



Contents lists available at ScienceDirect

Nutrition

journal homepage: www.nutritionjrnal.com

Applied nutritional investigation

Psychosocial factors influencing the frequency of fast-food consumption among urban and rural Costa Rican adolescents

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ARTICLE INFO

Article history:

Received 20 December 2012

Accepted 30 January 2013

Keywords:

Fast food

Dietary intake

Psychosocial factors

Adolescents

Costa Rica

ABSTRACT

Objective: The aim of this study was to identify psychosocial factors that influence fast-food consumption in urban and rural Costa Rican adolescents.

Methods: A self-administered questionnaire designed for the study asked about sociodemographic information, frequency of fast-food consumption, meaning of “fast food,” location of purchase, and psychosocial correlates. Five psychosocial factors were extracted by using principal components analysis with Varimax rotation method and eigenvalues. Descriptive statistics and a hierarchical linear regression model were used to predict the frequency of fast-food consumption.

Results: Responses from 400 adolescents (ages 12–17 y) reveal that daily consumption of fast food was 1.8 times more frequently mentioned by rural adolescents compared with urban youth. Urban and rural differences were found in the way adolescents classified fast foods (rural adolescents included more traditional foods like chips, sandwiches, and *Casado*—a dish consisting of rice, black beans, plantains, salad, and a meat), and in purchasing locations (rural adolescents identified neighborhood convenience stores as fast-food restaurants). Living in rural areas, convenience and availability of foods, and the presence of external loci of control were predictors of a higher frequency of fast-food consumption, whereas health awareness predicted a lower frequency.

Conclusions: The development of interventions to reduce fast-food consumption in Costa Rican adolescents should consider not only convenience, but also the availability of these foods where adolescents are more exposed, particularly in rural areas. Interventions such as improving the convenience of healthy fast foods available in school canteens and neighborhood stores, policies to increase the price of unhealthy fast food, and activities to provide adolescents with the skills to increase self-efficacy and reduce the effect of external loci of control are recommended.

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Introduction

Fast foods are foods sold in a restaurant or store, rapidly prepared and quickly served in a packaged form for takeout [1].

Monge-Rojas conceived and designed the study; collected, analyzed, and interpreted data; and drafted the manuscript. All authors contributed significantly to the interpretation and presentation of data and revisions of the manuscript. Specifically, Smith and Colón-Ramos contributed importantly to the analysis and interpretation of data. They also reviewed the draft, final and revised manuscripts. Aragón and Herrera-Raven made central contributions to reviewing the draft, final and revised manuscripts.

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Although causality between fast-food consumption and obesity has not been established, there is a clear positive association between fast-food consumption and energy intake, making individuals more prone to weight gain and obesity [2]. People who eat fast foods once per week have an additional 20% risk for developing coronary heart disease compared with those who never consume [3]. The risk increases to 50% for those who consume two or three times a week, and up to 80% for those who eat fast food more than three times a week. Fast-food consumption more than twice a week leads to a 27% increase in the risk for developing type 2 diabetes [3]. Based on this evidence, the World Health Organization has recommended minimum consumption of these foods [4].

Adolescence is a vulnerable period during which dietary habits are established that persist into adult life [5]. The proportion of adolescents who consume fast foods daily varies widely worldwide: Mexico, 13% [6]; Brazil, 20% [7]; Canada, 30% [8], and Australia, 89.9% [9]. In the United States, adolescents tend to visit fast-food restaurants at least twice a week [10], consuming more energy, fat, sugar and sugar-sweetened beverages, and less fiber, milk, fruits, and vegetables than their peers who do not visit fast-food restaurants [11]. Fast-food intake among adolescents has been associated with the availability of competitive foods in the school environment [12,13]; the proximity of fast-food restaurants to the physical environment surrounding the home and school [12,14]; peer influence on fast-food purchases [15,16]; peer social norms [12,16]; fast-food advertising and marketing [17]; fast-food taste [12,18] and costs [19]; fast-food purchases for family meals [20]; and the level of self-efficacy of parents and adolescents [21].

