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Adverse childhood experiences and their implications for the prevalence of overweight adolescents in one metropolitan region of Brazil

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Abstract

Introduction: exposure to adverse childhood experiences is considered an important predictor for excess weight or obesity.

Objective: this study aimed to analyze the link between exposure to adverse childhood experiences and excess weight in late adolescence.

Methods: the data were obtained between 2016 and 2017. A binary logistic regression model was used to investigate the link between to adverse childhood experiences and excess weight in late adolescence, independently of adjustment variable. A 5% significance level and 95% confidence interval were adopted.

Results: a total of 2,285 adolescents aged between 15 and 19 years old, from a metropolitan region of Brazil, participated in the study. “Sexual abuse” (OR=1.39; CI95%: 1.008-1.921), “domestic violence” (OR=1.71; CI95%: 1.066-2.734), “parental divorce or separation” (OR=1.3; CI95%: 1.015-1.689), “physical neglect” (OR=1.90; CI95%: 1.354-2.672), “emotional neglect” (OR=1.76; CI95%: 1.279-2.432), and cumulative exposure to between four and 10 adversities (OR=1.64; CI95%: 1.049-2.564) were positively linked with excess weight in late adolescence, compared to those who did not experience such adversities.

Conclusion: it is concluded that adolescents who have experienced to adverse childhood experiences are more likely to become overweight compared to those who have not suffered such adversities. Thus, it is suggested that greater attention is paid to adverse childhood experiences in the prevention and treatment of obesity in adolescence.

Keywords: adolescence, obesity, child abuse, exposure to violence, Brazil.

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Authors summary

Why was this study done?
This study was conducted to understand the contribution of Adverse Childhood Experiences (ACEs) to the development of obesity in adolescence, as it is considered a serious public health issue, with increasing prevalence among adolescents in both high-income and low- and middle-income countries. Adding to this concern are the harmful effects that obesity can cause during adolescence, such as asthma and impaired lung function, depression, and poor quality of life. Furthermore, adolescent obesity is associated with an increased risk of severe obesity, diabetes, cardiovascular diseases, and depressive symptoms.

What did the researchers do and find?
The authors conducted a cross-sectional study involving a sample of 2,285 adolescents. To our knowledge, this is one of the first studies in Brazil to explore the association between ACEs and excess weight in adolescents using a large, school-based sample. The study found that exposure to the co-occurrence of four to ten Adverse Childhood Experiences (ACEs) significantly increased the likelihood of overweight status among adolescents aged 15 to 19 years, independent of sex, age, household income, physical activity level, and consumption of ultra-processed foods. Regarding the individual contribution of specific types of ACEs, experiences such as sexual abuse, domestic violence, parental divorce or separation, physical neglect, and emotional neglect were identified as significant factors associated with a higher prevalence of excess weight in adolescents.

What do these findings mean?
In conclusion, the findings of this study indicate that adolescents who have experienced Adverse Childhood Experiences (ACEs) are more likely to develop excess weight compared to those who have not been exposed to such adversities. Regarding the individual contribution of ACEs, adolescents who experienced sexual abuse, domestic violence, parental divorce or separation, physical neglect, and emotional neglect, as well as those exposed to a cumulative number of adversities, showed a higher prevalence of excess weight. Therefore, it is essential to prioritize attention to ACEs in both the prevention and treatment of adolescent obesity, and to incorporate the prevention of ACEs as a long-term public health strategy.

Highlights
The study indicates that there is a positive association between the experience of ACEs and being overweight in adolescence. Regarding the individual contribution of the ACEs, adolescents who suffered “sexual abuse,” “domestic violence,” “parental divorce or separation,” “physical neglect,” and “emotional neglect,” as well as cumulative exposure to various adversities, presented a higher proportion of excess weight.

INTRODUCTION

Adverse childhood experiences (ACEs) are defined as any type of perpetuation of violence or acts of neglect directed toward under-18s, as well as situations that can make the family environment dysfunctional[1]. Physical abuse, sexual abuse, neglect, interpersonal violence, and the co-occurrence of multiple types of ACE are most frequently evaluated[2]. Exposure to these experiences is considered an important predictor of negative results for physical and mental health, such as depression, high blood pressure, excess weight or obesity, and diabetes, among others[1,3-11].

Therefore, it is important to shed light on the contribution of ACEs to the development of obesity in adolescence, since this is considered a serious public health problem, with rising prevalence rates among adolescents, both in high-income and in low- and middle-income countries[12-14]. In addition, there are the damaging effects that obesity can cause in adolescence, such as asthma and lung function problems[15,16], depression[17], and poor quality of life[18]. Moreover, obesity in adolescents is linked with an increased risk of serious obesity[19], diabetes[20], cardiovascular diseases[21] and depressive symptoms[22] in adult life.

It is known that adolescents exposed to ACEs are more susceptible to being overweight, obese, or having excess weight compared to those who have not experienced such adversities[1,3-11]. This connection can be understood as resulting from greater emotional vulnerability during childhood, when exposure to ACEs can compromise the balance needed for healthy development[23,24], since the premature and continuous stress associated with such events is capable of altering the functioning of the hypothalamic-pituitary-adrenal axis[23]. Although acute responses of this axis to stress are generally adaptive, excessive responses in combination with genetic susceptibility to diseases can lead to damaging effects in the long run[24].

Despite this evidence, there is still a scarcity of studies in the scientific literature that evaluate the link between ACEs and excess weight, especially among Brazilian adolescents aged 15 to 19 years old[25,26]. Thus, the present study aimed to analyze the link between exposure to ACEs and excess weight in late adolescence.

