

# Risk factors associated with treatment abandonment by overweight or obese children and adolescents

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## Risk factors associated with treatment abandonment by overweight or obese children and adolescents

**Objective.** To evaluate the risk factors associated with treatment abandonment by overweight or obese children and adolescents. **Methods.** A cross-sectional study, conducted in 2011, at the Childhood Obesity Center, in Campina Grande, Brazil, with the records of 208 children and adolescents, between three and 18 years of age, divided into two groups: Group I included

those who abandoned treatment, and Group II included those who did not abandon treatment. **Results.** Non-adherence was significantly associated with higher income (OR=5.8), high maternal education (OR=2.4), white skin color (OR=2.9), and obesity (OR=3.6). **Conclusion.** Despite the new academic-care approach, the non-adherence to treatment rate was high, and was associated with sociodemographic and nutritional factors.

**Key words:** obesity; overweight; continuity of patient care; child; adolescent; policy.

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### Factores de riesgo asociados al abandono del tratamiento en niños y adolescentes con sobrepeso u obesidad

**Objetivo.** Evaluar los factores de riesgo asociados al abandono del tratamiento en niños y adolescentes con sobrepeso u obesidad. **Métodos.** Estudio transversal realizado en el Centro de Obesidad Infantil, en Campina Grande, Brasil, con los registros de 208 niños y adolescentes entre 3 y 18 años de edad, divididos en dos grupos: I: abandonaron el tratamiento y II no abandonaron el tratamiento. **Resultados.** El abandono se asoció significativamente a mayor renta (OR=5.8), elevada escolaridad materna (OR=2.4), raza blanca (OR=2.9) y a obesidad (OR=3.6). **Conclusión.** El porcentaje de abandono del tratamiento fue elevado y se asoció a factores sociodemográficos y nutricionales.

**Palabras clave:** obesidade; sobrepeso; continuidade en la atención del paciente; niño; adolescente; políticas.

### Fatores de risco associados ao abandono do tratamento de crianças e adolescentes com sobrepeso ou obesidade

**Objetivo.** Avaliar os fatores de risco associados ao abandono do tratamento de crianças e adolescentes com sobrepeso ou obesidade. **Métodos.** Estudo transversal no Centro de Obesidade Infantil, em Campina Grande, Brasil, com os registros de 208 crianças e adolescentes, entre 3 e 18 anos de idade, divididos em dois grupos: Grupo I compreendendo os que abandonaram o tratamento e Grupo II para aqueles que não abandonaram o tratamento. **Resultados.** O abandono associou-se significativamente à maior renda (OR=5.8), elevada escolaridade materna (OR=2.4), cor branca (OR=2.9) e obesidade (OR=3.6). **Conclusão.** O percentual de abandono ao tratamento foi elevado e associado a fatores sócio-demográficos e nutricionais.

**Palavras chave:** obesidade; sobrepeso; continuidade da assistência ao paciente; criança; adolescente; políticas.

## Introduction

Most Brazilian public policies, focused on the care of children and adolescents, remain conditioned and vigilant to malnutrition rates and infectious causes of morbidity/mortality.<sup>1</sup> However, challenging public health, the nutritional risk due to the difficulties of accessing food has been gradually replaced by nutritional risk associated with poor eating patterns, which can lead to overweight or obesity; contributing to the increase of non-communicable chronic disease indicators, which are becoming serious public health problems in the world, increasing in all age groups, as the largest preventable cause of morbidity and mortality.<sup>2,3</sup>

The *World Health Organization* estimates that there are over than 1.6 billion people worldwide with overweight or obesity.<sup>3</sup> In Brazil, research shows that 33.5% of children between five to nine years of age are classified as having one of these conditions.<sup>2</sup> In 20 years, the percentage among

boys more than doubled: from 15% to 34.8%.<sup>4</sup> Historically, public policies were conducted by means of paternalistic practices, reflecting relationships that did not involve the recognition of the right to health.<sup>5</sup> The National Food and Nutrition Policy (PNAN in portuguese) was created in 1999, and has among its guidelines the monitoring of the food and nutritional situation; promotion of healthy dietary practices and healthy lifestyles; prevention and control of nutritional diseases; promoting the development of research lines; education of human resources on health and nutrition. Recently, the PNAN has turned its focus toward the seriousness of the problem represented by obesity in our country, such as the inclusion of targets in the National Health Plan to reduce overweight and obesity<sup>6</sup>

