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Artículo Original

Sociodemographics and food purchase preferences associated with food insecurity during the COVID-19 pandemic in Chile

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Abstract: Sociodemographics and food purchase preferences associated with food insecurity during the COVID-19 pandemic in Chile. Introduction: The COVID-19 pandemic induced substantial transformations in food systems and food security (FI) worldwide. **Objective:** To determine whether sociodemographic and food preferences are associated with FI during the COVID-19 pandemic in Chile. **Materials and methods:** Cross-sectional study, the online questionnaire included sociodemographic, food security (Household Food Security Scale) and food purchase prioritization questions. Logistic regression analyses were applied to identify associations, adjusting for relevant variables. A *p*-value < 0.05 was considered significant. **Results:** The study included 1,114 participants, 38.3% of the sample had some degree of FI; conversely, higher level of education was associated with lower FI. Similarly, time spent in quarantine was also associated with elevated FI, and being unemployed, self-employed, a student or housewife, and living with young children increased the likelihood of AI especially in the fifth week of quarantine. In terms of dietary intake, sugar (OR=1.71; 95% CI 1.30-2.24), rice and pasta (OR=1.52; 95% CI 1.06-2.18) and sausages (OR=1.42; 95% CI 1.07-1.89) were the highest priority foods among those with FI. **Conclusions:** FI in Chile during the pandemic was associated with social inequalities, educational level and employment status. In addition, FI was associated with food prioritization, favoring products of lower nutritional value. **Arch Latinoam Nutr 2025; 75(4): 279-288.**

Keywords: food insecurity, COVID-19, socio-demographics, education , diet.

Resumen: Sociodemografía y preferencias de compras de alimentos asociadas a la inseguridad alimentaria durante la pandemia de COVID-19 en Chile. Introducción: La pandemia de COVID-19 generó cambios significativos en los sistemas alimentarios y en la seguridad alimentaria (IA) a nivel global. **Objetivo:** Determinar si las preferencias sociodemográficas y alimentarias se asocian con la IA durante la pandemia de COVID-19 en Chile. **Materiales y métodos:** Estudio transversal, el cuestionario en línea incluyó preguntas sociodemográficas, de seguridad alimentaria (Escala de Seguridad Alimentaria en el Hogar) y priorización de compras de alimentos. Se aplicaron análisis de regresión logística para identificar asociaciones, ajustando por variables relevantes. Se consideró significativo un valor *p* < 0,05. **Resultados:** El estudio incluyó 1.114 participantes, el 38,3% de la muestra presentó algún grado de IA, por el contrario, el mayor nivel de educación se asoció con una menor IA. Del mismo modo, el tiempo pasado en cuarentena también se asoció con una IA elevada, además, estar desempleado, ser trabajador independiente, estudiante o ama de casa, y vivir con niños pequeños, aumentaron la probabilidad de IA especialmente en la quinta semana de cuarentena. En cuanto a la ingesta dietética, el azúcar (OR=1,71; IC95% 1,30-2,24), el arroz y la pasta (OR=1,52; IC95% 1,06-2,18) y embutidos (OR=1,42; IC95% 1,07-1,89) fueron los alimentos más prioritarios entre las personas con IA. **Conclusiones:** La IA en Chile durante la pandemia se asoció con desigualdades sociales, nivel educativo y situación laboral. Además, la IA se asoció en la priorización de alimentos, favoreciendo productos de menor valor nutricional. **Arch Latinoam Nutr 2025; 75(4): 279-288.**

Palabras clave: inseguridad alimentaria, COVID-19, factores sociodemografícos, educación, dieta.

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Introduction

In December 2019, in the city of Wuhan, province of Hubei, the first cases of the coronavirus disease (COVID-19) caused by the SARS-CoV-2 virus were reported. Despite of the efforts to contain the COVID-19 outbreak, the World Health Organisation (WHO) declared COVID-19 a pandemic on March 11th, 2020 (1,2). With the announcement of the pandemic, countries started to take containment and mitigation measures, emphasizing social distancing and quarantine (3). These contingency measurements are expected to have a great economic impact in high, middle- and low-income countries (4).

