

# **SOURCES OF NUTRITION INFORMATION OF CHILEAN SCHOOLERS, METROPOLITAN REGION, CHILE, SURVEY 1986-1987**

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## **SUMMARY**

The purpose of the present study was to determine the relative importance of different sources of nutrition information used by Chilean schoolers to learn the basics of nutrition. In this respect, a representative sample of 4,509 elementary and high-school children was randomly selected and stratified according to grade, sex, type of school and geographic area. Schoolers were individually interviewed in order to collect data related with socioeconomic status (SES) and sociocultural conditions, as well as to learn as to what they considered to be the most important sources of nutrition information influencing their nutritional learning, gathering the necessary data through a questionnaire especially designed for this purpose.

Results indicated that 87.8% schoolers mentioned their family (mainly the mother), as the most important source of nutrition information; 10.7% said the school teacher, and 1.5%, mass media (0.8% television, 0.5% books, 0.1% magazines and 0.1% radio) without significant differences by sex, age and geographic area. The role attributed to the family (mother) was important in all SES categories, but proved to be significantly higher in the high SES group (91.9%) than in the low SES group (84.6%). The role attributed to the school teacher, in contrast, was lower (6.7%) in the high SES

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group than in the low SES group (13.8%) ( $p < 0.001$ ). In relation to mass media, the influence attributed to books and magazines was high in the high SES group, but television and radio were more important in the low SES group. On the other hand, significant differences found by type of school were related to SES.

These findings could be useful in the establishment of food and nutrition policies, as well as in educational planning focused on the Chilean school population, considering that few studies have been carried out along these lines.

## INTRODUCTION

Recent findings have underlined that family (particularly the mother), school teacher and television are the most important sources of nutrition education influencing the nutritional learning of students enrolled in elementary first grade; the impact of socioeconomic conditions and sex was outstanding (1).

The mother's role, as educational agent in the nutrition education area, is important in all socioeconomic strata (SES), being significantly higher in the high SES children, probably because of their upper schooling level. On the other hand, in the low socioeconomic status, although their role is high, this decreases, teacher and mass media occupying now an important place (1).

Of all mass media, television, books and radio were pointed out as the most important sources of nutrition information for children, but television was the most outstanding (1). These findings are similar to those reported by other investigators in studies which involve the elderly population sector. Television and radio have been identified as the main educational factors for this age group (2).

In Chile, during the last years, important advances in the coverage of the educational system, have been made, since 95.4% of children in school age enroll in elementary first grade. In elementary and high school, approximately 70% and 40% of the schoolers enrolled in both educational levels, respectively, graduate (3). From this perspective, and as mentioned previously, the school teacher's role acquires more and more importance throughout the formal educational process, as source of nutrition education and information.

The purpose of the present study was to determine the relative importance of different sources of nutrition information, used by Chilean elementary and high school students and to learn the status of the subject nutrition by socioeconomic status, sex, age, type of school and geographic area.

## MATERIAL AND METHODS

### *Sample Selection*

The population, 523,158, comprised all schoolers who were enrolled in grades I, II, IV, VI and VIII of elementary school, and grades I and IV of high school from the Metropolitan Region of Chile in 1986-1987. Children belonged to public, private subsidized and private non-subsidized schools, and to urban and rural areas. The sampling plan was designed so as to yield approximately 1% of the student population. The representative and proportional sample

vada en el consumo de la mayoría de los alimentos. Ya en 1987 la situación era más definida, encontrándose los primeros cambios en el patrón alimentario, y un deterioro importante en la adecuación nutricional de la dieta del costarricense.

Pareciera ser, en todo caso, que los efectos de la crisis económica en la disponibilidad de alimentos, se dan con una respuesta "tardía", como algunos autores proponen (10, 11), ya que la encuesta de 1982 no llegó a detectar los importantes cambios encontrados en este estudio. Queda por ver si los hallazgos observados en 1987 son representativos de la situación actual de población, o si son las últimas consecuencias de la crisis económica que ha vivido el país a partir de 1980. Esto sólo podrá aclararse mediante una vigilancia estricta y constante de la situación alimentaria y nutricional, diseñada adecuada y eficientemente para identificar los grupos o sectores a riesgo, y para evaluar los programas ya existentes.

