O MUNDO DA SAÚDE

Sharing meals with parents and adolescents' diet: National School Health Survey, 2019

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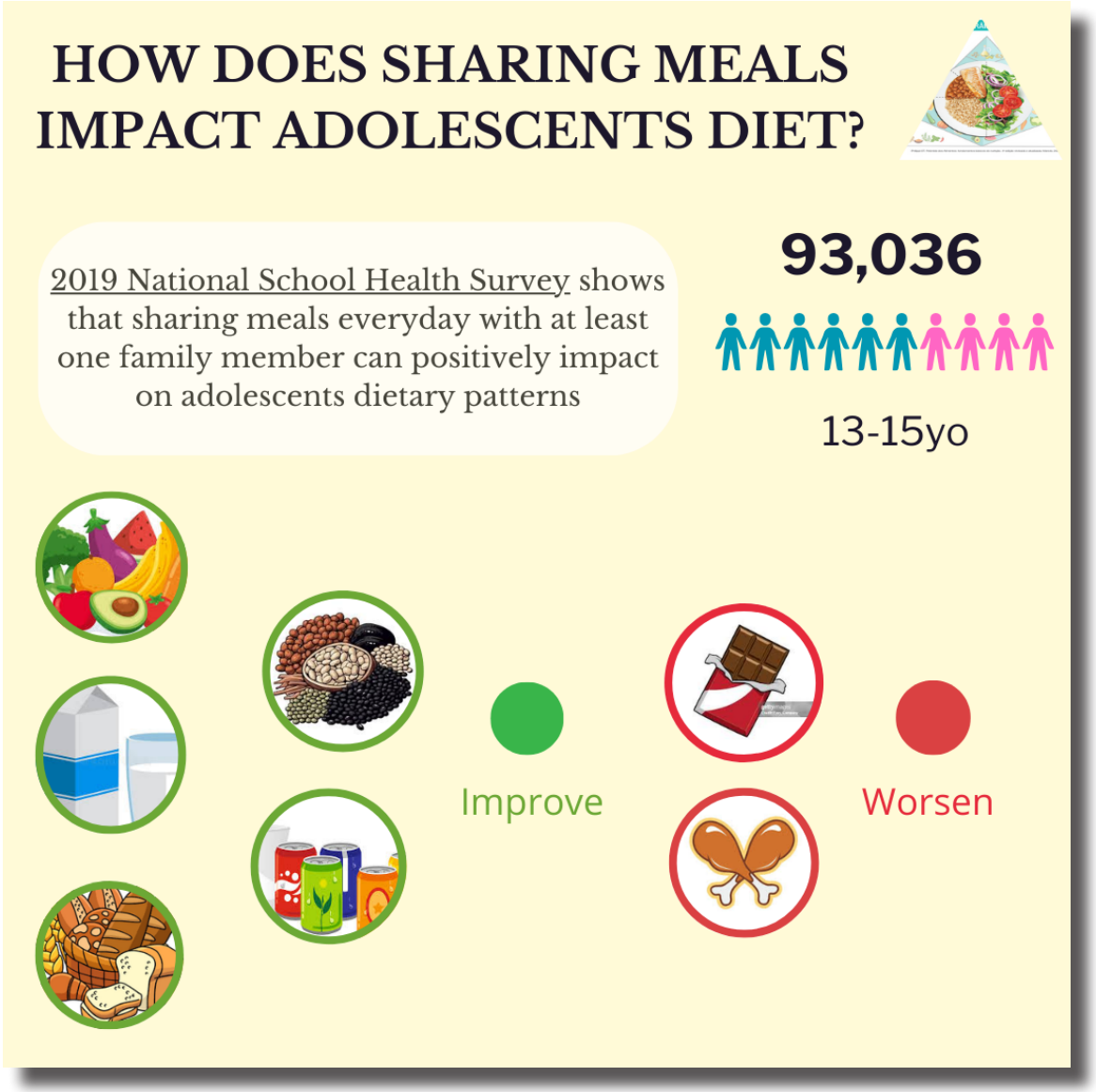
Graphical Abstract



