

## Identification of Cardiovascular Risk Factors in Parents/Caregivers of Children with Heart Diseases

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### Abstract

**Background:** Cardiovascular diseases are one of the major causes of morbidity and mortality worldwide. In Brazil, they are the major cause of death.

**Objective:** To identify cardiovascular risk factors in parents/caregivers of children with heart diseases by assessing their nutritional status, health conditions, and life style.

**Methods:** Cross-sectional study of 150 parents or caregivers of children with heart diseases who attended a cardiology outpatient clinic. Data on identification, lifestyle and health conditions were collected by means of a structured questionnaire. For the assessment of the eating habits, a questionnaire on eating frequency was used; for the assessment of the nutritional status, weight, height, and waist circumference were measured, and the body mass index (BMI) was calculated and classified.

**Results:** A total of 155 parents of children with heart diseases, predominantly of the female gender (91.6%), were evaluated; their mean age was  $35.0 \pm 10.6$  years. The most prevalent risk factors were sedentary lifestyle (85.2%), obesity (28%) and hypertension (22.6%). As regards the eating habits, a high frequency of intake of red meat, margarine, vegetable oil, and sugar and low intake of fish were observed. Comparison between genders showed a significant difference in relation to obesity, as detected by BMI, and hypertension, both more frequent among women. Waist circumference measurement also showed a higher cardiovascular risk in women.

**Conclusion:** Cardiovascular risk factors such as excess weight, sedentary lifestyle, and hypertension as well as inadequate eating habits such as a high frequency of intake of saturated fat and cholesterol and low intake of unsaturated fat were identified in the parents/caregivers assessed. (Arq Bras Cardiol 2012;99(4):936-943)

**Keywords:** Cardiovascular Diseases; Risk Factors; Child; Lifestyle; Nutritional Status; Caregivers; Parents.

### Introduction

Cardiovascular diseases (CVD) are one of the major causes of morbidity and mortality worldwide and their significant growth in developing countries is a warning sign for the potential impact on underprivileged social classes<sup>1</sup>. In Brazil, they are the main cause of death, accounting for approximately 30% in some age ranges<sup>2</sup>.

Traditionally, it is considered that CVD develop in adults and the elderly; however, a large part of the risk factors (RF) related to their development starts in childhood and adolescence<sup>1</sup> and may cause additional effects in adulthood<sup>3</sup>. Within the multiple causes of CVD, there is a series of RF that contribute to their development. According to the Brazilian Society of Cardiology, the most prominent RF in

the national cardiovascular health panorama in Brazil are: obesity, diabetes mellitus (DM), systemic hypertension (SH), dyslipidemia, and smoking<sup>1,3</sup>.

Eating habits and physical activity, however, can also be RF for cardiovascular diseases since they effectively participate in the etiology of dyslipidemia, obesity, DM and SH<sup>1,4</sup>.

Eating habits are acquired in childhood, under genetic and environmental influences<sup>5</sup>. The eating pattern involves effective participation of parents through family interactions that affect their children's eating behavior. The parent's eating behavior itself exerts a strong impact on the formation of a child's eating habits<sup>5</sup>. Therefore, the relevance of a healthy family lifestyle on the development and growth of a child with heart disease is evident.

Despite the large number of studies and investments directed to the control of cardiovascular disorders, mortality and morbidity rates have changed very little. The best results are obtained with programs targeting changes in life habits that are harmful to health<sup>3</sup>. Nonetheless, the profile and life habits of parents of children with heart diseases have not been much explored, and this may make it difficult to draw

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up effective intervention strategies that could lead to changes in the cardiovascular mortality profile.

Therefore, the objective of the present study is to identify cardiovascular risk factors in parents of children with heart diseases by assessing their nutritional status, health conditions and lifestyle.

## Methods

This is a cross-sectional study with a sample comprised of parents or caregivers of children with heart diseases who attend the Pediatric Cardiology Outpatient Clinic of *Instituto de Cardiologia/Fundação Universitária de Cardiologia de Porto Alegre* (IC-FUC).

The outpatient clinic where the present study was conducted is specialized in children with congenital heart diseases whose mean age is 12.7 years, with a mean age of 15 months at the moment of diagnosis. The most prevalent congenital heart diseases are cyanotic heart diseases, especially ventricular septal defect (alone or combined with other defects).

This is a convenience sample consisting of 155 parents/caregivers, with a 95% confidence interval. The significance level was set at 5%, with a prevalence estimate of approximately 50% and maximum error margin of 8%.