According to the Global Report on Food Crises 2025, more than 295 million people across 53 countries and territories experienced acute food insecurity in 2024, an increase of 13.7 million over the previous year (5). A person is considered food insecure when they lack regular access to sufficient, safe, and nutritious food to support normal growth, development, and an active, healthy life. In this regard, the basic pillars of food security must be considered: availability, access, biological utilization, and the stability of these three, as established at the FAO World Food Summit (1996) (6). This may be due to the unavailability of food and/or lack of resources to obtain food. FI can be experienced at different levels of severity (7).

Indeed, FI levels will differ within regions, with expectations that women and children from low and medium-income countries would be the most affected by the indirect effects of the COVID-19 crisis (7). In addition, there has been growing concern about the impact of COVID-19 on household food insecurity (8,9). Disruptions caused by the pandemic have the potential to influence the pillars of food security, including availability, access, utilization and stability (10). The COVID-19 pandemic may directly influence FI by disrupting food systems (such as primary food production, production stability, processing, food stocks and marketing) and indirectly through the impact of quarantines on households (reduced income, physical and economic access to food) (11).

It has been estimated that the effects of FI, as well as the decrease in essential services such as child healthcare, could result in the deaths of 42,240 children under five years old and 2,030 additional maternal deaths per month worldwide (7).

Severity will depend, among other factors, on people's socioeconomic status, levels of FI being the highest among people with low socioeconomic level and/or education (8). This is especially relevant in Latin America, a region characterized by high levels of social inequality (9). Among the Latin American region, Chile is one of the countries with high levels of social inequality (12). Although access to higher education in Chile has increased eight-fold in the lowest deprivation quintile since the 90s, the education gap persists when comparing those in the lowest and highest deprivation quintile. According to the National Socioeconomic Characterization Survey (CASEN), food insecurity increased during the pandemic from 13.6% in 2017 to 19.6% in 2020, followed by a slight decline to 19.5%. (2022) (13). Considering the existing inequality and the direct and indirect effect of the COVID-19 pandemic in Chile, and the lack of knowledge about the prioritization of food purchases in the basic food basket of Chileans during this period; Given the existing inequality and the direct and indirect effects of the COVID-19 pandemic in Chile, along with the limited understanding of how food purchases within the basic basket were prioritized during this period, the need arises for more detailed investigation of this issue. Although a recent study by the authors (14). explored the prioritization of certain foods, the factors influencing such prioritization remain unclear. Therefore, it is crucial to understand how sociodemographic factors are associated with food insecurity in Chile during the ongoing COVID-19 pandemic. Therefore, the aim of this study was to investigate what socio-demographic factors are associated with food insecurity and what food groups are prioritized by individuals with FI during the COVID-19 pandemic in the Chilean population.

Material and methods

Study design and Subjects

This cross-sectional study included individuals aged 18 years or older who were Chilean residents and had lived in Chile for at least the past five years. Participants were invited to take part in the study through email and social

media platforms such as Twitter, Facebook, LinkedIn, and Instagram. Individuals unable to provide informed consent were excluded from the study. The study was conducted in accordance with the Declaration of Helsinki and was approved by the Scientific Ethics Committee of the Pontificia Universidad Católica de Chile (number: 200327001).

Procedures

An online questionnaire designed in Google form was sent once to the participants via email between April 13th and May 17th of 2020. The questionnaire included a total of 48 questions regarding socio-demographic factors (10 questions), purchasing priority of some selected food products (26 questions), and household food security (12 questions). Food security was assessed using the Household Food Security Scale validated in Spanish by Lorenzana (15,16). The scale comprises 12 items related to the availability of money to buy food, the reduction or skipping of meals due to the lack of money and the experience of hunger by some of the household members during the last six months. The rate of occurrence of each item was codified as follows: three times correspond to "always"; twice corresponds to "sometimes"; once corresponds to "rarely" and zero to "never". The use of this codification made it possible to generate a FI score ranging from 0 to 36 points; households were classified in four categories: 0 points mean "secure"; 1-12 points mean "mild food insecurity"; 13-24 points mean "food insecurity with moderate hunger", and 25 or more points mean "food insecurity with severe hunger" (15). To determinate the prioritization of purchase, people answered for different food items if they had low, middle, high prioritization or did not buy the product. Foods that were included are part of the basic food basket of Chileans, which includes bread and cereals, meats, fish, dairy products, eggs, oils, fruits, vegetables, legumes, potatoes, sugar, sweetened beverages, wine, meals outside the home, as well as dried fruits and nuts and cured meats (17).

