


# Knowledge, Attitudes, and Practices of Parents Facing Child and Adolescent Obesity in Brazzaville, Congo

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## Abstract

The study aimed to assess obesity-related knowledge, attitudes, and practices of parents when facing child and adolescent obesity in order to improve the quality of care. A case-control study was conducted from February 1 to July 1, 2013. The study compared parents of obese school children (group 1 or cases;  $n = 254$ ) and those school children without obesity (group 2 or controls;  $n = 254$ ). These children were drawn from public and private primary schools of Brazzaville (Congo). Obesity-related knowledge was satisfactory in 83.5% of the cases, attitudes were correct in 29% of the cases, and the practices good in 25.6% of the cases. The parents' obesity-related knowledge was satisfactory when the socioeconomic level of the family was high ( $P < .02$ ), the mothers' educational level greater than primary ( $P < .001$ ), and the fathers' educational level was greater than primary ( $P < 10^{-4}$ ). The same observation was obtained with obesity-related attitudes and practices of the parents when correct. This influence remained after the adaptation of fathers' educational level. In conclusion, the disease-related knowledge of parents can be considered satisfactory in the majority of the cases; however, obesity-related attitudes and practices remain incorrect in most of the cases.

## Keywords

knowledge, attitudes, practices, parents, childhood, obesity, Congo

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## Introduction

Obesity in children and adolescents, as in adults, is an important public health concern due to not only the increasing number of cases but also the morbidity, one of the main risk factors of mortality in adulthood.<sup>1,2</sup> This trend noted in developed countries is now spreading in low-income developing countries. This is the case of Congo, where the number of obese children has almost quadrupled from 1963 (1.9%) to 2003 (7.1%).<sup>3</sup> The determinants of obesity are multiple and their interactions complex. Beyond the individual biological and genetic factors, obesity is related to lifestyle, including physical inactivity and eating behavior.<sup>2</sup> Thus, having better knowledge of these factors is crucial in the current context of worldwide rising prevalence of obesity.<sup>4</sup>

Besides, the fastidious character of the management of obesity in adulthood and the risk of persistence and worsening of the disease in adulthood are arguments justifying the need to go in for primary prevention of child obesity.<sup>5</sup> This primary prevention inevitably involves good obesity-related knowledge by parents and

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appropriate attitudes leading to efficient practices. In fact, some authors have shown that parental behaviors might predispose to obesity in offspring, by transmitting knowledge and attitudes that are admitted or not, implicitly or explicitly, by the society.<sup>6,7</sup> Thus, in many developed countries, public health interventions have been built based on the recommendations of the World Health Organization through the development of primary prevention programs of childhood obesity.<sup>8</sup> This study was conducted to assess the level of knowledge, attitudes, and practices of parents regarding childhood obesity. The data obtained should allow us develop effective national programs for childhood obesity prevention.

## Materials and Methods

### Sampling

A case-control study was conducted from February 1 to July 1, 2013, in Brazzaville, Congo's political and administrative capital, which has a population of 812 415 inhabitants, representing more than a third of the national population.<sup>9</sup> The students of primary school (public and private) represented the study population from which we derived the sample for this study. The prevalence of obesity in primary schools in Brazzaville is 7.1%,<sup>10</sup> and the sample size ( $n$ ) was determined using the following formula:  $n = (z^2 pq)/d^2$ , where  $z$  is the standard normal distribution (1.96), with  $d$  error component of interval estimate (0.05),  $p$  proportion for the population (0.071), and  $q = 1 - p$  (1 - 0.071). Thus, the sample should contain at least 144 participants. The study considered 72 parents of obese children as cases and 72 parents of non-obese children as controls. Cluster randomized trials were used (3 clusters). For the first cluster (district or commune), 3 of the 9 that compose Brazzaville were selected by random drawing at 1/3. With regard to the second cluster (school districts), 5 among 11 school districts of Brazzaville were selected by random drawing at 1/3, based on the list of selected municipalities. The investigators then conducted a survey of public and private primary schools by identifying the institutions with the complete package of primary education (preparatory, elementary, and middle) and which had more than 100 pupils. Of the 53 schools identified, 17 schools were selected after a systematic sampling, with an arithmetic progression of 3. The total number of students attending these 17 schools was 3810. A simple random sampling was then performed in every school, that is, in preparatory, elementary, and middle classes. Moreover, to respect the proportionality between groups of children, 1/3 between private schools and public schools,<sup>11</sup> we examined about 3 times more children in public schools

