

 Jéssica Almeida Leite ¹

 Emilly Della Pasqua Pompeo¹

 Luana Silva Monteiro²

 Ana Paula Muraro³

 Patrícia Simone Nogueira¹

 Paulo Rogério Melo Rodrigues¹

¹ Universidade Federal de Mato Grosso, Faculdade de Nutrição. Cuiabá, MT, Brasil.

² Universidade Federal do Rio de Janeiro, Curso de Nutrição Professor Aloisio Teixeira. Macaé, RJ, Brasil.

³ Universidade Federal de Mato Grosso, Instituto de Saúde Coletiva. Cuiabá, MT, Brasil.

Correspondence

Paulo Rogério Melo Rodrigues
pmmr84@gmail.com

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Association between household composition and dietary consumption in adolescents: a systematic review

Associação entre composição domiciliar e consumo alimentar em adolescentes: uma revisão sistemática

Abstract

Objective: To review systematically the association between household composition and eating habits of adolescents. **Methods:** Systematic literature review. The search of articles was conducted on the databases MEDLINE via PubMed, Scientific Electronic Library Online (SciELO), Web of Science, Virtual Health Library, Embase and Scopus. The articles were assessed through the Research Triangle Institute (RTI) Item Bank for risk of bias and accuracy of observational studies. Observational studies with adolescents (aged 10-19 years) were carried out. **Results:** Of 2,324 articles found, 11 met the eligibility criteria, nine being cross-sectional and two longitudinal studies. With respect to dietary habits, we assessed the following frequencies: family dinner, breakfast, meals consumption, breakfast skipping, food groups eaten, number of meals eaten per day, as well as energy density of food groups and the Healthy Diet Index. It was found that adolescents who lived with both parents had a higher frequency of having breakfast and eating more vegetables. The most positive and healthy food preferences were more frequent for adolescents who lived in nuclear families. On the other hand, irregular breakfast consumption and consumption of unhealthy food markers were more frequent among adolescents living in single-parent households, in reconstituted and extended families. **Conclusion:** Adolescents living with both parents have better eating patterns. The need to consider the household composition when planning healthy eating promotion programs for adolescents is highlighted.

Keywords: Eating habits. Household composition. Adolescents.

Resumo

Objetivo: Revisar sistematicamente a associação entre composição domiciliar e consumo alimentar em adolescentes. **Métodos:** Trata-se de revisão sistemática da literatura. A busca dos artigos foi realizada nas bases de dados MEDLINE via PubMed, Scientific Electronic Library Online (SciELO), Web of Science, Biblioteca Virtual em Saúde, Embase e Scopus. Os artigos foram avaliados por meio do Research Triangle Institute (RTI) Item Bank sobre risco de viés e acurácia de estudos observacionais. Foram avaliados estudos observacionais com adolescentes (10-19 anos de idade). **Resultados:** Dos 2.324 artigos encontrados, 11 atenderam aos critérios de inclusão, 9 de delineamento transversal e 2 longitudinais. Quanto à avaliação do consumo alimentar, foram avaliadas as frequências de: jantar em família, consumo de café da manhã, consumo de refeições, omissão do café da manhã, consumo de grupos alimentares, número de refeições realizadas durante o dia, assim como densidade energética de grupos alimentares e o Índice de Alimentação Saudável. Observou-se que adolescentes que moravam com ambos os pais apresentaram maior frequência

de consumo do café da manhã e maior consumo de vegetais. Preferências alimentares mais positivas e saudáveis foram mais frequentes entre adolescentes que residiam em famílias nucleares. Por outro lado, consumo irregular de café da manhã e consumo de marcadores de alimentação não saudável foram mais frequentes entre adolescentes residentes em domicílios monoparentais, com família reconstituída e famílias extensas. **Conclusão:** Adolescentes que moravam com ambos os pais apresentaram melhor consumo alimentar. Ressalta-se a necessidade de considerar a composição domiciliar ao planejar programas de promoção da alimentação saudável entre adolescentes.

Palavras-chave: Consumo alimentar. Composição domiciliar. Adolescentes.

INTRODUCTION

Inadequate eating habits is one of the risk factors for the development of noncommunicable chronic diseases, and prevalence increases over the years, affecting individuals of all ages, including young people.^{1,2} In this context, dietary patterns of adolescents have been characterized by a high consumption of ultra-processed products, rich in fats, sugars and sodium³⁻⁵ and a low consumption of *in natura*, fresh products, such as fruits and vegetables.⁶⁻⁹

Another behavior that has been associated with unfavorable health outcomes and impairs adolescents' development is the omission of meals, particularly breakfast, because this meal contributes to an adequate intake of nutrients, such as calcium, dietary fibers and micronutrients, whose main sources are consumed at this meal.^{10,11} Additionally, at this age, it is common to observe the replacement of the main meals by fast foods, especially dinner.¹⁰

