

Living With Parents, Healthy Living Practices And Common Mental Disorders in Adolescents: a School-Based Study in Brazil

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Abstract

Background: Mental health conditions represent 16% of the global burden of disease and injury in adolescents. Promotion, protection, and restoring the mental health must be considered indispensable, especially in adolescence. This study aims to verify the association of living practices, living with parents and the presence of Common Mental Disorders (CMD) in Adolescents.

Methods: Cross-sectional study that analyzed data from 71,553 Brazilian adolescents aged 12-17 years, from the Study on Cardiovascular Risks in Adolescents (ERICA), between 2013-2014. Principal Component Analysis was performed to identify Living Practices Patterns, and Logistic Regression Models were performed to identify the associations between Living Practices Patterns, living with parents, and presence of CMD.

Results: 71,553 adolescents were evaluated. To construct the Common Mental Disorders (CMD) variable, the Goldberg General Health Questionnaire was used. A pattern of Healthy Living Practices Standard (HLPS) was found. Adolescents belonging to the second (OR: 0.74; 95% CI 0.66–0.83) and third (OR: 0.45; 95% CI 0.39–0.51) terciles of the HLPS, that is, those who had higher rates of belonging to the pattern had lower chances of having CMD. Adolescents who lived with only the father or only the mother (OR: 1.25; 95% CI 1.09-1.43) or with no parent (OR: 1.59; 95% CI 1.27-1.99) were associated with a higher chance to present CMD.

Conclusions: An inverse association between HLPS and the presence of CMD and a direct association between not living with both parents or living only with the mother or only with the father and the presence of CMD was identified.

Background

Mental health can be defined as a state of well-being in which the individual, with their skills, can deal with everyday tensions, be productive and contribute to their community.¹ Therefore, promotion, protection, and restoring mental health must be considered indispensable to everyone, both individually and collectively, and in all age groups.^{1,2}

Special attention should be paid to adolescence, in which a significant percentage of these disorders start in childhood, adolescence or young adulthood, with more than half of the cases occurring around 14 years old.³⁻⁴ Worldwide, mental health conditions represent 16% of the global burden of disease and injury in adolescents.² In Brazil, data obtained from a representative study for the Brazilian population in 2014, found a 30% prevalence of Common Mental Disorders (CMD) in adolescents aged between 12 and 17 years old.⁵⁻⁶

To understand the factors associated with CMD and propose actions to prevent it still in adolescence, some studies have shown the importance of healthy living practices such as regular physical activity, healthy food consumption, adequate water intake, ideal sleep time, screen time control, and good relationship with parents suggesting them as variables related to better outcomes in adolescent mental health.⁷⁻¹⁷

It is observed, however, that despite the theme being explored in the international literature, in Brazil there are few studies with national representativeness that have evaluated the association between healthy living practices, living with parents and CMD in adolescents. This study aims to verify the association of healthy living practices, living with parents and the presence of Common Mental Disorders in Brazilian adolescents.

Methods

Design and sampling of eligible municipalities and schools

For this study, data from the Study on Cardiovascular Risks in Adolescents (ERICA) were used. ERICA was a cross-sectional, national, school-based study with data collection carried out between March 2013 and December 2014, with a sample of adolescents aged 12 to 17 years old of both sexes, enrolled in the last three years of elementary school and the three years of high school in Brazilian public and private schools.

The ERICA Study included 273 eligible Brazilian municipalities. To find the number of eligible cities, the population sampled was stratified into 32 geographic strata: each capital of the 27 units of the federation and five strata comprising municipalities with more than 100,000 inhabitants in each of the five macro-regions of the country.¹⁸

Therefore, 1,251 schools in 124 municipalities were selected. In each selected class, all students were invited to participate in the survey, which consisted of interviews, anthropometric measurements, and blood pressure measurements. Three questionnaires were applied: for adolescents, for parents/educators, and about the school. For the analysis of the present study, only the questionnaire for adolescents was used, including a 24-hour recall (24hR).

Detailed information on the sampling process, research protocol, participant selection, and data collection can be found in studies previously published by the ERICA Study Committee.¹⁸⁻²⁰

Study participants and data collection

The ERICA Study sample consisted of 102,327 eligible adolescents, however. Adolescents with some degree of disability that could compromise the anthropometric assessment or prevent them from completing the questionnaire and adolescents who were pregnant were excluded from the sample. Therefore, for this study, 71,553 adolescents were eligible, including those who answered the adolescent questionnaire and the 24hR.

