

## Background

Obesity is defined as excess body fat in relationship to lean body mass, due to the positive energy balance<sup>1</sup>. It has increased alarmingly worldwide both among adults and among children and adolescents<sup>2</sup>. It is epidemic in both developed countries and developing ones<sup>3,4</sup>. It is considered chronic non-communicable (NCD) and associated with the development of cardiovascular disease (CVD), hypertension, type 2 diabetes mellitus (T2DM), metabolic syndrome (MPS), some types of cancer, impairment of joint disease, psychological repercussions and decreased quality of life<sup>5,6</sup>.

Keywords: Child. Adolescent. Overweight. Obesity, Nutritional Status.

The Table 2 shows the prevalence according to socioeconomic level, education of the family head, time spent watching TV and using computer or playing videogames. We identified 92 students with at least two criteria for metabolic syndrome as represented at Table 3.

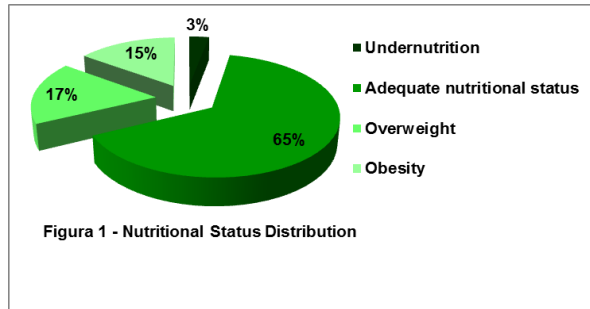


Table 3 – Children and adolescents that reached metabolic syndrome criteria

BP	AN	PAC	Overweight	Obesity	Nº
Normal	Absent	< P90	105	17	123
	Present	≥ P90	31	58	89
Borderline	Absent	< P90	41	20	61
	Present	≥ P90	18	69	87
Stage I Hypertension	Absent	< P90	-	-	-
	Present	≥ P90	-	1	1
Stage II Hypertension	Absent	< P90	-	-	-
	Present	≥ P90	-	3	3
Hypertension	Absent	< P90	-	-	-
	Present	≥ P90	-	1	1
Hypertension	Absent	< P90	-	-	-
	Present	≥ P90	-	-	-

BP–blood pressure; NA–acanthosis nigricans; PCA–percnentile of abdominal circumference

Two Criteria  
Three Criteria

## Objectives

The aim of this search was to describe the prevalence of overweight and obesity, and associated factors in children and adolescents from private and public schools in Uberaba, Minas Gerais, Brazil.

## Methods

Cross-sectional study of 1,125 children and adolescents of both genders, between 5 and 18 years of age, from public and private schools. Weight and height were obtained according to Brazilian guidelines (SISVAN)<sup>7</sup>. The triceps (TSF), subscapular (SSF), biceps, supra-iliac, femoral and calf skinfolds were measured in triplicate. The body mass index (BMI) was classified as BMI percentile (BMIP) according to WHO 2007 criteria: participants with BMIP <P3 were classified as undernourished, BMIP ≥P3<P85 were considered as normal nutritional status, BMIP ≥P85<P97 were classified as overweight and those with BMIP ≥P97 were considered obesity. The percentage body fat (%BF) was obtained using the equations by Slaughter et al., 1998 based on TSF and SSF. Evaluation of factors associated with overweight and obesity included gender, age, ethnicity, socioeconomic level, education of the family head, time spent watching TV and using computer or playing videogames. Categorical variables were analyzed using the Chi-square test; Mann-Whitney was used for comparisons between 2 groups and multiple comparisons were performed by Kruskal Wallis followed by Dun's test.

## Results

We evaluated 1125 students, 681(60,5%) females and 444 (39,5%) male. Distribution of the nutritional status can be viewed at Figure 1. The prevalence were 17,3% (n=195) for overweight and 15,0% (n=169) for obesity. The prevalence according to gender, ethnicity and age group were represented at Table 1.

Table 1 – Nutritional status according to gender, ethnicity and age.

VARIABLES	No	OVERWEIGHT	OBESITY	P
Gender	Male	152 (15.5%)	84 (18.9%)	S
	Female	212 (18.6%)	85 (12.5%)	S
Ethnicity	White	77 (48.4%)	82 (51.6%)	NS
	No White No Black	155 (56.8%)	67 (43.2%)	NS
	Black	50 (60.0%)	20 (40.0%)	NS
Age (Years)	<10	56 (46.3%)	65 (53.7%)	S
	≥10 <14	78 (52.0%)	75 (49.0%)	NS
	≥14	61 (67.8%)	29 (32.2%)	S

S – statistical significance p <0,05; NS – no statistical significance p >0,05

Table 2 Overweight and obesity associated factors according socioeconomic factors and sedentary habit by gender

Associated factors	Gender	No	Overweight	Obesity	P
Education of head of family	Lowest than elementary School or illiteracy	Male	33 (12,36,4%)	21(63,6%)	NS
		Female	54 (30,55,6%)	24 (44,4%)	NS
	Complete elementary School and incomplete High school	Male	33 (19,57,6%)	14 (42,4%)	NS
		Female	41 (26,63,4%)	15 (36,6%)	NS
Greater than High School	Male	84 (36,42,9%)	48 (57,1%)	S	
	Female	113 (70,61,9%)	43 (38,1%)	S	
Time Spent watching TV, using computer and playing videogames (hours per day)	< 2	Male	15 (74,46,7%)	8 (53,3%)	NS
		Female	26 (14,53,8%)	12 (46,2%)	NS
	≥ 2 < 5	Male	72 (33,45,8%)	39 (54,2%)	NS
		Female	94 (52,56,5%)	40 (42,5%)	NS
≥ 5	Male	50 (23,46,0%)	27 (54,0%)	S	
	Female	71 (47,61,2%)	24 (33,8%)	S	
Socioeconomic Class	Class A (Highest)	Male	17 (9,52,9%)	8 (47,1%)	NS
		Female	17 (11,64,7%)	6 (35,3%)	NS
	Class B	Male	58 (22,37,9%)	36 (62,1%)	S
		Female	85 (50,58,8%)	35 (41,2%)	S
	Class C	Male	65 (32,49,2%)	33 (50,8%)	S
		Female	93 (59,62,9%)	34(37,1%)	S
Class D + E (Lowest)	Male	12 (5,41,7%)	7 (58,3%)	NS	
	Female	15 (7,46,7%)	8 (53,3%)	NS	

S – statistical significance p <0,05; NS – no statistical significance p >0,05

## Conclusions

In Uberaba - MG the female prevalence of overweight was 18.6%, while the obesity was 12.5%. In the male group, overweight prevalence was 15.3% and obesity 18.9 %. No significant difference was observed among white and non-white/non-black and black ones. According to socioeconomic status, overweight was more prevalent in females, and obesity in males, from B and C classes. Considering sedentary leisure time ,overweight was more common in females and obesity in males when they spent more than 5 hours/day in these activities. In both female and males, overweight/obesity were more prevalent when parents had higher education level. We would like to emphasize the need for standardization of diagnostic criteria and instruments for measuring food intake and physical activity, raising the possibility of future research that could faithfully portray the nutritional status of Brazilian schoolchildren.

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