Adolescence is a period of intense changes which are influenced by family habits, friendships, socioeconomic conditions, among others.¹² Habits and learnings at this phase affect future life behaviors, such as dietary habits, self-image, preferences and psychosocial development.¹²

Knowing that adolescence is a phase in which habits are built, studies that investigated how eating habits are formed found that the adolescent's family context is also a determinant factor for food consumption, because it influences most of the adolescents' decisions on what, where, when and how to eat.^{13,14}

Studies demonstrate that adolescents' eating patterns are established in a complex process that involves internal and external factors such as food preferences and availability, body weight perception and influence of parents and peers.^{13,14}

Household composition can influence the quality of diets.¹⁵ Family income and the share of expenditure on food may vary according to the household composition, modulating the availability of foods at home.¹⁶ It can also be assumed that the presence of children and teenagers in the household determines the selection of foods due to the particularities of nutritional needs and food preferences.¹⁷

Thus, household composition becomes an underlying mechanism for psychosocial development and is part of a complex network of factors that can be associated with the eating habits of adolescents.¹⁴ It should be considered that today family structures are not always made up of consanguineous persons due to numerous factors that result in the diversity of household composition.¹⁸ Contemporary families are considered a wide and complex system of relationships that may include people from other families and people not connected to the family through blood or marriage.¹⁴

Considering the importance of assessing adolescents' dietary consumption and the influence of household composition, the aim of this systematic literature review was to examine the association between household composition and eating habits of adolescents.

MÉTODOS

It is a systematic literature review aiming to answer the question: 'Which household composition is associated with better eating habits of adolescents?' It was carried out based on the Preferred Reporting Item for Systematic Review and Meta-analysis (PRISMA)¹⁹ and its protocol was registered at the International Prospective Register of Systematic Reviews (PROSPERO), National Institute for Health Research, with number CRD 42020202677.

The search of articles was conducted in May, 2020 by two independent researchers, on six databases: MEDLINE via PubMed, Scientific Electronic Library Online (SciELO), Web of Science, *Biblioteca Virtual em Saúde* (BVS) (Virtual Health Library), Embase and Scopus, based on descriptors relating to the acronym PECO:²⁰ adolescent (Population), household composition (Exposure) and food consumption (Outcomes), and the terms were combined for the search using the Boolean operators “AND” and “OR”, as shown in Supplementary Table 1. In addition, a manual search (gray literature) was conducted to obtain a larger number of papers. Articles published in the English, Spanish or Portuguese idioms were considered.

Supplementary Table 1. Search strategy.

Databases	Search strategy
Pubmed	((“living arrangement” [mesh] OR “living arrangement” [tiab] OR “household arrangement” [tiab] OR “living situation” [mesh] OR “living situation” [tiab] OR “household composition” [tiab] OR “family characteristics” [mesh] OR “family characteristics” [tiab]) AND (“nutrient intake” [tiab] OR “diet” [tiab] OR “diet” [mesh] OR “dietary intake” [tiab] OR “dietary pattern” [tiab] OR “food intake” [tiab] OR “food” [tiab] OR “food” [mesh] OR “food choice” [tiab] OR “eating habit” [mesh] OR “eating habit” [tiab] OR “eating behavior” [tiab] OR “eating behavior” [mesh]) AND (“adolescent” [mesh] OR “adolescent” [tiab] OR “adolescents” [tiab] OR “adolescence” [tiab] OR “teen” [tiab] OR “teens” [tiab] OR “teenagers” [tiab] OR “teenager” [tiab] OR “youth” [tiab]))
BVS	((“living arrangement” OR “living arrangements” OR “household arrangements” OR “living situations” OR “living situation” OR “household composition” OR “family characteristics”) AND (“nutrient intake” OR “diet” OR “dietary intake” OR “dietary pattern” OR “food intake” OR “food” OR “food choice” OR “eating habit” OR “eating behavior”) AND (“adolescents” OR “adolescent” OR “adolescents” OR “adolescence” OR “teen” OR “teens” OR “teenagers” OR “teenager” OR “youth”))
WoS	((“living arrangement” OR “living arrangements” OR “household arrangements” OR “living situations” OR “living situation” OR “household composition” OR “family characteristics”) AND (“nutrient intake” OR “diet” OR “dietary intake” OR “dietary pattern” OR “food intake” OR “food” OR “food choice” OR “eating habit” OR “eating behavior”) AND (“adolescent” OR “adolescents” OR “adolescence” OR “teen” OR “teens” OR “teenagers” OR “teenager” OR “youth”))
Scopus	((“living arrangement” OR “living arrangements” OR “household arrangements” OR “living situations” OR “living situation” OR “household compositions” OR “family characteristics”) AND (“nutrient intake” OR “diet” OR “dietary intake” OR “dietary pattern” OR “food intake” OR “food” OR “food choice” OR “eating habit” OR “eating behavior”) AND (“adolescent” OR “adolescents” OR “adolescence” OR “teen” OR “teens” OR “teenagers” OR “teenager” OR “youth”))
Scielo	((“arranjo familiar”) OR (“arranjo de vida”) OR (“composição domiciliar”) OR (“composição familiar”) OR (“living arrangement”) OR (“living arrangements”) OR (“household arrangements”) OR (“living situations”) OR (“living situation”) OR (“household compositions”) OR (“family characteristics”)) AND (“padrão alimentar”) OR (“consumo alimentar”) OR (“nutrient intake”) OR (diet) OR (“dietary intake”) OR (“dietary pattern”) OR (“food intake”) OR (food) OR (“food choice”) OR (“eating habit”) OR (“eating behavior”)) AND ((adolescente) OR (adolescentes) OR (adolescent) OR (adolescents) OR (adolescence) OR (teen) OR (teens) OR (teenagers) OR (teenager) OR (youth))
Embase	((“living arrangement” OR “living arrangements” OR “household arrangements” OR “living situations” OR “living situation” OR “household compositions” OR “family characteristics”) AND (“nutrient intake” OR “diet” OR “dietary intake” OR “dietary pattern” OR “food intake” OR “food” OR “food choice” OR “eating habit” OR “eating behavior”) AND (“adolescent” OR “adolescents” OR “adolescence” OR “teen” OR “teens” OR “teenagers” OR “teenager” OR “youth”))