( $n = 2760$ ) than in private schools ( $n = 1050$ ). There were 1864 boys and 1947 girls, with a sex ratio of 0.96. Measures of height (H) and weight (W) of each child were required to determine body mass index. Thus, obesity was defined according to the growth curves of Rolland-Cachera et al.<sup>12</sup> For each child meeting the criteria for obesity, one parent was drawn between the father and the mother. In cases where the tutor was not 1 of the 2 parents, he was de facto retained. For each obese child (case), one child from the same school, who was not obese (control) was selected to form the control group. At the end of this process, 508 parents formed the study sample (254 cases and 254 controls), among whom 108 were cases and 126 were controls for fathers; mothers were divided into 46 cases and 28 controls. No survey form had been filled by another tutor, and all selected children were living into 2-parent families. Informed consent of parents and teachers of selected classrooms was obtained.

### Variables

*Sociodemographic Characteristics of Children and Parents.* Using a survey form created for this purpose, the data collected for each child included sex, age, size, birth order, parent's educational level, and socioeconomic level of which appreciation was based on the classification of Gayral-Taminh et al.<sup>13</sup>

*Knowledge, Attitudes, and Practices.* The data on obesity-related knowledge, attitudes, and practices of parents were analyzed. For this, the method of Basdevant et al<sup>14</sup> and the critical approach of Buss et al<sup>15</sup> on the assessment of parents' knowledge, attitudes, and practices on their children's issues have been used to build the evaluation questionnaire. Thus, in order to conceive the list of items, 60 parents (10 by district), randomly selected from the neighborhood, were interviewed on the topic, "Imagine what a parent can do or say when facing child obesity." This interview was limited in time to 15 minutes so that the reasons given by parents may belong to the register regularly activated by parents in their mode of explanation. The possible explanations have a probability of occurrence for giving an account of the obesity-related knowledge, attitudes, and practices of parents. This time limit also helped standardize the responses of parents according to their socioprofessional status. It was based on the assumption that the first representations of the parents would be shared by the entire population. After a thematic analysis of responses, the construction of the related items was set. However, methodological precautions were taken about the comprehension, the relevance, the plausibility, and the homogeneity of the items

proposed in the survey form. For this reason, the 60 parents had to take a pretest to make sure that the questionnaire was entirely understood (filling, turn, and comprehension of questions) and the given explanations met the speech and the attitudes commonly found in the parents. Thus, a total of 30 closed items were selected, divided as follows: 21 items on parental knowledge on childhood obesity, 5 items on their attitudes, and 4 items on their practices. Responses to each item of the questionnaire followed a 3-point Likert-type scale. Thus, each item was rated at 3 when the response was good and 1 when it was bad. Obesity-related knowledge was appreciated with regard to the definition, etiology, methods of measurement, and the place of the physician in its management. Concerning attitudes, they were limited to the parents' devotion or not, the place of diet, and the somatic and psychological perception of obese children. As for the practices, items were focused on medical consultations with the child, the diet follow-up, the recommendations with respect to the beneficial effects of regular physical activity, and weight control of the child.

The survey form sent by the classroom teacher(s) to the parent(s) was filled by the parents during a face-to-face interview with the investigator.

From the approach of Buss et al,<sup>15</sup> knowledge was considered good when the sum of responses totaled 31 points out of 63 satisfactory answers; correct attitudes with at least 8 points out of 15; and practices with at least 6 points out of 12.

