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Influence of socio-demographic characteristics on different dimensions of household food insecurity in Montevideo, Uruguay

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Resumen

Con datos de la Encuesta de Alimentación y Bienestar del año 2014 (dECON-FCS-UdelaR), representativa de los hogares de Montevideo y la zona Metropolitana, se evaluó la estructura factorial de la Escala Latinoamericana y Caribeña de Seguridad Alimentaria (ELCSA) con una metodología de análisis factorial. Además se analizó, a través de modelos probit, la influencia de las características socio-demográficas de los hogares en cada una de las dimensiones de inseguridad alimentaria identificadas. El porcentaje de respuestas afirmativas a las preguntas de la escala ELCSA varió entre el 31.7% a 4.4%. A partir del análisis factorial se identificaron dos factores en aquellos hogares en donde solo viven adultos y tres factores en aquellos en los que viven menores de 18 años. Los factores identificados se asocian a diferentes niveles de inseguridad alimentaria. La probabilidad de experimentar diferentes niveles de inseguridad alimentaria está afectada tanto por características individuales de los encuestados como por las características del hogar en el que viven, siendo el ingreso del hogar la variable que tiene mayor impacto en todas las dimensiones.

Keywords: *inseguridad alimentaria; ingreso; análisis factorial, América Latina*

Abstract

Using a cross-sectional survey with a representative sample of households from the metropolitan area centered on Montevideo, we evaluate first the factorial structure of the Latin American & Caribbean Household Food Security Scale (ELCSA) with an exploratory factor analysis. Secondly, using a probit model we study the influence of socio-demographic characteristics on each of the identified dimensions of the food insecurity. The percentage of affirmative responses to the items of the ELCSA scale ranged from 31.7% to 4.4%. Two factors were identified with the exploratory factor analysis from households without children under 18 years old, whereas three factors were identified for households with children. The identified factors were associated with different severity levels of food insecurity. Likelihood of experiencing different levels of food insecurity was affected by individual characteristics of the respondent as well as characteristics of the household. Household income had the largest influence on all the dimensions, which indicates a strong relationship between income and food insecurity.

Keywords: *food security; income; factor analysis; Latin America*

JEL: I14, I31, D12

1. Introduction

Food security occurs when "all people, at all times have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life" [1]. Food security is a multidimensional concept that involves four hierarchical dimensions: physical availability of food, economic and physical access to food, food utilization and stability of the previous dimensions over time [2].

When individuals do not have access to sufficient food in terms of both quantity and quality, food insecurity is experienced. Food insecurity has been classified in three main severity levels [3]. Food insecurity usually starts by mild insecurity, which is characterized by uncertainty or fear of running out of food in the future or eating foods that are less preferred or less healthful [4]. Moderate food insecurity has been associated with restriction of both the quality and quantity of foods [3]. Finally, the most severe form of food insecurity is hunger (the uneasy or painful sensation caused by insufficient food consumption) [2], which is met when people do not have access to enough food to meet their basic needs. Food insecurity usually affects the adults in the household first as children are usually protected by their mothers. When the severity of food insecurity increases it is no longer possible to protect them and food insecurity reaches the children of the household [5].

The effects of food insecurity are diverse and range from increased risk of malnutrition or disease, negative psychological consequences, to a decrease in productivity and economic performance [6-12]. For this reason, the benefits of strategies to cope with food insecurity go beyond individuals and also extend to the whole society.

Measuring household food insecurity provides an estimate of its underlying causes and contribute the development of intervention strategies and policies to alleviate its consequences [13]. Given the multidimensional nature of food insecurity, a variety of methods have been used for its measurement [14]. For many years, food insecurity has been measured based on economic indicators of food production and food availability, as well as dietary intake and anthropometric measures [15]. However, these methods were deemed insufficient to measure all the aspects related to food insecurity [16]. For this reason, scales for measuring food insecurity as it is experienced by individuals have been developed [17,

18; 15, 3), following the pioneer work of Radimer et al. [17], Briefel et al.[19], and Wehler et al. [20].

