participants without informed consent or with incomplete records were excluded from the analysis.

Studio size

The universe was the population of Quito of 2,239,191 inhabitants, of which the child population was 15.59% (349,089). With a confidence interval of 95% and a margin of error of 5%, the sample size was 1446 cases. The sample inclusion method was nonprobabilistic, "snowball" type, where all possible cases that can be analyzed are included until reaching the sample objective.

Variables

The variables were A) data of the respondent: age, origin, sex, relationship with the child, schooling, and marital status. B) Family structure: type of family, the total number of people living in the home. C) housing information: type, tenure, number of bedrooms. D) Information on the child or adolescent: Age, sex, schooling. E) Economic information: family income, employment status, and type of work. F) Compliance with confinement. G) Eating habits: number of excess meals per day, most consumed food group, drinks consumed, amount of food consumed, excess or decreased food consumption, consumption of ultra-processed foods, food before and during confinement. H) Behavior in food consumption: control in food intake, way of consuming food, feeling of hunger and satiety, desire to eat. I) Estimating nutritional status by caregivers: primary caregiver's perception of nutritional status and choice of food.

Data sources/measurement

The data were collected in an electronic form using the electronic platform Google form. A collection instrument was applied based on the survey by Quispe & Rodríguez (2020), "Effects of isolation by COVID-19 and its relationship with eating habits". This instrument has a reliability of 79.4% (alpha of Cronbach) consisting of demographic data: gender, age, education level, and district plus 19 questions categorized into dimensions and analyzed using nonparametric Chi-square tests, applied to the adult population aged 18 to 64 years of age in the districts of Tacna (urban area) and Locumba (rural area) in Peru, which assesses levels of affectation due to isolation by COVID-19 in emotional health, change in eating habits during the pandemic, involuntary search for food and behaviors against the consumption of foods. In this study, the original survey was adapted to the context of the research for our country, adding questions that assess the following aspects: socioeconomic data, demographic data, social data of the respondents, children, and adolescents, and the estimation of the primary caregivers on the nutrition of the participants. In addition, in the questions aimed at inquiring about excessive eating, contrary questions were included that value the decrease in food consumption; it modified the denomination of certain foods according to the one made in our country: table water for water; fruit juice for fruit juice, ketchup for tomato sauce and finally the question that assesses the consumption of alcoholic beverages and emotional health was eliminated. The final survey had questions that described the variables proposed for this research and allowed the assessment of the perception of parents or primary caregivers about the nutritional status of the participants to determine the influential factors in food consumption. The estimated response time to this questionnaire was 10 to 15 minutes.

Statistical method

In the initial phase, the data analysis is univariate and descriptive with frequencies and percentages. In the bivariate phase, healthy eating habits were compared to unhealthy ones, and proportions were compared with the chi-square test, odds ratio, 95% confidence interval, and P value. The statistical package SPSS v.25 was used for the analysis. (Armonk, NY: IBM Corp.).

Results

A total of 1446 surveys are analyzed (Figure 1).

General characteristics of the parents or guardians in the study

A total of 80.1% (n= 1158) lived in urban areas, and the most frequent provinces were Pichincha (77.8%, n= 1125), Cotopaxi (6.5%, n= 94) and Santo Domingo de Los Tsáchilas (5%, n=73). participants. The person who

answered the survey ranged from a minimum of 18 to a maximum of 74 years, with a mean of 38.2 (SD ± 7.75) years.

The sex of the predominant respondent was female at 77% (n=1113), the main relationship was a mother at 73.1% (n=1057), the level of education that was most frequently recorded was higher at 38.8% (n= 561), and marital status was married at 55.4% (n= 801). The predominant type of family was biparental in 58.3% (n= 843) of the respondents, and in 78.9% (n= 1141), more than three people live in the dwelling. The cement house was the most frequent type of dwelling, with 55.7% (n= 806), owned in 49.4% (n= 714) with up to three rooms in 51.3% (n= 743). A total of 49.7% (n= 719) had an income above 400 dollars, and 51.5% (n= 745) of those surveyed were working under dependency, being the most preferred type of face-to-face work in

