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Diet quality and associated factors among elementary school students of the Adventist school system in the Southwest region of São Paulo, Brazil

Calidad de la dieta y factores asociados en estudiantes de la escuela primaria del sistema educativo Adventista en la región suroeste de São Paulo, Brasil

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— **ABSTRACT: Objective:** to evaluate the association between diet and socioeconomic and demographic factors among elementary school students. **Methods:** A cross-sectional study, involving a random sample of 256 children of both genders, aged between six to eleven years, from grades first through fifth of seven Adventist elementary private schools located in the southwest region of São Paulo State. These schools enroll students independent of their religion. Socioeconomic and demographic data were obtained through a self-administered questionnaire sent home and completed by the parent or legal guardian. The diet quality was assessed through ALES index. Crude and adjusted odds ratios were calculated and logistic regression was used to analyze the variables. **Results:** Of the sample, 33.2% showed a poor ALES index score and 66.8% had a good score. There were no statistically significant differences between diet quality and the following variables: age, socioeconomic status, maternal level of education, head of household, maternal employment outside the home, exclusive breastfeeding up to 6 months, and origin of school snacks. The variables that remained associated with a good diet quality were: being female (OR = 0.53; 95% CI, 0.30-0.92) and being Adventist (OR = 2.52; 95% CI, 1.10-5.78). **Conclusions:** The factors associated with good diet quality were gender and religion.

— **Keywords:** Diet, food, and nutrition; eating; child nutrition; socioeconomic factors; students; São Paulo, Brazil; Brazil.

— **RESUMEN: Objetivo:** evaluar la asociación entre la dieta y factores socioeconómicos y demográficos entre los estudiantes de la escuela primaria. **Métodos:** Un estudio transeccional que involucra una muestra aleatoria de 256 niños de ambos sexos, de seis a once años, del primero a quinto grado de siete escuelas adventistas ubicados en la región suroeste de Sao Paulo. Estas escuelas inscriben estudiantes sin importar su religión. Datos demográficos y socioeconómicos se obtuvieron a partir de un cuestionario autoadministrado, llevado a casa y completado por el padre o responsable del niño. La calidad de la dieta se evaluó mediante el índice de ALES. Se calcularon las odds ratio brutas y ajustadas y se utilizó la regresión logística para el análisis de las variables. **Resultados:** De la muestra, 33,2% tuvo una puntuación pobre en el índice ALES y el 66,8% obtuvo una buena puntuación. No hubo diferencias significativas entre la calidad de la dieta y las siguientes variables: edad, nivel socioeconómico, educación maternal, jefe de la familia, trabajo materno fuera del hogar, lactancia materna exclusiva hasta los 6 meses, y el origen de las meriendas escolares. Las variables que se mantuvieron asociadas a una dieta de buena calidad fueron: ser del sexo femenino (OR = 0.53; 95% IC, 0.30-0.92) y ser Adventista (OR = 2.52; 95% IC, 1.10-5.78). **Conclusión:** Los factores asociados con la buena calidad de la dieta fueron el sexo y la religión.

— **Keywords:** Nutrición, alimentación y dieta; ingestión de alimentación; nutrición del niño; factores socioeconómicos; estudiantes; São Paulo, Brasil; Brasil.

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1. Introduction

Adequate food intake becomes an essential factor to promote and ensure a proper growth and development, especially in elementary school-age children, where energy expenditure increases, food intake becomes greater and eating habits are being formed which may persist through adulthood (Fagioli & Nasser, 2008; Rossi, Moreira, & Rauen, 2008). Food preferences of children are acquired from repeated experiences of consumption of certain foods. Genetic factors also play an important role in eating behaviors, which interferes with food preferences and over time passes through several environmental influences such as the type of feeding received in the first months of life, the timing of introduction of complementary foods, and positive and negative experiences regarding food through early infancy (Vitolo, 2008). During childhood, in addition to having little control over the environment they live in (for example, the domestic availability of foods), the child can undergo strong influences in relation to diet and physical activity from their parents and be subject to behavioral changes because of his/her insertion in the school environment (Mondini, Saldiva, Venâncio, Aguiar, & Setfanini, 2007).