The Latin American & Caribbean Household Food Security Scale (ELCSA) was developed modifying the US Household Food Security Supplemental Module (HFSSM) and translating the terms into Spanish [21]. This scale measures the perception of different aspects of food insecurity, as reported by a member of the household, and includes questions related to worries of running out of food, lack of access to food in sufficient quantity or quality, due to lack of monetary or other restrictions [22]. The operationalization of ELCSA depends on whether or not children are present in the household, which is a common feature of several food security scales due to the specific nutritional needs of children [16]. This scale has been used in several Latin American countries, including Bolivia, Brazil, Colombia, Ecuador, Mexico and Uruguay [21-25]. All the previous studies have considered ELCSA as one-dimensional and have not considered the different dimensions of food insecurity included in the scale. However, several studies have identified different dimensions in food insecurity scales, which account for different severity in food insecurity [26].

Effective interventions aimed at reducing food insecurity depend on accurate targeting of the vulnerable population [27]. Understanding the relationship between food insecurity and socio-demographic variables underlying food insecurity can contribute to the development of preventive measures that alleviate the consequences of food insecurity [15]. Food insecurity occurs for multiple reasons, being socioeconomic factors the most relevant as they can limit access to food [13, 27]. Households with children, living under poverty conditions, located far from urban areas and headed by single mothers or ethnic minorities have been reported to have the highest risk of household food insecurity [29-33].

The present work deals with the evaluation of food insecurity in Uruguay, a country in the southeast of South America, with a population of approximately 3.3 million people. Between 2006 and 2013 the percentage of households under poverty conditions has markedly decreased from 24.2% to 17.8% due to economic growth and social policies [34]. Although this reduction in poverty is expected to cause a reduction in food insecurity, economic growth on its own does not address aspects of food insecurity related to the quality of food consumed [2]. This makes it necessary to develop strategies that reduce poverty in conjunction with policies to ensure food security [35]. However, Uruguay has not

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yet adopted national programs to assess household food insecurity, which would allow the government to develop specific strategies aimed at improving access to and utilization of food of the most vulnerable segments of the population.

In this context, the aim of the present work was to evaluate the factorial structure of the Latin American & Caribbean Household Food Security Scale and to study the influence of socio-demographic characteristics on each of the identified dimensions in Montevideo, Uruguay.

2. Methods

2.1. Data collection

The present study was part of a cross-sectional survey designed to assess dietary patterns in a representative sample of households from the metropolitan area centered on Montevideo, the capital city of Uruguay. According to the 2011 National census this area comprises 1,319,108 inhabitants and 520,538 private households [36].

A 3-stage stratified random sampling method was considered. The first stage consisted of the random selection of 305 primary census areas, stratified by geographical location and socioeconomic level. The second stage comprised a random selection of 1,220 households from the primary census tracts. The number of households per tract was selected considering the number of occupied private households. Lastly, an adult (at least 18 years old) was randomly selected from each household.

Information letters were sent to the households. Then, trained interviewers went directly to the households to establish face-to-face contact with the selected adult from each household (up to five attempts on different days and at different times were considered). From the initial sample of 1220 households, complete data were obtained from 742 (60.8%), which comprised the final sample. This sample size enabled the estimation of population proportions with a precision of +/- 3.5 for a confidence level of 95%.

The survey was implemented by a group of 50 interviewers, most of which were Social Science students with previous experience in population surveys. The interviewers received training on the content of the survey prior to its administration. Data from all

surveys were checked by a supervisor and 20% of the households were contacted by phone to check that they had answered the survey.

All participants gave verbal consent. Data collection was carried out between April and September 2014.

2.2. Household food insecurity

Household food insecurity was measured using the Latin American & Caribbean Household Food Security Scale (ELCSA) [21]. This scale comprises 8 items for households without children under 18 years of age and 15 questions for households with children (Table 1). Respondents had to answer yes or no to each of the items. A score of 1 was given for each positive answer.

Table 1. Items of the Latin American & Caribbean Household Food Security Scale (ELCSA), back-translated from Spanish. Items 9-15 are only considered for households with children under 18 years of age.