## SUMMARY

### EVOLUTION OF THE FOOD INTAKE AND NUTRITIONAL STATUS IN THE METROPOLITAN AREA OF SAN JOSE, COSTA RICA

Evolution of food and nutrient intake patterns in urban San José, Costa Rica, during the last decade, was studied comparing data from the last two national surveys (1978, 1982) and 1987 data obtained from 51 families previously included in the 1982 survey.

Total food and nutrient intake was found to be similar to the 1982 results, although the pattern was altered, with a substantial decreased contribution of milk products to both energy and protein intakes. A small but constant decrease in the intake of more than half of the foods registered was also observed. Nevertheless, the nutritional adequacy of energy (from 100 to 78%), retinol (from 83 to 69%), riboflavin (from 94 to 63%), iron (from 106 to 69%) and niacin (from 103 to 81%), were found to be significantly lower than in previous years.

The findings herein reported suggest that the effects of the economic crisis initiated in 1980 on food availability, could well be showing a time lag.

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consisted of 4,509 schoolers, and was randomly chosen, and stratified according to grade, sex, type of school and geographic area. Schoolers were selected from grades II, IV, VI and VIII of elementary school, and grade IV of high school. This selection was done because they represent the end of each subcycle and the objectives pursued by the elementary and high school curriculum program from the Ministry of Education of Chile which have been formulated for each subcycle. Therefore, at the end of each subcycle those objectives could be evaluated. On the other hand, grade I of elementary and high school were chosen because the present investigation is part of a major study underway, the finality of which is to quantify the impact of food and nutritional status of Chilean schoolers on educational achievement and school desertion, according to which, a 12-year follow-up study will be carried out. The sample was calculated with 95% of reliability and with 5% of error. Schoolers aged 6-22 years were included. The survey was carried out during the period 1986-1987 in 13 schools belonging to eight communes from the Metropolitan Region of Chile. As a final comment, the sample is representative of the 38.0% of the Chilean school population.

### *Socioeconomic Study*

Socioeconomic status (SES) was determined through a socioeconomic scale which includes schooling, occupation of the household head and housing (conditions, property, water supply, sanitation and goods), information that was requested from the family members (4).

### *Sources of Nutrition Information*

Information sources on nutritional matters were identified through a questionnaire especially designed, where schoolers named and ranked them according to the importance attributed in relation to their learning of nutritional topics (nutritional contents from the curriculum programs of the Ministry of Education of Chile and nutrition knowledge and food habits acquired at home, through mass media exposure and from other sources). The questionnaire —based on 15 items (opened and closed)— was developed, evaluated, revised and applied by the researchers. The questionnaire was pilot tested on 310 schoolers for validity and reliability. Children were individually interviewed at school by the researchers in a room judged to be adequate for this purpose. In spite of the fact that field work was tiresome, data collection did not present any obstacles.

### *Statistical Analysis*

Data were analyzed through the chi-square test (5).

## RESULTS AND DISCUSSION

The order of importance assigned to the nutrition information sources is indicated in Table 1. As the data reveal, 99.0% of the schoolers mentioned family as the most important source, through which they learn about nutrition; the second place was assigned to the school teacher (66.3%). In relation to mass media, television (54.0%), books (43.9%), magazines (40.6%), newspapers (36.7%), radio (36.5%) and cinema (28.0%) were mentioned in descending order of importance. In the first place, 87.8% of the schoolers indicated family as the most important source of nutrition information, 10.7% stated school teacher, and 1.5%, mass media (0.8% television, 0.5% books, 0.1% magazines and 0.1% radio). It is worthwhile underlining the fact that a very low percentage of schoolers named guardian (0.02%), physician (0.07%), peers (0.04%) and housekeeper (0.04%) as source. Moreover, 2.1% were not influenced by any person.