Criteria for inclusion and exclusion of the studies

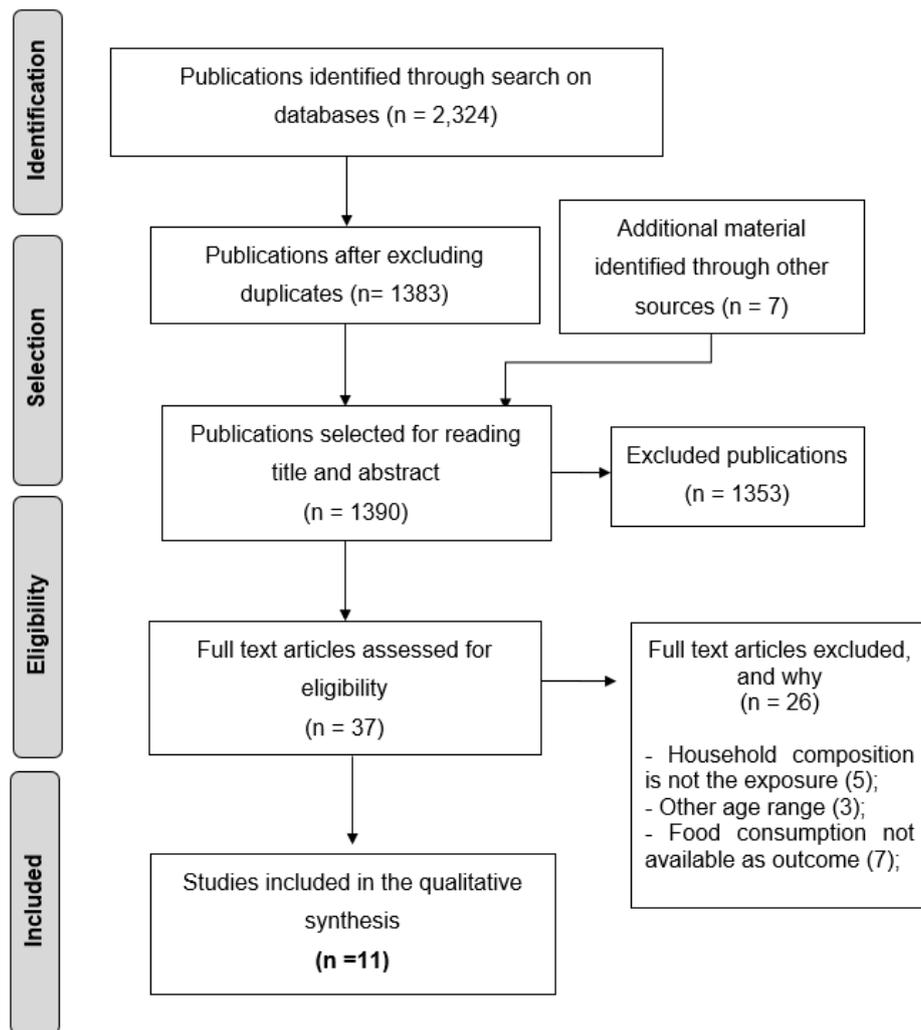
Criteria for inclusion were: observational studies (cross-sectional and longitudinal) carried out with adolescents (individuals aged 10-19 years according to the World Health Organization²¹) and which have investigated the association of household composition (as exposure) and dietary habits (as outcome).

Articles in which the study population had any kind of comorbidity were excluded; non-empirical articles, studies of interventions, opinions, editorials, case studies, studies in animals and abstracts of articles of scientific events that were not published in full as well as studies that had included individuals with other ages not between 10-19 years, without a separate analysis by age, were also excluded.