Understanding the effect of the social and psychological factors involved in the decision to eat fast foods is essential in guiding the implementation of health promotion and disease prevention programs among adolescents. This is especially important considering that the eating patterns of Costa Rican adolescents are not consistent with international healthy eating recommendations: Intakes of saturated and trans-fatty acids and sucrose are high, whereas intakes of some vitamins, minerals, fiber, fruits, and vegetables are notably low [22–25,27]. We have previously shown that urban adolescents have a significantly higher intake of saturated fatty acids, cholesterol, trans-fatty acids [22–24], and had a higher prevalence of overweight than rural adolescents [21,25,26], rural adolescents had a lower intake of ω -3 and ω -6 polyunsaturated fatty acids and micronutrients, as well as a higher intake of carbohydrates and fiber [22–25,27].

Given the increase in globalization and in the presence of fast-food chains in low- and middle-income countries, it is crucial to understand the extent of fast-food consumption and related factors among the vulnerable populations in these countries. The aim of this study was to identify fast-food consumption frequency and sociodemographic and psychosocial correlates among adolescents in Costa Rica.

Materials and methods

Study population

In 2011, a survey was conducted among adolescents (ages 12–17 y) from rural and urban schools in the area of San José, Costa Rica. The sample size was calculated using a 95% confidence interval and a permissible error of 5% (an additional 10% was added to cover possible non-response). Adolescents were recruited from 12 urban and 3 rural schools. Schools were selected at random using a probability proportional-size formula. Twenty-eight students were randomly selected from the seventh to eleventh grade in each school (about six students per grade). Consent forms were obtained from the students' parents, while the participating students provided their assent in compliance with the guidelines of the Bioethics Committee of the Costa Rican Institute for Research and Education on Nutrition and Health (INCIENSA).

Data collection tools

A three-section self-administered questionnaire was designed for the study. The first section of the questionnaire asked about sociodemographic information (age, gender, residential area) and ownership of goods (home ownership, access to utilities and ownership of household appliances such as Internet, cable TV, and microwave oven). Ownership of goods was used to determine socioeconomic status [28].

The second section included a multiple-answer question that was designed to obtain information about frequency of fast-food consumption in the past month, whereas another was designed to obtain the reliability of the reported frequency. Additionally, multiple-answer questions were developed to examine the meaning of fast food, and the locations of fast-food purchases, based on

a previously published instrument [29] adapted and tested with Costa Rican adolescents.

To explore the different psychosocial factors influencing fast-food consumption, 63 questions using a 7-point Likert Scale were created based on published literature and appeared in the third section [29]. The validity of this section was determined using factor analysis.

A nutritionist and a psychologist independently assessed the validity of the questionnaire to seek face validity. They used the cognitive forms appraisal method developed by Forsyth and Lessler [30]. Forsyth and Lessler developed a formal coding system to detect potential problems such as vague wording, complicated syntax, and difficult retrieval tasks. The appraisal system is based on the Four-Stage Model of the survey response process and is divided into the four major categories of comprehension, retrieval, judgment, and response generation.

Statistical analysis

Statistical analyses were performed using the Statistical Package for Social Sciences (SPSS Inc., version 15.0 for Windows, Chicago, Ill).

The Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity [31] were used to examine the adequacy of data for factor analysis. A principal components analysis with Varimax rotation and eigenvalues > 1 was used for component extraction [31]. Cronbach's- α and item-total correlation were used to assess internal consistency.

The Student's *t* test for independent samples and Pearson χ^2 test were used to assess associations ($P < 0.05$ was considered significant). Standardized adjusted residual scores (SAR) also were used to complement the χ^2 statistic to identify the contribution of specific cells to the overall χ^2 in complex cross-tabulations (in our case, 2×9 tables). A level of SAR > 2 was considered significant as suggested by García-Perez [32].

Pearson correlations were used to determine associations between the psychosocial factors extracted by principal component analyses, and variables including gender, age, and residential area, ownership of goods and frequency of fast-food consumption. A hierarchical linear regression modeled frequency of fast-food consumption as a function of sociodemographic variables and of the psychosocial factors. In the first step of the model, only sociodemographic variables (age, gender, area of residence and ownership of goods) were introduced, while in the second step, the factors extracted by principal component analyses were added. The "enter" method was used at each step of the regression method.

Results

After exclusion of 20 individuals, we report information on 400 adolescents (mean age: 15.2 ± 1.5 y) (Table 1). The majority (80%–85%) of our sample stated that their responses reflected their usual frequency of fast-food consumption (data not shown).

Factor analysis

The Kaiser-Meyer-Olkin measure and Bartlett's test of sphericity yielded a value of 0.63 and $\chi^2 = 4767.924$, $P < 0.001$, respectively, indicating acceptable adequacy of the sample for factor-analytical procedures. Factor analyses revealed five factors that explained 30.3% of the cumulative variance.