METHODS

This is a school-based cross-sectional epidemiological study, derived from the project “Surveillance of risk factors for diseases and grievances in adolescents aged 15 to 19 in the Metropolitan Region of Greater Vitória in Espírito Santo (VIGIADOLEC)”[27-29]. The Metropolitan Region of Greater Vitória in Espírito Santo (MRGV-ES) in Brazil has around 148,628 adolescents aged 15 to 1930 and 168 high schools with 65,763 regularly enrolled students. The study involved regularly enrolled students in the public (state and federal) and private high school networks of the MRGV-ES, in morning and afternoon sessions, aged between 15 and 19 and who did not present any type of cognitive, auditory, or visual impairment that impeded their active participation in the research. The study included all students who agreed to take part, who handed in the duly signed informed consent forms (ICFs), and who effectively answered the instrument. All of the data were provided by the students themselves.

The sample size was calculated in order to estimate the proportion of enrolled students in the MRGV, considering the population of 65,763 high school students

enrolled in 168 schools in the MRGV. Based on that universe, the sample calculation was made considering an estimated prevalence of overweight adolescents of 36.4%[31], a 2.5% error, a 95% confidence interval, and a design effect of 1.5, resulting in a minimum required sample of 2,090 individuals. However, to improve the representativeness of the sample and the statistical relevance, the data on all of the adolescents who took part in the study will be used.

The sampling process was developed in multiple stages. Initially, the sample was stratified by calculating the municipal quotas, obtained from the percentage distribution of students enrolled in the high schools of the MRGV-ES, which was subdivided as follows: Cariacica (19.3%), Fundão (0.5%), Guarapari (5.8%), Serra (23.2%), Viana (3.7%) Vila Velha (22.7%), and Vitória (24.8%). Next, 51 schools were randomly chosen using the BioEstat 5.4 program, considering the municipality of the school's location, the administrative dependence of the school, and the size of the school, in order to guarantee the adequate quantity of students. In the case of a chosen school being rejected, it was substituted respecting all of the aforementioned sampling criteria. The data collection occurred between 2016 and 2017 on the premises of the 54 schools, 43 of which were public and 11 were private. The structured interview was conducted in the chosen sessions during class time by previously trained interviewers. The responsible interviewer read to the group the research instrument, provided online. The adolescents completed it individually, using laptop computers, simultaneously to the reading. The Vigiadolec software is developed to carry out the data collection, enabling online or offline collection.

Nutritional status

To assess nutritional status, the World Health Organization criteria were adopted, evaluating the body mass index for age (BMI/A) according to sex, for children and adolescents aged from five to 19 years old32. The weight and height measures were self-reported by the adolescents; however, to improve these data the correction factor was applied33. To classify the anthropometric indices, the following cut-off points were considered: low weight = <-2 z-scores; eutrophia = ≥-2 z-scores to <+1 z-score; overweight = ≥+1 z-score to <+2 z-scores; and obesity = ≥+2 z-scores. For analysis purposes, the nutritional status was categorized as without excess weight (low weight and eutrophia) or without excess weight (overweight and obesity), with this being the outcome variable.

Childhood adversities

To evaluate exposure to adversities in childhood, the Portuguese version of the History of Childhood Adversity Questionnaire was used[1,34]. The instrument was composed of 31 dichotomous and multiple choice items. The adversity events experienced in childhood are grouped into the following dimensions: child abuse experiences (emotional abuse, physical abuse, sexual abuse), dysfunctional family environmental (exposure to domestic violence, parental divorce or separation, alcohol and drug abuse in the family environment, prison, mental illness, or suicide of some family member), and neglect (physical and emotional neglect).

Exposure to adversities in childhood was calculated from the sum of each occurrence of the adversities evaluated, classified as non-exposed or exposed[34]. Next, the total adversity was categorized as "non-exposed," "one to three adversities," and "four to 10 adversities," adapted from Felitte and collaborators1.

The instrument was previously tested using the test and retest method, in two stages, with a 21 day interval. In the first phase, it was applied to 46 adolescents aged between 15 and 19 years old (not included in the main study); in the second, it was applied again to the same students, to verify possible inconsistences in the adolescents' answers. From analyzing the answers obtained on both occasions, using the prevalence-adjusted Kappa test[35], the results showed a variation between 0.71 and 1.0. The McNemar test[36] was also applied to the answers, in order to evaluate the existence of a tendency for disagreement in the answers obtained. It was verified that there was no statistically significant disagreement, except in the variable "It was known that there was someone providing care and protection," which showed a significant discordant tendency (p=0.04)[28].

Control variables

The control variables adopted were the sociodemographic and behavioral characteristics linked with excess weight: sex (female, male), age in years (15-16, 17, 18-19), total family income in minimum wages (<R$880.00, R$880.01 to R$1.700.00, R$1.700.01 to R$2.640.00, >R$2.640.00), physical activity level (sedentary, moderately active, active), and consumption of ultraprocessed foods (lower consumption: 1st and 2nd quartile, higher consumption: 3rd and 4th quartile).

Physical activity level was measured using the International Physical Activity Questionnaire (IPAQ)[37] and classified according to frequency and duration criteria as follows: sedentary – does not engage in any physical activity for at least 10 continuous minutes during the week; moderately active – individuals who practice physical activities for at least 10 continuous minutes a week, but not enough to be classified as active; active – fulfills the following recommendations: a) vigorous physical activity – ≥3 days/week and ≥20 minutes/session; b) moderate or walking – ≥5 days/week and ≥30 minutes/session; c) any summed activity: ≥5 days/week and ≥150 minutes/week; or very active, fulfilling the following recommendations: a) vigorous – ≥5 days/week and ≥30 minutes/session; b) vigorous – ≥3 days/week and ≥20 minutes/session + moderate and/or walking ≥5 days/week and ≥30 minutes/session.

For ultraprocessed food consumption, the food questionnaire of the Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Survey (VIGITEL)[38] was adopted, using the question "In the last seven days, on how many days did you consume…?" in relation to each of the following food groups: artificial juice, soft drinks, sausages, cookies, fried snacks, and sweets. The consumption frequency reported was converted to

daily frequency and subsequently categorized as lower consumption (1st and 2nd quartile) or higher consumption (3rd and 4th quartile)[39].