The individuals included were those who accompanied the child at the moment of the medical visit, provided they were their parents or main caregivers. All gave written informed consent (WIC). Individuals only accompanying the patient to the visit but without a bond as a caregiver, therefore not having significant influence on the child's habits and lifestyle, were excluded.

Data were collected using a structured interview performed in the outpatient clinic waiting room, by means of the administration of a questionnaire containing 14 questions on general information about the parents/caregivers such as identification, gender, age, level of education, socioeconomic conditions and relationship to the patient; it also contained information regarding the lifestyle and health conditions such as smoking habit, alcohol use, performance of physical activities, history of previous and current diseases, all self-reported by the participants.

Smokers were defined as those individuals who smoked one or more cigarettes per day or who had quit smoking for less than six months. Alcoholics were defined as those who reported intake of alcoholic beverages from three to seven days a week, regardless of the type and amount. Regular physical activity was defined as the performance of physical exercises at least three times a week for at least 30 minutes per day.

An adapted Food Frequency Questionnaire (FFQ), which consists in quantifying the intake of certain foods or specific nutrients, was used to obtain information regarding the individuals' eating habits. Quantification was based on the individual's responses regarding how often the food listed was consumed<sup>6</sup>. The validated FFQ used in this research was adapted from Ribeiro et al's study<sup>7</sup>. For the analysis of the eating habit, only the qualitative data obtained from the FFQ were used. Some foods considered as possible

cardiovascular risk markers were selected – food with high contents of cholesterol, lipids, saturated fatty acids, in addition to the analysis of fiber-rich foods; their respective frequency of consumption was determined. Intake frequency was subdivided into three categories: very often (for an intake of 5X or more a week), often (for an intake of 1X to 4X a week), or seldom (for an intake of 1X to 3X a month or seldom/ never).

The individuals' nutritional status was assessed using weight (kg), height (m), and Waist Circumference (WC) measurements, calculation and classification of the Body Mass Index (BMI), and classification of WC. Weight was measured on a calibrated Welmy™ digital scale, with maximum capacity of 200 kg. The individuals were weighted in the standing position on the center of the scale, barefoot, wearing light clothes, and facing forward. Weighting was performed in a designated room. A 2.0-m stadiometer was used for height measurement. BMI was calculated by dividing the total body mass by the square height (weight – kg; height – m<sup>2</sup>). The cut-off points proposed by the World Health Organization (WHO), 1995, for the adult population<sup>8</sup> were used to classify the BMI values. Using a non-stretchable inextensible tape measure, the WC was measured with the patient in the standing position, at the end of expiration, with the tape measure surrounding the abdominal region midway between the high point of the iliac crest and the lower costal margin<sup>9</sup>. The cut-off point was established at 102 cm for men and 88 cm for women<sup>8</sup>.

Quantitative variables were described using means and standard deviations; qualitative variables, by means of absolute and relative frequencies. The Pearson's chi square test or Fisher's exact test were used to evaluate the association between the qualitative variables. The Student's t-test was used to compare means. The significance level was set at 5%, and statistical treatment of data was performed using the SPSS (Statistical Package for the Social Sciences) version 18.0.

The present study was approved by the Research Ethics Committees of *Instituto de Cardiologia/Fundação Universitária de Cardiologia de Porto Alegre* (IC-FUC) and of *Universidade Federal de Ciências da Saúde de Porto Alegre* (UFCSA). The study did not pose any risk to the participants and the procedures were in accordance with national and international guidelines for human research, as well as with the Declaration of Helsinki.

## Results

A total of 155 parents/caregivers of children with heart diseases were assessed. Of these, 142 (91.6%) were females and 13 were males (8.4%), with a mean age of 35.0 ± 10.6 years; their ages ranged from 17 to 68 years, with a median of 34 years. Characterization of the study sample as regards gender, marital status, relationship to the children, level of education and monthly family income is shown in Table 1.

The profile of the study sample is characterized by a young population, predominantly of females, and mothers as the relationship to the children most frequently found. In addition, they had a low level of education (60% of the sample had finished or unfinished elementary school) and low income (63.9% of the sample had a monthly family income of up to two minimum wages).