The integration of the National School Feeding Program, and the creation of the School Health Program, occurred at the intersectoral level, which has emerged as an intersectoral policy, from the perspective of comprehensive care (prevention,

promotion, caring and education) for the health of public school children, adolescents and young people, and aimed to prevent overweight and obesity in the years 2012 and 2013.<sup>5</sup> Moreover, the Unified Health System (SUS in portuguese) must perform food and nutrition surveillance, health promotion activities, such as promoting adequate and healthy food and physical activity, ensuring comprehensive health care of individuals with these conditions, and controlling and regulating food quality.<sup>5</sup> In the case of children and adolescents, it is clear that these periods are critical for the development of obesity, because of the prevalence of sedentary leisure activities and inadequate feeding practices.<sup>7</sup> Several health problems can result from obesity in this age group, such as hyperinsulinemia, insulin resistance, risk of cardiovascular disease, orthopedic complications, infertility and negative psychosocial consequences.<sup>8</sup>

In this context, it is clear that knowledge about the pathophysiology and therapeutic, medical and surgical alternatives has evolved. However, similar changes have not been seen in the treatment of children and adolescents with overweight, since the conventional treatment options are not always effective.<sup>9</sup> In contrast, an obesity and overweight treatment program formed by a multi-professional team, followed on a regular basis, as proposed by the PNAN and intersectoral programs, such as the National School Feeding Program and the School Health Program, can substantially contribute to the reduction of adiposity in children and adolescents.<sup>10</sup>

This multidisciplinary work is primarily engaged in the treatment of obesity, re-educating for life, seeking to achieve behavior modification in the child and family.<sup>11</sup> Thus, treating overweight and obesity in childhood and adolescence means not only enumerating actions, but making this activity of interest to them. The reason associated with restricted patient weight loss is probably the low adherence to treatment, and making necessary adjustments for energy needs according to age group to sustain weight loss and improve adherence.<sup>12</sup> Studies indicate that patient non-

adherence and abandonment of re-education for weight loss is frequent.<sup>13,14</sup> Therefore, the process of reformulating eating habits is complex, especially due to the current lifestyle.

Therefore, the Children's Obesity Center (COI in portuguese), which is a reference in the treatment of obesity, was implemented for almost three years in the city of Campina Grande, Brazil, reinforcing the need to develop strategies together with patients and their families, so that they are able to understand the needs, and the importance of the problem. This proposal is for a multidisciplinary academic-assistance approach as an area of strategic interest, not only for this service, but for the health system in general, from which students and health professionals in related areas, such as physical education, nutrition, psychology, social assistance, medicine and the nursing, are integrated within this context, due to a proven ability to deal with public interest issues, given its outreach across all levels of care. Representing the largest professional contingent in the country, it is an important support group for the complex policies, as has been shown to be the issue of overweight and obesity in populations.

The registered patients are treated by a team at the COI and, in addition to clinical care, participate in educational activities aimed at changing the lifestyle habits of children and adolescents and their families, as well as making them aware of the importance of monitoring in a specialized service. This activity comprises the intersectionality, universality and primary health care, suggested a Brazilian plan for coping with chronic diseases.<sup>15</sup> This proposal includes the completeness of action, involving promotion, prevention and caring, as well as the expanded academic training of future health professionals in epidemiological perspective, which will further help to manage this problem.

Despite the positive effects of the COI during the activities, a high rate of treatment abandonment was perceived, along with the influence of sociodemographic and dietary factors on this issue.<sup>16</sup> Then, the question arose: what are the risk

factors associated with children and adolescents with overweight or obesity abandoning treatment? We believe in the relevance of this study because of: its practical implication in the organization of care for overweight or obese children and adolescents, the inclusion of these issues in the National Agenda of Health Research Priorities;<sup>17</sup> the difficulties faced by professionals responsible for the care of this population;<sup>8</sup> and the possibility of contributing to the strengthening of targeted public health policies for children and adolescents, focusing on health promotion. Thus, the objective was to investigate the risk factors associated with overweight or obese children and adolescents abandoning treatment.

## Methods

This was a cross-sectional study conducted in 2011, in COI, a specialized clinical care service for overweight or obese children and adolescents,, which also provides educational activities focusing on prevention of these and other related morbidities, located in the Instituto de Saúde Elpídeo de Almeida, in the city of Campina Grande, Brazil. During admission into the service, the patient is regularly monitored by a multidisciplinary team, with frequent consultations, educational activities and clinical and laboratory evaluations, systematically monitoring their progress, focusing on maintaining a healthy weight and preventing complications.