Statistical analysis

Continuous data were expressed in mean ± SD, qualitative values in frequency and percentages. For the association tests, researchers used the Chi2 or Fisher test. To determine if the main socio-demographic factors were associated with FI, we used logistic regression analysis, where FI was the outcome (coded as 0 = food security and 1= food insecurity (which included low, moderate and severe food insecurity)). Variables included in the model were sex, education, socioeconomic level, nutritional status, occupation, children, and older people in the household. To determine what food groups were prioritized among individuals with FI and those without FI, logistic regression was performed where food prioritization was the outcome, and FI was the exposure. For this analysis, each food item was coded as a binary variable, with 0 = low prioritization (when the answer was low prioritization or no purchase) and 1 = high prioritization (when the answer was middle or high prioritization). Using stepwise methods, the analysis was adjusted by age, sex, socioeconomic level, level of education, weeks in quarantine and nutritional status. Results are presented as odds ratios (OR) with their respective 95 % CI. The statistical package R version 4.0.3 was used to perform all analyses. A p value of <0.05 was considered significant.

Results

Table 1 shows the characteristics of the population studied. A total of 1,114 people answered the survey, 87.8% were women, 53.2% had been in quarantine, and more than 60.2% had higher education (complete or incomplete). Of the responders, 32.3% reported living with a child, and 35.6% of the respondents reported living with an older adult. Regarding employment, 13.1% of the participants were unemployed, and 36.1% were dependent workers. For food security assessment, 61.7% were classified as food-secure, 32.3% mildly food-insecure, 5.7% moderately food-insecure and 0.4% severely food-insecure.

Table 2 shows the association of FI by different socio-demographic factors. Those with secondary and university education were 79% and 59% less likely to experience FI, respectively, compared to individuals with primary education. Similarly, favorable associations were found for those with middle and high socioeconomic levels compare to those with low. When it came to occupation status, those who were independent workers,