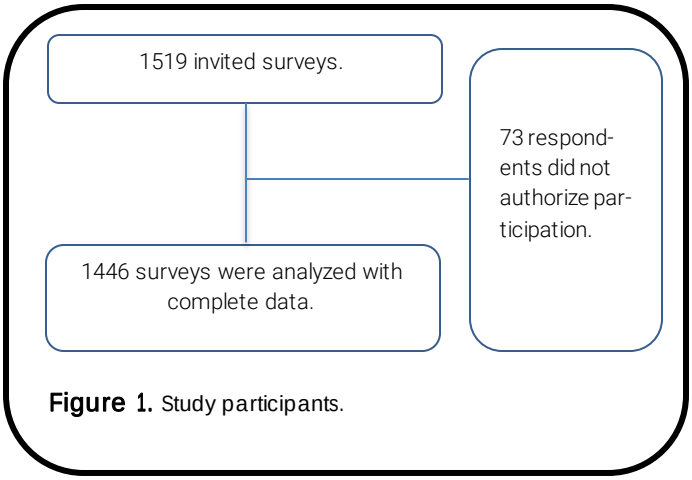

Figure 1. Study participants.

56.3% (n= 814) of the participants.

General characteristics of children and adolescents

The age of the children living in the home was recorded from a minimum of 5 to a maximum of 17 years, with a mean of 12.1 (SD ± 3.5) years. One son prevailed in each household with 38.9% (n= 562), followed by two sons in 36.8% (n= 532) of the cases, the majority being men with 58.7% (n= 849) with basic general education in 35.3% (n= 511) and the upper basic general in 35.8% (n= 518).

Eating habits

Before confinement, the respondent described the child's diet as healthy in 57.7% (n= 835) of the cases, and the predominant weight was normal in 87.1% (n= 1260). (Table 1). The food choice criterion was based more frequently on the health aspect in 79% (n= 1142), followed by costs in 30.8% (n=445) of the cases. A total of 53.2% (n= 769) of the participants reported that the

Table 1. Eating habits of children and adolescents

	Before the lockdown n = 1446	During confinement n=1446
Habit before confinement		
Unhealthy	83 (5.7%)	91 (6.3%)
moderately healthy	372 (25.7%)	416 (28.8%)
Healthy	835 (57.7%)	805 (55.7%)
Very healthy	156 (10.8%)	134 (9.3%)
Weight		
Low weight	85 (5.9%)	87 (6.0%)
Normal	1260 (87.1%)	1143 (79.0%)
Overweight	95 (6.6%)	207 (14.3%)
Obese	6 (0.4%)	9 (0.6%)
Criteria for choosing food during confinement		
Health	-	1142 (79%)
costs	-	445 (30.8%)
Food Shelf Life	-	207 (14.3%)
emotional well-being	-	175 (12.1%)
packaging	-	193 (13.3%)
Availability	-	167 (11.5%)
More than three meals were exceeded during confinement		
Almost always	-	186 (12.9%)
Often	-	324 (22.4%)
Sometimes	-	769 (53.2%)
Never	-	167 (62%)
Behavior against consumption		
Normal	-	999 (69.1%)
Always eating	-	137 (9.5%)
Impatient	-	98 (6.8%)
He is always hungry	-	68 (4.7%)
Hurried on	-	64 (4.4%)
eat out of boredom	-	46 (3.2%)
Ravenous (Insatiable)	-	24 (1.7%)
is never satiated	-	10 (0.7%)
food intake pattern		
Three usual meals -UM	-	669 (46.3%)
3 CH + 2 hors d'oeuvres	-	539 (37.3%)
3 CH + multiple intakes	-	157 (10.9%)
Frequently jumps CH	-	47 (2.9%)
No neat pattern	-	39 (2.7%)
Changed from feeling hungry		
Yes, much more appetite	-	624 (43.2%)
Yes, much less appetite	-	246 (17.0%)
Nope	-	576 (39.8%)
He had a great desire to eat		
Definitely yes	-	346 (23.9%)
Most likely, yes	-	434 (30.0%)
Undecided	-	170 (11.8%)
Most likely, not	-	277 (19.2%)