Statistical analysis

The data were analyzed in STATA version 14. The prevalence of overweight adolescents was determined. The absolute and relative frequencies were calculated and Pearson's chi-squared (X^2) test was used to analyze the differences in proportions of childhood adversity experiences and excess weight in late adolescence. A 5% significance level was adopted. Next, logistic regression was used to calculate the OR and respective 95%CIs. The regression included the variables that obtained a p-value lower than 0.20 in Pearson's chi-squared test. The adjustment was made for the sociodemographic and lifestyle variables linked with the outcome. The variables with a p-value lower than 5% were considered statistically significant.

RESULTS

The final sample was composed of 2,258 adolescents aged from 15 to 19. The prevalence of excess weight was 14.0% (n=321). Of the participants, 60% (n=1,370) were female, 55.6% (n=1,271) were aged between 15 and 16, 63.1% (n=1,440) self-reported as brown/black, 37.2% (n=850) had a family income of between one and two minimum wages, 51.8% (n=1,183) regularly engaged in physical activity, and 50% (n=1,142) had a higher consumption (3rd and 4th quartile) of ultraprocessed foods.

Among the ACEs, "exposure to domestic violence" (89.8%, n=2,032) and "parental divorce or separation" (81.3%, n=1843) presented the highest prevalence rates. In the analysis of excess weight according to the ACEs, a statistically significant difference was observed with "sexual abuse" (p=0.043), "exposure to domestic violence" (p=0.048), "parental divorce or separation" (p=0.022), "physical neglect" (p<0.001), "emotional neglect" (p<0.001), and "total adversity" (p=0.018), with a higher frequency of excess weight among the adolescents who were victims of these adversities (table 1).

Figure 1 illustrates the proportions of overweight among adolescents who were exposed to adversity in childhood.

Table 1: Overweight according to adverse childhood experiences in adolescents, VIGIADOLEC, RMGV-ES, 2016/2017

Variables	Overweight						
	Total		Yes		No		
	N	%	n	%	N	%	p*
Adverse childhood experiences							
Emotional Abuse (n=2,272)							0.953
No	823	36.2	114	13.9	709	86.1	
Yes	1,449	63.8	202	13.9	1,247	86.1	
Physical abuse (n=2,172)							0.224
No	1,076	49.5	135	12.5	941	87.5	
Yes	1,096	50.5	157	14.3	939	85.7	
Sexual Abuse (n=2,251)							0.043
No	471	20.9	52	11.0	419	89.0	
Yes	1,780	79.1	261	14.7	1,519	85.3	
Exposure to domestic violence (n=2,262)							0.048
No	230	10.2	22	9.6	208	90.4	
Yes	2,032	89.8	291	14.3	1,741	85.7	
Substance abuse in the family environment (n=2,270)							0.426
No	792	34.9	104	13.1	688	86.9	
Yes	1,478	65.1	212	14.3	1,266	85.7	
Divorce or parental separation (n=2,255)							0.022
No	939	41.6	111	11.8	828	88.2	
Yes	1,316	58.4	200	15.2	1,116	84.8	
Prisão de um membro da família (n=2,268)							0.086
No	425	18.7	48	11.3	377	88.7	
Yes	1,843	81.3	267	14.5	1,576	85.5	

Continuation - Table 1: Overweight according to adverse childhood experiences in adolescents, VIGIADOLEC, RMGV-ES, 2016/2017

Variables	Overweight						
	Total		Yes		No		
	N	%	n	%	N	%	p*
Mental illness or suicide (n=2,270)							0.206
No	576	25.4	89	15.5	487	84.5	
Yes	1,694	74.6	226	13.3	1,468	86.7	
Physical neglect (n=2,253)							<0.001
No	535	23.7	46	8.6	489	91.4	
Yes	1,718	76.3	268	15.6	1,450	84.4	
Emotional neglect (n=2,269)							<0.001
No	557	24.5	52	9.3	505	90.7	
Yes	1,712	75.5	264	15.4	1,448	84.6	
Total Adversity (n=2,093)							0.018
Not exposed	210	10.0	34	16.2	176	83.8	
1 a 3 adversities	1,184	56.6	172	14.5	1,012	85.5	
4 a 10 adversities	699	33.4	73	10.4	626	89.6	

Note: *p-value obtained through Pearson's chi-square test.

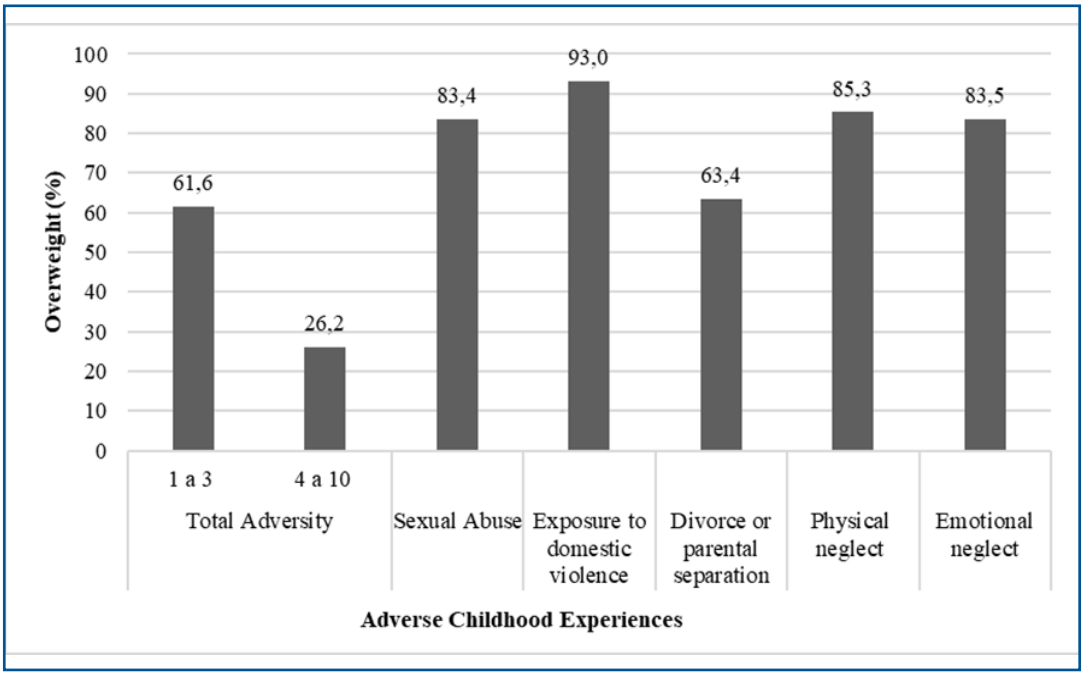

Figure 1: Proportion of overweight among adolescents who experienced Adverse Childhood Experiences. VIGIADOLEC, RMGV-ES, 2016/2017