**Operational Definitions.** The educational level of the mother or the father was considered "no school/preschool" or "nil" when she or he did not attend primary school or alphabetization courses. It was considered primary when the mother or father had completed primary curriculum up to primary 6 (CM2). The parents were considered to have knowledge of secondary school if they had completed high school. When the father or mother had reached the university (or college), the educational level was classified as tertiary. The socioeconomic level of the family was valued in accordance with the classification of Gayral-Taminh et al,<sup>13</sup> which was high when family resources came from the salary of a senior executive officer, a trader, or middle executive officers; middle when the resources came from a middle executive officer or the informal sector agent; and lower when resources were from the workers and parents' undocumented incomes.

### Data Analysis

Data analysis was performed using the Statview5 software, version 12.0. The influence of sociodemographic variables on obesity-related knowledge, attitudes, and

practices of parents required the calculation of odd ratio (OR) and confidence interval (CI). A multivariate analysis using the logit method was done to be in control of some confounding variables. Finally, the significance of differences between data collected was evaluated by the Hosmer-Lemeshow  $\chi^2$  test. The difference was considered statistically significant when the critical value of uncertainty ( $P$  value) was less than .05.

### Results

In total, 3810 children were surveyed. Among them, 254 were obese, representing 6.7% of the cases. Of the 254 obese children, 136 (4.9%) were from public schools and 118 (11.2%) were from private schools. There were 117 boys (6.3%) and 137 girls (7.1%), with a male-to-female ratio of 0.9. The family's socioeconomic level was low in 30 cases (11.8%), middle in 178 cases (70.1%), and high in 46 cases (18.1%). Their educational level was "no school/preschool" in 6 cases (2.7%) and 22 cases (8.7%), respectively, for the father and the mother; primary in 46 cases (18.1%) and 65 cases (25.6%), secondary in 105 cases (41.3%) and 98 cases (38.6%), and tertiary in 97 cases (38.2%) and 69 cases (27.2%). Parents' obesity-related knowledge was satisfactory in 235, including 112 (20.7%) belonging to the case group and unsatisfactory in the remaining cases (Table 1). There were significant associations between satisfactory obesity-related knowledge and each of the following covariates: high socioeconomic level of the family ( $P = .043$ ), mother's educational level beyond primary ( $P = .048$ ), and father's educational level beyond primary ( $P = .039$ ). Data from the regression analysis showed that an incorrect definition of the disease resulted in bad attitudes and practices from parents in the management of child obesity (Table 2). However, having an obese child had a positive impact on the knowledge of the etiology and complications of obesity ( $P < .01$ ). As for attitudes (Table 3), they were correct in 129 parents, including 62 parents belonging to the case group (12.2%) and not correct for the other parents. The parents' obesity-related attitudes (Table 3) were correct when the socioeconomic level of the family was high ( $P = .035$ ), mothers' educational level was a tertiary ( $P = .044$ ), and the fathers' educational level was tertiary as well ( $P = .041$ ). The practices were good in 75 (14.8%) of the parents of obese children (Table 4). These practices followed the same trend as that observed for knowledge and attitudes. Table 5 shows that physical activity practice and healthy diet in children were associated with higher odds of parents who did not have obese children in contrast to parents whose children were obese.

**Table 1.** Obesity-Related Knowledge of Parents According to Sociodemographic Characteristics.

	Case			Control		
	Knowledge +	knowledge -	$\chi^2$ (P)	Knowledge +	knowledge -	$\chi^2$ (P)
Family's socioeconomic level						
Low	11	64	10.3 (.043)	17	58	12.1 (.046)
Middle	68	53		79	42	
High	43	15		27	21	
Mother's educational level						
• Nil	25	29	9.9 (.048)	21	33	3.08 (.58)
• Primary	33	51		34	50	
• Secondary	27	49		23	53	
• Tertiary	29	11		20	20	
Father's educational level						
• Nil	4	4	32.0 (.039)	2	6	28.4 (.033)
• Primary	8	17		5	20	
• Secondary	35	62		24	73	
• Tertiary	86	38		59	11	

**Table 2.** Determinants of Children Obesity-Related Knowledge of Parents.

	Case (n = 254)	Control (n = 254)	OR [95% CI]	P
Source of information				
Medical practitioner	48	25	2.2 [1.3-3.7]	.039
Entourage/media	196	229	0.5 [0.3-0.8]	.043
Definition of obesity				
Incorrect	41	8	5.9 [2.7-12.9]	.036
Correct	213	246	0.2 [0.1-0.4]	.028
Etiology of obesity				
Knowledge -	41	153	0.1 [0.07-0.2]	.017
Knowledge +	213	101	7.9 [5.2-12]	.013
Complications of obesity				
Knowledge -	41	159	0.1 [0.07-0.2]	.011
Knowledge +	213	95	8.7 [5.7-13.2]	.010

Abbreviations: OR, odds ratio; CI, confidence interval.