Item	During the last 3 months, due to lack of money or other resources….
1	were you worried that your household would run out of food?
2	did your household run out of food?
3	did your household lack of a healthy diet?
4	did you or any adult in your household have to consume only a few types of food?
5	did you or any adult in your household did not eat breakfast, lunch or dinner?
6	did you or any adult in your household eat less than you thought you should?
7	did you or any adult in your household feel hungry but couldn't eat?
8	did you or any adult in your household eat only once a day or go without eating for a whole day?
9	did any children of 18 years of age in your household not receive a healthy diet?
10	did any children of 18 years of age in your household have to consume only a few types of food?
11	did any children of 18 years of age in your household did not eat breakfast, lunch or dinner?
12	did any children of 18 years of age in your household eat less than you thought necessary?
13	did you have to serve less food to any children of 18 years of age in your household?
14	did any children of 18 years of age feel hungry but couldn't eat in your household?
15	did any children of 18 years of age eat only once a day or go without eating for a whole day in your household?

2.3. Socio-demographic data

The following socio-demographic information was collected from each participant: gender, age, years of education of respondent, number of adults in the household, number of children under 18 years in the household, if the house was owned by the participant's family, number of rooms in the household, if the household had a place to cook, whether they were beneficiaries of food programs, and possession of a set of goods: stove, refrigerator, freezer, cable connection, washing machine, dryer, dishwasher, microwave, internet, heating, computer, car, motorcycle.

3. Data analysis

3.1. Factor analysis

Exploratory factor analysis (EFA) was carried out to evaluate the factor structure of the ELCSA scale. Factors were extracted using principal component analysis and orthogonally rotated with the varimax rotation. The number of factors was selected using parallel analysis [37]. Items with loadings above 0.40 were considered significant [38].

3.2. Influence of socio-demographic characteristics on the dimensions of the food insecurity scale

A probit model was used to determine the impact of some individual and household socio-demographic characteristics on the dimensions of the food insecurity scale.

The models were estimated using individual characteristics (sex, age and years of education), three variables representing household characteristics (number of adults in the household, per capita room, kitchen) and a set of variables that captured household income (home ownership, if the home is covered by a government assistance program and an index of deprivation). Two models were estimated: one for households with children under 18 years and the other for households without children. Table 2 shows the description of the variables used in the models and their descriptive statistics.

Table 2. Description of the independent variables included in the probit model relating the dimensions of food insecurity and socio-demographic variables.

Variable	Description	Mean	Std. Dev
Gender	1 if female	0.58	0.49
Age	Age of the respondent	48.88	18.28
Years_educ	Years of education of the respondent	10.42	4.65
Numb_adults	Number of adults in the household	2.13	0.99
Numb_child	Number of children under 18 years in the household	0.77	1.17
Homeowner	1 if the household is owner of the house	0.59	0.49
Rooms_per_capita	Number of rooms per capita	0.77	0.39
Cooking_place	1 if the household has a place to cook	0.95	0.21
Food_programs	1 if the household receives a food program	0.11	0.31
Privation	Index of deprivation*	0.25	0.20

*The index reflects the households' level of deprivation. It is based considering the possession of a set of goods (stove, refrigerator, freezer, cable connection, washing machine, dryer, dishwasher, microwave, internet, heating, computer, car, motorcycle). The indicator takes the value 1 if the household has a total lack of goods considered and 0 in the case of possessing all. For details of the methodology of the deprivation index see Borooah, 2001 [64].

4. Results

4.1. Descriptive statistics

The percentage of participants who only provided negative responses to the items of the Latin American & Caribbean Household Food Security Scale (ELCSA), which indicates food security, was 69.5% [64.5-74.2] for households without children under 18 years old and 49.9% [43.7-56.2] for households with children. Considering these results the percentage of people experiencing food security in Montevideo can be estimated as 60.8% [56.8-64.7].

Figure 1 shows the percentage of affirmative responses to each of the items of the ELCSA scale. As expected, items related to less severe aspects of food insecurity (e.g. Item 1, worried about running out of food) showed a higher percentage of affirmative responses that items associated with severe food insecurity (e.g. a children of 18 years of age felt hungry but couldn't eat). Besides, for the same severity children- related items tended to have a lower percentage of affirmative responses than adult-related items. For example, the percentage of affirmative responses for the item related to feeling hungry but being unable to eat was 11.2 for adults and 5.2 for children under 18 years of age (Figure 1).