Dependent variable

To construct the Common Mental Disorders (CMD) variable, the Goldberg General Health Questionnaire (1972) was used (GHQ-12), validated for use in adolescents.²¹ The GHQ-12 is a widely used self-administered instrument and is known to be a reliable measure of mental health.²²

For the screening of CMD among adolescents, the binary system with a cutoff point of five was considered, that is, the presence of CMD was considered when at least 5 of the 12 items were answered with one of the last two options of the questionnaire ("a little more than normal" or "much more than normal"). This cut-off point has a sensitivity of 86.7%, specificity of 88.9%, a positive predictive value of 71.2%, and ROC curve area (Receiver Operating Characteristics) of 0.94.²³

Independent variables

The pattern of healthy living practices

For the construction of the Healthy Living Practices Standard (HLPS), the following variables were used: water consumption, percentage of ultra-processed food consumption, breakfast consumption, hours of exposure to screens, physical activity, and average sleep time in hours.

The variable water consumption, obtained from the question "How many glasses of water do you drink in a day?", was categorized into "consumption greater than five glasses of water a day" and "consumption less than five glasses of water a day". This categorization was performed according to the possible answers to this question in the ERICA Study database, which would be: "do not drink water", "drink 1 to 2 glasses a day", "drink 3 to 4 glasses of water a day" and "drinks at least 5 or more glasses of water a day".

The percentage of consumption of ultra-processed food was calculated based on information from the 24hR, applied through face-to-face interviews carried out by trained researchers. The interview technique used was the multiple-pass method, which consists of a guided interview in five stages, to reduce underreporting of food consumption.²⁴ The Brazil-Nutri software²⁵ was used to record food consumption data. The software used had a list of 1,626 food, from the database on the acquisition of food and beverages in the Family Budget Survey 2002-2003 carried out by the Brazilian Institute of Geography and Statistics (IBGE)²⁶⁻²⁷.

Foods classified as ultra-processed according to NOVA were grouped and the kilocalories consumed from these foods were counted.²⁸ Outliers were considered and, consequently, excluded from the present study those adolescents who had a food intake

below 500 Kcal/day or above 6,000 Kcal/day.²⁹ The percentage of energy in Kcal from ultra-processed food concerning the total amount of energy ingested on the day evaluated.

The breakfast consumption variable was obtained from the question "do you eat breakfast". The categories of the variable adopted were: "does not have breakfast", "has a habit of consuming breakfast sometimes" and "has a habit of consuming breakfast regularly".

Screen time came from the question "On a common weekday, how many hours do you use a computer or watch TV or play video games?". The variable was categorized according to the recommendation of the Brazilian Society of Pediatrics,³⁰ as "less than three hours a day in front of screens" and "more than three hours a day in front of screens".

The categorization of the time of weekly physical activity practice was performed according to the cutoff points proposed by the National Adolescent Health Survey - PENSE³¹, in which students who did not practice physical activity in the reference period were considered "insufficiently active 1" those who practiced between 1 and 149 minutes, "insufficiently active 2" those who practiced 150 to 299 minutes and "active" those adolescents who accumulated 300 minutes or more of weekly physical activity.

To obtain the variable mean sleep time, the weighted mean between the time in hours of sleep usually practiced during weekdays and weekend days, separately, was calculated. Those individuals who reported sleeping less than 4 hours and more than 14 hours were not considered, according to Borges.³²

Living with parents

The variable living with parents has the following categories: lives with both parents live only with mother or only father and does not live with either parent.

Adjustment variables

The adjusted variables were identified from a theoretical model and selected with the aid of a Directed Acyclic Graph (DAG) built in the Dagitty (<http://www.dagitty.net/>). The model was carried out considering the outcome variable CMD and the explanatory variables healthy lifestyle and living with parents (Supplementary material).

The set of minimum adjustments sufficient to estimate the total effect of a healthy lifestyle and living with parents with CMD recommended by the DAG were: socioeconomic factors, age, sex, school administrative dependency (Supplementary material). Variables related to socioeconomic factors were considered: work activity performed by the adolescent, race/color, region of school, and macro-region of residence.

The age of the adolescents was categorized into three age groups: 12 and 13, 14 and 15, 16 and 17. Administrative dependence could be public or private administration. As for gender, the alternatives in the student's questionnaire were: female and male. The variable place of residence had the rural and urban categories, while the variable Region of Brazil had the five Brazilian regions: North, South, Midwest, Northeast, and Southeast. The race/color variable had the following categories: white, black, brown, yellow (Asian), and indigenous.

To establish the socioeconomic status of the adolescents, it was decided to calculate a pattern of socioeconomic indicators (Supplementary Material) through Principal Component Analysis (PCA), consisting of variables identified in the study by Ribeiro et al (2021)³³. The pattern of socioeconomic indicators generated by the PCA identified the main component, with a contribution of 36.22% of explained accumulated variation. The pattern was characterized by the presence of employees, fewer residents per room, more bathrooms, and more refrigerators in the home (Supplementary Material).