In recent years, the diet quality of populations has been evaluated through dietary indexes and most of these have been developed in the United States and adapted and used in other countries (Volp, Alfenas, Costa, Minim, Stringueta, & Bressan, 2010). Intaking of certain food groups has been linked to body weight or diet quality; however, studies showing this association, evaluated through a diet quality index proposed for children are scarce (Kranz, Findeis, & Shrestha, 2008; Molina, López, Faria, Cade, & Zambonade, 2010b). Research conducted in the Brazilian cities of Vitória, Espírito Santo (Molina *et al.*, 2010b; Molina, Faria, Montero, Cade, & Mill, 2010a) and São Leopoldo, Rio Grande do Sul (Raubert, Louzada, & Vitolo, 2014), with schoolchildren from both public and private schools, found low diet quality scores, reflecting an eating pattern at odds with the recommendation.

According to Kranz *et al.* (2008), who studied American preschoolers, the increase of one year in child age was accompanied with the decrease of two points in the diet quality score. These findings may be explained by the growing independence in this stage where children begin to play a role in the selection of their own food. Florence, Asbridge, & Veugelers (2008), studying fifth grade students, demonstrated the association between academic performance and diet quality. Academic performance has an important impact on factors that influence future health outcomes. Their observations reinforce the need for school-based programs aimed to improve diet quality of children and, in the long term, their quality of life.

The identification of an inadequate diet and the variables associated in children enables the use of strategies such as early intervention in preventing poor habits from progressing and, as a result, reducing risk factors for chronic diseases (Caetano *et al.*, 2009; Kourlaba, Kondaki, Grammatikaki, Roma-Giannikou, & Manios, 2009; Momm &



Höfelmann, 2014). Socioeconomic, demographic and cultural factors have been associated with the quality of the diet. The Seventh-day Adventist church promotes healthy lifestyle habits including a diet rich in plant-based foods such as fruits and vegetables, whole grains, and nuts (Butler et al., 2008; Sabaté & Wien, 2010). The scientific search of religious diets is important to nutritionists, because it helps improve nutrition for those who decide to follow such diets and expands our overall understanding of diet and health (Sabaté, 2004). So far there are no studies in the literature on the diet quality of Brazilian children who attend the Adventist school system. The objective of the present study was to evaluate diet quality and associated factors among elementary school students of the Adventist school system in the Southwest region of São Paulo State, Brazil.



2. Methods

2.1. Study design

This cross-sectional study included a random sample of 256 students aged between six to eleven years, of both genders, enrolled in grades first through fifth of seven Adventist elementary private schools located in the southwest region of São Paulo. Students enrollment in these schools is independent of their religion, non-Adventists usually being around 20% of the students. Data were collected in March and April 2015, with a prior authorization from the schools.

The sample size was calculated by the total number of students of the seven schools ($n=1,850$), with a tolerable error between 5 - 10% (between 100 and 330 subjects). A minimum target sample size was set at 250 participants. In order to reach this goal, we sent 50 self-administered questionnaires to each of the seven Adventist schools, totaling 350 questionnaires. The questionnaires were taken home, completed by the parent or legal guardian of the child and returned to the school. Out of the 350 questionnaires, 10 questionnaires went to each grade (1st to 5th), randomly selecting 5 boys and 5 girls.

The structured questionnaire was used to collect socioeconomic and demographic factors which included: child gender, child age, socioeconomic class, maternal years of education (< 8 years, 9 - 11 years, or ≥ 12 years), maternal employment outside the home (yes/no), head of household (father/stepmother or mother), exclusive breastfeeding (< 6 months or ≥ 6 months), school snack (brought from home or purchased), and religion (Adventist or non-Adventist). Socioeconomic class was determined by the "Brazilian Economic Classification Criteria" (Associação Brasileira de Empresas de Pesquisa, 2010) which classifies families into 5 decreasing categories (A, B, C, D, or E), based on the following variables: tangible household characteristics (possession and quantity of durable goods, number of bathrooms, employment of domestic workers, and educational level of the head of household). Due to the small



number of families in higher and lower socioeconomic classes A (n=25) and D (n=1), respectively, participants were regrouped into two categories: A/B (high/medium socioeconomic level) and C/D (medium/low socioeconomic level).