child sometimes exceeded more than three meals during confinement, showing normal behavior during food consumption in 69.1% (n= 999), with an intake of three usual meals in 46.3% (n= 669) of the cases. Regarding changes in the sensation of hunger/satiation, this was not evidenced in 39.8% (n= 576), while 30% (n= 434) probably felt a great desire to eat. A total of 31.5% (n= 456) indicated that there was probably an increase in the amount of food consumed during confinement, with a frequency of excess intake between one and two times a week in 25.4% (n= 367) of the children. In 35.7% (n=516), they answered that there was no decrease in the frequency of food consumption, confirmed by 68.7% (n=994), who reported no decrease in the frequency of consumption. There was no increase in the consumption of ultra-processed foods according to 36.4% (n=527), and 31.3% (n=452) there was a decrease in their consumption. A total of 55.7% (n= 805) of the respondents affirmed that the diet was healthy, with a frequency of food consumption out of control, sometimes in 35.3% (n= 510) of the cases. The weight was normal in 79% (n= 1143) and overweight in 14.3% (n= 207) of the children. The foods that reported having increased their consumption included fresh fruits in 64.7% (n= 935), followed by meat and chicken according to 60.3% (n= 871) of the participants. In the case of beverages, there was an increase in water in 71.6% (n= 1035) and natural juices in 68.1% (n= 985) of the cases. The foods that decreased their consumption were chocolates, bonbons, and candies according to 36.2% (n=523), and salty or sweet snacks, according to 31.5% (n=456) of the respondents. Regarding beverages, there was a decrease in the consumption of packaged juices in 40.5% (n= 585) and soft drinks in 36% (n= 521) of the children. During confinement, there was a change in eating habits in 32.2% (n= 465) of the respondents; the remaining 67.8% (n= 981) did not make changes in their eating habits (Table 2).

Bivariate analysis

There was a statistically significant association between healthy eating habits and patients from biparental families (OR = 1.29, P <0.05), 1 to 2 people living in the house (OR = 0.56 P <0.05), the type of face-to-face work (OR = 0.69, P<0.05), work under a dependency relationship (OR = 0.629, P<0.05), and work under a dependency relationship (OR = 0.81, P <0.05) (Table 3). The characteristics of the child and adolescent, such as sex, age, number of siblings, and schooling, did not show a statistically significant association with eating habits (P > 0.05).

The criteria for choosing the food were shelf life, availability, packaging, emotional well-being, health, and cost; the answers were combined between several criteria. A statistically significant association was found between healthy eating habits and the criteria for choosing foods, such as shelf life, availability, health, and costs (OR = 1.897, 95% CI 1.507-2.388, P <0.05) (Table 3).

Table 2. Foods whose consumption increased during confinement

	consumption increase n=1446	Consumption decreased n=1446
Habit before confinement		
canned fruit	70 (4.8%)83	273 (18.9%)
Canned meat preparations	57 (3.9%)	295 (20.4%)
Dried fruit, nuts	237 (16.4%)	291 (20.1%)
Fresh fruits	935 (64.7%)	296 (20.5%)
Fresh vegetables	682 (47.2%)	290 (20.1%)
fish and shellfish	394 (27.2%)	421 (29.1%)
beans, chickpeas	509 (35.2%)	204 (14.1%)
meat and chicken	871 (60.2%)	243 (16.8%)
Dairy products	609 (42.1%)	232 (16%)
Bread, cookies, cakes	646 (44.7%)	361 (25%)
Potato, pasta, cereals	564 (39%)	185 (12.8%)
tomato sauce, mayonnaise	323 (22.3%)	347 (24%)
chocolate, bonbons	245 (16.9%)	523 (36.2%)
Snacks (salty, sweet)	382 (26.4%)	456 (31.5%)
Beverages		
Water	1035 (71.6%)	211 (14.6%9
Natural juices	985 (68.1%)	253 (17.5%)
packaged juices	169 (11.7%)	585 (40.5%)
Energy drinks	85 (5.9%)	441 (30.5%)
Other types of unsweetened beverages	80 (5.5%)	164 (11.5%)
Industrialized fruit juices	105 (7.3%)	408 (28.2%)
Other types of sweetened beverages	193 (13.3%)	442 (30.6%)
soft drinks in sachet	211 (14.6%)	521 (36%)