The records of all children and adolescents were analyzed; only 208 were eligible, meeting the following criteria: age between three and 18; being followed by the service for a year; being overweight or obese, according to the international criteria Body Mass index (BMI) established by the Centers for Disease Control and Prevention (CDC). These criteria define the following categories for classification of nutritional status: severe obesity (BMI  $\geq$  97th percentile), obesity (95th percentile  $\geq$  BMI  $<$ 97), and overweight (85  $\geq$  BMI  $<$ 95).<sup>18</sup>

The medical records were divided into two groups, with 50 of them allocated to Group 1, children

and adolescents who abandoned treatment; the other 158 were in Group 2, which consisted of children and adolescents who had not abandoned treatment. Abandonment of treatment was characterized by absence from the COI for more than six months, based on the date of the last visit. The person responsible for the patients in this situation received up to three calls in sequence at the same period using the phone number provided upon registration, without response. The procedure was repeated at another time of day and it was considered abandonment, if, once again, a contact was not achieved. In case of disconnected or nonexistent numbers, an attempt to re- schedule was made during two months.

An instrument with sociodemographic variables (sex, age, income, maternal education, and race) and nutritional status (overweight and obesity) was used for data collection. The data were entered into and analyzed using the Statistical Package for the Social Sciences (SPSS), version 17.0 program. Descriptive statistics were used to calculate absolute and relative frequencies. For the combination of factors associated with treatment abandonment, the Chi-square test was conducted and the odds ratio (OR) was applied, considering a confidence interval of 95%. The research project was submitted to the Research Ethics Committee of the State University of Paraíba, and was initiated only after receiving a favorable opinion, which was obtained as the Ethics Assessment Approval Code No. 0379.0.130.000-10, as required by Resolution 466 / 12 of the National Health Council.

## Results

The socio-demographic profile and nutritional status, shown in Table 1, indicate that the predominant group was comprised of: adolescents (59.1%), females (63.5%), mixed race (61.5%), income of two to five times the minimum wage (53.4%), obese, and children of women who completed high school or higher education (56.6%). Moreover, in the children and adolescents who abandoned the treatment

(n = 50; 24%) the following characteristics were observed more frequently than in those who did not abandon treatment: income of two times the minimum wage (5.8 times), mothers with high school education or higher education (2.4 times), white skin color (2.9 times), and obesity (3.6 times).

Analyzing the association between sociodemographic and nutritional variables with “treatment abandonment”, income, race, nutritional status and maternal education were statistically associated factors, as shown in Table 1.

**Table 1.** Associations between sociodemographic and nutritional factors in overweight or obese children and adolescents and treatment abandonment. Centro de Obesidade Infantil, Campina Grande / PB, Brazil 2011

Variables	Total		Treatment abandonment				OR (CI 95% OR)	p
	N	%	Yes (cases)		No (controls)			
			n	%	n	%		
Sex								
Female	132	63.5	32	24.2	100	75.8	1.03 (0.51-2.11)	0.927
Male	76	36.5	18	23.7	58	76.3		
Age group								
Adolescents	123	59.1	29	23.6	94	76.4	0.94 (0.47-1.88)	0.851
Children	85	40.9	21	24.7	64	75.3		
Income (minimum wage)*								
2 or more	111	53.4	40	36	71	64	5.85 (2.43-14.5)	<0.001
¼ to 2	91	43.7	8	8.8	83	91.2		
Maternal education†								
CHS§ a CHE	116	56.6	36	31	80	69	2.41 (1.15-5.12)	0.011
None to IHS‡	89	43.4	14	15.7	75	84.3		
Race								
White	80	38.5	29	36.3	51	63.7	2.90 (1.44-5.87)	0.001
Mixed	128	61.5	21	16.4	107	83.6		
Nutritional status								
Obese	150	72.1	44	29.3	106	70.7	3.60 (1.36-10.0)	0.004
Overweight	58	27.9	6	10.3	52	89.7		

Income was not included in six medical records; † In three records maternal education was not included; ‡ IHS = Incomplete High School; § CHS = Complete High School; || CHE = Complete Higher Education.