2.2. Diet quality assessment

The diet quality of the students was evaluated through the ALES School Child Diet Index, proposed by Molina *et al.* (2010b), based on the recommended Dietary Guidelines for the Brazilian population (Ministério da Saúde, 2006). The development of the ALES index is derived from a study conducted with Spanish children and adolescents (Serra-Majem *et al.*, 2004). This instrument was validated and adapted to the Brazilian population through a study carried out with Brazilian elementary school children. This index is based on the frequency of consumption of 15 food items: raw vegetables, cooked vegetables, beans, fruits, dairy products (milk, yogurt, cheese), fish/seafood, natural fruit juice, French fries or fried cassava or fried banana, instant noodles, mayonnaise, hamburgers/hotdogs, soft drinks, fried snacks, candies, cookies, and the habit of eating breakfast daily. The individual frequency produces a summary score, which was analyzed according to the median of distribution. The index gives a positive and negative score according to the frequency of consumption of each food item.

After the sum of the individual score, the quality of the diet was classified as poor and good, taking the value (4) as a cutoff point, according to Molina *et al.* (2010b) and Michereff, Tachini, Mezadri, & Höfelmann (2014), who studied larger samples of Brazilian students. Scores ≤ 4 were considered poor, and scores > 5 were considered good.

2.3. Statistical analysis

Qualitative variables were shown in percentages, and the chi-square test (χ^2) was used to test the hypothesis of homogeneity of proportions. The level of significance was set at 5% ($p \leq 0.05$). Crude and adjusted odds ratios were calculated and logistic regression was used to analyze the significant variables. Good quality was taken as the reference category of the dependent variable: diet quality. Data were analyzed using the SPSS statistical package, version 17.0.

2.4. Ethical aspects

The research project was submitted and approved by the Adventist University of São Paulo Research Ethics Committee under protocol n° 892.625. Authorization for collection of data was provided through permission of the parent or legal guardian of the child by signing an informed consent form, which clarified the objectives of the study, as recommended by Resolution 466/12 of the Brazilian National Health Council. The study was financed by the Adventist school system in the Southwest region of São Paulo State, Brazil.



3. Results

Of the 350 questionnaires sent, 256 returned completed, representing a satisfactory response rate of 78%. Among the children, there was an even distribution of gender (50.4% female) and a mean age of 8.5 years (5.10 to 11.5 years). Most study participants belonged to higher social class (80.5%). Of the mothers, 75.4% worked outside of the home and the most frequent education years reported was 12 years or more. There was a predominance in families in which the head household was male (74%). Only 36.2% of the children received at least 6 months of exclusive breastfeeding and, among these, 75.0% scored a good diet quality. About 63% of school snacks were brought from home, and 37% purchased from the school. Eighteen percent of the student was Adventist and approximately 82% was non-Adventist (Table 1).

Overall, diet quality was poor in 33.2% of the studied children and good in 66.8%. Table 1 shows the socioeconomic and demographic characteristics of the studied population and their association with diet quality. There was a significant association between child's gender, time of exclusive breastfeeding, religion and diet quality; however, no significant differences were seen between child age, socioeconomic class, maternal level of education, maternal employment outside the home, head of household, origin of school snacks, and diet quality. Good diet quality was seen in 72% of the girls and 83% of the Adventist students (Table 1).

According to Table 2, the food/groups with higher proportion of consumption considered adequate among the total number of students (n=256) included natural fruit juice (90.6%), dairy (57.8%), beans (46.8%), and fruits (46.8%); these were predominantly consumed seven times/week. Fried snacks (94.5%); French fries/fried, banana/fried, and cassava (91.4%); soft drinks (83.9%); instant noodle (78.1%); cookies (72.3%); and sweets (56.2%) were mostly consumed either 0 to 1 times/week or rarely/never. The most inadequate food consumption among the total number of students was: cooked vegetables (77.3%), raw vegetable (55.1%), and fish/seafood (53.5%), mainly consumed from 0 to 4 times/week or rarely/never. The overall diet quality scores ranged from -4 and 16, with an average score of to 6.0 (SD= 3.7) and a median of 6.0.