Figure 1. Percentage of affirmative responses to each of the items of the Latin American & Caribbean Household Food Security Scale (ELCSA). The full wording of the items is shown in Table 1.
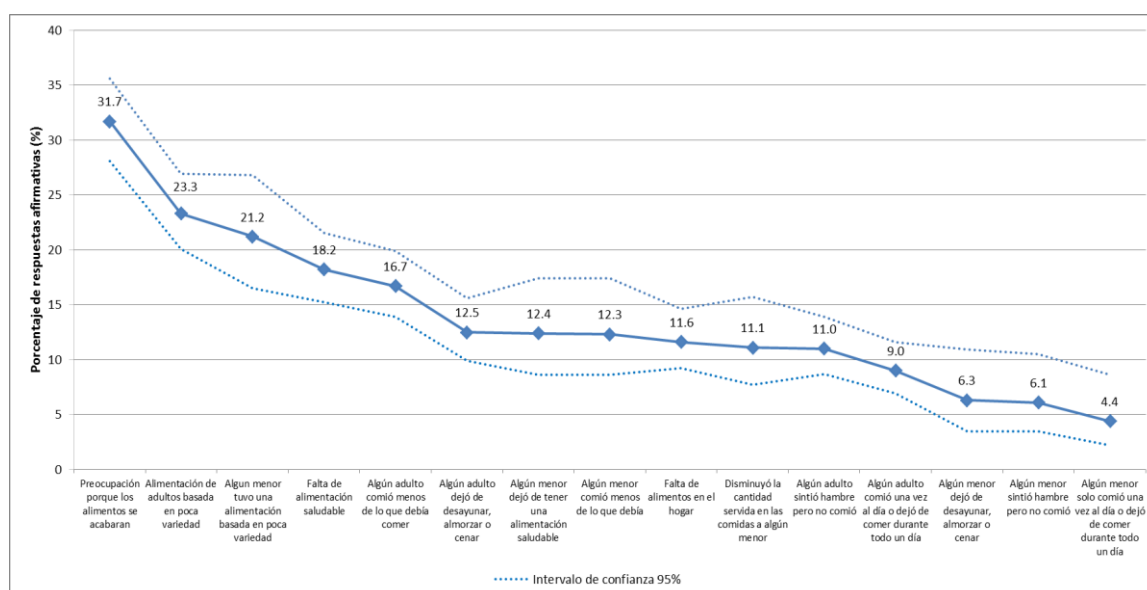
4.2. Factor analysis

Exploratory factor analysis was used to evaluate the factor structure of the ELCSA. Parallel analysis indicated 2 that the optimal solution contained 2 factors for households without children under 18 years of age. As shown in Table 3, Factor 1 was correlated to items related to lack of food in the household, which indicate moderate/severe food insecurity. Factor 2 was correlated to items related to worry about running out of food and items related to lack of a wholesome and healthy diet, which associated with mild food insecurity.

Table 3. Factor loadings of the **i**tems of the Latin American & Caribbean Household Food Security Scale (ELCSA) for households without children under 18 years of age.

Item	Factor 1*	Factor 2*
1	0.18	**0.52**
2	**0.72**	0.14
3	0.07	**0.78**
4	-0.04	**0.83**
5	**0.85**	-0.04
6	**0.59**	0.31
7	**0.75**	0.05
8	**0.80**	-0.13
% explained variance	38%	24%

*Factor loadings higher than 0.40 are highlighted in bold

In the case of households with children under 18 years of age, three factors were identified (Table 4). Factor 1 was identical for these households was identical to Factor 1 for households without children (cf. Table 3), being related to terms associated with lack of food for the household. Factor 3 was correlated to the items that denote mild food insecurity (i.e. worry about running out of foods and balanced diet). Factor 2 was related to the items associated with lack of food for the children, indicating severe food insecurity. It is interesting to note that although the item related to lack of healthy diet in the household (item 3, cf. Table 1) was correlated to terms related to diet quality, the item denoting lack of healthy food for the children (item 9, cf. Table 1) was correlated with items that indicate lack of food for the children.