Table 1. General characteristics of the sample by sex and food insecurity status

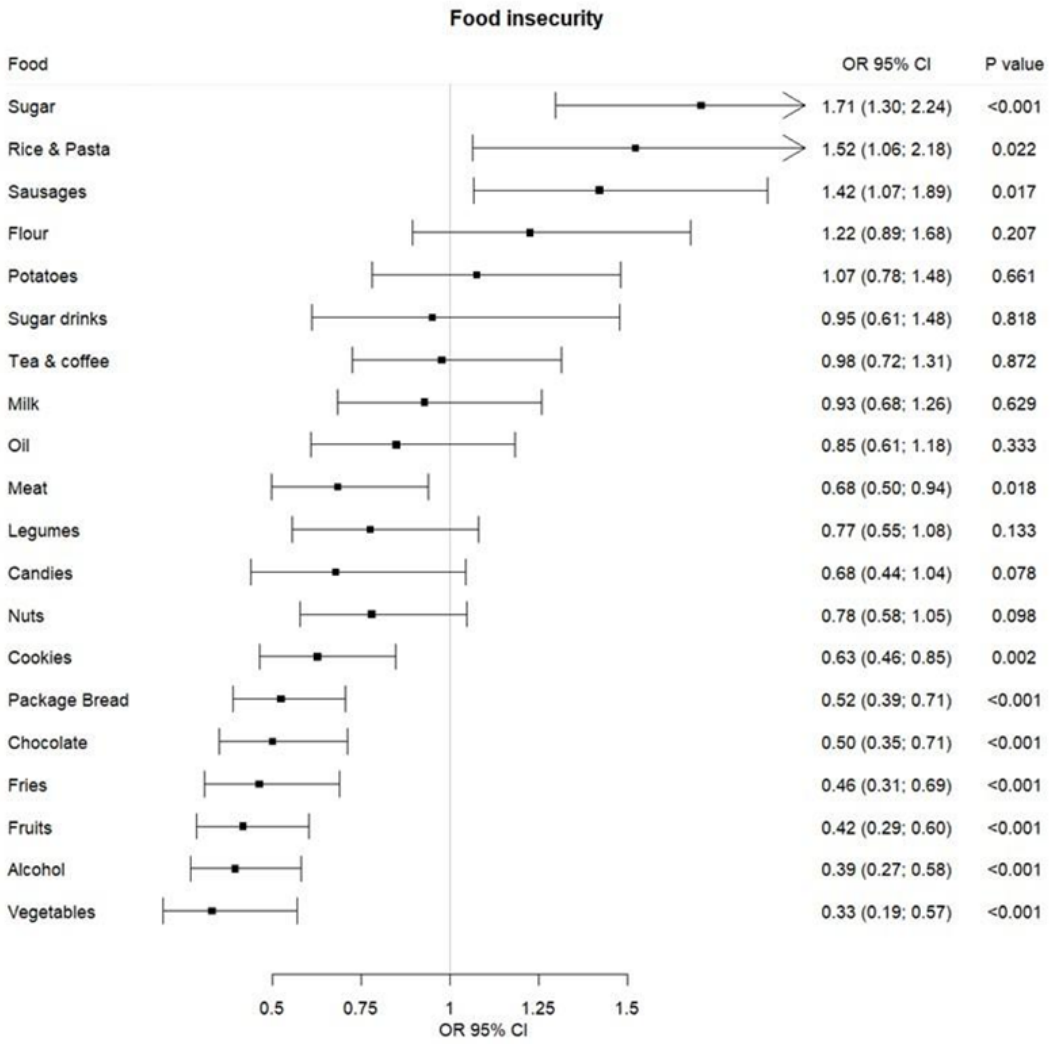
	Food insecurity	Food security	Overall
N (%)	427 (38.3)	687 (61.7)	1,114
Sex			
Men	42 (9.8)	94 (13.7)	136 (12.2)
Women	385 (90.2)	593 (86.3)	978 (87.8)
Age categories, n (%)			
18-29	126 (29.5)	210 (30.6)	336 (30.2)
30-39	105 (24.6)	199 (29.0)	304 (27.3)
40-59	165 (38.6)	203 (29.5)	368 (33.0)
≥60	31 (7.3)	75 (10.9)	106 (9.5)
Residency, n (%)			
Urban	379 (88.8)	631 (91.8)	1010 (90.7)
Rural	48 (11.2)	56 (8.2)	104 (9.3)
Level of education, n (%)			
Complete Higher Education	157 (36.8)	506 (73.7)	663 (59.5)
Incomplete Higher Education	100 (23.4)	124 (18.0)	224 (20.1)
Primary and Secondary (inc/com)	170 (39.8)	57 (8.3)	227 (20.4)
Occupation, n (%)			
Unemployed	81 (19.0)	65 (9.5)	146 (13.1)
Housewife	95 (22.2)	54 (7.9)	149 (13.4)
Student	78 (18.3)	109 (15.9)	187 (16.8)
Retired	27 (6.3)	38 (5.5)	65 (5.8)
Dependent worker	86 (20.1)	316 (46.0)	402 (36.1)
Self-employed	60 (14.1)	105 (15.3)	165 (14.8)
Weeks of quarantine, n (%)			
1 week	15 (3.5)	57 (8.3)	72 (6.5)
2 weeks	20 (4.7)	27 (3.9)	47 (4.2)
3 weeks	29 (6.8)	65 (9.5)	94 (8.4)
4 weeks	100 (23.4)	208 (30.3)	308 (27.6)
≥5 weeks	263 (61.6)	330 (48.0)	593 (53.2)
Self-perceived nutritional status, n (%)			
Underweight	16 (3.7)	9 (1.3)	25 (2.2)
Normal weight	152 (35.6)	359 (52.3)	511 (45.9)
Overweight	202 (47.3)	266 (38.7)	468 (42.0)
Obesity	57 (13.3)	53 (7.7)	110 (9.9)
Number of people living in the household, n (%)			
1 person	16 (3.7)	34 (4.9)	50 (4.5)
2 people	61 (14.3)	163 (23.7)	224 (20.1)
3 people	103 (24.1)	161 (23.4)	264 (23.7)
4 people	104 (24.4)	191 (27.8)	295 (26.5)
≥5 people	143 (33.5)	138 (20.1)	281 (25.2)
Are there children under ten years old in the household? n (%)			
Yes	180 (42.2)	180 (26.2)	360 (32.3)
No	247 (57.8)	507 (73.8)	754 (67.7)
Are there older people in the household? n (%)			
Yes	136 (31.9)	261 (38.0)	397 (35.6)
No	291 (68.1)	426 (62.0)	717 (64.4)
Food security, n (%)			
Food-secure	-	687 (100)	687 (61.7)
Mild food insecurity	360 (84.3)	-	360 (32.3)
Moderate food insecurity	63 (14.8)	-	63 (5.7)
Severe food insecurity	4 (0.9)	-	4 (0.4)