Table 1
General characteristics of the study sample (N = 400)

Characteristics	Percentage
Age groups (y)	
12–13	32.8
14–15	33.5
16–17	33.7
Gender	
Male	44.0
Female	56.0
Residential area	
Urban	61.2
Rural	38.8
School type	
Public	85.8
Private	14.2

The first factor (eigenvalue = 4.26, % explained variance = 6.66, Cronbach- α = 0.721, 11 items), called “availability,” consisted of items related to the availability of fast food in the adolescent environment, such as: “Having food vendors around the school makes me want to eat more fast food”; “Eating fast food allows me to eat anywhere I want (in the restaurant, on the bus, at home).”

The second factor, “external loci of control” (eigenvalue = 4.263, % explained variance = 6.61, Cronbach- α = 0.668, 16 items), included items related to self-efficacy and family and peer influence on fast-food consumption. The items that make up this subscale include: “I like to do what my friends think I should do”; “In the following month, I’ll have complete control over the number of times I will eat fast-food.”

The third factor, “fear of rejection” (eigenvalue = 4.14, % explained variance = 6.46, Cronbach- α = 0.734, 9 items), included items assessing the fear of not being socially accepted, such as, “I’m afraid that my peers will not approve of me”; “I’m frequently concerned that other people will notice my limitations.”

The fourth factor, “convenience” (eigenvalue = 3.49, % explained variance = 5.43, Cronbach- α = 0.656, 16 items), included items that reflect the amenities associated with fast-food consumption, such as price and time savings: “Eating fast food three or more times a week is relatively cheaper than eating other types of food”; “I save time when I eat fast food three or more times a week.”

The fifth factor, “health awareness” (eigenvalue = 3.27, % explained variance = 5.11, Cronbach- α = 0.548, 9 items), included items listed as, “Frequently, my weight concerns prevent me from eating fast food three or more times a week”; “Eating fast food three or more times a week may be harmful to my health.”

Frequency of fast-food consumption, meaning, and vendors

There was a significant ($P < 0.05$) association between frequency of fast-food consumption, area of residence, and gender (Table 2). A significantly (SAR > 2) larger percentage of urban adolescents reported consuming fast food three to four times per month (22%), compared with rural adolescents (19.6%). In contrast, more rural adolescents reported eating fast food every day (1.8 times higher than their urban counterparts). A higher percentage of boys than girls (SAR > 2) reported

consuming fast food daily (15.9% and 8.1%, respectively) and three to four times per month (19.6% and 29%, respectively).

Adolescents described fast foods as having high-fat content; being widely available and purchased quickly; promoting weight gain; eaten quickly without utensils; easily shared with friends or at parties, and contributing to fullness or satiety. Compared with urban adolescents, more rural adolescents identify fast foods as foods that usually are acquired at international chains or franchises (44.4% versus 29.3%; $P = 0.014$). Boys were more likely than girls to report that they consumed fast foods because it was more satiating than other foods (58.5% versus 41.5%, $P = 0.039$); meanwhile a higher proportion of girls than boys considered fast foods fattening (52.9% versus 47.1%; $P = 0.002$). More urban than rural adolescents indicated that fast foods are purchased to ensure satiety (24% versus 16.2%; $P = 0.04$; Table 3).

Rural and urban adolescents were able to identify foods that are often publicized in the media as “fast foods” (hamburgers, fried chicken, tacos, French fries, and pizza). However, the classification of specific local foods differed between areas of residence (Table 4) with a higher percentage of rural adolescents identifying more traditional foods (chips, sandwiches, and *Casados*) as fast foods. In urban areas, the proportion of adolescents who identify fried food and empanadas (deep fried corn dough turnovers filled with meat, chopped potato, mashed beans or white farmer’s cheese) as fast food was significantly higher ($P < 0.05$) than the percentage of rural adolescents who does so (64.5%; Table 4). In general, the classification of the different foods as fast food, were similar between gender; only a higher proportion of boys than girls ($P = 0.044$) identified the wraps (a soft flatbread rolled around a filling like cold sliced meat, poultry or fish, vegetables and a sauce) as fast food. Urban adolescents were more likely to buy fast foods at international fast-food chains or franchises, whereas rural adolescents reported buying fast foods more frequently at the school canteens and at neighborhood convenience stores (data not shown).