Regarding the characteristics of the intake, a significant association was evidenced with never exceeding more than three meals, normal behavior toward consumption, good eating habits, absence of changes in the sensation of hunger/satiety, not feeling great de-

sire to eat, not increasing food consumption, not increasing the frequency of excessive intake, not reducing intake, absence in the frequency of decreased intake, absence of increased intake of ultra-processed foods and absence of increased frequency of consumption of foods outside control during confinement. The remaining variables did not present a significant association (Table 3).

The group comprised 79.8% (n=791) of people who already had healthy habits and maintained this pattern during confinement, and the remaining 20.2% (n=200) changed their habits from healthy to unhealthy. On the other hand, 67.5% (n=307), who previously did not have healthy eating habits, continued this practice; finally, 32.5% (=148) went from having unhealthy to healthy habits, with a statistically significant association (OR = 8.204 CI 95% 6.389-10.535, $P < 0.05$). Compliance with quarantine (OR = 0.654, CI 95%, 0.510-0.840, $P<0.05$), type of healthy eating (OR 0.281, CI 95% 0.223-0.354, $P<0.05$), and normal weight (OR 0.455, CI 95% 0.351-0.589, $P<0.05$) constitute a protective factor for changes in eating habits, with a statistically significant relationship.

Table 3. Odds ratio of the study variables

Pooled Variable	Healthy habit N=939	No healthy habit N=507	OR	OR CI 95%	*P*
Sex man VS. woman	206 (21.9%)	127 (25%)	0.841	0.653-1.083	0.180
Urban Origin VS. Rural	750 (80.6%)	408 (81.4%)	0.945	0.716-1.247	0.687
High schooling VS. Short	298 (31.7%)	163 (32.1%)	0.981	0.778-1.237	0.872
Two-parent family VS. Monopatent	568 (60.5%)	275 (4.2%)	1.292	1.038-1.607	0.021
1 to 2 people living in cars VS. 3	32 (3.5%)	31 (6.1%)	0.559	0.338-0.925	0.022
Family income >400 USD VS. <400	475 (50.6%)	244 (48.1%)	1.103	0.889-1.370	0.372
Employment VS. Unemployment	499 (53.1%)	315 (62.1%)	0.691	0.479-0.799	0.001
Own business VS Others	192 (49.6%)	122 (24.1%)	0.811	0.627-1.050	0.064
Meet quarantine VS. it does not	737 (78.5%)	356 (70.2%)	1.548	1.210-1.979	<0.0001
Choose foods for various reasons VS health	143 (15.2%)	161 (31.8%)	0.386	0.298-0.500	<0.0001
Choose foods for various reasons VS availability	855 (91.1%)	424 (83.6%)	1.993	1.440-2.757	0.010
Choose foods for various reasons VS shelf life	821 (87.4%)	418 (82.4%)	1.481	1.098-1.998	0.010
Never exceeded >3 meals VS. >3 meals	122 (13%)	45 (8.9%)	1.533	1.069-2.198	0.019
Normal consumption behavior VS. others	736 (78.4%)	263 (51.9%9	1.694	1.359-2.112	<0.0001
No change in the feeling of hunger VS. change	453 (48.2%)	123 (24.3%)	2.910	2.289-3.699	<0.0001
Does not feel great desire to eat VS. Yes	395 (42.1%)	101 (19.9%)	2.919	2.265-3.761	<0.0001
I did not increase food consumption VS. Yes	382 (40.7%)	112 (22.1%)	2.419	1.889-3.096	<0.0001
There was no excess intake VS Yes	271 (28.9%)	70 (13.8%)	2.533	1.897-3.382	<0.0001
There was no decrease in intake VS. Yes	671 (71.5%)	323 (63.7%)	1.426	1.133-1.795	0.002
There was no increase in ultra-processed foods VS. Yes	670 (71.4%)	206 (40.56%)	3.639	2.901-4.566	<0.0001
There was no increase in frequency in feeding VS. Yes	860 (91.6%)	400 (78.9%)	2.912	2.127-3.986	<0.0001