In the multivariate analysis, after the adjustments for confounding factors (sex, age, total family income, physical activity level, consumption of ultraprocessed foods), it was identified that adolescents who suffered "sexual abuse" had 39% more chance of being overweight compared to those who did not suffer such violence (OR=1.39; CI95%: 1.008-1.921) (table 2).

Similarly, "domestic violence" (OR=1.71; CI95%: 1.066-2.734), "parental divorce or separation" (OR=1.31; CI95%: 1.015-1.689), "physical neglect" (OR=1.90; CI95%: 1.354-2.672), and "emotional neglect" (OR=1.76; CI95%: 1.279-2.432) were positively linked with excess weight in adolescence, with a higher prevalence among adolescents who experienced those adversities in childhood compared to those who did not suffer such violence (table 2).

Exposure to between four and 10 ACEs increased the chance of occurrence of excess weight by 64% (OR=1.64; CI95%: 1.049-2.564) among these adolescents in relation to those who did not suffer such adversities (table 2).

Figure 2 presents the ACEs linked with excess weight in late adolescence, considering the adjusted odds ratio, with its respective confidence intervals.

Table 2: Binary logistic regression between adverse childhood experiences and adolescent overweight, VIGIADOLEC, RMGV-ES, 2016/2017

Variables	Overweight							
	Gross Analysis				Adjusted analysis*			
	p	OR	CI 95%		p	OR	CI95%	
			LL	UL			LL	UL
Sexual Abuse	0.044	1.39	1.009	1.900	0.045	1.39	1.008	1.921
Exposure to domestic violence	0.050	1.58	1.001	2.495	0.026	1.71	1.066	2.734
Divorce or parental separation	0.022	1.34	1.042	1.714	0.038	1.31	1.015	1.689
Imprisonment of a family member	0.087	1.33	0.959	1.845	0.082	1.35	0.962	1.882
Physical neglect	<0.001	1.96	1.414	2.731	<0.001	1.90	1.354	2.672
Emotional neglect	<0.001	1.77	1.293	2.424	0.001	1.76	1.279	2.432
Total adversity								
1 to 3 adversities	0.532	1.14	0.761	1.697	0.560	1.11	0.744	1.683
4 to 10 adversities	0.025	1.66	1.067	2.572	0.030	1.64	1.049	2.564

Note: OR=Odds Ratio; CI95%: Confidence Interval; LL= Lower Limit; UL= Upper Limit; p = p-value obtained by binary logistic regression. *Adjustment performed with the following variables: sex, age, total family income, level of physical activity, consumption of ultra-processed foods.

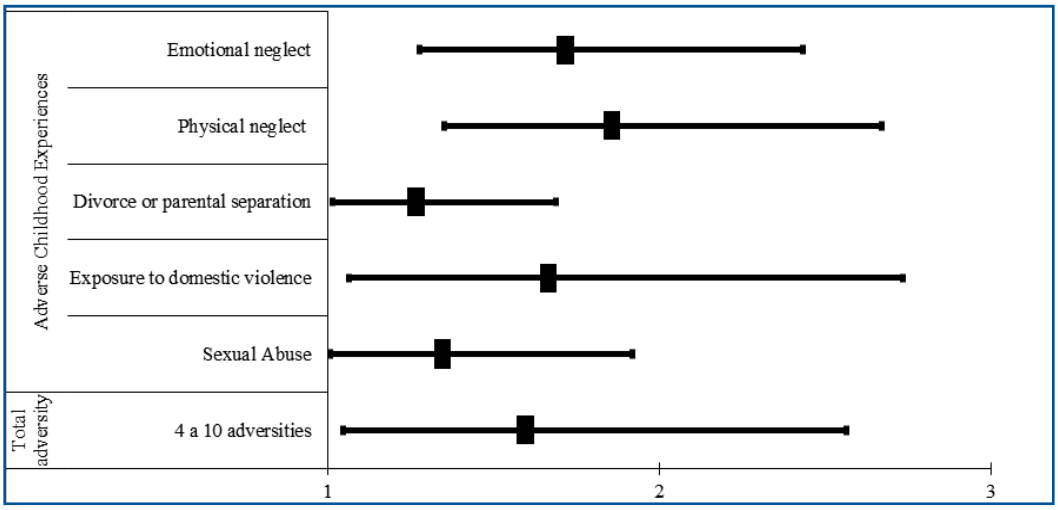

Figure 2: Analysis of the association of adverse childhood experiences with overweight in late adolescence. VIGIADOLEC, RMGV-ES, 2016/2017

DISCUSSION

To our knowledge, this is one of the first studies in Brazil to explore the association between ACEs and excess weight in adolescents using a large, school-based sample. In this investigation, exposure to the co-occurrence of between four and 10 childhood adversities increased the chances of adolescents aged from 15 to 19 being overweight, independently of measures of sex, age, family income, physical activity level, and consumption of ultraprocessed foods. With relation to the individual contribution of the types of ACE, "sexual abuse", "domestic violence", "parental divorce or separation", "physical neglect" and "emotional neglect" contributed to increasing the proportion of overweight adolescents.

