



## Applied nutritional investigation

## Adolescents' unhealthy eating habits are associated with meal skipping



Paulo Rogério Melo Rodrigues Ph.D.<sup>a</sup>, Ronir Raggio Luiz Ph.D.<sup>b</sup>,  
Luana Silva Monteiro Ph.D.<sup>c</sup>, Márcia Gonçalves Ferreira Ph.D.<sup>a</sup>,  
Regina Maria Veras Gonçalves-Silva Ph.D.<sup>a</sup>, Rosângela Alves Pereira Ph.D.<sup>d,\*</sup>

<sup>a</sup> Faculdade de Nutrição, Universidade Federal de Mato Grosso, Mato Grosso, Brazil

<sup>b</sup> Instituto de Estudos em Saúde Coletiva, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

<sup>c</sup> Faculdade de Nutrição - Universidade Federal do Rio de Janeiro/Campus Macaé Prof. Aloísio Teixeira, Rio de Janeiro, Brazil

<sup>d</sup> Departamento de Nutrição Social e Aplicada, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil

## ARTICLE INFO

## Article history:

Received 22 November 2016

Accepted 27 March 2017

## Keywords:

Meal habits

Diet quality

Food consumption

Food habits

Lifestyle factors

Adolescent

## ABSTRACT

**Objective:** Meal consumption and diet quality are important for healthy development during adolescence. The aim of this study was to determine the association between meal habits and diet quality in Brazilian adolescents.

**Methods:** A school-based, cross-sectional study was conducted in 2008 with a probabilistic sample of adolescents ages 14 to 19 y (N = 1139) from high schools in central-western Brazil. Consumption of breakfast, morning snack, lunch, afternoon snack, and dinner was assessed to evaluate adolescents' meal profile. The Brazilian Healthy Eating Index-Revised (BHEI-R) was calculated to evaluate diet quality. The association between meal profile and BHEI-R (global estimates and components) was assessed using multivariate linear regression models.

**Results:** Diet was characterized by unhealthy eating: a low consumption of fruits, vegetables, and milk/dairy, and a high consumption of fats and sodium. An unsatisfactory meal profile was observed in 14% of adolescents, whereas daily consumption of breakfast, lunch, and dinner was reported by 47%, 78%, and 52% of adolescents, respectively. Meal profile was positively associated with diet quality. Daily consumption of breakfast was associated with higher BHEI-R scores, lower sodium intake, and greater consumption of fruits and milk/dairy. Daily consumption of lunch was associated with greater consumption of vegetables and "meats, eggs, and legumes," whereas consumption of dinner was associated with an increased consumption of "whole fruits."

**Conclusion:** This study showed a parallelism between daily consumption of meals with healthier eating and greater adherence to traditional Brazilian food habits. Skipping meals was associated with a low-quality diet, especially concerning to the low consumption of fruits and vegetables and a high intake of sodium and calories from solid fats, added sugars, and alcoholic beverages. Therefore, the adoption of regular meal habits may help adolescents improve their diet quality.

© 2017 Elsevier Inc. All rights reserved.

This study was supported by Fundação de Amparo à Pesquisa do Estado do Mato Grosso (FAPEMAT) from doctorate scholarship (PRM RODRIGUES). The FAPEMAT had no role in the design, analysis, or writing of this article. PRMR was responsible for the study conception, data collection, statistical analysis and interpretation, manuscript conception, writing of the article, and the final revision. RRL was responsible for data statistical analysis, and the final revision of the manuscript. LSM was responsible for data statistical analysis and interpretation, as well as the final revision of the manuscript. MGF was responsible for the study conception, data statistical analysis, and final revision of the manuscript. RMVGS was responsible for the study conception, data analysis and interpretation, manuscript conception and final revision. RAP was responsible

for the study conception, statistical analysis and interpretation, manuscript conception, writing, and final revision. All authors read and approved the final version. The authors have no conflicts of interest to declare. The research project was approved by the Research Ethics Committee of the Júlio Muller University Hospital, Federal University of Mato Grosso (protocol #459/CEP-HUJM/07). Additionally, all authors certify the participation in the manuscript conception to render our public responsibility for its content, and we assure that the manuscript is being submitted only to this journal.