Review process

The selection of studies was also conducted independently by two researchers using the Mendeley software, and any divergence was analyzed and discussed by them in subsequent meetings. In case of no agreement between both, a third researcher would assist in the selection of studies. All publications identified through the databases and manual search in other sources (gray literature) were imported into Mendeley and, after exclusion of duplicates, the title and abstract of the articles were read. The articles would be rejected if the researchers considered that the studies did not meet the eligibility criteria. After analysis of the articles selected for full reading, those which addressed the association between household composition and dietary consumption in adolescents were included in the present systematic review (Figure 1).

Figure 1. PRISMA flow diagram of the process of selection of studies to investigate the association of household composition and eating habits of adolescents.



Source: authors.

Evaluation of the study quality

Risk of bias and accuracy of observational studies were assessed by two reviewers to determine the quality of the studies included in the present review. The instrument used was the Research Triangle Institute (RTI) Item Bank on Risk of Bias and Accuracy of Observational Studies, proposed and validated by Viswanathan & Berkman.²² Considering the authors' recommendations and the type of studies included in this review, ten items were used to assess cross-sectional studies (sample definition and selection, information consistency, outcomes, comparability of analysis, results of analysis, interpretation of results and funding) and 13 items for cohort studies (three additional questions about follow-up time and impact of losses). Therefore, a cross-sectional study with three or more items classified as negative or not clear, or a cohort study with four or more negative or unclear items were classified as having risk of bias (Table 1).

Table 1. Description of the studies included in the systematic review according to the criteria of assessment of household composition, control of confounding factors, assessment of dietary habits and main outcomes.

Author / Year/Location	Number and age of individuals	Household composition	Confounding factors	Assessment of dietary consumption	Main Outcomes	Risk of Bias (points)
Cohort studies						
Pearson et al. ²⁸ Melbourne, Australia.	N=1,884; 12-15 years old Wave 1: 2004 and 2005; Wave 2: 2006 and 2007.	1. Living with both parents; 2. Living with one parent.	School grade	- Breakfast skipping (<5 times/week); - Consumption of snacks of the group of chocolates, potato fries/ chips and salty snacks (High: >Once/week); - Consumption of fast foods (High: >once/week); - Consumption of vegetables (High: ≥3 servings/day); - Consumption of fruits (High: ≥3 servings/day).	- Male adolescents living with both parents were less likely to have a low intake of vegetables (OR ¹ = 0.66; 95%CI ² = 0.47; 0.93), when compared to those who lived with only one parent. - By comparing waves 1 and 2, the girls who lived with both parents were less likely to eat more salty snacks when compared to those who lived with only one parent (OR= 0.57; 95%CI = 0.33; 0.99).	Low (11)
Pedersen et al. ³³ Denmark.	N=561; Wave 1 (1990): 15 years old Wave 2 (1994): 19 years old; Wave 3 (2002): 27 years old.	1. Living with both parents; 2. Other family structures	Gender, socio-economic class	- Meal frequencies: breakfast, lunch and dinner.	- The low frequency of lunch consumption at the age of 15 years (OR = 2.19; 95%CI= 1.37; 3.48) and at the age of 19 years (OR = 3.11; 95%CI = 1.99; 4.84) among students who lived with both parents were a predictor for a low frequency of lunch meal in adulthood (age 27 years). - The low lunch frequency at the age of 15 years (OR = 0.72; 95%CI = 0.27;1.90) and at the age of 19 years (OR = 0.96; 95%CI = 0.37;2.55) among students who lived in other family structures was a predictor for a higher lunch frequency in adulthood.	Present (7)

Table 1. Description of the studies included in the systematic review according to the criteria of assessment of household composition, control of confounding factors, assessment of dietary habits and main outcomes. (Continues.)

Author / Year/Location	Number and age of individuals	Household composition	Confounding factors	Assessment of dietary consumption	Main Outcomes	Risk of Bias (points)
Cross-sectional studies						
Sweeting and West ²³ Glasgow, Scotland.	N=2,146; 11 years old; Data collected in 1995-1996.	1. Living with both parents; 2. Reconstituted family ⁴ ; 3. Single mother; 4. Others.	Socio-economic variables	- Healthy Diet Index categorized into: 1. Less healthy eating = fat score ≥ dietary fiber score; 2. Unhealthy snacking = snacks, sweets or chocolate, cookies, potato fries and sodas ≥ 5 points.	- “Less healthy eating” and “unhealthy snacking” were not associated with family structure. - Adolescents living in a family structure classified as “others” had a higher prevalence of fat intake (potato fries, processed meats, whole milk).	Low (9)
Pearson et al. ²⁴ UK.	N=328; 12-16 years old.	1. Living with both parents; 2. Living with one parent.	Age and gender	- Breakfast skipping (<5 times / week); - Total average daily consumption in the last month: - Chocolate-type snacks, potato fries and salty snacks; - Fast foods; - Vegetables and fruits.	- Adolescents living with dual-parent families ate breakfast on more days per week than those who lived with only one of the parents (p<0.01). - Adolescents from both household compositions who had authoritative parents ate breakfast on more days per week (p<0.001), more fruits (p<0.001) and less unhealthy snacks (p<0.05) compared with those who had neglectful or indulgent parents.	Low (9)
Deng ²⁷ China.	N=662; 12-17 years old.	1. Nuclear family ⁸ ; 2. Extended family ⁹ .	Age, gender, education, food knowledge, other household variables	- Preference scale of consumption food groups: fast food, salted snacks; fruits, vegetables; sugary drinks; - scoring range 5-25: higher scores indicate more positive or healthier food preferences.	- Those who lived in extended families had lower scores for food preferences than those living in nuclear families (p=0.008). - Adolescents from extended families, compared to those from nuclear families, had more preferences for salted snacks (p=0.09) and sugar-rich drinks (p=0.07).	Low (9)