**Table 1 – Study sample characterization as regards gender, marital status, relationship to the children, level of education and monthly family income**

Variables	n (%)
Age (years)*	35.0 ± 10.6
<b>Gender</b>	
Female	142 (91.6)
Male	13 (8.4)
<b>Marital Status</b>	
Married	92 (59.4)
Single	43 (27.7)
Divorced	12 (7.7)
Widowed	8.0 (5.2)
<b>Relationship to the child</b>	
Mother	132 (85.2)
Father	13 (8.4)
Grandparents	6 (3.9)
Uncle/Aunt	3 (1.9)
Siblings	1 (0.6)
<b>Level of Education</b>	
Unfinished Elementary School	67 (43.2)
Finished Elementary School	27 (17.4)
Unfinished High School	9 (5.8)
Finished High School	47 (30.3)
Unfinished College	1 (0.6)
Finished College	4 (2.6)
<b>Family Income</b>	
Up to 2 minimum wages	99 (63.9)
From 2 to 4 minimum wages	44 (28.4)
From 4 to 6 minimum wages	8 (5.2)
From 6 to 8 minimum wages	3 (1.9)
More than 8 minimum wages	1 (0.6)

\* described by mean ± standard deviation.

Table 2 shows the distribution of prevalences of smoking, alcoholism, physical activity, SH, DM, and dyslipidemia among the parents. Data from the present study show that 132 individuals (85.2%) do not perform physical activities. Table 3 shows the anthropometric profile of parents as regards their mean weight, height, BMI and WC.

Frequency distribution of intake of the foods assessed is found in Table 4, where we can observe that 57.4% of the study population consume beef at a frequency of 1 to 4X a week and 76.1% consume fish at a frequency of 1 to 3X a month or less. Eggs are also consumed 1 to 3X a month or seldom by 58.1% of the participants. As regards the intake of food source of fat, we verified that vegetable oils and margarine are consumed at a frequency of 5X a week or

**Table 2 – Prevalence distribution of smoking, alcoholism, physical activity, SH, DM, dyslipidemia among parents/caregivers**

Variables	n (%)
<b>Smoking</b>	
Yes	32 (20.6)
No	123 (79.4)
<b>Alcoholism</b>	
Yes	19 (12.3)
No	136 (87.7)
<b>Performance of physical activities</b>	
Yes	23 (14.8)
No	132 (85.2)
<b>SH</b>	
Yes	35 (22.6)
No	120 (77.4)
<b>DM</b>	
Yes	13 (8.4)
No	142 (91.6)
<b>Dyslipidemia</b>	
Yes	6.0 (3.9)
No	149 (96.1)

**Table 3 – Anthropometric profile of parents/caregivers regarding mean weight, height, BMI and WC**

Variables	m (±sd)
Weight (kg)*	70.16 ± 15.0
Height (m)	1.59 ± 0.07
BMI (kg/m <sup>2</sup> )	27.73 ± 6.06
WC (cm)	92.05 ± 12.86

\* described by mean ± standard deviation.

more by 98.7% and 58.7% of the participants, respectively. Frequency of consumptions of some food rich in sodium, such as fast food and snacks, was low – 54.8% and 72.3% in the seldom category (1 to 3 X a month or less, respectively). However, the frequency of consumption of canned foods was 49.7%, and that of sausages of 38.1% from 1 to 4x a week. Fruits, group A vegetables (lettuce, cucumber, cabbage, bell pepper, watercress and other green leaves) and group C vegetables (potato, cassava, sweet potato, etc.) were more frequently consumed often or very often, whereas group B vegetables (beetroot, carrot, chayote, string beans, pumpkin, etc) were seldom consumed (45.8%). A high frequency of sugar consumption is evident when we observe that the percentage of consumption of sweets and sugar-sweetened beverages