The variable work, was constructed from two variables from the questions "Has the student worked without pay in the last year?" and "Student worked with pay in the last year?", that is, the performance of paid and unpaid activities was considered as work. Therefore, the categories of the variable considered for the model were "No" and "Yes".

Statistical analysis

Descriptive analysis included the calculation of absolute and relative frequencies for categorical variables, in addition to measures of central tendency. The chi-square test was performed to compare proportions between variables.

To identify the HLPS, the PCA was performed; the following variables were considered: water consumption, percentage of consumption of ultra-processed foods, habits of eating breakfast, time of exposure to screens, the habit of physical activity, and average sleep time in hours. The Kaiser-Meyer-Olkin (KMO) was estimated as a measure of the adequacy of PCA, with values between 0.5 and 1.0 considered acceptable for this index. Subsequently, components with an eigenvalue greater than 1.0, defined according to the scree plot graph, were extracted from the PCA. The structure of the components was obtained by indicators that had factor loadings greater than 0.30 or less than -0.30, generating a variable in scoring units for the pattern of behavior found, named according to the indicators retained. For each pattern, a categorical variable was created from the values of the terciles of distribution of the scores of these patterns.

Crude and adjusted analyzes were performed using simple logistic regression models, considering the presence of CMD as a dependent variable and HLPS and living with parents as independent variables. The odds ratio (OR) with a 95% confidence interval (95%CI) was used as a measure of effect.

It is noteworthy that because the data from the ERICA Study come from a complex sample, the survey command (svy:) was applied in all statistical analyses, which were performed in the Stata 14.0 software.

Ethical aspects

This report was approved by the Research Ethics Committee of the Instituto de Estudos de Saúde Coletiva da Universidade Federal do Rio de Janeiro (IESC/UFRJ) which belongs to the report's central coordination (IESC/UFRJ – Aprovação nº 45/2008) and of each State. Informed consents were obtained from all subjects, parent and their legal guardian(s). The authors confirm that all methods were performed in accordance with the Declaration of Helsinki.

Results

Sample characteristics

In this study, data from 71,553 Brazilian adolescents were evaluated. Table 1 shows the characterization of the studied adolescents, it was observed that the presence of CMD was more prevalent among male adolescents (32.08%), aged between 16 and 17 years (20.30%), who perform work activities (20.13%), who does not live with any of the parents (23.23%), they study in schools located in the urban area (17.24%) and belong to the first tertile of the HLPS, that is, those who had less healthy living practices (22.81%) (Table 1).

The pattern of healthy living practices among Brazilian adolescents

The PCA results for identifying the HLPS are shown in Table 2. The main component was identified, with a contribution of 21.99% of explained accumulated variance. The KMO index and the factor loadings of all indicators were satisfactory. The pattern was characterized by higher water consumption, lower consumption of ultra-processed foods, the habit of eating breakfast, less exposure time to screens, habit of physical activity, and longer average sleep time in hours.

Association between healthy habits pattern and CMD

The variables associated with the presence of CMD in Brazilian adolescents in the logistic regression model are shown in Table 3. Based on the results, we identified that adolescents belonging to the second (OR: 0.74; 95%CI 0.66–0.83) and third (OR: 0.45; 95%CI 0.39–0.51) terciles of the HLPS, that is, those who had higher rates of belonging to the pattern had lower chances of having CMD.

Moreover, adolescents who lived with only the father or only the mother (OR: 1.25; 95%CI 1.09-1.43) or with no parent (OR: 1.59; 95%CI 1.27-1.99) were associated with a higher chance to present the outcome.

Discussion

The results of the present study showed an inverse association between belonging to the pattern of healthy living practices and the presence of CMD, and a direct association between not living with both parents or living only with the mother or only with the father and the presence of CMD in adolescents Brazilians.

Mental health is an essential component for the individual's integral health and can be affected by multiple factors, such as those of a social, economic, family, community, and individual order.^{34,35} Impaired mental health, therefore, can be associated with rapid social changes, stressful working conditions, situations of violence, social exclusion, impaired family life, and an unhealthy lifestyle.³⁶

The pattern of healthy living practices, was inversely associated the presence of CMD in adolescents. Lubans et al. (2016)³⁷ proposed a conceptual model for the effects of physical activity on the mental health of children and adolescents, highlighting three hypotheses of mechanisms: the neurobiological hypothesis, related to improved cognition and mental health through changes in the structural and functional composition of the brain; psychosocial hypothesis, based on mental well-being through psychosocial mechanisms, which would occur through the satisfaction of basic psychological needs for social connection, autonomy, self-acceptance, environmental domain, and life purpose; and the behavioral hypothesis, which says that changes in mental health resulting from physical activity are mediated by changes in behavior, in particular, in the improvement of aspects related to sleep.