## Discussion

This study reports the results of a survey of knowledge, attitudes, and practices of parents facing child obesity in Brazzaville. The main results of this survey show that (a) childhood obesity-related knowledge is fragmentary and (b) attitudes and parental practices are related to their level of education. However, the analysis does suffer from some limitations including lack of information of departments that do not allow their extrapolation to the Congolese people. The lack of resources to conduct national studies did not permit us to reach this goal. In all cases in Brazzaville, with over a third of the Congolese population,<sup>9</sup> we can admit that our results provide insight on the extent of the problem at the national level. Similarly, the survey could also include children of secondary school. However, we

believe that the knowledge, attitudes, and practices of parents of elementary school children should not be different from those of parents whose children attend the secondary school.

In addition, parents of obese children from Brazzaville are distinguished by a good knowledge of the disease in 48.0% of cases. This is an unsatisfactory result when we know the place of parents in the prevention of childhood obesity. Indeed, preventive actions are easier to carry out when speaking to people with deeper understanding of the disease. Besides, the ANAES study,<sup>16</sup> on the recommendations of the management of child and adolescent obesity, emphasizes on the need for family involvement and the proximity approach. Thus, the results reported in this study can predict a poor awareness of parents toward child obesity, in a context of the

**Table 3.** Attitudes of Parents Facing Child Obesity According to Sociodemographic Characteristics.

	Case			Control		
	Correct +	Incorrect -	$\chi^2$ (P)	Correct +	Incorrect -	$\chi^2$ (P)
Family's socioeconomic level						
• Low	3	27	19.05 (.035)	6	24	10.91 (.031)
• Middle	43	135		47	131	
• High	16	30		14	32	
Mother's educational level						
• Nil	13	41	11.01 (.044)	9	45	12.93 (.047)
• Primary	28	56		31	59	
• Secondary	21	55		25	51	
• Tertiary	4	36		6	34	
Father's educational level						
• Nil	2	6	12.17 (.041)	3	5	14.08 (.034)
• Primary	10	15		9	16	
• Secondary	47	50		46	51	
• Tertiary	64	60		68	56	

**Table 4.** Practices of Parents According to Sociodemographic Characteristics.

	Case			Control		
	Good	Bad	$\chi^2$ (P)	Good	Bad	$\chi^2$ (P)
Family's socioeconomic level						
• Low	4	26	10.36 (.046)	6	24	8.27 (.052)
• Middle	17	161		13	165	
• High	34	12		31	15	
Mother's educational level						
• Nil	10	44	14.15 (.031)	13	41	13.15 (.043)
• Primary	21	63		20	64	
• Secondary	22	54		19	57	
• Tertiary	32	8		34	6	
Father's educational level						
• Nil	2	6	37.42 (.028)	1	7	10.28 (.046)
• Primary	5	20		3	22	
• Secondary	20	77		16	81	
• Tertiary	81	53		79	55	

targeted communication for a change in behavior. However, parental knowledge on obesity was linked to the socioeconomic level ( $P = .043$ ). They were all the more satisfactory because the socioeconomic level was high, and so was the level of education. But in Congo, more than half of the households live below the poverty line.<sup>17</sup> Thus, actions to change behavior should take this fact into account. In fact, to reach a wide audience, the broadcast channel of a message must take into account the accessibility of the population regardless of socioeconomic level. The best knowledge found among more educated parents suggest that obesity should be common among children belonging to educated parents. Thus, in

developing countries, the prevalence of childhood obesity increases when the parental educational level increases.<sup>18</sup> In contrast, in industrialized countries, there is an inverse relationship between educational level and body mass index.<sup>19</sup>

A deeper understanding of the impact of socioeconomic factors in the occurrence of child obesity is essential for the implementation of an effective prevention policy.

