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ORIGINAL ARTICLE

Screening for emotional and psychosocial disorders in children and adolescents with excess weight

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Abstract

Objectives: To realize screening for emotional and psychosocial disorders in overweight and obese children and adolescents by application of pediatric symptoms checklist. **Methods:** Cross-sectional epidemiological study of children and adolescents aged six and 16 years; evaluated at the general pediatrics outpatient clinic of the Hospital Universitário do Oeste do Paraná, in Cascavel City, State of Paraná. The variables analyzed were: sex, age, BMI, and their relationship to the pediatric symptoms checklist (PSC). For the analysis of the data the chi-square hypothesis tests and Fishers exact hypotheses were used for the proportions. The measure of effect of interest was the 95% confidence interval ratio, obtained with the Poisson regression, considering significant results with value of $p<0.05$ Wald test. **Results:** 157 subjects aged six to 16 years participated, 123(78%) of which were under 12 years of age. Of these, 66 (42%) were female and 91 (58%) male, 88 (56%) were obese and 69 (44%) were overweight. The pediatric symptoms checklist was positive in 39 (24%) of the participants. Most participants with positive PSC were less than 12 years old and obese. There was no statistical significance between age, sex and BMI and positive score on the pediatric symptoms checklist. **Conclusion:** 24% of overweight and obese children were at risk for emotional and psychosocial problems.

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INTRODUCTION

The World Health Organization (WHO) considers obesity a worldwide epidemic, conditioned mainly by dietary errors and lack of physical activity. Obesity in the pediatric age group has increased dramatically in the last two decades, in both sexes and especially in the population with lower family income[1,2].

Overweight and obesity are frequently associated with emotional dysfunctions, school problems and worse quality of life when compared to normal weight children and adolescents[3,4]. Excess weight is related to high rates of specific comorbidities such as attention deficit hyperactivity disorder, depression, learning problems, developmental delay, asthma, allergies, headache, ear infection, among others[2,5,6]. The prejudice suffered by obese children and adolescents is increasing, resulting in fewer friends, less affection from parents and worse school performance. With the experience of suffering through *bullying* , adolescents with obesity have little motivation to do physical activities, avoid healthy lifestyles and may even have suicidal ideation[4] . In addition, it is known that those who remain obese for more than four years and have low self-esteem are more likely to develop risk behaviors, such as alcohol consumption and smoking, when compared to their obese peers with normal self-esteem[4,7]. Sleep disorders, especially deprivation, are mediated by emotional, hormonal and behavioral factors and can cause an obesogenic effect[8,9]. Patients with longer time for eating and reduced sleep time increase ghrelin and reduce leptin, which increase appetite[9].

There are several validated instruments for screening behavioral and emotional problems, such as the Pediatric Symptom List (LSP), *CBCL* (*Child Behavior Checklist*) and the Behavioral Assessment Scale for Children – Second Edition (*BASC–2*)[10,11], although not as diagnostic tools, they make it possible to survey positive cases for various mental health problems in childhood and adolescence[12,13]. Studies show that between 10 and 15% of the general pediatric population are positive in screening for mental disorders and less than 50% of the population in the pediatric age group undergo some screening for psychosocial problems and a much smaller number undergo consultation with a psychologist or psychiatrist[12,14].

The aim of this study was to perform a screening for emotional and psychosocial disorders in overweight and obese children and adolescents through the application of the LSP questionnaire.

MATERIALS AND METHODS

A cross-sectional epidemiological study of children and adolescents, aged between six and 16 years, attended at the general pediatric outpatient clinic of the University Hospital of Oeste do Paraná, in the city of Cascavel, Paraná.

Among all outpatients , patients aged between six and 16 years who were overweight were selected, and those with a BMI between Z-Score ≥ +1 and ≤ + 2 were characterized as overweight, and those with Z-Score > 2 were obese. +2.