**Table 4 – Distribution of frequency of food intake in the study population (n = 155)**

Food	Very often (≥ 5x/week) n (%)	Often (2 to 4x/week or 1x/week) n (%)	Seldom (1 to 3x/month or seldom/never) n (%)
Whole milk	57 (36.8)	34 (21.9)	64 (41.3)
Yellow cheese	40 (25.8)	50 (32.3)	65 (41.9)
Fried egg	5.0 (3.2)	60 (38.7)	90 (58.1)
Beef	60 (38.7)	89 (57.4)	5.0 (3.2)
Pork	2.0 (1.3)	54 (34.8)	99 (63.9)
Chicken	15 (9.7)	125 (80.6)	15 (9.7)
Fish	0.0	37 (23.9)	118 (76.1)
Sausages	44 (28.4)	59 (38.1)	52 (33.5)
Organ meat	2.0 (1.3)	36 (23.2)	117 (75.5)
Vegetable oil	153 (98.7)	1.0 (0.6)	1.0 (0.6)
Bacon	19 (12.3)	10 (6.5)	126 (81.3)
Butter	10 (6.5)	3.0 (1.9)	142 (91.6)
Margarine	91 (58.7)	36 (23.2)	28 (18.1)
Mayonnaise	11 (7.1)	87 (56.1)	57 (36.8)
Snacks	6.0 (3.9)	37 (23.9)	112 (72.3)
Fast food (pizza, pastry, hamburger, etc)	4.0 (2.6)	66 (42.6)	85 (54.8)
Canned food	8.0 (5.2)	77 (49.7)	70 (45.2)
White rice	145 (93.5)	4.0 (2.6)	6.0 (3.9)
White bread	122 (78.7)	23 (14.8)	10 (6.5)
Biscuits	39 (25.2)	61 (39.4)	55 (35.5)
Pasta	9.0 (5.8)	123 (79.4)	23 (14.8)
Beans	117 (75.5)	28 (18.1)	10 (6.5)
Group A vegetables	69 (44.5)	71 (45.8)	15 (9.7)
Group B vegetables	24 (15.5)	60 (38.7)	71 (45.8)
Group C vegetables	19 (12.3)	122 (78.7)	14 (9.0)
Fruits	89 (57.4)	54 (34.8)	12 (7.7)
Sweets	65 (41.9)	59 (38.1)	31 (20)
Sugar-sweetened beverages	115 (74.2)	15 (9.7)	25 (16.1)
Sweetener	15 (9.7)	8.0 (5.2)	132 (85.2)
Soda	25 (16.1)	107 (69)	23 (14.8)
Artificial juice	70 (45.2)	53 (34.2)	32 (20.6)

(beverages with sugar and artificial juices) was more frequently in the very often category, which corresponds to a minimum intake of 5X a week.

Table 5 shows the association between the variables studied and gender; we can observe a higher prevalence of obesity among women (31%). If we add the number of obese and overweight women, we can observe that the weight of 60% of the study population is above the normal range. As regards SH, 24.6% of the women were hypertensive. WC measurement shows that a large part of the women assessed (58.5%) were in the very high risk for CVD category, whereas most of the men assessed (61.5%) had no risk for CVD.

## Discussion

In the present study, we could identify a high prevalence of some cardiovascular risk factors such as obesity, sedentary lifestyle and SH among parents/caregivers of children with heart diseases. In addition, by means of the analysis of food consumption, we also identified eating habits considered as cardiovascular risk markers, such as high intake of food rich in cholesterol and saturated fatty acids.

As regards the relationship to the children with heart disease, there was a predominance of mothers in the study population. Studies have pointed out that the interaction between the

Table 5 – Association of study variables according to gender

Variables	n (%)		p value*
	Female	Male	
<b>BMI</b>			
Well nourished	56 (39.4%)	5.0 (38.5%)	0.020
Overweight	42 (29.6%)	8.0 (61.5%)	
Obesity	44 (31%)	0.0 (0%)	
<b>Alcoholism</b>			
Yes	15 (10.6%)	4.0 (30.8%)	0.057
No	127 (89.4%)	9.0 (69.2%)	
<b>SH</b>			
Yes	35 (24.6%)	0.0 (0%)	0.041
No	107 (75.4%)	13 (100%)	
<b>DM</b>			
Yes	4.0 (2.8%)	2.0 (15.4%)	0.081
No	138 (97.2%)	11 (84.6%)	
<b>Waist Circumference</b>			
Normal	29 (20.4%)	8.0 (61.5%)	0.01
High Risk	30 (21.1%)	4.0 (30.8%)	
Very High Risk	83 (58.5%)	1.0 (7.7%)	

\* Pearson's chi-square.

children and their mothers is the most important influence on the acquisition of the eating habits, because in the family environment mother and child share the same socioeconomic conditions, habits and lifestyle, and these interfere in the food preferences and affect the energy balance of food consumed by means of the food composition and availability<sup>10,11</sup>.

Another interesting finding in this study was the low income and low level of education of the study population. Family income is related to the maternal level of education, since this interferes with the job opportunities and wages. The eating habits and family lifestyle have a direct relationship to the parents' purchasing power and level of education, since these determine the access to information and food<sup>12</sup>.