\* Corresponding author. Tel.: +55 21 2562 6679; fax: +55 21 2280 8343.

E-mail addresses: [roapereira@ufrj.br](mailto:roapereira@ufrj.br), [roapereira@gmail.com](mailto:roapereira@gmail.com) (R. A. Pereira).

## Introduction

According to the World Health Organization [1], adolescence is recognized as a period of high nutritional risk, as dietary habits develop during this phase of life and are strongly influenced by the environment. This includes the effects of sociocultural, emotional, and behavioral factors, as well as the fact that adolescents become more independent and begin to have access to foods that are not available at home.

Unhealthy food consumption is common during adolescence and includes excessive consumption of sugar-sweetened beverages; candies; and fatty, salty snacks coupled with reduced consumption of fruits, vegetables, and milk/dairy products [2,3]. These habits are concerning because of their close association with increased risks for obesity and cardiovascular disease [4,5]. Therefore, monitoring such habits is crucial as it is believed that they tend to persist throughout one's life [6]. Diet quality indexes such as the revised Brazilian Healthy Eating Index (BHEI-R) [7] are methodologic tools that may be used to assess overall diet quality to estimate adherence to dietary recommendation [8] and can be useful in evaluating and monitoring adolescents' diets.

Habits such as skipping breakfast [2,9–12] or replacing dinner with snacks [13] have been frequently reported among adolescents. These habits may result in low nutritional diet quality [9,11,14,15], inadequate nutrient intake [9,10], and an increased risk for overweight and obesity [2,16,17]. Furthermore, daily consumption of meals has been recommended as a strategy to prevent developing overweight or metabolic disorders [18,19]. However, to our knowledge, few studies, mainly in Brazil, have evaluated the association between meal consumption and diet quality. Therefore, the present study assessed the association between meal habits and diet quality among adolescents and examined whether skipping meals predicted an unhealthy diet.

## Materials and methods

This was a secondary analysis of a school-based study that was conducted in 2008 to estimate the prevalence of risk behaviors for eating disorders among adolescents from Cuiabá, central-west Brazil. The students were enrolled in public and private high schools in Cuiabá. Because there were no specific studies on the prevalence of risk behaviors for eating disorders in this city at the time the study was designed, the sample size was estimated based on a prevalence of 0.50, a confidence level of 95%, and an error of 3%, which yielded 1067 adolescents. The sample size was adjusted at 20% to consider the effect of the cluster sample design (design effect = 1.2): 1280 adolescents distributed over 10 schools. Details of the study are published elsewhere [20].

In summary, according to the 2006 school census (Department of Education, State of Mato Grosso), 30 584 adolescents were enrolled in Cuiabá high schools, distributed throughout the state (22 082), federal (1085), and private (7417) educational systems. A multistage, cluster random-sampling method was used to select a stratified sample proportional to the number of students in each type of school. For logistical reasons, only schools with  $\geq 400$  students were eligible for the study (23 of 62 schools, 23 501 students). These 23 schools were strategically located in four geographic regions of the city. The only federal public school that offered secondary education was included in the study because it was self-representative. Additionally, to maintain the proportionality in the number of students enrolled in each type of school, 7 of 18 eligible state public schools and 2 of 4 eligible private schools were systematically selected to complete the sample. In each school, classrooms were randomly selected until a minimum of 128 students was achieved.

The study included only high school students in the selected schools and excluded those with a physical or mental condition that prevented their participation and pregnant or lactating girls. To participate, adolescents (those aged  $\geq 18$  y) or their parents or legal guardians (for those aged  $< 18$  y) provided informed written consent. Data collection was authorized by the schools' principals. The research project was approved by the research ethics committee of Julio Muller University Hospital, Federal University of Mato Grosso.

