
Prevalence of overweight and obesity in a group of children between the ages of 2 to 12 years old in Puerto Rico

MYRTA OTERO-GONZÁLEZ, MD*; LOURDES GARCÍA-FRAGOSO, MD, FAAP†

Background: Obesity in children has been related with co-morbid conditions being an important risk factor in adult morbidity and mortality. The objective of this study was to identify the prevalence of overweight / obesity in a group of children in Puerto Rico.

Methods: Participants included 158 children receiving pediatric care at the San Juan City Hospital and a primary care clinic. Body mass index (BMI) was calculated in children and parents.

Results: Fifty-six percent of children were overweight / obese as well as 61% of mothers and 75% of fathers.

Using weight-height percentiles graphs, 49% of children were overweight.

Conclusions: This study shows the high prevalence of overweight and obesity in children and their parents. Using the BMI for evaluating weight identified more children at risk than the traditionally used graphs. Identifying risk factors will help health care professionals and parents intervene to improve the health of these families.

Key words: Obesity, Children, Overweight.

In the last decade, obesity in children has increased three fold or more in the United States (1). Traditional weight-for-height growth charts classify overweight children as those over the 95th percentile. Obesity refers to excess adiposity rather than excess weight, and body mass index (BMI) is a surrogate for adiposity. The American Academy of Pediatrics defines a BMI between 85th and 95th percentile for age and sex as a child who is at risk of overweight, and a BMI at or above the 95th percentile as overweight or obese (2). The American Obesity Association uses the 85th percentile of BMI as a reference point for overweight and the 95th percentile for obesity. It uses the 95th percentile for obesity since it corresponds to a BMI of 30, which is the marker for obesity in adults. The 85th percentile corresponds to the overweight reference point for adults, which is a BMI of 25 (3).

Obesity has been related with co-morbid conditions in the pediatric age group being an important risk factor for much of adult morbidity and mortality. Because of the enormous epidemic of obesity and increasing incidence of co-morbidities associated with overweight and obesity, early diagnosis is essential (2). The American Academy of Pediatrics (2) has developed guidelines for the

pediatricians to follow in order to assess and prevent overweight and obesity in children. The purpose of this study was to assess the prevalence of overweight and obesity in a group of children in Puerto Rico and their parents and to identify complications possibly related to being overweight.

Materials and Methods

This study included 158 children between the ages of 2 and 12 years of age and their parents. Participants were recruited at a public primary pediatric care clinic in the San Juan metropolitan area and at the San Juan City Hospital pediatric ward from September to December 2004. Both facilities provide medical care to families of low socio-economic status covered by government health insurance. All parents of children meeting the age inclusion criteria who visited the clinic one specific day of the week, during the study period, were invited to participate. Those who volunteered to participate were included in the study.

Parents were asked about health issues in the child and their perception of the children weight status. Weight status of children and both parents was calculated based on height and weight measurements. All children were weighed and their height measured by a nurse at the clinic or upon hospital admission as recorded on the medical record. The parents' weight and height were assessed using standard procedures by the principal investigator. Body Mass Index (BMI) was calculated by using the ratio of weight in kilograms to the height in square meters. For

*San Juan City Hospital, Department of Pediatrics, †University of Puerto Rico School of Medicine, Department of Pediatrics, Neonatology Section.

Address correspondence to: Lourdes García MD, UPR School of Medicine, Department of Pediatrics, Neonatology Section, PO Box 365067, San Juan, PR 00936-5067. E-mail address: lougarcia@rcm.upr.edu. Telephone 787-777-3225. Fax 787-758-5307.

the purpose of this study, the 85th percentile of BMI was used as the reference point for overweight and the 95th percentile for obesity.

The study was approved by the San Juan City Hospital Institutional Review Board. The statistical analysis was done including frequency distribution, percentages, and means. A p-value < 0.05 was considered statistically significant for differences among groups.

Results

The mean age of children was 6 years old. The prevalence of overweight and obesity in this group of children was 56% (20% overweight, 36% obese). We used the traditional weight/height graphs to classify children as overweight. Using these graphs, 49% of the children were classified as overweight in contrast to 56% using the BMI. There was no difference in prevalence of overweight and obesity in preschoolers when compared to school age children (52% vs. 58%). There was no difference in prevalence of obesity between boys and girls.

There was a high prevalence of overweight and obesity in the parents of the studied children. Table I summarizes these findings. The mean BMI for mothers was 28, which is classified as overweight. The mean BMI for fathers was 30, which is classified as obese. Forty-six percent of mothers of overweight/obese children were overweight/

Table 1. Characteristics of participants

Mean age (years)	6 (2-12)
Male: female ratio	1:1
Maternal education	
Less than high school	33%
High school	28%
Post high school studies	39%
Mean BMI	
Children	20 (11.5-52)
Mothers	28 (14-54)
Fathers	30 (19-56)
Overweight and obese	
Children	56%
Mothers	61%
Fathers	75%

obese themselves. There was no correlation between the parents' education level and the weight status of parents and/or children.

Twenty-six percent of the mothers answering the survey identified their children as overweight. However, using BMI standards, 56% of the studied children were classified as overweight or obese. In the group of children classified as overweight (by BMI), only 45% were identified as such by their mothers. Furthermore, only 7% of the obese children were identified as such by their mothers

($p=0.0000$). Four children had history of high cholesterol levels. One child was overweight and three were obese. The mothers of 3 children considered their child to have low self-esteem. Of these, one child was overweight, 2 were obese.