## Discussion

Women in the general population have a higher prevalence of overweight and obesity when compared to men, although very discreetly, which was also observed in children and adolescents in this study, as well as in another study conducted in a Brazilian private nutritional clinic of Maringá, in the state Paraná, with a similar population.<sup>12</sup> In that research, 91.1% were female, which can

more often be explained by the higher prevalence of overweight in women and because of the thinner aesthetic standard which is synonymous with beauty for society; such stereotyping may be less important for males.<sup>12</sup>

Regarding the age group, although a higher prevalence was found among adolescents, it is believed, based on literature findings,<sup>19,20</sup> that overweight and obesity have a similar distribution

pattern between different ages of childhood and adolescence. The prevalence in the adolescents can be better explained by the accumulation of more common inadequate life habits than in the children, such as leisure activities with low physical movement and high consumption of foods rich in carbohydrates.<sup>7</sup> In this sense, reinforcing the idea of similarity in the pattern of distribution of overweight and obesity among children and adolescents, this study also pointed to a percentage of overweight or considerable obesity among these populations. A survey conducted in the city of Campina Grande, in the state of Paraíba, Brazil, with 255 children (6-10 years old), found that the majority of children (66.3%) practiced less than three days of physical activity per week and that obesity, overweight and unhealthy eating habits were common.<sup>21</sup>

Regarding income, the fact that the largest quantity of children and adolescents were from families with higher incomes, indicates the higher prevalence of overweight and obesity among these individuals, because they consume more inappropriate foods. Snacks are the main substitutes for meals during adolescence,<sup>7</sup> which was identified in another study; there is a higher frequency of snack consumption in children of higher incomes.<sup>21</sup> In other studies<sup>19,20</sup> a higher prevalence of overweight in schoolchildren from private schools was found, PNA when compared to those enrolled in the public institutions and who have lower income, in general, given the Brazilian reality.

Regarding maternal education, most children and adolescents had mothers with completed high school and/or higher education. It is believed that women with more years of education have greater employability and integration into the labor market, and can influence the eating pattern of the family, which usually tends to prioritize practical food instead of a healthy diet. Therefore, the treatment of obesity in children and adolescents may be even more difficult than in adults, since this age depends on the parental food choices and available time.<sup>13</sup> Furthermore, a greater presence of mixed races in treatment was observed. It is

possible to speculate that the largest part of these receive treatment in the public service,, particularly black instead of white individuals, due to the fact that the latter have incomes substantially higher than the former, even among those who have the same level of education.<sup>22</sup> So, white people, in general, with their higher purchasing power, may voluntarily seek private health plans where they can continue with the therapy.

The highest risk of treatment abandonment, in the subjects with higher income and those children of mothers with high educational levels, may be related to the lack of time for those responsible for them to accompany the children to the COI, due to having more than one job as they seek to maintain their standard of life. The abandonment in this case can be justified by the possible purchase of health insurance, in which case the children of higher-income parents fail to attend the public service network, as well as the double working hours with consequent unavailability of parents to take the patients to the service. The inclusion of women in the labor market results in increased household income and higher maternal education, culminating in the difficulty of prioritizing the care of children and adolescents who are overweight, hindering the continuation of treatment. The treatment of obesity in this group can be even more difficult than in adults, as it depends on the food choices and parental time availability.<sup>13</sup>

Despite the reality that children and adolescents of mothers with higher income and education have abandoned treatment in the COI, and therefore in the public network, it may not be applied to this case. It is possible, therefore, that this reality reveals an even more fragile SUS that is disconnected from social needs, as the demand for people with lower income and educational levels for the services offered by this service can reinforce the idea of a simple system available for the most humble, but not for everyone, as can be seen from one of its most important principles: universality. In that regard, in a study aimed at understanding the social representation of the SUS, conducted in the state of Minas Gerais,



Brazil, with 136 participants, approximately 19% stated that they understood the system to be a health plan for the poor; which in the authors' view, shows a false idea that it was designed to focus public resources on performing less complex procedures that should meet excluded segments of society.<sup>23</sup>

The findings of this research also indicate a higher frequency of obese subjects, a fact that was expected because overweight patients face difficulties on a smaller scale than those in conditions of obesity, and therefore generally do not seek health care. Thus, the demand for specialized treatment tends to be higher for subjects with body weight far above that which is recommended.<sup>13</sup> The fact that overweight individuals demonstrate a smaller presence in treatment in relation to the obese may also indicate that the public health policies, while stimulating the demand for health services by the general population, primarily for health prevention, this logic seems far away in the reality of Brazilian citizens, since health services displace human, material and financial resources to offer programs and services to patients when they already have very advanced stages of morbidities, as with obesity.