Table 1. Description of the studies included in the systematic review according to the criteria of assessment of household composition, control of confounding factors, assessment of dietary habits and main outcomes. (Continues.)

Author / Year/Location	Number and age of individuals	Household composition	Confounding factors	Assessment of dietary consumption	Main Outcomes	Risk of Bias (points)
Cross-sectional studies						
Hallström et al. ²⁵ Europe: Greece, Germany, Belgium, France, Hungary, Italy, Austria, Sweden and Spain	N=3,360; 12-17 years old.	1. Living with both parents; 2. Living with one parent;	Age and Gender	- Breakfast consumption was assessed based on the agreement with the following statement: "I often skip breakfast"; - 7 categories of responses, ranging from "disagree totally" to "agree totally".	- Boys who lived with only one parent were less likely to be regular breakfast consumers (OR = 0.55; 95%CI = 0.38;0.81; p<0.01), compared with the boys who lived with both parents. - For girls, no significant associations were observed (OR = 1.00; 95%CI = 0.69; 1.46).	Low (10)
Jørgensen et al. ³⁰ Denmark	N=6,269; 11, 13, 15 years old.	1. Traditional family ⁶ ; 2. Single-parent family ⁷ 3. Reconstituted family ⁴ .	Gender, age and family' social class.	- "How often do you have breakfast (more than one glass of milk or fruit juice)?" - Dichotomous variable: 1. Regular breakfast consumption (0-1 day/week); 2. Irregular breakfast consumption (2-5 days/week).	- Prevalence of irregularity of breakfast habits was higher for adolescents from single-parent families (OR = 1.56; 95%CI = 1.28; 1.89) and reconstituted families (OR = 1.27; 95%CI = 0.98;1.63) compared with those from traditional families. - For girls, prevalence of irregularity of breakfast habits was higher for those from single-parent families and reconstituted families (OR = 1.37; 95%CI = 1.05; 1.99 and 1.45; 95%CI = 1.05; 1.99, respectively) compared with those from traditional families. - Boys living with single-parent families are more likely to have irregular breakfast habits (OR = 1.77; 95%CI = 1.32; 2.37) when compared with those who live with traditional families	Present (8)

Table 1. Description of the studies included in the systematic review according to the criteria of assessment of household composition, control of confounding factors, assessment of dietary habits and main outcomes. (Continues.)

Author / Year/Location	Number and age of individuals	Household composition	Confounding factors	Assessment of dietary consumption	Main Outcomes	Risk of Bias (points)
Cross-sectional studies						
Zuercher et al. ²⁹ United States	N=2,380; Age 2-18 years (12-18yr adolescents) Data collected in 1994-1996.	Household head: 1. Female; 2. Male; 3. Female and male.	Age, race, years of education, income, size of family	- Food groups: Grains; Meat, Fish, Egg and Bean; Vegetables; Fruits; Milk and Dairy; - Individuals whose food intake was in the top 20% of total food group energy density were considered "big eaters"	Female household head: - Compared with adolescents who lived in male-headed households, adolescents from female-headed households trended to have a higher intake (energy density above the highest quintile in relation to the "big eaters") of grains in the meals in general (OR = 3.79; 95%CI = 1.54;6.04), of grains (OR = 1.75; 95%CI = 1.13;2.27) and milk/dairy (OR = 3.23; 95%CI = 1.85;4.61) at breakfast; grains (OR = 1.87; 95%CI = 1.23;2.51) and meats (OR = 3.01; 95%CI = 1.79;4.23) at brunch/lunch; and grains (OR = 1.79; 95%CI = 1.08;2.51), vegetables (OR = 5.93; 95%CI = 3.37;8.49) and milk/dairy (OR = 6.68; 95%CI = 3.31;10.05) at dinner/supper. Male household head: - Compared with adolescents who lived in female-headed households, adolescents from male-headed families trended to have a higher intake (energy density above the highest quintile in relation to the "big eaters") of grains (OR = 2.60; 95%CI = 1.76;3.44) and milk/dairy (OR = 2.43; 95%CI = 1.31;3.55) at breakfast; grains (OR = 1.88; 95%CI = 1.37;2.39) and meat (OR = 2.01; 95%CI = 1.19;2.83) at brunch/lunch; and grains (OR = 4.54; 95%CI = 2.80;6.28), fruits (OR = 7.09; 95%CI = 2.07;12.11), vegetables (OR = 4.40; 95%CI = 2.63;6.17), milk/dairy (OR = 3.48; 95%CI = 1.43;5.53) and meat (OR = 1.85; 95%CI = 1.26;2.44) at dinner/supper.	Present (8)

Table 1. Description of the studies included in the systematic review according to the criteria of assessment of household composition, control of confounding factors, assessment of dietary habits and main outcomes. (Continues.)