Table 4. Factor loadings of the items of the Latin American & Caribbean Household Food Security Scale (ELCSA) for households without children under 18 years of age.

Item	Factor 1*	Factor 2*	Factor 3*
1	0.34	-0.07	**0.45**
2	**0.73**	-0.01	0.15
3	0.26	-0.03	**0.65**
4	-0.02	0.01	**0.84**
5	**0.78**	0.14	-0.04
6	**0.65**	-0.05	0.29
7	**0.72**	-0.04	0.11
8	**0.78**	0.1	-0.17
9	0.05	**0.44**	0.39
10	0.02	0.23	**0.70**
11	-0.07	**0.88**	0.05
12	0.29	**0.52**	0.12
13	0.26	**0.42**	0.24
14	0.14	**0.48**	0.03
15	0.07	**0.80**	-0.08
% explained variance	25%	19%	18%

*Factor loadings higher than 0.40 are highlighted in bold

4.3. Influence of socio-demographic characteristics on the different dimensions of food insecurity

A probit model was estimated in order to determine the impact of some individual and household characteristics on each of the dimensions of food insecurity described above.

Results for intermediate (Factor 1) and mild food insecurity (Factor 2) for households with no children under 18 are presented in Table 5, whereas estimations for intermediate (Factor

1), severe insecurity (Factor 2) and mild food insecurity (Factor 3) for households with children under 18 years old are presented in Table 6.

For households composed exclusively of adults, the estimations for Factor 1, corresponding to intermediate insecurity, showed that the probability of experiencing a situation of intermediate insecurity declined with the age and educational level of the respondent, when the family owned their house, and when the household had an appropriate place for cooking (Table 5). Having an appropriate place to cook (kitchen) reduces 23 percentage points (pp) the likelihood of intermediate insecurity.

Likelihood of experiencing intermediate food insecurity increased when the household received food assistance through special programs and as the level of deprivation increased (Table 5). The variables that attempted to capture household income were the most important to determine intermediate household food insecurity. In particular, owning the house decreased the risk of being in a situation of intermediate food insecurity 7 pp, whereas deprivation increased intermediate food insecurity by 41 pp. Besides, being covered by state programs, which already shows vulnerability in terms of revenues, increased the probability of food insecurity in 38 pp.

In the case of Factor 2, which indicates mild food insecurity, the probability of experiencing insecurity slightly increased when the respondent was female compared to male (8 pp), and as the level of deprivation increased (38 pp). On the other hand, mild food insecurity was reduced with the years of education of the respondent and if the household had an appropriate cooking place.

Table 5. Coefficients and marginal effects of probit model estimation for households without children under 18 years

Dependent Variables	Factor 1 (Severe/ intermediate food insecurity)		Factor 2 (Mild food insecurity)	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Gender (Female)	0.108		0.255 *	0.083
	(0.178)		-0.149	-0.049
Age	-0.011 **	-0.002	-0.005	
	(0.005)	(0.001)	(0.004)	
Years_educ	-0.043 *	-0.008	-0.038 **	-0.013
	(0.024)	(0.004)	(0.019)	-0.006
Numb_adults	0.072		-0.122	
	(0.101)		(0.088)	
Rooms_per_capita	0.305		-0.297	
	(0.223)		(0.206)	
Cooking_place	-0.843 **	-0.234	-0.817 *	-0.309
	(0.424)	(0.154)	(0.463)	-0.181
Homeowner	-0.345 *	-0.067	-0.090	
	(0.198)	(0.041)	(0.168)	
Food_programs	1.242 ***	0.384	-	-
	(0.426)	(0.166)	-	-
Privation	2.219 ***	0.407	1.165 **	0.381
	(0.584)	(0.115)	(0.485)	-0.159
Constant	-0.171		1.058	
	(0.803)		(0.659)	
Observations	418		406	

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

In the case of households with children under 18, the probability of severe, intermediate and mild were reduced with the level of education of the respondent (5pp intermediate, 2 pp severe and 3 pp for mild). Meanwhile, the chance of intermediate and severe insecurity increased with the number of children in the household and with the level of deprivation. The number of children in the household increased the likelihood of severe and moderate food insecurity between 6 pp and 7 pp, whereas it did not significantly affect likelihood of experiencing mild insecurity.