**Table 1**

Difference of proportions observed between diet quality and associated factors in schoolchildren (n=256) from the Southwest region of *São Paulo*, Brazil, 2015

VARIABLE	Diet Quality						p-value
	Total		Poor		Good		
	n	%	n	%	n	%	
Sex							0.04
Male	127	49.6	50	39.4	77	61.4	
Female	129	50.4	35	27.1	94	72.1	
Age (years)							0.88
6-7	94	36.7	29	30.9	65	69.1	
8-9	91	35.6	31	34.1	60	65.9	
10-11	71	27.7	24	33.8	47	66.2	
Socioeconomic class							0.84
A/B	206	80.5	69	33.5	137	66.5	
C/D	50	19.5	16	32.0	34	68.0	
Maternal years of education							0.36
≤ 8 years	2	0.8	0	0.0	2	100.0	
9 to 11 years	114	44.5	42	36.8	72	63.2	
12 years or more	140	54.7	43	30.7	97	69.3	
Maternal employment outside the home							0.86
Yes	194	75.8	65	33.5	129	66.5	
No	62	24.2	20	32.3	42	67.7	
Head of household (n=243)							0.77
Father/Stepfather	182	74.9	56	30.8	126	69.2	
Mother	61	25.1	20	32.8	41	67.2	
Exclusive breastfeeding (n=254)							0.04
< 6 months	162	63.8	62	38.3	100	61.7	
≥ 6 months	92	36.2	23	25.0	69	75.0	
School snack (n=249)							0.87
Home	157	63.1	51	32.5	106	67.5	
Purchased	92	36.9	29	31.5	63	68.5	
Religion							0.01
Adventist	47	18.4	8	17.0	39	83.0	
Non-Adventist	209	81.6	77	36.8	132	63.2	

p-value based on chi-square test (χ^2)

Source: elaborated by the authors.

Table 2

Relative frequency (%) of food consumption and score for the components of the diet quality index among schoolchildren (n=256) from the Southwest region of São Paulo, Brazil, 2015

Variable	Score	n	(%)
Raw vegetable (times/week)			
0 - 4	-1	141	55.1
5 - 6	0	39	15.2
7	+1	76	29.7
Cooked vegetables (times/week)			
0 - 4	-1	198	77.3
5 - 6	0	26	10.2
7	+1	32	12.5
Beans (times/week)			
0 - 2	-1	43	16.8
3 - 6	0	93	36.3
7	+1	120	46.9
Fruits (times/week)			
0 - 2	-1	39	15.2
3 - 6	0	97	37.9
7	+1	120	46.9
Dairy: milk, yogurt, cheese (times/week)			
0 - 4	-1	76	29.7
5 - 6	0	32	12.5
7	+1	148	57.8
Fish/seafood (times/week)			
Rarely/never	-1	137	53.5
1	+1	119	46.5
Natural fruit juice (times/week)			
0 - 6	0	24	9.4
7	+1	232	90.6
French fries, fried cassava or fried bananas (times/week)			
0 - 2	+1	234	91.4
3 - 6	0	17	6.6
7	-1	5	2.0
Instant noodles (times/week)			
Rarely/never	+1	200	78.1
1 - 6	0	53	20.7
7	-1	3	1.2

Table 2...



Table 2...

Variable	Score	n	(%)
Mayonnaise/butter (times/week)			
Rarely/never	+1	81	31.6
1 - 6	0	124	48.4
7	-1	51	19.9
Hamburger/hot dog (times/week)			
Rarely/never	+1	101	39.5
1 - 6	0	154	60.2
7	-1	1	0.4
Soft drink (times/week)			
0 - 2	+1	215	84.0
3 - 6	0	30	11.7
7	-1	11	4.3
Fried Snacks (times/week)			
0 - 2	+1	242	94.5
3 - 6	0	14	5.5
7	-1	0	0.0
Sweets: candy, dessert (times/week)			
0 - 2	+1	144	56.3
3 - 6	0	90	35.2
7	-1	22	8.6
Cookies (times/week)			
0 - 2	+1	185	72.3
3 - 6	0	65	25.4
7	-1	6	2.3

Source: elaborated by the authors.

As shown in Table 3, when comparing the two groups (Adventist and non-Adventist) in relation to food frequency consumption, there was no statistically significant differences between the following foods/groups: raw and cooked vegetables, beans, fruits, dairy products, fish/seafood, natural juices, French fries/fried banana/fried cassava, instant noodles, mayonnaise/butter, soft drinks, fried snacks and cookies. However, the Adventist group showed a lower consumption of hamburgers ($p=0.05$) and sweets (candies/desserts) ($p=0.01$). Adventists also showed a tendency to have a lower intake of dairy products when compared to non-Adventist, although differences were not statically significant.

**Table 3**

Relative frequency (%) and significance levels of food consumption and score for the components of the diet quality index among Adventist and non-Adventist schoolchildren (n=256) from the Southwest region of São Paulo, Brazil, 2015.