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Abstract

Sharing meals with parents have been associated with better dietary patterns, however, most of the studies have been conducted with children (≤ 10yo) and in high-income countries. This study described the frequency of sharing meals with parents and their associations with adolescents' dietary patterns. Cross-sectional population-based study with 93,036 Brazilian adolescents. Dietary patterns were assessed based on their intake frequency and classified as adequacy and moderate components. Moderate components were reversed score. Sharing meals with parents were categorised as daily, weekly and rarely/never. Descriptive statistics and logistic regression models were used. A total of 73.47% reported sharing meals on daily basis. Adolescents who shared meals with parents on weekly (OR = 0.89; 95%CI 0.84, 0.93) and rarely (OR = 0.58; 95%CI 0.56, 0.61) vs. daily basis consumed less fruit and vegetables. Dairy (OR = 0.93; 95%CI 0.88, 0.99) and beans (OR = 0.78; 95%CI 0.74, 0.81) were less consumed on weekly basis. Cereals (OR = 0.89; 95%CI 0.89, 0.97), dairy (OR = 0.88; 95%CI 0.83, 0.93) and beans (OR = 0.62; 95%CI 0.60, 0.65) were less consumed on weekly basis. Sugar-sweetened beverages were not less consumed on daily vs. weekly (OR = 0.94; 95%CI 0.89, 0.98) and rarely (OR = 0.95; 95%CI 0.91, 0.99) basis. Alternatively, free sugars were more consumed on weekly basis (OR = 1.23; 95%CI 1.16, 1.31). Results suggests that adolescents' dietary patterns when sharing meals needs attention for sugar-sweetened beverages, but fruits and vegetables and beans are consumed on daily basis.

Keywords: Meals. Family members. Adolescent behaviour. Diet. Population-based studies.

INTRODUCTION

In Brazil as well as in many high- and middle-low-income countries have been focusing on the proliferation of options for consumers (e.g., "processed" foods availability), adolescents meeting dietary recommendations and high rates of obesity and other diet-related diseases[1,2]. On the other hand, there has been an increase interest in identifying causes of poor food choices and their related outcomes (e.g., individuals and societal aspects) and particular subgroups that may need targeted interventions[3]. The family and home environment have received particular attention due to their influences on children's healthy food choices. One of these aspects are sharing meals with family which shows promise in promoting healthy eating behaviours[4]. Many studies conducted in high-income countries[5–7] have assessed associations between sharing meals and dietary outcomes for adolescents, however, there is a paucity of population-based studies in low-middle-income countries that have included these associations. Thus, budling on a population-based survey on adolescents (n ≥ 90,000) the present study will describe meals patterns to draw attention to knowledge gaps and provide guidance for future studies.

Sharing meals have been defined in a variety of ways, including the frequency of most or all family members shared a meal together or consume "regular" family dinners. Many studies do not specify family members who are together sharing a meal[3] but it is assumed that parents are one of these family members, which can be both or either mother and father. They have central role in sharing meals and are the gatekeepers of both the table and food choice[8]. Further studies should provide more details on family members who are sharing the meals as this can ease the development on strategies to promote healthy food choices of children and adolescents. To address current gap in the literature, this study aimed to describe the frequency of sharing meals with parents and their associations with adolescents' dietary patterns.

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METHODS

Data Source and Study Population

The data source for this assessment was the 2019 National School Health Survey (acronym in Portuguese PeNSE), a triennial school-based cross-sectional study of adolescents aged 13-17 years old[9]. This survey consists of general health questionnaire and food screener. Ethics approval was obtained by the National Commission of Ethics and Research of the National Health Council and followed the Strengthening the Reporting of Observational Studies in Nutritional Epidemiology reporting guidelines for cross-sectional studies[10]. From a total sample of 165,838, the analysis in this paper were restrictive to demographic and eating behaviours questionnaires: (i) living with mother, (ii) living with father, (iii) number of individuals living in the house (≥ 2 people), and (iv) sharing meals with at least one parent. Because participants may live separately from their parents, analysis examining only participants who reported living with both of their parents were included[11], yielding a final analysis sample of 93,036 (50.3% male) adolescents.

Sharing Meals with Parents

The PeNSE 2019 included a question that gathered information on the frequency of sharing meals with mother, father, or another caregiver. The number of times (frequency) of shared meals were categorized as (i) everyday, (ii) weekly (1-5 per week) and (iii) rarely/never[12].

Dietary Outcomes

A 28-item food screener was used to assess adolescents' dietary patterns during the past seven days that proceed the interview date. Items were categorized into five adequacy and three moderation components. Adequacy components were fruits and vegetables; cereals; milk and dairy; meats; and beans; while moderation were sugar sweetened beverages, high in fat and sugar sources, and free-sugar sources. Affirmative responses were given a score of one and zero if adolescent did not consume. Moderation components were reverse scored. The sum of these scores represented the dietary diversity score ranging from zero to eight (M_{score} = 3.19±1.30) was normally distributed and showed significant differences across sample demographic characteristics (data not shown).

Socio-Demographic Co-Variates

Potential demographic covariates were assessed using direct questions on adolescents' sex, age, ethnicity (white vs. non-white), maternal education attainment (did not attend vs. ≤ high school vs. some college or university degree), number of people living in the house (2-5 vs. ≥ 5 people) and living with their mother and/or father.