Discussion

Among the respondents, the predominant group were women (77%) and mothers (73.1%), with a higher level of education 38.8%, married 55.4%, from Pichincha 77.8%, and from the urban area 80.1%. The most representative family structure among the respondents is characterized by biparental families in 58.3%, with more than three family members who live in their own house and with an economic income greater than 400 dollars, with work under dependency relationship and with face-to-face modality with 56.3%. Children and adolescents had an average age of 12.1 years, 58.7% were male, and 35.8% had higher primary general education. This study manages to bring together the demographic aspects that have been identified as representative elements of greater vulnerability for the development of disorders in eating habits of overeating in Ecuadorian children and adolescents of school age [12].

Of those surveyed, 75.6% always complied with the confinement, while 1.8% omitted it, a situation of similar behavior in Argentina, which maintained 73.5% compliance with the confinement, and 25% did not respect it due to outings to buy food and work reasons. [13].

During confinement, the most frequent criteria for choosing food were health in 79% and costs in 30.8% of

cases; the criteria for buying food, according to Macías & Gordillo & Camacho (2012) [2], are related to the family nucleus, social and cultural factors, the most frequent being economic availability and the possibility of accessing food. Meanwhile, ECLAC (2020) [8] states that the decrease in income Economics influenced the purchase of food.

Among the characteristics of the children's diet during confinement, they highlight that 53.2% sometimes exceeded more than three meals, normal behavior during food consumption in 69.1%, intake of three usual meals in 46.3%, 30% probably felt a great desire to eat, 31.5% presented an increase in the amount of food consumed, excess intake between one and two times a week in 25.4%, with an increase in the consumption of ultra-processed foods in 27.6%, consumption of food out of control in 35.3%, which agrees with Ammar, et al., (2020) [6] who affirm that home confinement caused greater food consumption, in greater frequency, quantity and with unhealthy characteristics.

Before confinement, 57.7% of respondents described the child's diet as healthy, with a predominance of average weight in 87.1% of cases; during confinement, 55.7% of respondents affirmed that the diet was healthy, with an average weight. Normal weight in 79% and overweight in 14.3% of children, the importance of this is based on the statements of Macías & Gordillo & Camacho (2012) [2], who mention that healthy eating acts as a positive factor for the child having a standard or adequate nutritional status. The JUNAEB in Chile warned of the relationship between obesity and increased consumption of ultra-processed foods during confinement (JUNAEB, 2021) [9].

The foods that reported having increased their consumption included fresh fruits in 64.7%, followed by meat and chicken according to 60.3% of the participants. In the case of beverages, there was an increase in water in 71.6% and natural juices in 68.1% of cases. The decrease in the consumption of these foods occurred during confinement in many homes in the United States, according to Sharma et al. (2020) [14], so their increase in the country constitutes a favorable aspect as a habit of healthy eating, as confirmed by Ruiz et al. (2020) [7], who also recorded an increase in the consumption of these foods in their study.

The foods that decreased their consumption were chocolates, bonbons, and candies (36.2%) and salty or sweet snacks (31.5%). There was a decrease in the consumption of packaged juices in 40.5% and soft drinks in 36% of children. These foods have been considered a characteristic consumption in the Ecuadorian population, according to ENSANUT-ECU (2014) [12]; however, the decrease in their consumption represents a positive aspect as a healthy eating habit during confinement. During the confinement, there was a change in eating habits in 32.2% of the respondents; this aspect has been evaluated by ECLAC (2020) [8], who points out that during the confinement, there were changes in food consumption habits worldwide.