ACEs have been repeatedly linked with excess weight, being overweight, and obesity in the scientific literature. In Ireland, exposure to any ACE increased the chances of adolescents being overweight and obese at 13 years old by 56%[5]. Similar results were found in an analysis of exposure to two or more ACEs and its relationship with overweight and obese adolescents in the United States[10]. Likewise, Davis *et al.*[7] highlighted that the strength of association was even greater between exposure to six ACEs and the presence of excess weight, obesity, and severe obesity in adolescence. A similar result has been identified in systematic reviews that have demonstrated a positive link between exposure to various ACEs and a high prevalence of obesity in childhood[3], adolescence[4], and adulthood[11].

Although this study is not able to explore the causal processes of the relationship between ACEs and excess weight, there are various potential mechanisms that could be responsible for that relationship, including chronic stress, activation of the hypothalamic-pituitary-adrenal axis, and behavioral factors, such as diet and physical exercise[23,24]. Another possible cause is psychological anxiety, which is related with ACEs and obesity[40,41].

Stress experienced in childhood can cause alterations in the response capacity of the hypothalamic-pituitary-adrenal axis to stress[23,24]. This can lead to

increased cortisol levels, which can influence the reward system, contributing to increased food intake[23] and lipolysis inhibition, which can lead to fat accumulation (especially visceral fat)[23,24], as well as reduced engagement in physical activity[26]. In addition, age and pubertal development, as well as gender differences, can also influence the functioning of the hypothalamic-pituitary-adrenal axis[42,43].

Regarding the individual contribution of the types of ACE, the experience of "sexual abuse" in childhood has been associated with greater chances of excess weight in adolescence. This finding is consistent with those of Isohookana *et al.*[8] and Veldwijk *et al.*[44], in which the victims of sexual abuse in childhood also presented the highest prevalence rates of obesity in adolescence, compared to those who did not suffer such abuse. The relationship between sexual abuse in childhood and the development of obesity in adolescence may be explained by the possible mental inducement and emotional disorders, as well as the stress, poorly adapted responses, inflammation, and metabolic disorders that can be caused by that adversity[45].

Exposure to "domestic violence" was another ACE that also maintained a positive link with a higher proportion of excess weight among the adolescents. Similarly, the contribution of exposure to domestic violence to a higher frequency of excess weight or obesity in adolescence has already been reported in the literature[6,46]. Witnessing domestic violence is linked to feelings of terror, insecurity, and impotence in children, as well as depression, anxiety, somatic complaints, and sleep disorders[47], which are factors that can contribute to a greater dietary intake, reduced engagement in physical activity, and, consequently, excessive weight gain.

The adolescents who experienced "parental divorce or separation" in childhood presented higher chances of being overweight in adolescence. Deng and Lacey[48] showed that girls who experienced parental divorce or separation presented the highest proportions of excess weight. It is known that adolescents who have experienced parental divorce have a higher probability of developing anxiety and depression[49,50], which may explain the higher prevalence of excess weight, since there is a relationship between depression and obesity[51].

"Physical neglect" and "emotional neglect" in childhood also showed a link with becoming overweight in late adolescence. That link is consistent with Veldwijk *et al.*[44], who highlighted that exposure to physical neglect in childhood increased by 1.5 times the chance of being obese in adolescence, while emotional neglect increased by 1.72 to 3.76 times the chance of being overweight or obese among adolescents in the Netherlands, respectively. "Physical neglect" was also linked to excess weight among Brazilian adolescents[26]. It is believed that the negative impact derived from experiencing such adversities can modify the adolescents' dietary behavior and engagement in physical activity[52,53].

The results of the present study should be interpreted in light of its limitations. Regarding nutritional status, it is possible that the proportion of overweight young people was underestimated, given that height and weight were self-reported; however, the correction factor[33] was used to improve the data. With relation to the ACEs, the data may produce socially-expected answers and interpretations, and age may have an influence on the self-perception of the experience generated in the ACE actions. However, despite the limitations regarding the instrument itself, it was shown to be quite effective according to the pilot study[28]. The reporting of the adversities may also have been influenced by memory biases or by the fact that the students were not willing to report experiencing traumatic situations.

Despite the limitations mentioned, the data presented here reflect the reality of the influence of the ACEs on excess weight among adolescents aged from 15 to 19 and the study design adopted enables the assumption that the conclusions may be used in similar contexts. It should also be highlighted that this research used a school-based sample from the public and private network and is representative of adolescents in the MRGV-ES.

In conclusion, the results of this study indicate that there is a positive association between the experience of ACEs and being overweight in adolescence. Regarding the individual contribution of the ACEs, adolescents who suffered "sexual abuse," "domestic violence," "parental divorce or separation," "physical neglect," and "emotional neglect," as well as cumulative exposure to various adversities, presented a higher proportion of excess weight.

It is known that obesity in adolescence is related to intensification of the development of various health problems in adolescence[15-18] and in adulthood[19-22] and experiencing adversities in childhood may further aggravate that situation. Thus, greater attention must be paid to ACEs in the prevention and treatment of obesity in adolescence and, consequently, ACEs should be included as a long-term public health measure.

REFERENCES

1. Felitti VJ, Anda RF, Nordenberg D, Williamson DF, Spitz AM, Edwards V, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults. The Adverse Childhood Experiences (ACE) Study. Am J Prev Med [Internet]. 1998 May;14(4):245–58. Available from: http://dx.doi.org/10.1016/s0749-3797(98)00017-8.
2. Soares ALG, Howe LD, Matijasevich A, Wehrmeister FC, Menezes AMB, Gonçalves H. Adverse childhood experiences: Prevalence and related factors in adolescents of a Brazilian birth cohort. Child Abuse Negl [Internet]. 2016 Jan;51:21–30. Available from: http://dx.doi.org/10.1016/j.chiabu.2015.11.017.
3. Schroeder K, Schuler BR, Kobulsky JM, Sarwer DB. The association between adverse childhood experiences and childhood obesity: A systematic review. Obes Rev [Internet]. 2021 Jul;22(7):e13204.

Available from: http://dx.doi.org/10.1111/obr.13204.