Data is presented as frequency and percentage.

Table 2. Food insecurity by sociodemographic variables.

	Food-secure	Mild food insecurity	Moderate food insecurity	Severe food insecurity	Total	OR 95% CI	*P* value
Sex							
Male	94 (69.2)	8 (5.9)	33 (24.2)	1 (0.7)	136 (100)	1.00 (Ref.)	
Female	593 (60.6)	55 (5.6)	327 (33.5)	3 (0.3)	978 (100)	1.21 (0.77; 1.91)	0.407
Educational attainment							
Primary school	57 (25.1)	140 (61.6)	29 (12.8)	1 (0.44)	277 (100)	1.00 (Ref.)	
Secondary school	124 (55.3)	88 (39.3)	11 (4.9)	1 (0.45)	224 (100)	0.21 (0.14; 0.32)	<0.001
Higher education	506 (76.3)	132 (19.9)	23 (3.4)	2 (0.30)	663 (100)	0.41 (0.25; 0.69)	0.001
Socioeconomic level							
Low	14 (2.0)	89 (24.7)	29 (46.0)	2 (50.0)	134 (12.0)	1.00 (Ref.)	
Medium	536 (78.0)	255 (70.8)	34 (54.0)	2 (50.0)	827 (74.2)	0.13 (0.07; 0.24)	<0.001
High	137 (19.9)	16 (4.4)	0 (0)	0 (0)	153 (13.7	0.04 (0.02; 0.09)	<0.001
Self-perceived nutritional status							
Normal weight	359 (70.4)	123 (24.1)	28 (5.5)	1 (0.2)	511 (100)	1.00 (Ref.)	
Underweight	9 (37.5)	10 (41.6)	4 (16.7)	1 (4.2)	24 (100)	0.32 (0.13; 0.81)	0.017
Overweight	266 (56.8)	178 (38.0)	23 (4.9)	1 (0.2)	468 (100)	0.46 (0.18; 1.17)	0.102
Obesity	53 (48.1)	48 (43.6)	8 (7.7)	1 (0.9)	110 (100)	0.56 (0.20; 1.54)	0.260
Occupation							
Dependent worker	316 (78.6)	11 (2.7)	74 (18.4)	1 (0.3)	402 (100.0)	1.00 (Ref.)	
Independent worker	105 (63.6)	11 (6.7)	47 (28.5)	2 (1.2)	165 (100.0)	1.47 (0.92; 2.34)	0.105
Student	109 (58.3)	4 (2.1)	74 (39.6)	0 (0.0)	187 (100.0)	1.80 (1.06; 3.06)	0.029
Housewife	54 (36.2)	12 (8.1)	83 (55.7)	0 (0.0)	149 (100.0)	1.76 (1.05; 2.94)	0.031
Unemployed	65 (44.5)	19 (13.0)	61 (41.8)	1 (0.7)	146 (100.0)	3.37 (2.12; 5.35)	<0.001
Retired	38 (58.5)	6 (9.2)	21 (32.3)	0 (0.0)	65 (100.0)	2.36 (1.24; 4.46)	0.008
Are there children under ten years old in the household?							
Yes	180 (50.0)	143 (39.7)	37 (10.3)	0 (0)	360 (100)	1.00 (Ref.)	
No	507 (67.2)	217 (28.8)	26 (3.4)	4 (0.6)	754 (100)	1.63 (1.19; 2.24)	0.003
Are there older people in the household?							
Yes	261 (65.7)	114 (28.7)	21 (5.3)	1 (0.3)	397 (100)	1.00 (Ref.)	
No	426 (59.4)	246 (34.3)	42 (5.9)	3 (0.4)	717 (100)	0.72 (0.53; 0.99)	0.041