Factors influencing fast-food consumption

Results from the hierarchical linear regression (Table 5) suggest that sociodemographic variables (gender, age, area of residence, and ownership of goods) are not predictors of fast-food consumption (the overall model was not significant [$R^2 = 0.11$; $F_{4,374} = 1.08$; $P = 0.364$] and explained only 1% of the variance). However, once the five psychosocial factors were included in the

Table 2
Percentage of Costa Rican adolescents by frequency of fast-food consumption per month

Frequency	Total (N = 400)	Residence area		SAR*	Gender		SAR*
		Urban (n = 155)	Rural (n = 245)		Male (n = 176)	Female (n = 224)	
Never	6.5	6.8	6.3	-0.5	6.8	9.9	1.2
1–2 times/mo	27.3	23.9	29.9	0.6	25.8	27.6	1.4
3–4 times/mo	23.3	28.4	19.2	2.1†	22.0	19.6	2.1†
5–6 times/mo	9.8	7.4	11.6	-0.3	10.2	13.5	1.6
7–8 times/mo	7.0	10.8	4.0	1.2	9.0	6.4	2.6†
9–10 times/mo	3.8	4.5	3.1	1.1	2.0	3.1	0.7
11–12 times/mo	2.8	2.3	3.1	1.1	1.9	3.2	0.5
13–14 times/mo	4.5	4.5	4.5	0.0	4.5	5.9	0.0
Every day	11.5	8.0	14.3	3.5†	15.9	8.1	2.3†
Missing data	3.8	3.4	4.0	-	1.9	2.7	-

SAR, standardized adjusted residual

* Score determined using the standardized Z value. Overall χ^2 value for residence area = 18.62; df = 8; $P < 0.05$; overall χ^2 value for gender = 17.45; df = 8; $P < 0.05$. SARs indicate if the observed count within a specific cell is significantly larger or smaller than the expected count under the null hypothesis of no association between the variables.

† Significant difference: SAR > 2.

Table 3
Frequency of characteristics used to describe fast food by urban and rural Costa Rican adolescents ages 12 to 17 y.

Foods that...	Frequency (%) (N = 400)	Residence area		P-value*	Gender		P-value*
		Urban (n = 155)	Rural (n = 245)		Male (n = 176)	Female (n = 224)	
Are high in fat content	75.8	75.3	76.8	0.320	72.4	79.2	0.532
Are sold everywhere you go (neighborhood, school, at the movies, malls, etc.)	57.2	59.3	56.0	0.363	53.5	60.2	0.052
Are served quickly	55.8	56.7	55.2	0.498	54.7	56.6	0.238
Are fattening	54.8	58.7	60.6	0.325	52.9	47.1	0.002†
You can eat with your hands (no utensils required)	41.8	38.7	44.4	0.128	41.2	43.0	0.521
Are shared at friend gatherings	37.2	41.3	33.6	0.096	39.4	34.4	0.063
Are purchased to ensure satiety	35.0	24.0	16.2	0.040†	58.5	41.5	0.039†
Are served instantly, no service required	31.2	29.3	32.0	0.298	98.2	25.3	0.310
One normally acquires at international chains or franchises	29.7	29.3	44.4	0.014†	23.5	21.7	0.462
Are eaten at parties	27.6	26.7	29.2	0.379	24.7	29.9	0.621
Are tasty	21.2	48.0	53.5	0.134	54.1	49.3	0.168
Are purchased when money is short for a meal	17.7	18.0	17.4	0.523	18.2	17.2	0.471
Are teenager staple food	8.7	8.0	9.1	0.406	10.0	7.7	0.059
Have high energy content	5.4	4.7	6.2	0.327	3.5	7.2	0.428

* Determined using the Pearson χ^2 test.

† Significant association: $P < 0.05$.

model, the following were positive predictors of fast-food consumption: living in a rural area, convenience, availability, and external loci of control. Convenience appeared to be the main predictor of consumption frequency. The model also highlighted health awareness as a negative predictor of consumption frequency: As awareness increases, consumption frequency declines. This model was highly significant ($R^2 = 0.39$; $F_{8,374} = 4.499$; $P < 0.001$), and explained the 16% of consumption frequency variance in these adolescents.

Discussion

Our findings reveal that consumption of fast foods is very frequent among adolescents in Costa Rica. External locus of control, rural living, availability, and convenience were identified

as positive predictors of consumption frequency, whereas health awareness was a negative predictor.