4. Flaherty EG, Thompson R, Dubowitz H, Harvey EM, English DJ, Proctor LJ, et al. Adverse childhood experiences and child health in early adolescence. JAMA Pediatr [Internet]. 2013 Jul;167(7):622–9. Available from: http://dx.doi.org/10.1001/jamapediatrics.2013.22.
5. Gardner R, Feely A, Layte R, Williams J, McGavock J. Adverse childhood experiences are associated with an increased risk of obesity in early adolescence: a population-based prospective cohort study. Pediatr Res [Internet]. 2019 Oct;86(4):522–8. Available from: http://dx.doi.org/10.1038/s41390-019-0414-8.
6. Gooding HC, Milliren C, Austin SB, Sheridan MA, McLaughlin KA. Exposure to violence in childhood is associated with higher body mass index in adolescence. Child Abuse Negl [Internet]. 2015 Dec;50:151–8. Available from: http://dx.doi.org/10.1016/j.chiabu.2015.08.005.
7. Davis L, Barnes AJ, Gross AC, Ryder JR, Shlafer RJ. Adverse childhood experiences and weight status among adolescents. J Pediatr [Internet]. 2019 Jan;204:71–6.e1. Available from: http://dx.doi.org/10.1016/j.jpeds.2018.08.071.
8. Isohookana R, Marttunen M, Hakko H, Riipinen P, Riala K. The impact of adverse childhood experiences on obesity and unhealthy weight control behaviors among adolescents. Compr Psychiatry [Internet]. 2016 Nov;71:17–24. Available from: http://dx.doi.org/10.1016/j.comppsych.2016.08.002.
9. Lumeng JC, Wendorf K, Pesch MH, Appugliese DP, Kaciroti N, Corwyn RF, et al. Overweight adolescents and life events in childhood. Pediatrics [Internet]. 2013 Dec;132(6):e1506–12. Available from: http://dx.doi.org/10.1542/peds.2013-1111.
10. Lynch BA, Agunwamba A, Wilson PM, Kumar S, Jacobson RM, Phelan S, et al. Adverse family experiences and obesity in children and adolescents in the United States. Prev Med [Internet]. 2016 Sep;90:148–54. Available from: http://dx.doi.org/10.1016/j.ypmed.2016.06.035.
11. Wiss DA, Brewerton TD. Adverse childhood experiences and adult obesity: A systematic review of plausible mechanisms and meta-analysis of cross-sectional studies. Physiol Behav [Internet]. 2020 Sep 1;223(112964):112964. Available from: http://dx.doi.org/10.1016/j.physbeh.2020.112964.
12. Bloch KV, Klein CH, Szklo M, Kuschnir MCC, Abreu G de A, Barufaldi LA, et al. ERICA: prevalences of hypertension and obesity in Brazilian adolescents. Rev Saude Publica [Internet]. 2016 Feb;50 Suppl 1(suppl 1):9s. Available from: http://dx.doi.org/10.1590/S01518-8787.2016050006685.
13. Ogden CL, Carroll MD, Lawman HG, Fryar CD, Kruszon-Moran D, Kit BK, et al. Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014. JAMA [Internet]. 2016 Jun 7;315(21):2292. Available from: http://dx.doi.org/10.1001/jama.2016.6361.
14. Swinburn BA, Sacks G, Hall KD, McPherson K, Finegood DT, Moodie ML, et al. The global obesity pandemic: shaped by global drivers and local environments. Lancet [Internet]. 2011 Aug 27;378(9793):804–14. Available from: http://dx.doi.org/10.1016/S0140-6736(11)60813-1.
15. Azizpour Y, Delpisheh A, Montazeri Z, Sayehmiri K, Darabi B. Effect of childhood BMI on asthma: a systematic review and meta-analysis of case-control studies. BMC Pediatr [Internet]. 2018 Apr 26;18(1):143. Available from: http://dx.doi.org/10.1186/s12887-018-1093-z.
16. Forno E, Han YY, Mullen J, Celedón JC. Overweight, obesity, and lung function in children and adults-A meta-analysis. J Allergy Clin Immunol Pract [Internet]. 2018 Mar;6(2):570–81.e10. Available from: http://dx.doi.org/10.1016/j.jaip.2017.07.010.
17. Sutaria S, Devakumar D, Yasuda SS, Das S, Saxena S. Is obesity associated with depression in children? Systematic review and meta-analysis. Arch Dis Child [Internet]. 2019 Jan;104(1):64–74. Available from: http://dx.doi.org/10.1136/archdischild-2017-314608.
18. Ul-Haq Z, Mackay DF, Fenwick E, Pell JP. Meta-analysis of the association between body mass index and health-related quality of life among children and adolescents, assessed using the pediatric quality of life inventory index. J Pediatr [Internet]. 2013 Feb;162(2):280–6.e1. Available from: http://dx.doi.org/10.1016/j.jpeds.2012.07.049.
19. The NS, Suchindran C, North KE, Popkin BM, Gordon-Larsen P. Association of adolescent obesity with risk of severe obesity in adulthood. JAMA [Internet]. 2010 Nov 10;304(18):2042–7. Available from: http://dx.doi.org/10.1001/jama.2010.1635.
20. Tirosh A, Shai I, Afek A, Dubnov-Raz G, Ayalon N, Gordon B, et al. Adolescent BMI trajectory and risk of diabetes versus coronary disease. N Engl J Med [Internet]. 2011 Apr 7;364(14):1315–25. Available from: http://dx.doi.org/10.1056/NEJMoa1006992.
21. Umer A, Kelley GA, Cottrell LE, Giacobbi P Jr, Innes KE, Lilly CL. Childhood obesity and adult cardiovascular disease risk factors: a systematic review with meta-analysis. BMC Public Health [Internet]. 2017 Aug 29;17(1):683. Available from: http://dx.doi.org/10.1186/s12889-017-4691-z.