Data Analysis

Analyses were completed in RStudio (PBC, Boston, MA) using survey weights to adjust for differential probabilities of selection, non-response, season and day of the week. Differences between sharing meals frequency and demographic characteristics were assessed using chi-square test and between dietary outcomes were assessed using ANOVA with Bonferroni correction. Logistic regressions were conducted to evaluate associations between each dietary component and sharing meal frequency (daily frequency treated as a reference).

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RESULTS

The adolescent participants (n=93,036) were the majority in an age range of 13-15 years old (71.19%), 50.28% were male, 53.61% were white, and 86.09% were living in a house with 2-5 people. Most of the adolescents reported sharing meals with parents on a daily basis (73.47%), while 11.26% on weekly basis and 15.26% rarely/never shared meals. Significant differences were found between the number of people living in the house and frequency of sharing meals with parents, i.e., living in a house with 2-5 people were significant in regard to sharing meals in daily and weekly basis (Table 1).

Unadjusted and adjusted models have shown significant associations between certain food groups and frequency of sharing meals with parents considering daily basis as a reference (Table 2). A reduced intake of fruit and vegetables were observed when meals were shared on weekly (OR 0.89; 95%CI 0.84; 0.93) and rarely (OR 0.58; 95%CI 0.56; 0.61) basis. Adolescents consumed less cereals (OR 0.93; 95%CI 0.89, 0.97) on rarely basis, less dairy on weekly (OR 0.93; 95%CI 0.88; 0.99) and rarely (OR 0.88; 95%CI 0.83; 0.93) basis, and less beans on weekly (OR 0.78; 95%CI 0.74; 0.81) and rarely (OR 0.62; 95%CI 0.60; 0.65) basis. Free sugar sources were more consumed on weekly basis (OR 1.23; 95%CI 1.16; 1.31). Interestingly, sugar sweetened beverages were less consumed on weekly (OR 0.94; 95%CI 0.89; 0.98) and rarely (OR 0.95; 95%CI 0.91; 0.99) basis and meat were more consumed on weekly basis (OR 1.05; 95%CI 1.00; 1.10).

Table 1 - Demographic characteristics of adolescents and prevalence of sharing meals with parents, by eating every day, weekly, and rarely/never. National School Health Survey (n=93,036), Brazil, 2019.

	Total	Every day (73.47%)	Weekly (11.26%)	Rarely/never (15.26)	p-value
Sex					
Female	49.72	48.11	52.11	55.75	**<0.001**
Male	50.28	51.89	47.89	44.25	
Age					
13-15 years	71.19	74.28	61.66	63.35	**<0.001**
16-18 years	28.81	25.72	38.34	36.65	
Race/ethnicity					
White	**53.61**	**44.39**	**49.67**	**40.65**	
Non-white	44.41	53.77	48.20	56.85	**<0.001**
DNR	1.98	1.85	2.13	2.50	
Number of people in the house					
2-5 people	86.09	85.80	90.03	84.60	**<0.001**
≥ 6 people	13.91	14.20	9.97	15.40	

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... continuation Table 1.

	Total	Every day (73.47%)	Weekly (11.26%)	Rarely/never (15.26)	p-value
Maternal education background					
No school	3.00	3.33	0.98	3.02	**<0.001**
≤ high school	47.01	47.28	39.30	51.99	
Some college/graduate degree	49.99	49.38	59.72	44.98	

DNR: Do not respond; M: Mean; SD: standard deviation
Differences between groups were calculated using chi-square and ANOVA tests for categorical and continuous variables.

Table 2 - Predicted models examining associations of sharing meals with parents and dietary outcomes. National School Health Survey, 2019 (n=93,036), Brazil, 2019.

OR (95% Confidence Interval)	Unadjusted Model[a]	Adjusted Model[a, b]
ADEQUACY COMPONENTS		
Fruit and vegetables intake		
Weekly sharing meals	0.97 (0.93; 1.02)	0.89 (0.84; 0.93)***
Rarely sharing meals	0.57 (0.55; 0.59)***	0.58 (0.56; 0.61)***
Cereals intake		
Weekly sharing meals	1.08 (1.04; 1.13)***	1.02 (0.98; 1.07)
Rarely sharing meals	0.92 (0.88; 0.95)***	0.93 (0.89; 0.97)**
Dairy intake		
Weekly sharing meals	0.91 (0.86; 0.96)***	0.93 (0.88; 0.99)*
Rarely sharing meals	0.82 (0.78; 0.86)***	0.88 (0.83; 0.93)***
Meat intake		
Weekly sharing meals	1.06 (1.01; 1.10)**	1.05 (1.00; 1.10)*
Rarely sharing meals	0.99 (0.96; 1.03)	1.00 (0.96; 1.04)
Beans intake		
Weekly sharing meals	0.75 (0.72; 0.79)*	0.78 (0.74; 0.81)***
Rarely sharing meals	0.62 (0.59; 0.64)*	0.62 (0.60; 0.65)***
MODERATION COMPONENTS		
Sugar Sweetened beverages		
Weekly sharing meals	0.92 (0.88; 0.96)***	0.94 (0.89; 0.98)*
Rarely sharing meals	0.92 (0.88; 0.95)***	0.95 (0.91; 0.99)*
Free Sugars		
Weekly sharing meals	1.31 (1.24; 1.38)***	1.23 (1.16; 1.31)***
Rarely sharing meals	1.32 (0.97; 1.06)	1.00 (0.95; 1.05)
High in sodium and fat		
Weekly sharing meals	0.97 (0.92; 1.02)	1.02 (0.96; 1.08)
Rarely sharing meals	1.06 (1.01; 1.11)*	1.03 (0.98; 1.09)