Despite the higher incidence of obesity in the COI, being obese was a risk factor for treatment abandonment. This data corroborates the literature, which indicates that obese and severely obese have higher dropout rates due to the difficulty in the apparent weight loss, thus serving as a discouragement for managers and patients. A study showed that higher abandonment rates of treatment were observed in patients with higher degrees of weight, possibly due to the amount of weight to be lost, and that the lack of adherence was related not only to the patient, but also to the professional, the environment and the treatment.<sup>12</sup>

The fact that a considerable number of patients registered in the COI failed to maintain treatment is worrying. The difficulty of adherence, the treatment abandonment of overweight and obese children and adolescents, and the lack of an

effective system for combating these conditions by nutrition education and encouragement for physical activity increasingly exacerbates the health conditions of these populations.<sup>21</sup> A study conducted in the Brazilian state of Paraná evaluated the follow-up of similar groups, during 16 weeks, and found abandonment in 27.5% of the subjects.<sup>10</sup> In another study, conducted with 120 Chilean patients, a dropout rate of 18.3% of the obese patients who remained in regular follow-up for 12 months was identified.<sup>24</sup>

The dropout rate for the treatment of obesity and overweight, found in this study, was considered relatively low when compared to those mentioned above. This fact can be related to the active search conducted by the COI, in order to reintegrate patient monitoring, as well as to the completeness of the model involving promotion, surveillance and assistance.

From this perspective, in order to improve adherence and reduce abandonment, it is important that nurses and health professionals consider the sociodemographic/nutritional factors in the planning of care. It is also necessary to monitor the frequency of consultations, which can be accomplished through active search, monitoring the absences and their rationale. Moreover, implementing a rescue group, involved in the quantification of losses and the development of motivational activities, may also appear as an important alternative. Also, welcoming by the care team can help the patient to realize that his/her effort to attend the service is worthwhile.<sup>13</sup> The regularity of a behavior, and its transformation into a habit, involves multiple issues. Motivation for action, perceived benefits, adaptation to personal needs and satisfaction with performed activity are fundamental factors for this to happen.<sup>25</sup> The key issue remains the ability to sufficiently motivate all stakeholders.<sup>26</sup> Therefore, nurses must motivate and lead the adoption of interventions that promote the improvement of healthy living habits among children and adolescents.<sup>26</sup>

Health promotion actions must be performed in each of the microsystems: school, home,

community organizations, and institutions. The impact of a health promotion intervention from a broad perspective can certainly reflect on the SUS spending, in relation to diseases and preventable deaths, improving the population's quality of life, and understanding that health maintenance is a collective task.<sup>25</sup> The Healthy Lifestyle Project is a public policy example developed in the Brazilian city of Curitiba, in Parana state, which transforms public spaces, such as parks and community spaces in areas of health education and physical activity, adoption of healthy eating habits, cultural and leisure activities, environmental education, among others, creating opportunities for participation that promote the acquisition of skills for a healthier life. However, good intentions alone are not enough, and the civil society must be responsible for the maintenance of such practices. A continuous public investment is necessary, with consistent and structured policies articulated as intersectoral actions.<sup>26</sup>

The findings of this study report a considerable percentage of treatment abandonment by overweight or obese adolescents and children, and showed that high-income, race and the nutritional status of these subjects, as well as the high level of education of their mothers, are risk factors associated with such abandonment. Therefore, the major contribution that the study presents is to indicate that, despite the academic-care model pursuing the integrality of actions, promotion, surveillance, prevention and care, the abandonment rate was still elevated, although it was lower than that reported in the literature,. The abandonment of treatment by overweight or obese children and adolescents was associated with sociodemographic and nutritional factors, requiring that nurses and other health professionals adopt new methods of approach, further develop instruments that include the family, and consider the extra-ambulatory context of obesity treatment.

It is important that research supports care for overweight and obese patients by the SUS, reducing abandonment rates in the treatment of overweight in this and other world health systems. Moreover, it contributes to direct the actions of

nurses and health professionals who are engaged in this emblematic mission to reduce the rates of overweight and obese children and adolescents, with a view to preventing future health problems. The limitations of this study are related to the fact that these patients belonged to a single center, which reduces the power of generalization.

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