## Data collection

Data were collected in the classrooms with a standardized self-administered questionnaire, which included questions addressing demographic and socioeconomic characteristics, lifestyle, meal consumption frequency, and a semiquantitative food frequency questionnaire (FFQ). A questionnaire was designed specifically for this research, and consisted of five sections: demographic and socioeconomic, lifestyle-related behaviors, FFQ, eating habits, and other information on health and nutrition. The questionnaire content was evaluated by conducting a pilot test on a group of adolescents like those in the study, and the questionnaire was revised based on the pilot results. To reduce the nonresponse rate, three visits were made to each school to examine previously absent students.

Socioeconomic status was assessed per the education level of the head of household (in years of study) and type of school (federal, state, or private). In this study, the type of school was considered as a proxy of socioeconomic status, an approach that was applied by Fernandes et al. [21]. Skin color/ethnicity was self-assessed and classified into the following five categories: white, black, brown, Asian, and Brazilian native. In the analysis, these categories were grouped into white and non-white, which was the same procedure adopted by Andrade et al. [22]. Age was obtained from the difference between the data collection date and the date of birth and was categorized into 14 to 15 y and 16 to 19 y. Students also were categorized per class shift (morning or afternoon).

Leisure-time physical activity was assessed by combining practice frequency and duration regarding the previous 7 d and grouped according to the categories used by Currie et al. [23]: physically inactive (adolescents who did not perform any physical activity), insufficiently active ( $< 299$  min/wk), and active ( $\geq 300$  min/wk).

The consumption of alcoholic beverages (beer, wine, and distilled beverages) was obtained from the FFQ. Adolescents were classified as alcoholic beverage reporters (regardless of the amount, frequency, and type) and nonreporters. Smoking was assessed according to the World Health Organization's criteria [24], which consider smokers to be those who reported having smoked at least once in the past 30 d.

The FFQ used in this study was adapted [20] from a questionnaire validated for adults in Cuiabá [25]. The FFQ changes included items that are typically consumed by adolescents such as breakfast cereals. The food list assessed the consumption of 76 items over the past 6 mo. For each item, there were up to three standardized servings to report the amount consumed. The FFQ also included eight options to report the frequency of consumption ranging from *never/almost never to more than three times/d*.

To estimate usual daily energy intake, all reported frequency of food consumption was converted into daily frequency, which was multiplied by the reference portion or serving usually consumed, obtaining an estimation of the daily amount of consumption for each item in the FFQ list, which was used to estimate energy and nutrients intake. Food composition data came from a compilation of three food composition tables: The Brazilian Food Composition Table [26], the US Department of Agriculture food composition table [27], and the Nutrition Data System for Research [28]. Adolescents with energy intake  $\pm 2$  SD from the mean were excluded from the analysis [20]. To estimate the consumption of food groups as established by the BHEI-R's components, standardized recipes were used to break down mixed dishes [29], such as sandwiches, into their ingredients, which were then individually categorized into their respective groups.

## Diet quality assessment

Diet quality was assessed using the BHEI-R [7]. The index was originally estimated by scoring 12 components that characterize different dietary aspects such as selected food groups (total fruits; whole fruits; total vegetables; dark green vegetables, orange vegetables, and legumes; total cereals; whole grains; meat, eggs, and legumes; milk and dairy; oils), nutrients (saturated fat, sodium), and nutrients combined with foods, like the calories from solid fats, added sugars, and alcoholic beverages (SoFAAS). The total BHEI-R score ranged from 0 to 100 and higher scores indicated healthy diets. In this study, the BHEI-R included only 11 components because of a lack of specifications on the type of cereals in the FFQ; therefore, points assigned to "whole grains" were added to "total cereals," maintaining a score equal to 100. Detailed descriptions of the criteria for attributing points to each component can be found in Previdelli et al. [7].

## Meal habits

The usual frequency of meal consumption (i.e., breakfast, morning snack, lunch, afternoon snack, and dinner) was ascertained by the question, "On average, how often did you have these meals in the past 6 mo?" The response options were as follows: *every day, three to six times per week, one to two times per week, or never*.

Download English Version:

<https://daneshyari.com/en/article/5656867>

Download Persian Version:

<https://daneshyari.com/article/5656867>

[Daneshyari.com](https://daneshyari.com)