Brazil is going through a process of nutritional transition, in which we observe an important change in the eating pattern of low-income families, which tend to consume high-energy density food, because of its lower cost<sup>13</sup>. Therefore, family income and maternal level of education have a strong influence on their children's nutritional status.

As regards the nutritional status, a high prevalence of overweight and obesity was observed. Data from the Family Budget Survey (*Pesquisa de Orçamento Familiar – POF*)<sup>15</sup> estimate that approximately 49% of the adult individuals in the country have excess weight and 14.8%, obesity. If considered alone, obesity was found in 28% of this sample. Corroborating this finding, different studies conducted in the country have found high prevalences of obesity: 37.5% in Cotia, SP<sup>15</sup>; 21% in Pelotas, RS<sup>16</sup>; and 17.8% in Campos, RJ<sup>17</sup>.

Gender stratification of the nutritional status showed a statistically significant difference, with the presence of

obesity in almost one third of the women assessed, whereas no obese male was observed. High prevalences of obesity among women have been found in the past years<sup>2</sup>. Our results corroborate those found in a cross-sectional study conducted in adolescents and their parents that showed a positive association between parenteral obesity, especially maternal obesity, and children obesity<sup>18</sup>. Ramos de Marins et al<sup>19</sup> also observed a relationship between the maternal nutritional status and excess weight in children and adolescents, and proposed that obesity prevention programs be targeted at the family.

Studies with twins and adopted children have demonstrated that obesity is not only an inherited tendency, but it also is under strong environmental influence, although parental obesity is an important risk factor<sup>3</sup>. Whitaker et al<sup>20</sup> observed that children whose father or mother is obese have a high probability of becoming obese adults. Another study demonstrated that obese parents who were able to significantly lose weight had a positive influence on their children's excess weight control<sup>21</sup>.

Our results regarding excess weight in women coincide with an increased WC in females, with a statistically significant difference in the comparison between genders; 79% of the women had some (high or very high) cardiovascular risk according to their WC measurement, in contrast with only 38% of the men (Table 5). A study conducted in Sao Paulo with the purpose of analyzing the importance of BMI and WC in the determination of SH in adults<sup>22</sup> showed similar results, with the presence of cardiovascular risk in 55% of the women and 37% of the men. The WHO indicates the use of WC measurement for the surveillance of risk factors for chronic diseases as a means of evaluating abdominal fat deposition.

The use of BMI associated with WC measurement is a better way to predict the risk, since there are individual differences regarding body composition and distribution of fat deposits<sup>4</sup>. An epidemiological study showed that excess abdominal fat may be a better predictor of acute myocardial infarction and stroke than total body mass<sup>23</sup>.

The prevalence of hypertension observed in the present study was similar to the estimate found in a population-based study on the analysis of the prevalence of SH in Brazil, which was 20% among adults<sup>24</sup>. The prevalence of systemic hypertension varies largely among the studies, and the Ministry of Health estimates that from 10% to 20% of the Brazilian adult population are hypertensive<sup>25</sup>. In a 2006 study on the prevalence, identification and control of SH in Rio Grande do Sul<sup>26</sup>, the authors observed a prevalence of SH among adults of 33.7%, of which 49.2% were not aware that they were hypertensive.

A statistically significant difference was also observed in the comparison of the presence of SH between genders, again with a higher prevalence among women. Similar results were observed in a study conducted in Sao Paulo<sup>2</sup>, where the frequency of hypertension was 22.7% among women and 16.8% among men. However, the prevalence of SH among genders is variable, with the finding of a higher prevalence among males in other studies<sup>22,27,28</sup>.

DM was reported by 8.4% of the population, a value lower than those found in other studies which showed prevalences of 12.6%<sup>29</sup> and 15.4%<sup>2</sup>. No statistically significant difference was found between genders.

It is important to consider the limitations in observational studies, where information bias may be present since the participants' blood pressure measurements were not taken to define the diagnosis of SH, nor was blood glucose determined for the diagnosis of DM. Data informed in the present study were self-reported by the interviewees, who could be not aware of diseases. Also, only qualitative data obtained by means of the FFQ were analyzed, and further studies are necessary for a more detailed analysis of the eating habits of parents/caregivers of children with heart diseases.