External locus of control

Food choices are mediated by the influence of external factors such as peers and family members [12]. Therefore, social norms around foods established by the peers and parents play a significant role in adolescent fast-food consumption. Fortin and Yazbeck [15] have revealed that the number of days per week that teenagers go to a fast-food restaurant is increased by 15.7% when their peers increase their fast-food restaurant visits by one day.

Parents are another important external control on the decisions of Costa Rican adolescents, as they are immersed in an environment where household food choices are controlled by

Table 4
Percentage of the urban and rural Costa Rican adolescents who labeled different foods as "fast foods"

Foods	Frequency (%) (N = 400)	Residence area		P-value*	Gender		P-value*
		Urban (n = 155)	Rural (n = 245)		Male (n = 176)	Female (n = 224)	
Burritos	77.8	77.4	78.0	0.899	80.7	75.4	0.211
Casado ^{‡,§}	13.0	8.4	15.9	0.029†	14.2	12.1	0.525
French fries	95.3	96.1	94.7	0.511	93.2	96.9	0.085
Fried cassava/plantain chips	54.8	49.0	58.4	0.068	55.7	54.0	0.740
Fried chicken	82.3	80.6	83.3	0.504	83.5	81.3	0.555
Empanadas ^{‡,}	68.3	74.2	64.5	0.042†	66.5	69.6	0.500
Hamburgers	95.8	95.5	95.9	0.834	94.9	96.4	0.448
Ice cream	33.0	30.3	34.7	0.365	30.7	34.8	0.382
Nachos	76.5	75.5	77.1	0.703	76.7	76.3	0.932
Pizza	87.3	85.8	88.2	0.491	86.4	87.9	0.638
Popcorn	54.8	52.3	56.3	0.426	54.0	55.4	0.783
Sandwiches [‡]	42.5	28.4	51.6	0.000†	43.2	42.2	0.836
Tacos	87.3	85.8	88.2	0.491	84.7	89.3	0.168
Tortilla chips [‡]	52.3	45.2	57.1	0.019†	49.4	54.9	0.276
Wraps [¶]	50.0	45.8	52.7	0.182	55.7	45.5	0.044*

* Determined using the Pearson χ^2 test.

† Significant association: $P < 0.05$.

‡ Local meals.

§ Casado consisting of rice, black beans, plantains, salad, and a meat.

|| Empanadas consisting a deep fried corn dough turnover filled with meat, chopped potato, mashed beans or white farmer's cheese.

¶ A wrap is a soft flatbread rolled around a filling like cold sliced meat, poultry or fish, vegetables and a sauce.

Table 5
Hierarchical linear regression model using the fast-food consumption frequency as a dependent variable

Model		Unstandardized coefficients		Standardized coefficients	t	Sig.
		B	Typ. error	Beta		
Step 1	(Constant)	20.082	10.332		1.563	0.119
	Gender*	0.157	0.270	0.030	0.581	0.561
	Age	0.032	0.084	0.020	0.387	0.699
	Residential area [†]	0.551	0.294	0.104	1.877	0.061
Step 2	Ownership of goods	0.014	0.032	0.024	0.430	0.668
	(Constant)	10.096	10.664		-0.659	0.510
	Gender*	0.498	0.255	0.096	1.950	0.052
	Age	-0.072	0.082	-0.044	-0.877	0.381
	Residential area [†]	0.573	0.275	0.109	2.084	0.038 [‡]
	Ownership of goods	0.016	0.030	0.028	0.538	0.591
	Availability	0.486	0.152	0.178	3.196	0.002 [‡]
	External locus of control	0.329	0.166	0.099	1.987	0.048 [‡]
	Fear or rejection	-0.195	0.123	-0.081	-1.585	0.114
	Convenience	0.922	0.183	0.272	5.048	0.000 [‡]
	Nutrition knowledge	-0.281	0.133	-0.109	-2.113	0.035 [‡]

* Male = 0, Female = 1.

[†] Urban area = 0, Rural area = 1.

[‡] Significant association: $P < 0.05$.

adult authority [33]. Costa Rican parents exert direct influence over access to and intake of fast food among their adolescent children [34].

Parents can influence attitudes, preferences, and standards toward food, so that the adolescents increase their self-efficacy and reduce the effect of external loci of control on food choices. Perceived self-efficacy has been strongly related to healthy eating patterns [21].