Mild, moderate and severe food insecurity were markedly related to the level of deprivation, being the variable with the largest influence. As shown in Table 6 increased with the level of deprivation. As shown in Table 6 likelihood of experiencing food insecurity increased between 31 pp and 63 pp with privation.

Table 6. Coefficients and marginal effects of probit model estimation for households with children under 18 years

Dependent Variables	Factor 1 (Moderate food insecurity)		Factor 2 (Severe food insecurity)		Factor 3 (Mild food insecurity)	
	Coefficients	Marginal Effects	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Gender (Female)	0.041		0.128		0.116	
	(0.196)		(0.205)		(0.176)	
Age	-0.009		0.004		0.000	
	(0.009)		(0.008)		(0.008)	
Years_educ	-0.171 ***	-0.050	-0.092 **	-0.019	-0.075 ***	-0.030
	(0.039)	(0.009)	(0.039)	(0.007)	(0.023)	(0.009)
Numb_adults	0.032		0.131		0.081	
	(0.102)		(0.109)		(0.089)	
Numb_child	0.255 **	0.074	0.277 ***	0.057	0.131	
	(0.103)	(0.032)	(0.098)	(0.023)	(0.099)	
Homeowner	-0.186		-0.301		-0.082	
	(0.196)		(0.212)		(0.182)	
Rooms_per_capita	0.700		0.288		-0.427	
	(0.578)		(0.602)		(0.560)	
Cooking_place	-0.051		-0.148		-0.100	
	(0.366)		(0.354)		(0.413)	
Food_programs	0.074		0.089		0.193	
	(0.299)		(0.249)		(0.254)	
Privation	1.646 ***	0.478	1.500 **	0.308	1.573 **	0.628
	(0.620)	(0.187)	(0.676)	(0.148)	(0.670)	(0.267)
Constant	0.164		-1.469		0.253	
	(0.996)		-1.026		(0.809)	
Observations	295		297		296	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Discussion

Food insecurity in Montevideo, with its corresponding 95% confidence interval, was estimated as 39%, which indicates that food insecurity is still an important problem. As expected, the prevalence of food insecurity was similar to that reported in other [39] but similar to reports from other Latin American countries, such as Brazil [40], Colombia [41-42], Venezuela [43], Argentina [44], but much higher than that reported in developed countries such as Canada, France, New Zealand or United States [30, 33, 45-48]. Although the number of undernourished people in Latin America and the Caribbean has decreased to less than a half, meeting the Millennium Development Goal and the World Food Summit, hunger still affects more than 34 million people in Latin America (FAO, 2015). Differences between countries in the prevalence of food insecurity have been explained by the influence of socio-economic factors, public policies and social assistance programs [49, 50].

Food insecurity was significantly higher in households with children than in those without. Having children in the household increased the prevalence of food insecurity by 28% when there were children in the households, in agreement with other studies conducted in Canada and USA [48]. The higher prevalence of food insecurity in households with children to food insecurity in Montevideo can be explained by the high prevalence of poverty among children. In 2014 the percentage of children living under poverty conditions in Uruguay was 20%, while poverty prevalence among adults aged 65 years and over it was only 2% [51].

Affirmative responses to the individual items of the ELCSA scale decreased with their severity (Figure 1), as expected [21]. The percentages of affirmative responses were similar to those reported five years ago by Pérez-Escamilla et al. [25]. Although Uruguay lacks of a routine national monitoring of food insecurity, results from the present work suggest that household food insecurity has not decreased since 2006. This result was not expected since Uruguayan economy has experienced a steady growth in the last ten years, which has been accompanied by social policies aimed at reducing poverty [34]. In this sense, it is important to stress that hunger is not only a result of lack of food but it is also related to inequalities in the mechanisms of food distribution and lack of access to better living conditions [52]. Rivera et al. have reported that improvement in income did not lead to an improvement in the quality and variety of foods [53]. Therefore, public policies aimed at reducing food insecurity should improve income distribution in the country but also provide additional

support to vulnerable families. An increase in social support and nutritional education in vulnerable households can contribute to reducing food insecurity [54].