The guardians and subjects were invited to participate in the study voluntarily, and the importance and objectives of the research were explained, and then the Free and Informed Consent Term (FICT) was delivered for signature by those responsible and the Free and Informed Consent Term. Clarified by the patient, as an adolescent aged ≥ 12 years.

Data collection was carried out by approaching overweight patients and guardians during routine consultations between March/2017 and December/2018. Participants had their weight and height measured wearing light clothing and barefoot on a Líder R digital scale (model P-300C, series 31403, year of manufacture: 2014; Brazil) and height was measured using a wall stadiometer (model E150 A, Tonelli Equipamentos Médicos Ltda., Brazil).

After performing the anthropometric measurements, the body mass index (BMI) was calculated by dividing weight (in kilograms) by height (in meters) squared, and the result was evaluated according to growth tables for children and adolescents of five to 19 years of the World Health Organization (WHO, 2007)[8].

157 questionnaires were delivered, all of which were completed. No guardian refused to sign the informed consent and children and adolescents did not withdraw from participating in the research. The variables analyzed for each patient were LSP score, age, sex, and BMI .

Those responsible for the subjects answered the Brazilian Portuguese version of the *PSC (Pediatric Symptoms Checklist),* the Pediatric Symptoms Checklist (LSP), which is a screening tool for emotional and/or psychosocial problems for children and adolescents aged six to 16 years, consisting of 35 items, easy to apply, understand and interpret the results, in addition to being quickly completed, which reflect the parents' impression of their child's psycho-emotional behavior and development. LSP is not specific to a specific mental disorder, but the questions address symptoms of attention, internalizing problems (somatic complaints, anxiety and depression) and externalizing problems (hyperactivity, aggressive and impulsive behavior). The score that indicates the frequency in which the situation proposed in the question occurs is zero for "never", one for "sometimes" and two for "often". The cutoff point established for this research was equal to or greater than 28 points, that is, a value equal to or greater than this was considered positive and the child or adolescent would have an indication to assess mental health in a reference service[4,7,9,15].

Data analysis

Were performed using the *software Stata* version 12. Descriptive measurements were made, such as absolute (n) and relative (%) frequencies for categorical variables and measures of central trends (mean and median) and dispersion (standard deviation and minimum value and maximum) for continuous variables. The outcome proportion was estimated

as well as its 95% confidence interval (95% CI). Chi-square and Fischer's exact hypothesis tests were used for proportions. The effect measure of interest was the Prevalence Ratio (PR) with 95% CI obtained with Poisson regression, considering significant results with p-value <0.05 in the Wald test.

The study exclusion criteria were: children and adolescents with chronic diseases, except obesity; those with a diagnosis of mental deficiency or psychiatric disorders and undergoing psychotherapeutic follow-up.

This work was approved by the Research Ethics Committee of the Universidade Estadual do Oeste do Paraná, Cascavel-PR, under protocol number 1,558,854/2016.

RESULTS

Of the 157 participants, 91 (58%) were male and 66 (42%) were female, 123 (78%) were younger than 12 years and 34 (22%) were between 12 and 16 years old, 69 (44%) had overweight and 88 (56%) obese.

Of all respondents, 39 (24%) had a positive score (≥ 28) on the LSP, 25 (64%) were male and 14 (36%) were female. Table 1 shows the variables analyzed, with a mean age of 9.21 years for females and 10.6 years for males and a more homogeneous sample for females with a standard deviation of 2.33 years when compared to 5.44 years for males.

Table 2 presents the variables sex, age and weight and their relationship with PBL positivity, in addition to the descriptive results of the sample and the prevalence of PBL by sex and age group.

DISCUSSION

Obesity has become one of the biggest public health problems in Brazil and in the world. With the increase in the number of obese children and adolescents, the number of comorbidities has also increased. Therefore, in addition to diagnosing and managing childhood obesity, it is essential to identify comorbidities early, including psychological ones[16].