Health awareness and concept of fast food

The conceptualization of fast foods suggests that a high proportion of adolescents recognize them as a risk factor for weight gain. Additionally, the hierarchical regression model indicates that the greater the health awareness, the lower the frequency of fast-food consumption. This evidence suggests that health awareness may be an effective initiative to promote healthy food choices in adolescence; however, several studies have shown that knowledge-based strategies cannot modify food consumption behaviors [35,36] because of adolescent feelings of omnipotence and little thought for the future. As part of their psychosocial development, adolescents need to see immediate positive results to adopt a new behavior, and lack of obvious negative effects of their actual conduct will be obstacles to behavior change [36]. However, the belief that fast foods provide satiety, pointed out by boys, and that "make you fat," noted mainly by girls, may explain the important differences observed in the daily frequency of fast-food consumption between boys and girls. This may be associated to the influence that exerts the social construction of gender on the foods selection [37]. Recently Monge-Rojas et al [38], revealed that Costa Rican adolescent boys reinforce their masculinity through consumption of foods high in fat, whereas girls link their femininity to low-calorie eating and to taking care of their body image.

Convenience of fast-food consumption

Convenience (understood as time and money savings) has been identified in this study, as well as in others [12,13] as the major predictor of fast-food consumption frequency. Studies in the United States and Italy have suggested that adolescents do

not wish to invest their free time purchasing or receiving food; therefore, fast foods are a convenient alternative that allows them more time to socialize with their peers [11,39]. Low price is also an aspect of convenience that appears to be attractive to this population. Several studies have shown that the low price promotes the acquisition of fast foods, whereas increasing the price will deter it [11,39]. In Costa Rica and elsewhere, price competition between vendors often is showcased in advertisements [40]. Time and price savings can be a very persuasive marketing tool to induce adolescents to buy fast foods [41]. This is worrisome considering that fast-food items are typically high in calories, saturated fat, and sodium [42] and in several countries, including Costa Rica, the restaurants that offer these types of foods are systematically clustered within a short walking distance of schools, giving adolescents greater access to low-priced foods of poor nutritional quality [1,14].

Availability of fast food

He et al [14] indicate that the presence of one or more local fast-food sales points within a 1-km ratio of the adolescent household increases the probability of adolescents buying fast food by 1.6%. This could explain why rural adolescents are more likely than their urban counterparts to consume fast foods daily. Additionally, the fact that rural adolescents purchase fast foods mainly at the neighborhood convenience store may play an important role in their perception of what constitutes fast food. Congruent with our findings, Creel et al [43] have shown that in rural areas in the United States unusual foods are labeled as fast foods due to the lack of flagship fast-food stores that are typically available in urban areas. Further research to identify if the foods consumed by rural adolescents are equally high in calories, saturated fat, and sodium, as the ones sold in flagship fast-food stores found in urban areas, will inform interventions and policies aimed at controlling the availability of unhealthy foods in and around schools in Costa Rica.

Exposure to poor-quality food environments has important effects on the frequency of fast-food consumption in adolescents [13,44]. Fast foods are one of the options offered in the school canteens. However, many countries are currently promoting strong changes in the school food policies to create a supportive environment with accessible and affordable healthy food choices

[45]. Costa Rica has adopted new food policy regulations restricting the sale of highly processed foods high in sugars, calories, sodium, and fats [45]. Adolescents spend a considerable amount of time at school, and often are forced to eat foods that are only available at the school [34]; it is crucial to pay attention to the food options available at points of purchase at school and its environs, in order to promote healthy eating among adolescents.

Conclusion

Interventions aimed at reducing the frequency of fast-food consumption should include consideration of strategies to decrease their availability in school and community environments, increasing adolescent levels of self-efficacy to minimize the effect of external loci of control on their food choices, and creating convenient fast food that is satiating, healthy and easily available in the adolescent everyday environment.

Acknowledgments

We are grateful to the study participants and staff of Liceo de Moravia, Liceo del Sur, Liceo de Tabarcia, Liceo Rodrigo Facio, Liceo Roberto Brenes Mesén, Liceo Julio Fonseca Gutiérrez, Liceo Luis DoblesSegreda, LiceoAnastasio Alfaro, Liceo San Antonio, Colegio Salesiano Don Bosco, Colegio Bilingüe San Judas Tadeo, Colegio Saint Clare, Liceo San Gabriel, Colegio Técnico Profesional José Figueres Ferrer (La Lucha), and Colegio Técnico Profesional de Acosta, for their support and for letting us conduct this study during school hours.

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