Variable	Score	Total n	Adventist		non-Adventist		p-value	
			%	n	%	n		%
Raw vegetable (times/week)								
0 - 4	-1	141	55.1	19	40.4	122	58.4	0.08
5 - 6	0	39	15.2	9	19.1	30	14.3	
7	+1	76	29.7	19	40.4	57	27.3	
Cooked vegetables (times/week)								
0 - 4	-1	198	77.3	38	80.9	160	76.6	0.66
5 - 6	0	26	10.2	5	10.6	21	10.0	
7	+1	32	12.5	4	8.5	28	13.4	
Beans (times/week)								
0 - 2	-1	88	34.4	17	36.2	71	34.0	0.93
3 - 6	0	48	18.7	8	17.0	40	19.1	
7	+1	120	46.9	22	46.8	98	46.9	
Fruits (times/week)								
0 - 2	-1	39	15.2	4	8.5	35	16.7	0.27
3 - 6	0	97	37.9	17	36.2	80	38.3	
7	+1	120	46.9	26	55.3	94	45.0	
Dairy: milk, yogurt, cheese (times/week)								
0 - 4	-1	76	29.7	18	38.3	58	27.8	0.06
5 - 6	0	32	12.5	9	19.1	23	11.0	
7	+1	148	57.8	20	42.6	128	61.2	
Fish/seafood (times/week)								
Rarely/never	-1	137	53.5	31	66.0	106	50.7	0.58
>1	+1	119	46.5	16	34.0	103	49.3	
Natural fruit juice (times/week)								
0 - 6	0	183	71.5	32	68.1	151	72.2	0.58
7	+1	73	28.5	15	31.9	58	27.8	
French Fries, fried cassava or fried banana (times/week)								
0 - 2	+1	234	91.4	44	93.6	190	90.9	0.56
3 - 6	0	17	6.6	3	6.4	14	6.7	
7	-1	5	2.0	0	0.0	5	2.4	

Table 3...



Table 3...

Variable	Score	Total n	Adventist		non-Adventist		p-value	
			%	n	%	n		%
Instant noodles (times/week)								
Rarely/never	+1	200	78.1	38	80.9	162	77.5	0.64
1 - 6	0	53	20.7	8	17.0	45	21.5	
7	-1	3	1.2	1	2.1	2	1.0	
Mayonnaise/butter (times/week)								
Rarely/never	+1	81	31.6	18	38.3	63	30.1	0.18
1 - 6	0	124	48.4	24	51.1	100	47.8	
7	-1	51	20.0	5	10.6	46	22.0	
Hamburger/hot dog (times/week)								
Rarely/never	+1	101	39.5	26	55.3	75	35.9	0.05
1 - 6	0	154	60.1	21	44.7	133	63.6	
7	-1	1	0.4	0	0.0	1	0.5	
Soft drink (times/week)								
0 - 2	+1	215	83.0	43	91.5	172	82.3	0.30
3 - 6	0	30	11.7	3	6.4	27	12.9	
7	-1	11	4.3	1	2.1	10	4.8	
Fried Snacks (times/week)								
0 - 2	+1	242	94.5	45	95.7	197	94.3	0.92
3 - 6	0	14	5.5	2	4.3	12	5.7	
7	-1	0	0.0	0	0.0	0	0.0	
Sweets: candy, dessert (times/week)								
0 - 2	+1	144	56.2	35	74.5	109	52.2	0.01
3 - 6	0	90	35.2	8	17.0	82	39.2	
7	-1	22	8.6	4	8.5	18	8.6	
Cookies (times/week)								
0 - 2	+1	185	72.3	38	80.9	147	70.3	0.24
3 - 6	0	65	25.4	9	19.1	56	26.8	
7	-1	6	2.3	0	0.0	6	2.9	
Breakfast (daily)								
Yes	+1	225	87.9	39	83.0	186	89.0	0.25
No	-1	31	12.1	8	17.0	23	11.0	

Note: +1: positive food/group consumption frequency; -1: negative food/group consumption frequency.

Source: elaborated by the authors.



Table 4 shows the results of binomial logistic regression. Among the variables investigated, gender and religion remained associated with poor diet quality, even after adjusted analysis. In summary, girls were 47% less likely to have a poor diet quality, indicating a protective factor and non-Adventists had a 2.55 greater chance of having a poor diet quality.