**TABLE 1**  
**ORDER OF IMPORTANCE OF THE MAIN SOURCES OF NUTRITION**  
**INFORMATION OF CHILEAN SCHOOLERS**

Order of Importance	Family	Teacher	TV	Books	Maga- zines	News papers	Radio	Cine- Ma
Percentage of schoolers								
1	87.8	10.7	0.8	0.5	0.1	-	0.1	-
2	9.9	45.8	8.0	3.6	2.5	1.0	0.8	0.1
3	0.7	5.0	23.3	14.0	7.1	3.5	3.1	0.4
4	0.2	1.6	9.8	8.6	8.5	8.2	8.3	1.2
5	0.1	1.0	4.8	6.0	9.4	9.2	5.7	2.4
6	0.1	0.8	4.2	5.2	7.1	8.2	6.0	2.3
7	0.1	0.5	1.9	3.9	4.7	5.1	10.0	4.2
8.	0.1	0.9	1.2	2.1	1.2	1.5	2.5	17.4
Total	99.0	66.3	54.0	43.9	40.6	36.7	36.5	28.0

n = 4,132.

Note: More than one source could be chosen by the schooler.

The above-mentioned results are in agreement with our own previous findings and with those reported by other investigators (1, 6, 7). Nevertheless, and in contrast with other studies (6), in the present case, peers as source of nutrition information were named by a very low percentage of schoolers.

Figure 1 shows the most important family members named by schoolers as sources of nutrition information; 86.9% of the children indicated their mother as the most outstanding family member contributing to their nutri-

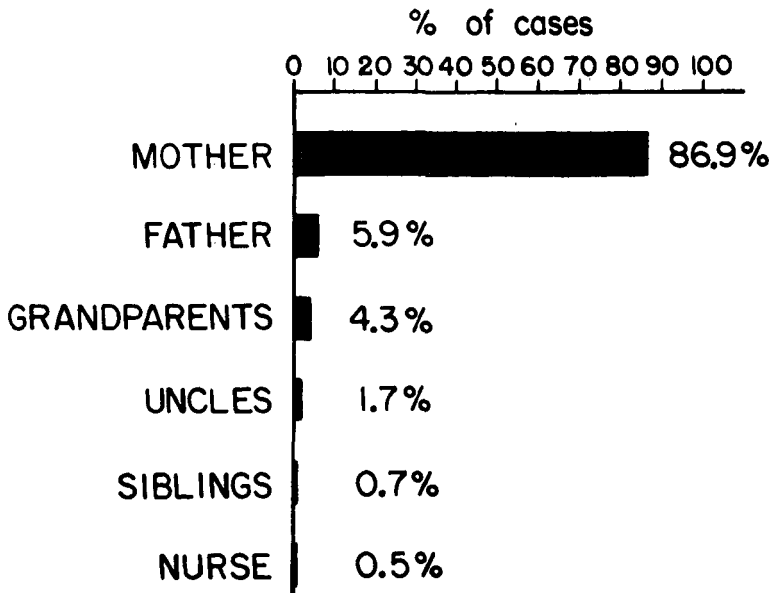


FIGURE 1

**Most important family members as sources of nutrition information of Chilean schoolers**

tional learning, followed by father (5.9%), grandparents (4.3%), uncles (1.7%), siblings (0.7%) and nurse (0.5%). Table 2 presents the distribution of family members mentioned as sources of nutrition information by categories of SES. As observed, 24.5%, 36.4% and 39.1% of the study sample pertained to high, medium and low SES, respectively. It can be appreciated that the mother's role is very high in all categories of SES, being significantly higher in the high SES children. This fact can be explained because of the high educational level of high SES schooler's mothers. In the low SES, besides the lower educational level of the mothers, we must consider a major family instability due to which, in some cases the mother (or other person) is the household head. In these cases, the mother's role as source of nutrition information is replaced by other relatives. Therefore, as Table 2 shows, the role of grandparents, uncles, and siblings significantly increased in low SES schoolers. The nurse as educational agent, and as was to be expected, by socioeconomic reasons had a significantly higher role in the high SES children.

