

Overweight and obesity in six-year-old children in 4th and 5th quintile schools in Mangaung, South Africa

Van den Berg L, PhD, Senior Lecturer; Meko L, PhD, Lecturer

Department of Nutrition and Dietetics, School of Allied Health Professions, Faculty of Health Sciences, University of the Free State

Correspondence to: Louise van den Berg, e-mail: vdbergvl@ufs.ac.za

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Abstract

Objective: Weight status at age six years has been identified as an important predictor of overweight and obesity in adolescence, which, in turn, tracks into adulthood, increasing the risk of future metabolic diseases. This study aimed to describe the prevalence of overweight and obesity in six-year-old children in 4th and 5th quintile schools in Mangaung as part of a campaign to raise awareness of the problem among parents and educators.

Design: The study design was cross-sectional and descriptive.

Subjects and setting: Ninety-nine randomly selected grade 1 children, born in 2007, in 4th and 5th quintile primary schools, Mangaung, were the study subjects.

Method: Body mass index (BMI) and waist-to-height ratio (WHtR) were recorded.

Results: Based on BMI-for-age, 24.2% of the children were overweight and obese (10.9% of the boys and 11.3% of the girls were overweight; and 10.9% of the boys and 15.1% of the girls were obese). WHtR was above normal in 16.2% of the study sample (8.7% of the boys and 22.6% of girls). WHtR correlated significantly with BMI ($R\ 0.8$, p -value < 0.0001) in this sample.

Conclusion: Almost a quarter of the six-year-old children in this study were overweight and obese. Parents need to be made more aware of future morbidities associated with excess weight at this age and be empowered to prevent, recognise and appropriately address weight problems in their children.

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Introduction

Overweight and obesity have become a global pandemic in developed and developing countries in both adults and children. Parents' perceptions of their children's weight play an important role in the prevention and treatment of obesity.¹ However, a recent meta-analysis of 69 studies found that more than 50% of parents underestimated the weight of their overweight or obese children.¹ In the course of normal growth and development, body fat gradually decreases during early childhood to reach a minimum between the ages of four and six years, followed by an adiposity rebound, during which body fatness gradually increases until puberty, in preparation for the adolescent growth spurt. Adiposity rebound starts earlier and is more pronounced in overweight and obese toddlers, and is associated with increased body mass index (BMI) in adulthood.² Overweight children aged 2-5 years are five times more likely to be overweight at 12 years of age than their non-overweight

counterparts,¹ and pooled data from three German cohorts has also indicated that the BMI category at age six predicts overweight in adolescence.³ A relatively large body of evidence demonstrates that being overweight or obese during childhood and adolescence predicts premature mortality and physical morbidity in adulthood.⁴

The current study aimed to assess the prevalence of overweight and obesity in six-year-old children in schools which represent the higher socio-economic strata in Mangaung, Free State province, as part of a campaign to raise awareness of the problem among parents and educators.

Method

Ethical approval for the study was obtained by the Ethics Committee, Faculty of Health Science, University of the Free State, and permission granted by the Department of Education. All seventeen 4th and 5th quintile primary schools in Mangaung were approached. A tenth of

Table 1: Anthropometry of six-year-old children in 4th and 5th quintile schools in Mangaung

Classification	Total (n = 99)		Boys (n = 46)		Girls (n = 53)	
	n	%	n	%	n	%
Body mass index						
Severely underweight	5	5.1	2	4.3	3	5.7
Underweight	12	12.1	6	13.0	6	11.3
Normal	58	58.6	28	60.9	30	56.6
Overweight	11	11.1	5	10.9	6	11.3
Obese	13	13.1	5	10.9	8	15.1
Waist-to-height ratio						
< 0.5	83	83.8	42	91.3	41	77.4
≥ 0.5 (at risk*)	16	16.2	4	8.7	12	22.6