Approximately one in four overweight children in this study was at risk for developing psycho-emotional disorders, a result similar to a survey in the United States carried out at an obesity referral center[9,17]. In two other studies, the percentage of positivity in PBL ranged from 14% to 16%, a result that is well below this study, it is worth mentioning that one of these studies evaluated children regardless of weight[7,13]. Although *LSP positivity* does not necessarily mean a psychiatric disorder, it does indicate those who would benefit from a more complete investigation[6,9] . Several epidemiological studies have shown that the prevalence of mental disorders is increased in obese children, who, in addition to sedentary habits, such as excessive television and internet use, have eating disorders, such as binge eating, related to anxiety, depression and low self-esteem[13,16,18-20,21-23]. Although the present study did not show a relationship between weight and psycho-emotional disorders, there are reports in the literature that children themselves tend to attribute more negative characteristics to overweight figures than to figures with normal weight[23].

Although there is no relationship between sex and psycho-emotional disorders in this research, the literature

Table 1. Mean, median, standard deviation and amplitude of the variables analyzed.

Variable	Average	median	Standard deviation	Amplitude
Age	9.8 anos	10 anos	2.4 anos	6 - 16 anos
BMI	23.82	23.52	5.13	16.24 - 51.25
Height	1.44 m	1.43 m	0.14 m	1.12 - 1.9 m
Weight	51.2 kg	46.5 kg	19.2 kg	23 - 141 kg
Male				
Age	10.6 anos	10 anos	2.33 anos	6 - 16 anos
BMI	25.2 kg/m^2	25.4 kg/m^2	5.42 kg/m^2	18.04 - 51.2 kg/m^2
Height	1.5 m	1.51 m	0.1 m	1.2 - 1.68 m
Weight	57.57 kg	58.75 kg	15.78 kg	30.5 - 96.2 kg
Women				
Age	9.21 anos	9 anos	5.44 anos	6 - 16 anos
BMI	22.82 kg/m^2	21.16 kg/m^2	4.69 kg/m^2	16.24 - 39.05 kg/m^2
Height	1.4 m	1.38 m	0.14 m	1.12 - 1.9 m
Weight	46.64 kg	37.7 kg	20.3 kg	23 - 141 kg

shows that males are more prone to emotional disorders, this is due to the presence of externalizing symptoms such as aggressive and impulsive behavior, attention deficit hyperactivity disorder and binge eating, These factors contribute to overweight[13,18-20]. Considering girls, they are more likely to suffer more than social stigmas linked to the physical form, which come not only from the contemporary cultural standards of beauty, in which women need to be thin and slender, but also from living with their own parents, who reinforce these standards in the family context, providing children with a way negative and stigmatized view of people being overweight from an early age[23] .

Table 2. Relationship between LSP and age group, sex and overweight.

Relationship between age group and positive PSC				
		Participants	Positive PSC	*p* value
Male				
	< 12 years	79 (86.8%)	21 (26.6%)	
	≥ 12 years	12 (13.2%)	4 (33.3%)	0.730
Feminine				
	< 12 years	44 (66.7%)	9 (20.4%)	
	≥ 12 years	22 (33.3%)	5 (22.7%)	0.831
		Participants	Positive PSC	
Male				
	Overweight	39 (42.9%)	8 (20.5%)	
	Obesity	52 (57.1%)	17 (32.7%)	0.198
Feminine				
	Overweight	30 (45.5%)	9 (30%)	
	Obesity	36 (54.5%)	5 (13.9%)	0.111

One of the limitations of this study was the number of participants compared to other studies, perhaps this is due to the fact that the patients were selected in a general pediatric outpatient clinic rather than a specialized obesity outpatient clinic.

Thus, it was concluded that in this study, almost 1/4 of overweight and obese children and adolescents were at risk of developing emotional and/or psychosocial problems, regardless of age and sex. LSP can serve as the first source of screening for emotional problems in this population, requiring rigorous clinical evaluation and frequent outpatient follow-up.

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