The most important family members influencing the nutritional learning by type of school, are detailed in Table 3. Mother's role is significantly higher in schoolers from private non-subsidized schools, as compared to the other educational establishments. The other family members, except nurse, are more important in public and private subsidized schools, in spite of the fact that mother is the most important source of nutrition information. This fact

TABLE 2

**MOST IMPORTANT FAMILY MEMBERS AS SOURCES  
OF NUTRITION INFORMATION OF CHILEAN SCHOOLERS,  
BY SOCIOECONOMIC STATUS (SES)**

Family members	Percentage of Schoolers			
	High SES	Medium SES	Low SES	Total
Mother	89.5	88.4	83.8	86.9
Father	6.8	4.9	6.3	5.9
Others:				
Grandparents	1.5	4.5	5.9	4.3
Uncles	0.1	1.3	3.1	1.7
Siblings	0.5	0.8	0.9	0.7
Nurse	1.6	0.1	-	0.5
Total	100.0	100.0	100.0	100.0
Number of cases	985	1,459	1,568	4,012

$$X^2_0(4) = 41,535 > X^2_t(4) 0.001=18.460.$$

TABLE 3

**MOST IMPORTANT FAMILY MEMBERS AS SOURCES OF NUTRITION  
INFORMATION OF CHILEAN SCHOOLERS, BY TYPE OF SCHOOL**

Family members	Type of school			Total
	Public	Private subsidized	Private non-subsidized	
	Percentage of Schoolers			
Mother	84.4	88.5	91.2	86.9
Father	7.1	4.2	5.2	5.9
Others:				
Grandparents	5.1	4.7	1.5	4.3
Uncles	2.1	2.0	0.1	1.7
Siblings	1.0	0.6	0.3	0.7
Nurse	0.3	-	1.7	0.5
Total	100.0	100.0	100.0	100.0
Number of cases	2,039	1,247	726	4,012

$$X^2_0(4) = 32.648 > X^2_t(4) 0.001=18.460.$$

is strongly related to socioeconomic factors, since in private non-subsidized schools 77.9% and 22.1% of the schoolers belonged to high and medium SES, respectively. In this manner, medium and low SES schoolers attended mainly public and private subsidized schools. Thus, in public schools, 34.2% and 48.0% of the schoolers belonged to medium and low SES, respectively, these values being of 47.0% and 48.7%, in public and private subsidized schools, respectively. In conclusion the samples behavior, according to type of school, is more adequately explained by socioeconomic factors.

The main family members influencing the nutritional learning of Chilean schoolers, by sex, are depicted in Table 4. The mother and father's role was significantly higher in females and males, respectively, a fact which we think is due to some socialization patterns.

TABLE 4

**MOST IMPORTANT FAMILY MEMBERS AS SOURCES OF NUTRITION INFORMATION OF CHILEAN SCHOOLERS, BY SEX.**

Family members	Males	Females	Total
Mother	85.2	88.7	86.9
Father	7.0	4.7	5.9
Others:			
Grandparents	5.0	3.7	4.3
Uncles	1.6	1.8	1.7
Siblings	0.8	0.6	0.7
Nurse	0.4	0.5	0.8
Total	100.0	100.0	100.0
Number of cases	2,053	1,959	4,012

$$X^2_0(2) = 11,771 > X^2_t(2) 0.001 = 9.21.$$

Table 5 indicates the most important family members as sources of nutrition information for Chilean schoolers, by age. Mother's role positively and significantly increased with age, at the same time that the importance of other family members' role decreased. This finding is explainable, since the majority of mothers (72.5%) were housekeepers, and thus were fully dedicated to children's needs, in all age groups. Due to the fathers' working duties, they spent less amount of time dedicated to their children. Importance of the other family members decreases with age, probably on account that adolescents tend to be more independent, and besides, some of these members died.