As for food consumption, Godos et al. (2020)³⁸ in a review, evoke that food and mental health are strictly linked. Among the hypothetical mechanisms demonstrated, excessive and long-term consumption of foods with high sugar content, a common feature among some ultra-processed foods, may be associated with alterations in the central nervous system mediated by increased neuroinflammation in the hippocampus. Furthermore, the consumption of sausages is associated with the production of inflammatory biomarkers, which are related to mental disorders. Moreover, the synergy between the consumption of healthy foods and the adoption of healthy eating practices seems to act in the prevention of mental disorders.

It is important to emphasize that modifiable life practices related to mental health are frequently addressed in the literature, however, in an isolated way. However, adolescents live in environments that expose them to multiple risk and protective factors simultaneously, promoting the interaction of these factors that can influence the severity of mental disorders when there is an interaction between risk factors, or, moreover, potentiate protective effects when adopting simultaneous healthy living practices.³⁷⁻⁴⁴

The adoption of multiple healthy living practices as protective factors for mental health in adolescents, as observed in the present study, was also supported by other studies^{7,45}. Loewen et al.⁷, in a prospective study with groups of Canadian adolescents, found that those who adhered to multiple recommendations for a healthy lifestyle, such as eating according to the Food Guide of Canada, physical activity, reduction of screen time, and adequate hours of sleep, had fewer visits for mental health care over the three years of the study, reinforcing the importance of adhering to multiple recommendations for the prevention of mental disorders.

Adolescence is a crucial period for the development of personality, self-esteem, and lifestyle, being a period of opportunity to promote protective habits for mental health, and the family plays an essential role in this context.⁴⁶ Minuzzi et al. (2019),⁴⁷ verify the association of parents' lifestyle profiles with those of their children, found that positive parental behavior, that is, behaviors that promote health and quality of life, increases the chances of positive behavior by the children. In addition, some studies have shown that the family structure³¹⁻³³ and the parenting styles adopted, especially authoritarian and neglectful styles, can contribute to the worsening of mental health in adolescence, as the form of treatment, attitudes, and quality of care relationships with parents influence socio-emotional development.^{48,53,54}

In the present study, living with only the father or only the mother, or with neither of the parents, was associated with increased odds for the presence of CMD. By living with their parents, adolescents may have greater chances of contacting those responsible, strengthening the parent-child bond. The strengthening of this bond and attachment to parents is inversely

associated with emotional difficulties, fewer conduct problems, and prosocial behavior.⁵⁵ It is observed that the active presence and support of parents or responsible, can contribute to better mental health outcomes in adolescents.^{54,56}

Limitations

Our study has some limitations, such as the use of a 24hR of just one day for the construction of the variable that makes up the pattern of healthy living practices, which may imply consumption that does not correspond to that of the assessed adolescent, in addition to the possibility of memory bias and individual omission. However, to ensure that the data from this recall would be collected in the best possible way, the multiple-pass method interview technique was used.²⁴

Conclusion

This study identified an inverse association between HLPS and the presence of CMD and a direct association between not living with both parents or living only with the mother or only with the father and the presence of CMD in Brazilian adolescents.

Abbreviations

CMD: Common Mental disorders

ERICA: Report on Cardiovascular Risk in Adolescents

GHQ-12: Goldberg General Health Questionnaire

PCA: Principal Component Analysis

ROC curve area: Receiver Operating Characteristics

IBGE: Instituto Brasileiro de Geografia e Estatística

DAG: Directed Acyclic Graph

WHO: World Health Organization

KMO: Kaiser Meyer Olkin

FCP: Food Consumption Patterns

Declarations

Ethics approval and consent to participate: This report was approved by the Research Ethics Committee of the Instituto de Estudos de Saúde Coletiva da Universidade Federal do Rio de Janeiro (IESC/UFRJ) which belongs to the report's central coordination (IESC/UFRJ – Aprovação nº 45/2008) and of each State. Informed consents were obtained from all subjects, parent and their legal guardian(s). The authors confirm that all methods were performed in accordance with the Declaration of Helsinki.

Consent for publication: Not applicable.

Availability of data and materials: The datasets used and/or analysed during the current study are available from the ERICA Study Comitee on reasonable request.

Competing Interests: The authors declare no competing interests.