A statistically significant association was found between healthy eating habits and coming from a biparental family, 1 to 2 people living in the house, the type of face-to-face work, working under a dependency relationship, and always complying with quarantine. These aspects have been related to healthy eating habits by Deschasaux et al. (2020) [15]. They warn that during the pandemic, the type of work and the number of people at home influence eating habits due to their part Aguilar et al. (2021) [16] confirming the association between these variables, especially emphasizing the importance of establishing eating habits at school age as a crucial stage for it, an aspect that also points out Scaglioni et al., (2018) [17], concerning healthy eating habits and the family environment, with parents being responsible for being role models to achieve it. Likewise, Molina et al. (2021) [18] related eating behavior to the biparental family structure. A statistically significant association was found between healthy eating habits and the criteria for choosing foods, such as shelf life, availability, health, and costs; in terms, cost is a factor pointed out by Viteri, Iza, Mejía, & Moreno (2020) [19] related to lack of food consumption. On the other hand, the results agree with those obtained by De Oliveira, Quevedo, Samara, & Da Silva (2016) [20], with factors such as health and costs, before convenience, as factors that influence the selection for the purchase of food.

Regarding the characteristics of the intake, a significant association was found between healthy eating habits and never exceeding more than three meals, normal behavior toward consumption, good eating

habits, absence of changes in the sensation of hunger/satiation, not feeling a big desire to eat, not increasing food consumption, not increasing the frequency of excess intake, not reducing intake, absence of the frequency of decreased intake, absence of increased intake of ultra-processed foods and absence of increased frequency of food consumption out of control during confinement. These aspects have been pointed out by authors such as Naja & Hamadeh, (2020) [21] and Androutsos, Perperidi, Georgiou, & Chouliaras, (2021) [22] as common eating patterns during home confinement. These results agree with those obtained by Pérez et al. (2020) [23], who found a statistically significant association in the consumption of healthy foods during confinement, with an increase in fruits, vegetables, and fish and a lower frequency of products harmful to health.

In contrast, the aspects pointed out by authors such as Naja & Hamadeh (2020) [21] and Androutsos, Perperidi, Georgiou, & Chouliaras (2021) [22] as common eating patterns during home confinement warn that they were irregular habits were more frequent, aspects that do not agree with what was observed in this study, mainly due to its relationship with the economic situation of the participants in these studies. Similarly, it does not agree with the study conducted in Ecuador by Viteri, Iza, Mejía, & Moreno (2020) [19], who showed that those under 18 years of age skipped meals and consumed less food than usual during confinement.

A statistically significant association was found between the absence of changes in eating habits and compliance with quarantine, type of healthy eating, and average weight. The results obtained in this study guide eating disorders caused during confinement in the pediatric population; however, it is essential to consider that due to the characteristics of the snowball sampling technique, the sample is subject to the decision of the respondents, who in turn select new individuals to participate in it, which could result in the participants sharing specific characteristics or traits even though different diffusion routes were used. The respondents' language barrier, internet access, and social networks are points to take into account for future studies with a similar methodology to reach the majority of social groups in the country.

Conclusions

The characteristics of the families, children, and adolescents that determined patterns related to changes in eating habits due to the effect of home confinement due to the COVID-19 pandemic included the type of biparental family, living with less than three people in the home, low work dependency, compliance with quarantine, shelf life, availability, health and costs, such as criteria for choosing food, behavior toward consumption, mode of intake and characteristics of intake. Parents or caregivers reported a subjective perception of the nutritional status of children and adolescents during home confinement with a predominance of average weight, healthy eating habits, and infrequent changes in eating habits.

Abbreviations

ECLAC: Economic Commission for Latin America and the Caribbean
COVID-19: Coronavirus 2019.
JUNAEB: Economic Commission for Latin America and the Caribbean (Chile).
ENSANUT: national health and nutrition survey (Ecuador).

Supplementary information

Supplementary materials are not declared.