22. Martinson ML, Vasunilashorn SM. The long-arm of adolescent weight status on later life depressive symptoms. Age Ageing [Internet]. 2016 May;45(3):389–95. Available from: http://dx.doi.org/10.1093/ageing/afw020.
23. Adam TC, Epel ES. Stress, eating and the reward system. Physiol Behav [Internet]. 2007 Jul 24;91(4):449–58. Available from: http://dx.doi.org/10.1016/j.physbeh.2007.04.011.
24. Li L, Chassan RA, Bruer EH, Gower BA, Shelton RC. Childhood maltreatment increases the risk for visceral obesity: Childhood Maltreatment and Visceral Obesity. Obesity (Silver Spring) [Internet]. 2015 Aug;23(8):1625–32. Available from: http://dx.doi.org/10.1002/oby.21143.
25. Soares ALG, Matijasevich A, Menezes AMB, Assunção MC, Wehrmeister FC, Howe LD, et al. Adverse childhood experiences (ACEs) and adiposity in adolescents: A cross-cohort comparison. Obesity (Silver Spring) [Internet]. 2018 Jan;26(1):150–9. Available from: http://dx.doi.org/10.1002/oby.22035.
26. Coelho LSVA, Soares SG, Carvalho GD, Oliveira VJ, Belo VS, Romano MCC. Association between violence in childhood and increase in the Body Mass Index among adolescents. Texto Contexto Enferm [Internet]. 2021;30:e20200201. Available from: http://dx.doi.org/10.1590/1980-265X-TCE-2020-0201.
27. Reisen A, Leite FMC, Santos Neto ETD. Associação entre capital social e bullying em adolescentes de 15 a 19 anos: relações entre o ambiente escolar e social. Cien Saude Colet [Internet]. 2021 Nov 15;26(suppl 3):4919–32. Available from: http://dx.doi.org/10.1590/1413-812320212611.3.21522019.
28. Reisen A, Viana MC, Dos Santos Neto ET. Adverse childhood experiences and bullying in late adolescence in a metropolitan region of Brazil. Child Abuse Negl [Internet]. 2019 Jun;92:146–56. Available from: http://dx.doi.org/10.1016/j.chiabu.2019.04.003.
29. Reisen A, Viana MC, Santos-Neto ETD. Bullying among adolescents: are the victims also perpetrators? Rev Bras Psiquiatr [Internet]. 2019 Nov;41(6):518–29. Available from: http://dx.doi.org/10.1590/1516-4446-2018-0246.
30. Instituto Brasileiro de Geografia e Estatística (IBGE). Censo demográfico 2010 [Internet]. [cited 2025 May 19]. Available from: https://censo2010.ibge.gov.br/.
31. Barbosa LM de A, Arruda IKG de, Canuto R, Lira PIC de, Monteiro JS, Freitas DL, et al. Prevalence and factors associated with excess weight in adolescents in a low-income neighborhood - Northeast, Brazil. Rev Bras Saúde Materno Infant [Internet]. 2019 Sep;19(3):661–70. Available from: http://dx.doi.org/10.1590/1806-93042019000300010.
32. Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. Development of a WHO growth reference for school-aged children and adolescents. Bull World Health Organ [Internet]. 2007 Sep;85(9):660–7. Available from: http://dx.doi.org/10.2471/blt.07.043497.
33. Teixeira IP, Pereira JL, Barbosa JPDAS, Mello AV de, Onita BM, Fisberg RM, et al. Validity of self-reported body mass and height: relation with sex, age, physical activity, and cardiometabolic risk factors. Rev Bras Epidemiol [Internet]. 2021 Aug 9;24:e210043. Available from: http://dx.doi.org/10.1590/1980-549720210043.
34. Silva S, Maia A. Versão Portuguesa do Family ACE Questionnaire (Questionário da História de Adversidade na Infância). In: Noronha A, Machado C, Almeida L, Gonçalves M, Martins S, Ramalho V. (Coords.). XIII Conferência Internacional de Avaliação Psicológica: formas e contextos. Braga, PT: Psiquilibrios Edições, 2008 [cited 2025 May 19]; Available from: https://core.ac.uk/reader/55611999
35. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics [Internet]. 1977 Mar;33(1):159–74. Available from: http://dx.doi.org/10.2307/2529310.
36. McNEMAR Q. Note on the sampling error of the difference between correlated proportions or percentages. Psychometrika [Internet]. 1947 Jun;12(2):153–7. Available from: http://dx.doi.org/10.1007/BF02295996.
37. Matsudo S, Araújo T, Matsudo V, Andrade D, Andrade E, Oliveira LC, Braggion G. Questionário Internacional de Atividade Física (IPAQ): estudo de validade e reprodutibilidade no brasil. Revista Brasileira de Atividade Física & Saúde [Internet]. 2001;6(2):5–18. Available from: http://dx.doi.org/10.12820/RBAFS.V.6N2P5-18.
38. Ministério da Saúde (MS). Secretaria de Vigilância em Saúde. Secretaria de Gestão Estratégica e Participativa. Vigitel Brazil 2009: surveillance of risk and protective factors for chronic diseases by telephone survey [Internet]. Brasília (DF): Ministério da Saúde; 2010. [Cited 2021 Mar 10]. [Internet]. Available from: https://bvsms.saude.gov.br/bvs/publicacoes/vigitel_brasil_2009.pdf.
39. Gomes DR, Santos Neto ETD, Oliveira DS de, Salaroli LB. Características associadas ao consumo de alimentos in natura ou minimamente processados e ultraprocessados por adolescentes em uma região metropolitana brasileira. Cien Saude Colet [Internet]. 2023 Feb;28(2):643–56. Available from: http://dx.doi.org/10.1590/1413-81232023282.07942022.