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Tables

Table 1. Characterization of Brazilian adolescents with presence of Common Mental Disorders. ERICA, Brazil 2013-2014.

Common Mental Disorders

Variable	Total Sample (n)	Total Sample (%)	No (%)	Yes (%)	p-value ^a
Sex					
Female	39,690	49.79	76.70	23.30	<0.001
Male	31,863	50.21	53.95	32.08	
Age (Years)					
12–13	19,883	35.10	86.19	13.81	<0.001
14–15	26,670	34.99	82.40	17.60	
16–17	25,050	29.90	79.70	20.30	
Socioeconomic pattern^b					
Tertile 1	31,609	46.26	82.68	17.32	0.2841
Tertile 2	24,864	35.04	86.66	16.34	
Tertile 3	14,349	18.70	82.53	17.47	
Paid or unpaid work					
No	54,190	73.97	83.99	16.01	<0.001
Yes	17,363	26.03	79.87	20.13	
Race/Color					
White	25,425	40.05	82.87	17.13	0.5365
Black	5,409	8.31	83.41	16.59	
Brown	36,477	48.83	83.20	16.80	
Yellow (Asian)	1,805	2.12	81.05	18.95	
Indigenous	535	0.69	78.68	21.32	
Housing Area					
Middle West	9,331	7.67	82.23	17.77	0.7908
Northeast	22,205	21.34	83.21	16.79	
North	14,494	8.43	82.23	17.56	
South East	16,434	50.78	83.06	16.94	
South	9,089	11.78	82.59	17.41	
School region					
Rural	1,317	3.90	86.84	13.16	0.0132
Urban	70,236	96.10	82.76	17.24	
Live with parents					
Both parents	39,231	57.27	84.67	15.33	<0.001

Only with mother or only with father	27,403	36.85	81.18	18.82	
Neither parents	4,919	5.88	76.77	23.23	
Type of school					
Public	56,703	83.47	83.57	16.99	0.4025
Private	14,850	16.43	82.47	17.53	
Pattern of healthy living practices^c					
Tertile 1	18,914	34.08	77.19	22.81	<0.001
Tertile 2	18,914	32.78	83.42	16.58	
Tertile 3	18,912	33.15	90.02	9.98	

^a The chi-square test

^b The pattern of socioeconomic indicators was characterized by a higher number of employees in the home, a lower number of residents per room, a higher number of bathrooms in the home and a higher number of refrigerators in the home (Supplementary Material).

^cThe pattern of healthy habits was characterized by greater consumption of water, less consumption of ultra-processed foods, habit of eating breakfast, less time of exposure to screens, habit of physical activity and longer average sleep time in hours (Table 2).

Boldface indicates statistical significance ($p < 0.05$)

Table 2. Factor loadings of the Healthy Living Practice Pattern of Brazilian adolescents. ERICA, Brazil, 2013-2014.

Indicators	Pattern of healthy living practices	KMO^a
Water consumption	0.4388	0.5580
Percentage of consumption of ultra-processed food	-0.3854	0.6063
Habit of having breakfast	0.5068	0.5843
Daily screen hours ^b	-0.4255	0.5838
Average sleep hours	0.3486	0.5504
Practice of physical activity	0.3155	0.5407
<i>Eigenvalue</i>	<i>1.31911</i>	.
<i>Explained variance (%)</i>	<i>21.99</i>	.
<i>Overall</i>	.	<i>0.5696</i>

^aKaiser-Meyer-Olkin

^b Only televisions, computers and video games were considered as devices.

Table 3. Crude and adjusted logistic regression analysis. ERICA Brazil, 2013-2014.

Variable	Common Mental Disorders	
	Crude OR (CI 95%)	Adjusted OR (CI 95%) ^a
Healthy Living Practice Pattern		
First tercile	(Ref.)	(Ref.)
Second tercile	0.67 (0.60 – 0.74) ^{***}	0.74 (0.66 – 0.83) ^{***}
Third tercile	0.37 (0.33 – 0.42) ^{***}	0.45 (0.39 – 0.51) ^{***}
Living with parents		
Both parents	(Ref.)	(Ref.)
Only with mother or only with father	1.27 (1.14 – 1.41) ^{***}	1.25 (1.09 – 1.43) [*]
Neither parents	1.67 (1.38 – 2.03) ^{***}	1.59 (1.27 – 1.99) ^{**}

OR: Odds Ratio; CI: Confidence Interval

^a Adjusted by age, sex, socioeconomic status, color, work activity, administrative dependence of the school, region of school, region of the country

* indicates statistical significance (*p<0.05, **p<0.01, ***p<0.001).

Supplementary Files

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