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Author contributions

Nataly Estefanía Calderón Herrera: Conceptualization, Data Retention, Funding, Research, Resources, Software, Writing - original draft.
Jenny Susana Grandes Hidalgo: Conceptualization, Data Retention, Supervision, Funding, Research, Resources, Writing: proofreading and editing.
Freddy Carrión: Curation of data, research, acquisition of funds, supervision, methodology.
Carlos Erazo: conceptualization, data conservation, supervision, visualization, methodology.
All authors read and approved the final version of the manuscript.

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Availability of data and materials

The data sets generated and analyzed during the current study are not publicly available due to participant confidentiality but are available through the corresponding author upon reasonable academic request.

Statements

Ethics committee approval and consent to participate

It was not required for an online survey study.

Publication consent

It does not apply to studies that do not publish MRI/CT/Rx images or physical examination photographs.

Conflicts of interest
The authors declare no conflicts of interest.

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References

1. Pereira JM, Salas M. Analysis of eating habits with tenth-year students of a Technical College in Pérez Zeledón based on the cross-cutting themes of the third cycle program of primary general education in Costa Rica. Educare Electronic Magazine, 2017;21(3):1-6 https://doi.org/10.15359/ree.21-3.12 .

2. Macias A, Gordillo L, Camacho E. Eating habits of school children and the role of health education. In Chilean Journal of Nutrition 2012;39(3):1-8. https://doi.org/10.4067/S0717-75182012000300006.

3. Ávila H, Gutiérrez G, Martínez M., Ruíz J, Guerra J. Behavior and eating habits in school students. Health Horizon, 2018;17(3):1-7. https://doi.org/10.19136/hs.a17n3.2113

4. Wang G, Zhang Y, Zhao J, Zhang J, Jiang F. Mitigate the effects of home confinement on children during the COVID-19 outbreak. The Lancet 2020;395, Issue 10228). https://doi.org/10.1016/S0140-6736(20)30547-X

5. WIN. (2020). The effects of COVID-19 on food security and nutrition: developing effective policy responses to address the pandemic of hunger and malnutrition. In FAO: Rome. https://www.fao.org/3/cb1000es/cb1000es.pdf

6. Ammar A, Brach M, Trabelsi K, Chtourou H, Boukhris O, Masmoudi L., et al. Effects of COVID-19 home confinement on eating behavior and physical activity: Results of the ECLB-COVID19 international online survey. Nutrients 2020;12(6). https://doi.org/10.3390/nu12061583

7. Ruiz M, Padilha P, Mantilla-Escalante D, Ulloa N, Brun P, Acevedo-Correa D, et al. Covid-19 confinement and changes of adolescent's dietary trends in Italy, Spain, Chile, Colombia, and Brazil. Nutrients, 2020;12(6):1-6 https://doi.org/10.3390/nu12061807

8. FAO & ECLAC. (2020). Food systems and COVID-19 in Latin America and the Caribbean N° 10: food consumption habits and malnutrition. Food Systems and COVID-19 in Latin America and the Caribbean. https://repositorio.cepal.org/bitstream/handle/11362/45794/1/cb0217_es.pdf

9. JUNAEB. (2021, March 25). Nutritional Map Junaeb 2020 detects the profound impact of the pandemic on the increase in obesity. JUNAEB. https://www.junaeb.cl/archivos/63811

10. Rubio M., Bretón I. Obesity in times of COVID-19. A global health challenge. Endocrinology, Diabetes, and Nutrition, 2021;68(2):123–129. https://doi.org/10.1016/j.endinu.2020.10.001

11. Kaufman-Shriqui V, Navarro D, Raz O, Boaz M. Multinational dietary changes and anxiety during the coronavirus pandemic-findings from Israel. Israel Journal of Health Policy Research, 2021;10(1). https://doi.org/10.1186/s13584-021-00461-1

12. Freire W, Ramírez Luzuriaga M., Belmont P, Mendieta M, Silva K, Sáenz K, Piñeiros P, Gómez L, Monge R. (2014). National Survey of Health and Nutrition ENSANUT-ECU 2012 Volume I: National Survey of Health and Nutrition of the Ecuadorian population from zero to 59 years. In ENSANUT-ECU 2012. Ministry of Public Health/National Institute of Statistics and Censuses: Vol. Volume 1. https://www.ecuadorencifras.gob.ec/documentos/webinec/Estadisticas_Sociales/ENSANUT/MSP_ENSANUT-ECU_06-10-2014. pdf