Data is presented as frequency and percentage and odds Ratio (OR) for food insecurity with their 95% confidence interval (CI). Variables included in the model were sex, education, socioeconomic level, nutritional status, occupation, children, and older people in the household. The reference group was people without food insecurity denoted as 1.00 (Ref.).



Data are presented in the odds ratio with 95% confidence intervals. The reference group was low prioritized of food group. Model was adjusted by age, sex, socioeconomic level, level education, weeks in quarantine and nutritional status.

Figure 1. Association of food purchase prioritization with food insecurity

retired, student, unemployed and housewives were between 1.4- and 3.4-times more likely to experience FI. Individuals who live with children were 1.6-times more likely to experience FI, while those living with older adults were 28% less likely. There were also lower odds of FI for those who were underweight, who were 68% less likely to experience FI compared with those who perceived weight themselves as having a normal bodyweight. No differences were found across age group, sex, and place of residency.

The associations between food groups preference and FI are shown in Figure 1. Participants with FI, compared to those without, were 1.7-times more likely to prioritize the purchase of sugar (OR;1.71: CI95% 1.30-2.24), 52% more likely to prioritize rice & pasta (OR;1.52: CI95% 1.06-2.18), 42% more likely to prioritize sausages (OR;1.42: CI95% 1.07-1.89). While in contrast, meat, cookies, bread, chocolates, fries, alcohol, fruits and vegetables were between 32% and 67% less likely to be prioritized among individuals experiencing FI.

Discussion

The results show that having a child under ten years old, being unemployed, being a housewife, and giving a high priority to the purchase of sugar, rice and pasta, and sausages are associated with FI.

At the time of the present study, Chile and the world are undergoing a sanitary crisis by COVID-19; this situation has negatively influenced the health and the food security of individuals and their households (18) and even more so if they are quarantined. In the present research, participants in quarantined areas duplicated their FI level by the fifth week. Other adverse consequences of the crisis situation are reflected in the food system, incomes and food consumption. The COVID-19 crisis has brought negative impacts on the economy, income generation and employment. This situation can be seen in this research. In Chile, as in the rest of Latin America, there is a large number of people working informally, so confinements directly affect income and the ability to buy fresh food (19).

Poverty, low incomes and low SEL are predictors of FI [20]. In Chile, The National Survey of Food Consumption showed a lower consumption of dairy products, fruits and vegetables, red meats, fish and seafood among the low socioeconomic level (SEL) (21). The WHO considers that a healthy diet must include enough fruits and vegetables, nuts, seeds, whole grains and minimal amounts of processed meats, free sugars, saturated fats, trans fats and salt (22). Clearly, following these recommendations requires a greater investment in economic terms and better purchase decisions. Populations with low incomes do not follow these patterns and tend to choose less expensive, highly caloric, low-nutrient-dense foods such as sugar, rice or sausages; this information is consistent with the findings of this study and with data reported in other studies (23). Education is undoubtedly a protective factor; however, the economic downturn triggered by the COVID-19 pandemic further constrained households' ability to access nutritious foods. While many were aware of the need to adopt healthier diets, financial limitations and restricted access prevented them from doing so, particularly among low-income groups, for whom the pandemic represented a double burden: pre-existing vulnerability compounded by the health and economic crisis. Food prioritization among low-income populations is therefore shaped by economic constraints, leading to the purchase of inexpensive, calorie-dense but nutrient-poor foods a mechanism that helps explain the growing association between poverty and overweight or obesity.