TABLE 5

**MOST IMPORTANT FAMILY MEMBERS AS SOURCES OF NUTRITION  
INFORMATION OF CHILEAN SCHOOLERS, BY AGE**

Family members	Age (yr)				Total
	6-9	10-13	14-17	> 18	
	Percentage of Schoolers				
Mother	81.1	87.3	92.5	95.8	86.9
Father	9.3	4.9	3.1	3.2	5.9
Others:					
Grandparents	5.5	5.1	2.4	0.7	4.3
Uncles	2.2	1.7	1.5	0.3	1.7
Siblings	1.0	0.8	0.4	-	0.7
Nurse	0.9	0.2	0.1	-	0.5
Total	100.0	100.0	100.0	100.0	100.0
Number of cases	1,392	1,442	893	285	4,012

$$X^2_0(6) = 93.05 > X^2_t(6) 0.001 = 22.46.$$

On the contrary of what was to be expected, no difference was found in the main family members as sources of nutrition information by geographic area, by which, family member's behaviour was the same, whether in the urban or rural areas.

Such as shown in Table 1, the most important sources of nutrition information (mentioned in first place) were family (87.8%), followed by school teacher (10.7%), television (0.8%), books (0.5%), magazines (0.1%) and radio (0.1%). Table 6 details these sources by categories of SES. The family's role is significantly higher in high SES schoolers, compared with medium and low SES children. On the other hand, the school teacher's role is significantly higher in the low SES schoolers compared to those belonging to the high SES group (6.7%). In relation to mass media, these were mentioned by very few schoolers (1.5%), although TV and radio were important in the low SES, and books and magazines in the high SES, and without important changes by socioeconomic strata. In the high SES, family schooling levels were significantly higher, while in the low SES, deficiencies in family nutrition knowledge (especially the mother) are compensated by the school teacher and mass media. These results are similar to those informed in a previous report (1). Furthermore, these data confirm the importance of the school teacher as source of nutrition information, since as mentioned earlier, it ranks in the second place of importance (Table 1), their role being particularly outstanding in the low SES. In other words, these findings would suggest the need of teacher further training, because of the deficiencies found in the school teacher's nutrition knowledge (8).

TABLE 6

**MOST IMPORTANT SOURCES OF NUTRITION INFORMATION  
(MENTIONED IN FIRST PLACE) OF CHILEAN SCHOOLERS  
BY SOCIOECONOMIC STATUS (SES)**

Sources of nutrition information	High SES	Medium SES	Low SES	Total
Family	91.9	88.5	84.6	87.8
Teacher	6.7	10.0	13.8	10.7
Mass media				
Television	0.4	0.8	0.9	0.8
Books	0.7	0.6	0.3	0.5
Magazines	0.3	0.1	0.1	0.1
Radio	-	-	0.3	0.1
Newspapers	-	-	-	-
Cinema	-	-	-	-
Total	100.0	100.0	100.0	100.0
Number of cases	1,000	1,495	1,637	4,132

$$X_0^2(4) = 34.111 > X_1^2(4) 0.001 = 18.46.$$

Table 7 presents the most important sources of nutrition information (mentioned in first place) used by schoolers to learn nutrition by type of school. As said previously, sample behavior —according to type of school— is more properly explained by socioeconomic factors. In relation to sex, age and geographic area, no significant differences were found.

In summary, findings of the present study underline the importance of mother's role in the nutritional learning of the Chilean school population. This fact suggests the need of carrying out a diagnosis of mother's nutrition knowledge with the finality of implementing further training programs especially focused on them. In this context, our results are outstanding, considering that some investigators have confirmed that nutritional behavior of schoolers improves as a result of a parent nutrition education program (9). Additionally, research has shown that many parents possess limited nutrition knowledge and even parents who are knowledgeable about nutrition often fail to encourage their children to eat nutritious food and to develop adequate food habits (10, 11).