Table 4

Crude and adjusted odd ratios (OR) and confidence intervals (CI) between diet quality and associated factors among schoolchildren from the Southwest region of São Paulo, Brazil, 2015.

Variable	Crude OR (95% CI)	p-value	Adjusted OR* (95% CI)	p-value
Gender		0.038		0.024
Male	1		1	
Female	0.57 (0.34-0.97)		0.53 (0.30-0.92)	
Age (years)		0.821		0.683
6-7	1		1	
8-9	1.16 (0.62-2.14)		1.25 (0.66-2.40)	
10-11	1.22 (0.63-2.34)		1.32 (0.67-2.61)	
Maternal years of education		0.353		0.132
< 11 years	1.28 (0.76-2.16)		1.53 (0.88-2.67)	
12 years or more	1		1	
Time of exclusive breastfeeding				0.048
>6 months	1.82 (1.03-3.20)	0.038	1.81 (1.005-3.29)	
< 6 months	1		1	
Religion		0.012		0.029
Adventist	1		1	
Non-Adventist	2.84 (1.26-6.39)		2.52 (1.10-5.78)	

95% CI: 95% Confidence Interval

*Adjusted by gender, age, maternal level of education, time of exclusive breastfeeding and religion.

Source: elaborated by the authors.

4. Discussion

The present study assessed the diet quality of schoolchildren and found that more than half of the students (66.8%) were classified as having a good diet quality. The average scores found among children in this study were higher than those found by Molina *et al.* (2010b), which studied 1,282 children aged 7 to 10 years old living in Vitória (Espírito



Santo), indicating a better diet quality among the children investigated in the present study. The mean score observed among students of Vitória was of 4.3 points, while in the present study the mean was of 6.0 points, and the score range attained more positive scores (-9 to +14 and -4 to +16, respectively). The mean total ALES index score in this sample was more similar to those presented by Momm & Höfelmann (2014), who evaluated the diet of 523 public schoolchildren aged 6 to 15 years, from Itajaí (Santa Catarina), with a mean score of 6.9 ranging from -9 to +17 points.

Among the items that were positively assessed in the diet of the current total sample were: the low consumption of French fries/fried banana/fried cassava, instant noodle, soft drinks, fried snacks, sweets, cookies, and also the adequate consumption of beans, fruits, dairy and natural fruit juice. On the other hand, the low consumption of fish/seafood, and raw and cooked vegetables were negative aspects of the diet. These results indicate the need to create and reevaluate strategies and actions focusing on promoting healthy food habits, to increase the overall diet quality. The low consumption of vegetables is also described in other studies (Molina *et al.*, 2010b; Michereff *et al.*, 2014) that employed ALES index with schoolchildren. Unlike found in other studies (Momm & Höfelmann, 2014; Michereff *et al.*, 2014), in this study girls had less chance of having a poor diet quality.

Molina *et al.* (2010b) and Michereff *et al.* (2014) concluded that low maternal education is a variable linked to poor quality of diet. Among the children of this study, this socioeconomic factor was not associated to a poor diet quality. This may be in part due to the small number of mothers with fewer years of education in this study. Higher education levels are thought to be related to increased awareness and practice of healthy behaviors. Several studies have observed the correlation between maternal education and the child's diet. Higher maternal educational level is associated with longer breastfeeding time higher intakes of fruits and vegetables, and lower consumption of soft drinks (Cribb, Jones, Rogers, Ness, & Emmett, 2011). In this study, there was an association between exclusive breastfeeding and diet quality; however, it did not remain statically significant after the adjusted model. However, the data suggest that there is a positive trend associated between exclusive breastfeeding and a good diet quality score. Studies indicate that breastfeeding has a positive impact on the development of a child's later eating behaviors (Birch, Savage, & Ventura, 2007).

Religion is an important aspect of many people's lives. However, very little data exists about the relationships between religion and diet in Brazil. Although few Adventist participants showed poor diet quality, our data suggest better diet quality among Adventist students compared to their non-Adventist counterparts. This may be because members of the Adventist community are oriented to adopt a diet rich in plant-based foods such as fruit and vegetables, nuts, and whole grains. The lower emphasis in the consumption of animal products in the Adventist diets may explain the significant lower consumption of hamburger and the tendency (not significant) to have a lower dairy consumption compared with non-Adventists. This study shows that being an Adventist may be protective to the consumption of sugar dense foods, such as sweets (candies/desserts) among elementary school students. These healthy lifestyle habits



are encouraged in their schools and may be the reason because more than half of the students in total were classified as having a good diet quality.