*: of metabolic syndrome and cardiovascular disease

the children were randomly selected from the seven schools that were willing to participate, in proportion to the number of six-year-old children born in 2007 in each school. Coverage of 10% of the population in the sample was considered to be representative and practically achievable. Only children for whom informed assent and consent could be obtained were included. Weight, height and waist circumference were measured according to published procedures, and used to calculate BMI, and waist-to-height ratio (WHtR). BMI-for-age z-scores and the universal cut-off of 0.5 for WHtR was used to identify overweight and obese children, and children at risk of metabolic disease, respectively.⁵ Descriptive statistics were expressed as frequencies and percentages. The association between BMI and WHtR was assessed using Spearman's rank correlation coefficient.

Results

The final sample (n = 99) consisted of 46.5% boys and 53.5% girls, and included 63.6% black, 26.3% white, 9.1% coloured and 1.0% Asian children. According to the BMI, 24.1% of the children (21.8% of the boys and 26.4% of the girls) were overweight and obese, while 17.2% were underweight and severely underweight (Table 1). WHtR was increased above the universal cut-off of 0.5 in 16.1% of the children (8.7% of the boys and 22.6% of the girls). The WHtR correlated significantly with BMI (R 0.8, p-value < 0.0001).

Discussion

This study found that one in four children from schools in the upper socio-economic strata in Mangaung were overweight or obese when they entered the primary school system. This is higher than the national prevalence of 11% of overweight and obese children aged 6-9 years, reported by the South African National Health and Nutrition Examination Survey, 2012 (SANHANES-1).⁶ The literature identifies six years as a vital stage in the development of children, i.e being overweight or obese has far-reaching health implications.¹⁻⁴ Thus, intervening to prevent overweight and obesity in the preschool years

should be a priority for parents. Studies show that interventions in overweight and obese children are more successful when the parents are involved as they play a crucial role in modelling and establishing their children's dietary and physical activity patterns.¹ However, to become involved, parents must first be willing to acknowledge that a problem exists. One of the main reasons suggested for why more than 50% of parents of overweight and obese children struggle to recognise their child's weight problems is fear of them being labelled or stigmatised.¹ This was also evident in the current study since most of the eligible schools declined to participate because the principals and personnel were concerned about overweight and obese children being stigmatised, and were hesitant to discuss the matter with parents and the school board.

Although emphasis in the current study was on overweight and obesity, one in six children in the sample were also underweight – approximately 5% severely. SANHANES-1 confirmed this double burden in children of all ages in the country.⁶ A recent meta-analysis found that similar to parents of overweight and obese children, more than 50% of parents of underweight children fail to recognise that a problem exists, placing these children at risk of developmental problems and malnutrition, with far-reaching consequences.⁷

Conclusion and recommendations

The health risks associated with overweight and obesity at age 4-6 years, when children should be at their leanest,² tracks into adolescence and adulthood.²⁻⁴ Similarly, underweight in these children is also predictive of health risks. The anthropometrical screening of children when they enter primary school may raise awareness of the problem among parents and offer the opportunity for timely intervention. At-risk children should be referred to a dietitian who can assist the parents to address the issue in a safe and appropriate way.

For screening purposes, WHtR may be useful in identifying children who are at risk of weight-related metabolic risks associated with excess weight in children. With the same cut-off point of 0.5 for all ages and both genders, WHtR is less complicated than BMI for a lay person to interpret. It also translates to a simple public health message which can be taught to teachers, parents and children; namely that a piece of string equal to a person's height should be able to wrap around his or her waist at least twice to protect against chronic diseases of lifestyle. However, this does not identify underweight individuals.

Dietitians and nutritionists are uniquely qualified to drive policies and steer interventions to create environments that facilitate healthy dietary practices and physical activity at pre-primary and primary schools. The high prevalence of weight problems found in this study on six-year-old children represents an urgent call for healthcare professionals to increase their efforts to empower parents, educators and children with the necessary skills to ensure healthy dietary practices and adequate physical activity.

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