Author / Year/Location	Number and age of individuals	Household composition	Confounding factors	Assessment of dietary consumption	Main Outcomes	Risk of Bias (points)
Cross-sectional studies						
Levin and Fleming ³¹ Scotland	N=16,406; 11, 13, 15 years old	1. Living with both parents; 2. Reconstituted family ⁴ ; 3. Single mother; 4. Single father.	Year (2002; 2006; 2010), gender, age, school grade and race	- "How often do you have breakfast (more than one glass of milk or fruit juice)?" - Dichotomous variable: 1. Regular breakfast (≥ 4 days/week); 2. Irregular breakfast (≤ 3 days/week).	- Regular breakfast consumption was higher among young individuals who lived with both parents (70.4%; $p < 0.001$). - Irregular breakfast consumption decreased between 2002 and 2010 for children who lived with both parents (OR = 0.86; 95%CI = 0.75; 0.97). - For the young individuals who lived in reconstituted families, having a second home was associated with more odds to have irregular breakfast consumption (OR = 1.37; 95%CI = 1.09; 1.74). - Girls who lived only with their mothers were less likely to have irregular breakfast consumption when compared with other family arrangements (OR = 1.64; 95%CI = 1.41; 1.92; $p = 0.029$).	Present (8)
Levin et al. ³² Scotland.	N=26,626; 11, 13, 15 years old	1. Living with both parents; 2. Reconstituted family ⁴ ; 3. Single mother; 4. Single father.	Age, gender, school grade and year (1994; 1998; 2002; 2006; 2010)	- "How often do you have breakfast (more than a glass of milk or fruit juice)?" - Dichotomous variable: 1. Every day; 2. < Every day.	- Daily breakfast consumption was lower among single-mother children (OR = 0.70; 95%CI = 0.65; 0.75), single-father children (OR = 0.65; 95%CI = 0.54; 0.78) and reconstituted families OR = 0.78; 95%CI = 0.72; 0.85) compared with those living with both parents. - Daily breakfast consumption tended to increase between 1994 and 2010 among adolescents who lived with both parents; on the other hand, it decreased over time among adolescents of single-parent families, mainly those who lived with a single father.	Present (8)

Table 1. Description of the studies included in the systematic review according to the criteria of assessment of household composition, control of confounding factors, assessment of dietary habits and main outcomes. (Continues.)

Author / Year/Location	Number and age of individuals	Household composition	Confounding factors	Assessment of dietary consumption	Main Outcomes	Risk of Bias (points)
Cross-sectional studies						
Parikka et al. ²⁶ Finland.	N=2,864; 7-16 years old (14-16 yr old adolescents)	1. Nuclear family ⁸ ; 2. Reconstituted family ⁴ ; 3. Single-parent family ⁷ ; 4. Other family structures ³ .	Gender and socio-economic variables	- Breakfast skipping (≤6 times/week); - Number of daily meals: 1. Others (< 4 meals/ day or > 6 meals/day); 2. Recommended number of daily meals (4-6 meals/day); - Family dinner: Once a week of less; 2 to 3 times/week; 4 or 5 times/week.	- Adolescents living in a single-family (43.5%) and reconstituted family (46.3%) had a higher prevalence of skipping breakfast when compared with adolescents who lived with both parents (29.6%; p<0.001). - Adolescents who lived in reconstituted families (OR = 2.03; 95%CI = 1.27;3.25) and in single-parent families (OR = 1.81; 95%CI = 1.28;2.57) were more likely to skip breakfast when compared with those who lived in nuclear families. - Adolescents (OR = 0.59; 95%CI = 0.43;0.81) who lived with single-parent families tended to often eat dinner with family, compared with adolescents from nuclear families.	Low (9)

¹OR: Odds Ratio; ²CI: Confidence Interval; ³Other family structures: families constituted by the father or mother only and/or others; ⁴Reconstituted family: when father/mother marries again with other partners; ⁵No parents: adolescents who lived with family bonds other than their mother or father; ⁶Traditional family: constituted by both parents ; ⁷Single-parent family: refers to a single father/mother; ⁸Nuclear family: family composed by two generations (parents and children, including families with a couple and children, single parents and children and separated parents and children); ⁹Extended family: refers to families with several generations where children lived with parents and grandparents.

Source: the authors.