[a]Daily shared meals with parents used as a reference.
[b]Adjusted for Sex, age, race/ethnicity, maternal education background, number of people living in the house.
*P<0.05; ** P<0.01; *** P<0.001.

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DISCUSSION

Among this representative sample of Brazilian adolescents, the frequency of sharing meals with parents on a daily basis was 73.47%. This frequency is similar to those found among adolescents from the 2015 National School Health Survey, but meals frequency was categorized into ≥5 days vs. 0-4 days[13], and this might have underestimated the frequency of sharing meals. Although diet outcomes were grouped differently (degree of processing vs. food groups), the current observation shows that sugar-sweetened beverages were not reduced when meals where shared on daily bases, but free sugars and high in sodium and fat sources were reduced, suggests that classifying foods based on the degree of food processing may explain the differences in prevalence of consumption. The Eating Among Teens, cohort study in the United States following adolescents (Mage =15yo) until young adults (Mage =20.4yo) found that although there was reduction on the intake of soft drinks when sharing meals, adolescents were still consuming one serving per meal[14]. The U.S. study specified the number of serving sizes, while the Brazilian does not, which contribute to a more accurate assessment.

Sharing meals with parents on a daily basis predicted an increase intake for fruit and vegetables, grains, dairy, and beans. Existing research exploring associations between adolescents (10-19yo) and sharing meals with parents have been limited and those that made were in high-income countries and over the past decades[3]. Family meal frequency was examined in 3 large-scale cross-sectional study among adolescents and found that fruits and vegetables and grains were correlated with meal frequency[15], while beans and legumes were not evaluated in none of these studies. Staple foods in the U.S. and other Western countries does not include beans and legumes in their dietary patterns, but might include more potatoes, corns, and other vegetables that make sense to be evaluated in these studies. Additional research is needed to understand the role of staple foods on countries that differs from U.S. and countries with similar patterns.

While research has shown that pre-school and school-age children who frequently shared meals with parents have relatively better dietary patterns3, fewer studies have explored this association among adolescents. Similarly to the current findings, the 2015 National School Health Survey found that Brazilian adolescents who shared meals ≥ 5x per week had an increase on adequacy vs. moderation components[13]. Taken together, results suggest that intake of specific dietary components, i.e., fruits and vegetables, and sugar-sweetened beverages, may be particularly sensitive to the number of times that these foods have been consumed over the week with parents, and family.

Some limitations should be considered when interpreting the results: study data was cross-sectional, which could not evaluate causality. Food screener with dichotomized answers (yes vs. no) cannot evaluate the if participants are meeting dietary recommendations. The sample, although representative from Brazil, the majority of the participants (94.55%) is from urban areas, results may not be generalizable. Future research should consider exploring influence of dietary patterns using quantitative methods among not only urban adolescents, but other living under vulnerable conditions.

CONCLUSION

These results underscore the importance of practitioners, researchers, and policymakers supporting parents and adolescents in establishing healthy food choices during their shared meals. Dietary intervention and additional supports are indicated to improve the dietary patterns of adolescents with parents from Brazil (as well as other countries with similar economies).

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CRediT author statement

Conceptualization: Leme, ACB; Philippi, ST. Methodology: Leme, ACB; Figueredo, ALH; Philippi, ST. Validation: Ganen, AP; Mello, APQ; Castro, AGP. Statistical Analysis: Leme, ACB. Formal Analysis: Leme, ACB. Investigation: Leme, ACB; Figueredo, ALH. Resources: Leme, ACB; Castro, AGP; Figueredo, ALH; Ganen, AP; Mello, APQ; Philippi, ST. Writing-original draft preparation: Leme, ACB; Figueredo, ALH. Writing-review and editing: Ganen, AP; Mello, APQ; Castro, AGP; Philippi, ST. Visualization: Leme, ACB; Castro, AGP; Figueredo, ALH; Ganen, AP; Mello, APQ; Philippi, ST. Supervision: Leme, ACB; Castro, AGP. Project administration: Leme, ACB; Philippi, ST.

All authors have read and agreed to the published version of the manuscript.

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