This study shows that the attitudes and practices of parents (cases) when faced with child obesity were only correct in 12.2% and 14.8% of cases, respectively. This fact may suggest that parents are not challenged by the



**Table 5.** Determinants of Attitudes and Practices of Parents Facing Children Obesity.

	Case (n = 254)	Control (n = 254)	OR [95% CI]	P
Medical consultation				
• Yes	225	83	16.5 [10.4-26.3]	.006
• No	29	171	0.1 [0.06-0.2]	.020
Physical activity practice				
• Yes	73	236	0.03 [0.02-0.5]	.014
• No	181	18	32.5 [18.7-56.4]	.002
Healthy diet				
• Respected	85	181	0.2 [0.1-0.3]	.017
• Not respected	169	73	4.9 [3.4-7.2]	.021
Weight loss				
• Controlled	126	135	0.9 [0.6-1.3]	.063
• Not controlled	128	119	1.2 [0.8-1.7]	.058

Abbreviations: OR, odds ratio; CI, confidence interval.

disease, which is the first factor of adult mortality in developed countries.<sup>1</sup> However, it is important to note that for children's obesity prevention measures to be effective, it must be addressed by the whole family; in fact, family behavior and habits need to be corrected as they are often reproduced and acquired by the child.<sup>20</sup> Thus, parents may resort to practices that encourage the development of eating habits and behaviors in their children.<sup>21</sup> Indeed, children's eating habits are shaped mainly by the family environment,<sup>19</sup> due to parents' eating habits.<sup>22</sup> Similarly, the environment seems to be a particularly powerful determinant of physical activity<sup>23</sup> and a healthy diet,<sup>24,25</sup> as observed in this study. Moreover, the model of Hoover-Dempsey and Sandler,<sup>26</sup> which examines the process of parental involvement in the success of children's education, indicates that parental involvement influences the education of children by 3 mechanisms including their knowledge and skills: remodeling, reinforcement, and instruction. Thus, the low percentage of correct attitudes and practices of parents in this study reflect the heavy burden devolved not only to health authorities but also to associations fighting against chronic diseases in changing the attitudes and practices of parents. This burden is all the more higher because the right attitudes and practices predominate only among parents with high socioeconomic level and tertiary educational level. Good practices consist in having a healthy diet in accordance with the recommendations of the French National Program for Nutrition and Health,<sup>16</sup> and regular physical activity (at least the equivalent of 30 minutes of brisk walking every day).<sup>27-29</sup> However, despite its importance in the prevention and treatment of obesity, physical activity remains insufficient even in developed countries. For example, it is estimated that French children are the least active in the world,<sup>30</sup> even

though several opportunities are offered to them in a day for reaching the minimum level of physical activity recommended.<sup>31-33</sup> In developing countries, sport seems to be a secondary concern for a father whose monthly income is uncertain or low enough to ensure regular food to his family. So the best attitudes and practices of parents facing their children's obesity in Congo require above all a substantial increase in purchasing power.

In sum, taking into consideration the rising prevalence of child obesity in Congo, the knowledge of this disease by parents should be utilized to promote the acquisition of correct attitudes and good practices for family management of obese children, in accordance with current recommendations. Thus, there is urgent requirement that Congolese health authorities develop appropriate strategies in order to prevent or treat obesity by involving parents and audiovisual media.

### Author Contributions

MBJR: Contributed to conception; contributed to acquisition, analysis, and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

NER: Contributed to design; contributed to analysis and interpretation; drafted manuscript; critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

NMKGC: Contributed to design; contributed to acquisition and analysis; drafted manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

MMSV: Contributed to design; contributed to interpretation; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

BBSBA: Contributed to interpretation; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

MHG: Contributed to conception; contributed to acquisition, analysis, and interpretation; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

MG: Critically revised manuscript; gave final approval; agrees to be accountable for all aspects of work ensuring integrity and accuracy.

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