Data extraction

From each selected study, the following data were drawn: identification data with name of the author(s), year and country of publication, study design, age group, sample, method of assessment of household composition, confounding factors, method used to assess dietary habits and main outcomes.

RESULTS

A total of 2,324 articles were identified on the databases, to which were added seven articles from gray literature. Of these articles, 941 were excluded for being duplicates and 1,353 after reading the title and abstract. Of 37 articles selected for full reading, 11 corresponded to the criteria of inclusion and were assessed in this systematic review.

Table 1 contains the main characteristics and an assessment of the quality of the studies. With respect to the risk of bias in the studies, six²³⁻²⁸ (54.5%) studies were classified as with low risk of bias (Table 1). The studies were carried out in 16 countries, distributed in North America,²⁹ Europe,^{23-26,30-33} Asia²⁷ and Oceania.²⁸

With respect to the study design, nine of them were cross-sectional studies^{23-27;29-32} and only two were cohort studies.^{28,33} The sample size of the studies ranged from 328²⁴ to 26,626 individuals.³² There was predominance of the female sex in four studies^{25,28,30,32} and in four of them there was no description of the frequency of each gender.^{23,26,31,33}

With respect to household composition, the following classifications were observed: "living with parents" or "living without parents" or "living with only one parent" in three studies;^{24,25,28} "living with both parents"; "reconstituted family", "single (unmarried) mother", "single (unmarried) father" and "others" in three studies;^{23,24,32} "living with both parents" and "other family structures" in one study;³² "nuclear family" and "extended family" in one study;²⁷ "traditional family", "single-parent family", "reconstituted family" in one study;³⁰ "nuclear family", "reconstituted family", "single-parent family" and "other family structures" in one study²⁶. Finally, one study categorized household structure according to the sex of the household head: family with a female head, family with a male head or a couple.²⁹

Dietary habits were identified by the following methods: Healthy Diet Index;²³ Evaluation of the frequency of meals eaten (breakfast, lunch and dinner);³³ Evaluation of the frequency of breakfast only;³⁰⁻³² Evaluation of the frequency of breakfast skipping;^{25,26,28} Evaluation of the frequency of consumption of food groups;^{24,27,28} Evaluation of the frequency of consumption of five food groups and energy density,²⁹ and Evaluation of the frequency of family dinner and the number of meals eaten per day.²⁶

With respect to the consumption of meals, there was a higher frequency of breakfast consumption among European adolescents who lived with both parents.^{24,25,30-32} On the other hand, Danish adolescents who lived with both parents had a high frequency of lunch consumption in adolescence and adulthood.³³

Finnish adolescents who lived in single-parent families, i.e., with only one of the parents, showed a higher frequency of skipping breakfast.²⁶

Australian adolescents who lived with both parents usually ate more vegetables.²⁸ Likewise, American teenagers showed a high consumption of grains, milk, dairy products and meats at breakfast, snack and lunch, when the household head, irrespective of sex, had energy density in the highest quintile.²⁹

In Chinese adolescents, more positive and healthier food preferences were more frequent among those who lived in nuclear families, i.e., composed of two generations (parents and children, including families

with a couple and children, single parents and children, separated parents and children) when compared with those from extended families, who indicated more preferences for salty snacks and sugary drinks.²⁷ Similarly, among Scottish teenagers who did not live with both parents there was a higher frequency of fatty foods consumption (fried potatoes, processed meats, whole milk).²³

DISCUSSION

This systematic review included 11 studies that investigated the association of household composition and dietary habits in adolescents. In general, healthy foods intake and the presence of healthy eating habits such as having meals regularly, not replacing meals for snacks, were observed among teenagers living in households with both parents.

Living with both parents was positively associated with the habit of eating vegetables and inversely associated with the consumption of snacks, suggesting that this household composition is an important factor for creating healthy eating habits in adolescents, because the parents' dietary behavior is strongly associated with that of their children.^{28,34,35}

The social environment of eating meals at home as a determinant factor for healthy dietary habits among children and teenagers has been widely studied, and one of the measures of the social environment of home meals is the parents' marital status and dietary behaviors.³⁵

In Brazil, based on data from the National Dietary Inquiry of 2008-2009, it was found that the parents' eating patterns are associated with those of their children, being more expressive for the "Great traditional meal", characterized by typical foods of the traditional Brazilian diet such as rice and beans.³⁶

Adolescents consider their parents as an important influence on the consumption of healthy foods.^{34,35} In agreement, the results of the present review suggest that the presence of both parents, with their food practices and choices, has a positive influence on adolescents' dietary intake, considering that their eating habits are being formed at this age.³⁵ Deng²⁷ states that adolescents' food preferences are more associated with the characteristics of their families than individual factors such as gender, education and food knowledge. On the other hand, Pearson et al.³⁴ suggest that because young people spend more time out of the home during adolescence their food preferences are more influenced by peers and the school environment than their families.