Discussion

Childhood obesity has reached epidemic levels in developed countries (4). The 2000 National Health and Nutrition Examination Study (NHANES) survey found that the prevalence of BMI >95th percentile was 15% for children 6 to 19 years old, representing an almost 4-fold increase in children 6 to 11 years old and a 3-fold increase in children 12 to 19 years old since the 1960s (2). In some European countries, such as the Scandinavian countries, the prevalence of childhood obesity is lower as compared with Mediterranean countries; nonetheless, the proportion of obese children is rising in both cases. The highest prevalence rates of childhood obesity have been observed in developed countries; however, its prevalence is increasing in developing countries as well. The prevalence of childhood obesity is high in the Middle East, Central and Eastern Europe. In 1998, The World Health Organization reported Iran as one of the seven countries with the highest prevalence of childhood obesity. In Saudi Arabia, one in every six children aged 6 to 18 years old is obese (4).

The prevalence of obesity has been found to be higher among both Hispanic- and African-American youth than among non-Hispanic white children (5). To our knowledge there are no recent scientific reports on the prevalence of obesity in children in Puerto Rico although some press reports have addressed the problem. A study conducted to determine the prevalence of overweight children clients of community health centers in medically underserved areas of the USA Health Resources and Service Administration regions II and III (including Puerto Rico), showed that Hispanic children in the sample had a 24.6% prevalence of obesity (6). Another study, in adolescents attending a public junior-high school in San Juan, Puerto Rico during year 2000, showed the prevalence of level I obesity (BMI 30.0 - 34.9) and level II obesity (BMI 35.0 - 39.9) among 12 to 16 year old adolescents to be 33.2% and 14.2%, respectively (7).

The Centers for Disease Control reported that in 2001 the Behavioral Risk Factor Surveillance System Survey showed that, in Puerto Rico, 62.8% of the adults were overweight or obese similar to what we found in this group of children (8).

Studies have shown that for young children, if one parent is obese, the odds ratio for obesity increases to more than 10. Before the age of 3 years old, parental obesity is a

stronger predictor of obesity in adulthood than the child's weight status. The probability of childhood obesity persisting into adulthood is estimated to increase from approximately 20% at 4 years of age to approximately 80% by adolescence (2). In our study, the prevalence of overweight and obesity was similar in preschoolers and school-age children. This should alert us to intervene during the first years of life to create good eating habits that can help prevent obesity during the preschool years and on.

Health care professionals need to be aware of the importance of the early identification of children making interventions more effective. When we used the traditional weight/height graphs to classify children's weight, we missed 7% of children who were overweight. These children are better identified by using the BMI percentile graphs. The American Academy of Pediatrics recommends measuring BMI once a year (2).

We need to get parents involved. The study showed that mothers could not identify their children as overweight. Being overweight has a heavy social burden, and mothers want to protect their children from being labeled as such. Accepting or recognizing the fact that the child is overweight can help the family take an active role in improving their child's health. The high prevalence of overweight and obesity in this group of parents should make us aware that the interventions should be directed to the family and not only to the child, emphasizing the importance of creating adequate nutrition and physical activity related habits.

Because of the relatively small sample size and the characteristics of the subjects in the study, we understand that the findings cannot be generalized to the Puerto Rican population. A larger and more representative sample will help us address the magnitude of the problem and identify the risk factors which will help health care professionals and parents intervene to improve the health of these children and their families.

Resumen

La obesidad en niños se relaciona con condiciones comórbidas siendo éstos factores de riesgo importantes

de morbilidad y mortalidad en adultos. El objetivo de este estudio fue identificar la prevalencia del sobrepeso y la obesidad en un grupo de niños en Puerto Rico. Participaron 158 niños que recibían cuidado pediátrico en el Hospital Municipal de San Juan y en una clínica primaria. Se calculó el Índice de Masa Corporal (IMC) a niños y padres. Un 56% de los niños estaba sobrepeso u obeso al igual que el 61% de las madres y el 75% de los padres. Usando las gráficas de percentil de peso-estatura, el 49% de los niños estaba sobrepeso. Este estudio muestra una alta prevalencia de sobrepeso y obesidad en niños y padres. Usando el IMC, se identificaron más niños a riesgo que utilizando las gráficas tradicionales. Al identificar los factores de riesgo, los profesionales de la salud y los padres podrán intervenir para mejorar la salud de estas familias.

References

1. Bowman, SA, Gortmaker, SL, Ebbeling CB, Pereira MA, Ludwig DS. Effects of fast-food consumption on energy intake and diet quality among children in a national household survey. *Pediatrics* 2004;113:112-118.
2. American Academy of Pediatrics, Committee on Nutrition. Prevention of Pediatric Overweight and Obesity. *Pediatrics* 2003;112:424-430.
3. Childhood obesity: prevalence and identification. American Obesity Association Web site. Available from: URL: <http://www.obesity.org/subs/childhood/prevalence.shtml>.
4. Dehghan M, Akhtar-Danesh N, Merchant AT. Childhood obesity, prevalence and prevention. *Nutr J* 2005;4:24.
5. Ogden, C, Flegal, K, Carroll, M, Johnson, C. Prevalence and trends in overweight among US children and adolescents, 1999-2000. *JAMA* 2002;288:1728-1792.
6. Stettler N, Elliott MR, Kallan MJ, Auerbach SB, Kumanyika SK. High prevalence of overweight among pediatric users of community health centers. *Pediatrics* 2005;116:381-388.
7. Venegas HL, Pérez CM, Suárez EL, Guzmán M. Prevalence of obesity and its association with blood pressure, serum lipids, and selected lifestyles in a Puerto Rican population of adolescents 12-16 years of age. *P R Health Sci J* 2003;22:137-143.
8. Centers for Disease Control and Prevention (CDC). Behavioral Risk Factor Surveillance System Survey Data. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2001.