Another point that should be mentioned is the high percentage of children of both groups that have the habit of eating breakfast. The observed prevalence of omission of breakfast was lower than that found in a similar study (Höfelmann & Momm, 2014) with public school students in grades first to fifth, respectively 12.2% and 25%. Breakfast is one of the three main meals of the day and is considered a key indicator of healthy eating habits. According to Höfelmann & Momm (2014), the consumption of breakfast is an opportunity for the intake of foods rich in nutrients such as calcium, protein, vitamins, minerals, and fiber; it brings health benefits to the individual.

Some potential limitations should be discussed to fully appreciate the results. First, although our sample is smaller than that of some studies carried out with elementary school students, it is significant when taking into account the lack of studies done with Adventist students in Latin America. Second, the results should be interpreted with caution, considering the great number of individuals that belonged to a high social class. The third is in relation to the instrument ALES index, which evaluates diet quality based on selected foods that represent the food reality in the Brazilian population. Considering that the Adventist population is encouraged to adopt a vegetarian dietary pattern, the ALES index may underscore individuals who avoid fish and/or dairy, and consequently impact OR differences between Adventist and non-Adventist groups. The index also includes breakfast as a positive indicator to assess the diet quality; however, the quantity and quality of foods consumed at breakfast are not known. There are a variety of definitions for breakfast, particularly in relation to the types of food consumed (Höfelmann & Momm, 2014).



5. Conclusion

The mean ALES index scores found by the present study were higher than those found by other Brazilian studies. This study evaluated a sample of students predominantly from a high socioeconomic class and a differentiated diet quality dietary pattern, with low consumption of fried foods, instant noodles, soft drinks, snacks, sweets, cookies, adequate consumption of beans, fruits, dairy products, natural juices, and high breakfast consumption. Unlike other studies, diet was not related to the socioeconomic class and years of maternal education. Most children who received at least 6 months of exclusive breastfeeding showed a positive tendency in relation to diet quality which has the potential to influence food intake in the future. Girls and Adventists presented better diet quality when compared to boys and non-Adventists. Adventists consumed less candies, and hamburgers/hot dogs than non-Adventists. This may be protective to chronic diseases and contribute to the establishment of a healthy diet later in life.



The Seventh-day Adventist educational system is known for encouraging healthy food habits in their students which may be considered a positive factor in influencing the diet quality of the current sample. These findings support the important role that schools have in promoting healthy dietary habits.

Although most of the students presented high diet quality scores, there is a need to increase consumption of cooked and raw vegetables, and fish. The low consumption of vegetables in children is consistent with other studies, making it necessary to promote the daily consumption of this food group to improve even more the overall quality of the diet and prevent diseases. These observations should contribute to future interventions in food and nutrition education targeted at students, their parents and school canteens.

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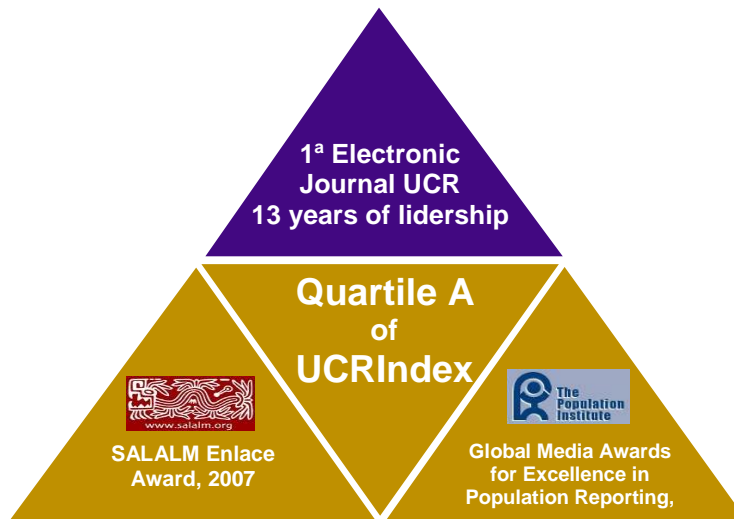


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