40. Mersky JP, Topitzes J, Reynolds AJ. Impacts of adverse childhood experiences on health, mental health, and substance use in early adulthood: a cohort study of an urban, minority sample in the U.S. Child Abuse Negl [Internet]. 2013 Nov;37(11):917–25. Available from: http://dx.doi.org/10.1016/j.chiabu.2013.07.011.
41. Dong C, Sanchez LE, Price RA. Relationship of obesity to depression: a family-based study. Int J Obes Relat Metab Disord [Internet]. 2004 Jun;28(6):790–5. Available from: http://dx.doi.org/10.1038/sj.ijo.0802626.
42. Doom JR, Hostinar CE, VanZomeren-Dohm AA, Gunnar MR. The roles of puberty and age in explaining the diminished effectiveness of parental buffering of HPA reactivity and recovery in adolescence. Psychoneuroendocrinology [Internet]. 2015 Sep;59:102–11. Available from: http://dx.doi.org/10.1016/j.psyneuen.2015.04.024.
43. Negriff S, Saxbe DE, Trickett PK. Childhood maltreatment, pubertal development, HPA axis functioning, and psychosocial outcomes: An integrative biopsychosocial model: Maltreatment, Puberty, Cortisol, and Outcomes. Dev Psychobiol [Internet]. 2015 Dec;57(8):984–93. Available from: http://dx.doi.org/10.1002/dev.21340.
44. Veldwijk J, Proper KI, Hoeven-Mulder HB, Bemelmans WJE. The prevalence of physical, sexual and mental abuse among adolescents and the association with BMI status. BMC Public Health [Internet]. 2012 Oct 4;12(1):840. Available from: http://dx.doi.org/10.1186/1471-2458-12-840.
45. Hemmingsson E, Johansson K, Reynisdottir S. Effects of childhood abuse on adult obesity: a systematic review and meta-analysis: Childhood abuse and adult obesity. Obes Rev [Internet]. 2014 Nov;15(11):882–93. Available from: http://dx.doi.org/10.1111/obr.12216.
46. Jun HJ, Corliss HL, Boynton-Jarrett R, Spiegelman D, Austin SB, Wright RJ. Growing up in a domestic violence environment: relationship with developmental trajectories of body mass index during adolescence into young adulthood. J Epidemiol Community Health [Internet]. 2012 Jul;66(7):629–35. Available from: http://dx.doi.org/10.1136/jech.2010.110932.
47. Klostermann K, Kelley ML. Alcoholism and intimate partner violence: effects on children's psychosocial adjustment. Int J Environ Res Public Health [Internet]. 2009 Dec;6(12):3156–68. Available from: http://dx.doi.org/10.3390/ijerph6123156.
48. Deng K, Lacey RE. Adverse childhood experiences, child poverty, and adiposity trajectories from childhood to adolescence: evidence from the Millennium Cohort Study. Int J Obes (Lond) [Internet]. 2022 Oct;46(10):1792–800. Available from: http://dx.doi.org/10.1038/s41366-022-01185-1.
49. Størksen I, Røysamb E, Holmen TL, Tambs K. Adolescent adjustment and well-being: effects of parental divorce and distress. Scand J Psychol [Internet]. 2006 Feb;47(1):75–84. Available from: http://dx.doi.org/10.1111/j.1467-9450.2006.00494.x.
50. Oldehinkel AJ, Ormel J, Veenstra R, De Winter AF, Verhulst FC. Parental divorce and offspring depressive symptoms: Dutch developmental trends during early adolescence. J Marriage Fam [Internet]. 2008 May;70(2):284–93. Available from: http://dx.doi.org/10.1111/j.1741-3737.2008.00481.x.
51. Luppino FS, de Wit LM, Bouvy PF, Stijnen T, Cuijpers P, Penninx BWJH, et al. Overweight, obesity, and depression: a systematic review and meta-analysis of longitudinal studies: A systematic review and meta-analysis of longitudinal studies. Arch Gen Psychiatry [Internet]. 2010 Mar;67(3):220–9. Available from: http://dx.doi.org/10.1001/archgenpsychiatry.2010.2.
52. Imperatori C, Innamorati M, Lamis DA, Farina B, Pompili M, Contardi A, et al. Childhood trauma in obese and overweight women with food addiction and clinical-level of binge eating. Child Abuse Negl [Internet]. 2016 Aug;58:180–90. Available from: http://dx.doi.org/10.1016/j.chiabu.2016.06.023.
53. Overskeid G. Do we need the environment to explain operant behavior? Front Psychol [Internet]. 2018 Mar 20;9:373. Available from: http://dx.doi.org/10.3389/fpsyg.2018.00373.

Resumo

Introdução: a exposição às Experiências Adversa na Infância é considerada um importante preditor para o excesso de peso ou obesidade.

Objetivo: este estudo transversal teve o objetivo de analisar a associação entre a exposição às Experiências Adversas na Infância e excesso de peso na adolescência tardia.

Método: os dados foram obtidos entre 2016 e 2017. Adotou-se a regressão logística para investigar a associação entre as Experiências Adversas na Infância e o excesso de peso na adolescência tardia, independente de variáveis de ajuste. Adotou-se nível de significância de 5% e intervalo de confiança de 95%.

Resultados: participaram do estudo 2285 adolescentes entre 15 e 19 anos, de uma região metropolitana do Brasil. O "abuso sexual" (OR=1,39; IC95%: 1,008-1,921), a "violência doméstica" (OR=1,71; IC95%: 1,066-2,734), o "divórcio ou separação parental" (OR=1,3; IC95%: 1,015-1,689), a "negligência física" (OR=1,90; IC95%: 1,354-2,672), a "negligência emocional" (OR=1,76; IC95%: 1,279-2,432) e a exposição acumulativa, de 4 a 10 adversidades (OR=1,64; IC95%: 1,049-2,564) foram associados de forma positiva ao excesso de peso na adolescência tardia, comparado aos que não vivenciaram tais adversidades.

Conclusão: conclui-se que os adolescentes que vivenciaram às Experiências Adversas na Infância são mais prováveis de desenvolver excesso de peso comparado aos que não sofreram tais adversidades. Assim, sugere-se uma maior atenção às Experiências Adversas na Infância na prevenção e tratamento da obesidade na adolescência.

Palavras-chave: adolescência, obesidade, abuso de crianças, exposição à violência, Brasil.