For the same severity, the percentage of affirmative responses was higher for items related to adults than to items related to children, in agreement with the assumption that children are usually protected within the household and that they are usually the last to experience food insecurity [54]. In this sense, it is interesting to highlight that the item denoting lack of healthy food for the children was correlated with the factor which indicates intermediate food insecurity (Table 4).

The factorial structure of the ELCSA scale was assessed using exploratory factor analysis. The optimum solution identified two independent factors in the ELCSA scale when it was applied to households without children under 18, and three independent factors when it was applied to households with children. As shown in Tables 3 and 4, the factors grouped the items of the ELCSA scale in different severity levels, mild and moderate in households composed only of adults, and mild, moderate and severe in households with children. These results are in agreement other studies conducted in Latin American countries when using different scales to measure household food insecurity [43, 55-57]. Therefore, the complex construct of food insecurity seems to be multidimensional, being composed of different independent dimensions related to its severity. The consideration of these separate dimensions may enable a better understanding of the determinants of food insecurity in different populations.

In the present work a probit model was used to model the influence of socio-demographic characteristics of the respondents and the households on the identified dimensions of food insecurity (Table 2). Although the influence of socio-demographic variables varied among the dimensions of the ELCSA scale, the deprivation index, which was a proxy variable to measure household income, was the strongest predictors of all the dimensions of food insecurity (Tables 5 and 6). Research in different countries has shown that household income is strongly negatively associated with household income [33, 47, 49, 58, 59]. This result is consistent with the definition of food insecurity [1], as insufficient income is expected to prevent individuals from getting enough food to meet their physiological and psychological needs. According to Sarlio-Lähteenkorva & Laherlma [58] past economic disadvantage also positively contributes to food insecurity, particularly mild food insecurity as it increases worries and fears of running out of food. This result stresses the

importance of implementing social programs aimed at increasing the availability of money for food purchase in vulnerable households. In this sense, it is interesting to highlight that results showed that severe and intermediate food insecurity was higher in those households that received social food programs (Table 5), which indicates that these programs are being adequately targeted at the most vulnerable population.

Regarding the individual characteristics of the respondents, educational level was the strongest predictor of household food insecurity, in agreement with several studies that show that the most vulnerable people to food insecurity has usually the least number of years of education [33, 40, 49, 60]. The negative association between education and food insecurity can be explained considering that lower educational levels are usually negatively associated to income and social status.

Regarding gender, it only significantly increased influenced responses to the mild food insecurity dimension of the ELCSA scale in households without children (Table 5). The greater vulnerability of women to food insecurity has been reported by several authors, who have attributed it to family composition and the fact that women tend to deprive themselves to protect their children [33, 40, 47, 48, 61, 62]. However, Hadley et al. [63] argued the existence of gender bias to the questions included in the food insecurity scales. According to these authors differences between males and females can be explained considering differences in tolerance to stress. This explanation seems plausible as females are in charge of food preparation in most households. In this sense, results from the present work sum up to this hypothesis by showing that gender differences were only observed for the dimension of food insecurity related to worrying about running out of food. Further research on the influence of personal characteristics on responses to household food insecurity scales may contribute to develop guidelines on how to select respondents in surveys to accurately estimate the prevalence of food insecurity.

6. Conclusions

The present study showed that food insecurity affects a considerable proportion of the population in Montevideo, Uruguay. The percentages of affirmative responses to the items of the scale were similar to those reported in the literature five years ago, which suggests that the reduction of poverty experienced in the same period did not lead to a decrease in

food insecurity. This result stresses the need to perform national routine studies aimed at measuring the prevalence of household food insecurity and identifying its causes. Besides, public policies based on comprehensive visions of the food system seem necessary to improve access to adequate quantity and quality of food.

Two independent dimensions were identified in the ELCSA scale, which suggests that the influence of socio-demographic variables on each separate dimension may provide a more accurate understanding of the determinants of the different severity levels of food insecurity. Household income had the largest influence on responses to all the dimensions, which indicates a strong relationship between income and food insecurity. Further research should be conducted to improve our understanding of the variables that can reduce vulnerability to food insecurity in the Uruguayan context and to identify the most effective public policies that can help to cope with this problem.

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