Adolescents living with extended families, comprised of more family generations and members, have a higher frequency of unhealthy eating habits or health risk.²⁷ This suggests that teenagers living with grandparents in extended families are more likely to have unhealthy eating preferences. According to Jiang et al.,³⁷ grandparents have the tendency to offer fast foods or sugar-rich beverages in excess to adolescents, either as a form of reward and/or to compensate for any previous experience with food deprivation or restriction. Furthermore, grandparents are more permissive, a behavior that is associated with a greater likelihood of consuming unhealthy foods, which can contribute to an increase of inadequate dietary preferences.³⁷

Unhealthy eating habits or those considered of risk to health were observed among adolescents of single-parent families.²³ A possible explanation could be the change of the parents' marital condition, which can enhance the behavioral autonomy of teenagers, that is, young people who live in single-parent families may have more responsibilities, independence and power to make decisions than those who live with both parents.^{32,38} Another possibility is the fact that traditional families are stricter regarding the food choices of adolescents.³⁹ Additionally, Pearson et al.³⁴ suggest that unhealthy eating habits among adolescents from

single-parent families can be explained by the fact that single parents have less time to shop for food and prepare healthy meals because of their jobs or other demands of daily routine.³⁴

Irregular breakfast consumption by teenagers was observed more frequently in single-parent and reconstituted family structures.^{25,26,30-32} The association between family structures and breakfast consumption habits can be explained by social and contextual factors that are associated with single-parent families, such as their sociodemographic level, education and status of the parents in the labor market and the adolescent's personal preferences (hunger, taste and health).^{25,26}

Videon & Manning¹³ found that adolescents who were allowed to make their own decisions about the foods they ate were 25% more likely to skip breakfast, which explains the lower probability of consumption of this meal in single-parent families. Breakfast skipping may result in an inadequate intake of foods and nutrients, which may not be provided in other meals and may hinder proper growth and development.¹³

Furthermore, the omission of a meal and the low frequency of meals consumption that were observed in adolescents of single-parent families in the studies included in the present review may predict the continuity of this behavior in adulthood³⁰ and have been associated with overweight in adolescents.^{1,40-42}

Timlin et al.⁴³ conducted a longitudinal study and a follow-up period of five years with 2,216 adolescents and found that frequent consumption of breakfast was a marker of a healthy lifestyle, being inversely associated with weight gain. In addition, frequent consumption of breakfast is associated with a greater intake of calories, carbohydrates and dietary fibers, and less saturated fat.⁴³

According to St-Onge et al.,⁴⁴ regular and frequent consumption of the main meals reduces the risk of obesity in children and adolescents. Likewise, meals skipping is associated with higher metabolic risk such as high Body Mass Index, waist circumference, fasting plasma glucose and reduced fasting plasma HDL, alterations that are risk factors for an early onset of noncommunicable chronic diseases.⁴⁴

Thus, living with both parents is particularly important, because through family routines and rituals, adolescents can assimilate their parents' habits and attitudes.^{31,45} Family routines are associated not only with the adolescent's psychological health but also with the body weight status and eating habits.^{10,13,31}

Various family-related factors can influence the adolescents' eating habits, among them the presence of parents, dietary behaviors and incentives to consume healthy foods, patterns of family meals and the parents' lifestyle.^{13,30,34} The frequency of consumption of unhealthy food groups by teenagers was observed when family heads, men or women, also consumed much of these foods in the same meal. This observation corroborates the premise that adult models in the same household affect the eating behavior of children and teenagers.²⁹

In the present study, different ways of classifying household composition were observed, which limited a comparison between the studies and the results found. However, irrespective of how household composition was categorized, it was possible to observe some consistency regarding the aspects examined.

The limited number of studies available on household composition and its relationship with the eating habits of adolescents showed the importance of more studies to explore the subject. In addition, it is necessary to standardize the categories to assess household composition in order to facilitate the comparison of results.

One of the strengths of this study is the selection of the major scientific databases, which enables a broad search for quality publications. Another strength was the low presence of risk of bias in most of the studies examined, strengthening the results found.

The potential influence of the family on teenagers' eating habits is considerable, indicating that the subject of household composition and its association with dietary habits should be valued and requires further investigations. In addition, household composition should be considered when programs for the promotion of healthy eating habits among adolescents are devised.

CONCLUSION

The present systematic review showed that, in general, adolescents who lived with both parents had a higher frequency of having breakfast and a higher consumption of vegetables. The most positive and healthy food preferences were more frequent in adolescents who lived in nuclear families. On the other hand, adolescents who lived in single-parent households or in reconstituted families exhibited a higher consumption of unhealthy food markers.

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Contributors

Leite JA and Rodrigues PRM contributed to the concept, design and writing of this study; Leite JA and Pompeo EDP searched on electronic databases, examined the articles and extracted data; Monteiro LS and Muraro AP developed the strategies for the search on databases and revised critically the manuscript; Nogueira PS and Rodrigues PRM formulated the research question and revised critically the manuscript. All authors contributed to the writing of the manuscript and approved it.

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