It is possible that people who are experiencing FI, by prioritizing foods such as flour (to make bread and other preparations with it), pasta/rice, sugar and oil, can present lower intakes of protein, vitamins especially A, C, B12, minerals such as calcium and zinc among others and a lower intake of antioxidants and dietary fibre. For example, in our study, we observed a low prioritization of buying fruits and vegetables. These two food groups are good sources of water, antioxidants and fibre, all of which play a role in the control of hypertension, diabetes and weight gain. Some of the most important risk factors in complications of COVID-19 (24). On the other hand, it is observed that people with FI have a greater prioritization in the purchase of sugar, rice, pasta and sausages, foods with low or no nutrient intake, but which generate satiety. This result is similar to another study published in Latin America (25). In addition, stressors specific to confinement were added to the classic factors influencing food purchases (26).

In this investigation, greater levels of FI were found among those respondents that according to their perception were underweight or obese. Poverty is associated with FI in Latin America and the Caribbean, while in Eastern Europe, Central and Eastern Asia, there is evidence of an increasing occurrence of overweight and obesity among the poor population. This is in opposition to the trend observed in Sub-Saharan Africa and South Asia, where the greatest prevalence was observed among the higher-income population (27). Other studies have also reported an association between overweight and low incomes (28,29). Obesity rates continue to rise worldwide as well as in Chile, and the crisis is likely to increase malnutrition in all its forms especially among vulnerable groups (30). Moreover, several studies have demonstrated an association between poverty and a higher prevalence of overweight and obesity (31,32). This relationship may be explained by multiple mechanisms, including limited health literacy, restricted access to healthy food options, lack of safe environments for physical activity, lower utilization of healthcare services, and elevated levels of chronic stress (33).

Another factor associated with FI is family composition (19). Several studies have revealed that the presence of children in the household is associated with lower food security (34-36), as well as families with members under 18 years old (37). Similar findings were reported at the national level; families with children and adolescents had the greatest levels of FI (20). In Australia, the presence of children in the household was associated with lower fruit consumption; it is likely that food choices are made according to children's preferences, and fast food and meals rich in fats and sugars are prioritized. Lower incomes are associated with low educational attainment (38) and FI (39). In urban areas, the association between educational level and food security is mediated by its relationship with employment, income and decision making, directly impacting in the availability of foods, access to them and their consumption. In Chile, FI level were double when a comparison of the illiteracy or literacy of the head of the household was made (19). In this study, participants with higher education had a lower risk of FI.

Among the strategies to improve nutrition and reduce FI is nutrition education, and there is extensive literature that shows that it can generate positive changes in nutrition, including the use of telemedicine (40), which can become an important educational tool during and after the pandemic (41,42).

One of the main limitations of this study is that it is not based on a representative sample. In particular, there is a high proportion of women and individuals with higher education, even though a large part of the Chilean population has only completed secondary education. This composition may influence the interpretation of the findings, as both factors are associated with distinct behavioral patterns, resource access, and health outcomes compared to the general population. In a context of pronounced social inequality, as observed in this study, the overrepresentation of these groups may reflect greater awareness or access to healthy practices, as well as reduced exposure to certain structural barriers. However, it also limits the generalizability of the results to populations with lower educational attainment or to men, who may face different conditions and social determinants that could alter the observed associations. In addition, the use of the STEPwise method for variable selection in regression modeling is discouraged in modern statistics, as results can vary with small changes in the data and it does not necessarily identify the most parsimonious or best-fitting model. Finally, the cross-sectional design precludes causal inference, though it does allow for the identification of associations. Among the strengths, we may highlight the use of a validated survey. Therefore, it is possible to compare the data with other similar studies performed in the region.

Conclusions

Socioeconomic factors are critical determinants of FI during the COVID-19 crisis. Evidence shows that FI was particularly severe in low-income settings, a situation further aggravated by the economic downturn caused by quarantine measures, which reduced income opportunities and shifted household purchasing decisions toward highly caloric but nutrient-poor foods. The problem was especially pronounced in households with children under 10 years of age, a group requiring special attention due to their heightened vulnerability in terms of nutrition, health, and care. The coexistence of multiple forms of malnutrition alongside FI highlights the urgent need for dual-purpose interventions that simultaneously address child nutrition, diet quality, the food environment, and the broader socioeconomic determinants of health.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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