Physical inactivity is an independent risk factor for cardiovascular diseases<sup>30</sup>; for this reason, regular performance of physical activities has been recommended for both the prevention and rehabilitation of CVD. The prevalence of sedentary lifestyle observed in the present study was higher than those found in other Brazilian studies (55.8% to 80.8% among adults)<sup>31</sup>, which shows a high incidence of sedentary lifestyle identified in the parents studied. In a well-conducted review of the literature from 2006<sup>32</sup>, 40 articles were analyzed and the prevalence of a sedentary lifestyle was consistently high, with two-thirds of the individuals from the study populations not performing regular physical activities. Beneficial consequences have already been observed in children of physically active parents; they present a lower risk of a sedentary lifestyle after 15 years of age, thus confirming the parents' lifestyle ability to interfere in their children's behavior<sup>33</sup>.

The WHO has recently reaffirmed that physical inactivity, along with the consumption of inappropriate food is among the ten major factors determining mortality<sup>34</sup>.

It is well established in the scientific literature that the amount and type of dietary fat have a direct influence on cardiovascular risk factors, such as the concentration of plasma lipids and lipoproteins<sup>34</sup>. In the present study, a high frequency of consumption of red meat was observed; like other animal fats, this is a source of saturated fatty acids. Dutra de Oliveira<sup>35</sup> calls the attention for the intake of saturated fatty acids, stressing that it is strongly related to the serum cholesterol level, and this, in turn, to the incidence of myocardial infarction. The author also observes that in countries with a high incidence of coronary artery disease there is a predominance of food with a high content of saturated fat. On the other hand, in countries with a low incidence of coronary artery disease, the eating habits include especially vegetable oils and a low intake of dairy products.

Along with a high frequency of consumption of red meat, another eating habit identified as a cardiovascular risk factor is the low frequency of consumption of food rich in unsaturated fat such as fish. A food intervention study conducted in Finland<sup>36</sup> for twenty years proved efficient in reducing CVD; participants were instructed to reduce their total daily fat intake from 38% to 34%, and saturated fatty acid intake from 21% to 16%, in addition to increasing the consumption of fruits and vegetables. Another similar study<sup>37</sup>, showed that every 5% reduction in calories from saturated fat resulted in a 17% lower risk of CVD.

Diet cholesterol is found in animal food and affects blood cholesterol levels. Its intake may be reduced by decreasing the consumption of organ meats, poultry skin, sausages and cold cuts<sup>1</sup>. In the present study, a high frequency of consumption of sausages was observed.

In a study on eating patterns in several countries, an increased risk for acute myocardial infarction of approximately 30% was identified in populations that have a fat-rich diet – also known as western diet; an inverse relation was observed in populations that have a diet rich in fruits and vegetables – also known as prudent diet<sup>38</sup>.

By means of the analysis of food consumed by parents, we can identify some eating habits considered as cardiovascular risk markers. Considering the strong influence that the parental eating behavior exerts on the formation of the eating habit during childhood – a period in which the lifestyle and eating patterns are being structured, we can stress the importance of acquiring healthy habits in the prevention and treatment of CVD in the family environment<sup>31</sup>; after all, several randomized assays have demonstrated that adequate food interventions may significantly decrease or prevent the onset of different noncommunicable chronic diseases<sup>34</sup>.

It is possible to hypothesize that the parents/caregivers habits exert greater or less influence according to the severity of the heart disease. First, because more severe heart diseases may be accompanied by malnutrition in the early childhood, thus raising concerns from the caregiver about feeding the child in a compensatory way. This habit may persist even after correction of the heart disease. Second, because the heart disease, per se, can have consequences that may be exacerbated by the family habits, as in the case of hypertension associated with coarctation and the risk of defects in heart diseases with coronary anomalies<sup>39</sup>.

Thus, we point out that the prevention of cardiovascular risk factors is important in all phases of life. However, this may be even more important in children with heart diseases, in whom the lifestyle may have an even greater impact, as previously exposed.

## Conclusions

The present study identified the presence of risk factors for cardiovascular diseases in parents of children with heart diseases, namely obesity, sedentary lifestyle and hypertension, in addition to risk markers regarding the eating habit, such as a high frequency of intake of saturated fat and cholesterol, and a low frequency of intake of unsaturated fat. Many of the risk factors identified are modifiable; early detection will help establish public health measures to promote education and primary prevention.

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The risk factors start during childhood; therefore their management should also start in this phase. Considering the significant influence that the family exerts on the formation of the children's lifestyle and habits, interventions should address this aspect, transforming the family environment into an opportunity for healthy daily practices thus helping reduce the incidence of chronic diseases in adulthood.

## Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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## Study Association

This study is not associated with any post-graduation program.

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