13. Unicef. (2020). The impact of the COVID-19 pandemic on families with children and adolescents (S. Waisgrais, Ed.; First). Unicef. https://www.unicef.org/argentina/media/8646/file/tapa.pdf

14. Sharma SV, Chuang RJ, Rushing M, Naylor B, Ranjit N, Pomeroy M, Markham C. Social Determinants of Health-Related Needs During COVID-19 Among Low-Income Households With Children. Prev Chronic Dis. 2020 October 1;17:E119. **DOI**:10.5888/pcd17.200322. **PMID**:33006541 ; **PMCID**: PMC7553207.

15. Deschasaux M, Druesne N, Esseddik Y, de Edelenyi F, Allès B, Andreeva V, et al. diet and physical activity during the COVID-19 lockdown period (March-May 2020): Results from the French NutriNet-Santé cohort study. MedRxiv 2020. https://doi.org/10.1101/2020.06.04.20121855

16. Aguilar-Martínez A, Bosque-Prous M, González-Casals H, Colillas-Malet E, Puigcorbé S, Esquius L, Espelt A. Social Inequalities in Changes in Diet in Adolescents during Confinement Due to COVID-19 in Spain: The DESKcohort Project. Nutrients. 2021 May 8;13(5):1577. **doi**:10.3390/nu13051577. **PMID**: 34066867 ; **PMCID**: PMC8151229.

17. Scaglioni S, De Cosmi V, Ciappolino V, Parazzini F, Brambilla P, Agostoni C. Factors Influencing Children's Eating Behaviors. Nutrients. 2018 May 31;10(6):706. **doi**:10.3390/nu10060706. **PMID**: 29857549 ; **PMCID**: PMC6024598.

18. Molina P, Gálvez P, Stecher M, Vizcarra M, Coloma M, Schwingel A. Family influences maternal feeding practices for preschool children from vulnerable families in the Metropolitan Region of Chile. Primary Care, 2021;53(9). https://doi.org/10.1016/j.aprim.2021.102122

19. Viteri C, Iza P, Moreno C. Food insecurity in Ecuadorian households during the COVID-19 confinement. Research & Development, 2020;12(1):1-8. https://revistas.uta.edu.ec/erevista/index.php/dide/article/cite/985/TurabianCitationPlugin

20. De Oliveira D, Gomes S, Quevedo F, Rodrigues W. Food selection and consumption criteria in small Brazilian cities. Invention, 2016;19:123–135. https://www.redalyc.org/pdf/877/87747436008.pdf

21. Naja F, Hamadeh R. Nutrition amid the COVID-19 pandemic: a multilevel framework for action. Eur J Clin Nutr. 2020 Aug;74(8):1117-1121. **DOI**:10.1038/s41430-020-0634-3. Epub 2020 April 20. **PMID**: 32313188 ; **PMCID**: PMC7167535.

22. Androutsos O, Perperidi M, Georgiou C, Chouliaras G. Lifestyle Changes and Determinants of Children's and Adolescents' Body Weight Increase during the First COVID-19 Lockdown in Greece: The COV-EAT Study. Nutrients. 2021 March 13;13(3):930. **DOI**:10.3390/nu13030930. **PMID**: 33805678 ; **PMCID**: PMC7998995.

23. Pérez C, Gianzo M, Hervás G, Ruiz F, Casis L, Aranceta J. Changes in eating habits during the confinement period due to the COVID-19 pandemic in Spain. Revista Espanola De Nutricion Comunitaria-Spanish Journal of Community Nutrition, 2020;26(2). https://www.renc.es/imagenes/auxiliar/files/RENC_2020_2_0X_Cambios_habitos_alimentarios_estilos_vida_confinamiento_Covid-19(1).pdf

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