On the other hand, of no less importance is the school teacher's role, since it was pointed out, ranks in the second place of importance. Nevertheless, as stated previously, some authors emphasize that school teacher's nutrition knowledge is insufficient, thus emphasizing the need to evaluate this problem through a diagnostic study.

Results of the present investigation also reveal that in Chilean schoolers,

TABLE 7

**MOST IMPORTANT SOURCES OF NUTRITION INFORMATION  
(MENTIONED IN FIRST PLACE) OF CHILEAN SCHOOLERS,  
BY TYPE OF SCHOOL**

Sources of nutri- tion information	Type of school			Total
	Public	Private subsidized	Private non-subsidized	
Percentage of Schoolers				
Family	86.5	87.3	92.2	87.8
Teacher	11.9	11.0	6.6	10.7
Mass media				
Television	0.7	1.0	0.5	0.8
Books	0.5	0.5	0.5	0.5
Magazines	0.3	-	0.2	0.1
Radio	0.1	0.2	-	0.1
Newspapers	-	-	-	-
Cinema	-	-	-	-
Total	100.0	100.0	100.0	100.0
Number of cases	2,083	1,305	744	4,132

$$X^2_0(4) = 17.577 > X^2_1(4) 0.01 = 13.280.$$

television is an important source of learning about nutrition. In this respect, television has been recognized as a powerful instrument for solving nutrition education problems (12-20).

Considering that, in Chile, 98% of the population has access to television, an important fact to consider is the insufficient use made of this mass media, classified in the third place of importance, as a vehicle of nutrition education for the Chilean population; thus, it should be taken in consideration in any food and nutrition education planning program.

## RESUMEN

### FUENTES DE INFORMACION NUTRICIONAL DE ESCOLARES CHILENOS. REGION METROPOLITANA, CHILE, 1986-1987

El objetivo del presente trabajo fue determinar la importancia relativa de diferentes fuentes de información nutricional utilizadas por los escolares chilenos para aprender nutrición. Con tal propósito se seleccionó una muestra representativa de 4,509 alumnos de enseñanza básica y media de la Región Metropolitana de Chile, en

forma aleatoria y estratificada de acuerdo al curso, sexo, tipo de colegio y área geográfica. Los escolares fueron entrevistados individualmente utilizándose un cuestionario especialmente diseñado con el fin de obtener la información relativa al nivel socioeconómico (NSE), a las condiciones socioculturales y a las fuentes de información que afectan su aprendizaje de contenidos nutricionales.

Los resultados revelaron que 87.8% de los escolares mencionó a la familia (principalmente a la madre) como la fuente de información más importante en relación al aprendizaje de contenidos nutricionales; 10.7% señaló al maestro y 1.5% a los medios de comunicación de masas (0.8% televisión, 0.5% libros, 0.1% revistas y 0.1% radio), no constatándose diferencias significativas por sexo, edad y área geográfica. A pesar de que el rol de la familia fue muy importante en todos los niveles socioeconómicos, su importancia decreció significativamente de 91.9% en el NSE alto a 84.6% en el NSE bajo, observándose una relación inversa respecto al profesor (6.7% NSE alto y 13.8% NSE bajo). En cuanto a los medios de comunicación de masas, el impacto de los libros y revistas fue mayor en el NSE alto, pero la televisión y la radio fueron más importantes en el NSE bajo. Por otra parte, las diferencias significativas encontradas por tipo de colegio se debieron al nivel socioeconómico.

Estos resultados pueden ser relevantes para una política alimentaria y nutricional, así como en la planificación educacional dirigida a la población escolar chilena, considerando que son pocas las investigaciones referentes a esta materia.

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