

## The double burden of underweight and overweight in South African adolescents: a challenge and an opportunity for nutritionists and dietitians

The prevalence of obesity is increasing in paediatric populations in developed and developing countries.<sup>1,2</sup> During puberty, rapid and dynamic changes occur with respect to body composition and hormonal regulation, which may be associated with a future risk of disease.<sup>3,4</sup> The South African National Health and Examination Survey (SANHANES-1) reported on the anthropometric nutritional status of South African children and adolescents.<sup>5</sup> The results provided recent and clear evidence of the double burden of malnutrition in adolescents at national level, and confirmed that overweight and obesity in adolescent girls is of particular concern.<sup>5,6</sup>

In this edition of the *South African Journal of Clinical Nutrition*, Van Niekerk, Grimmer and Louw<sup>7</sup> present a study on the prevalence of underweight, overweight and obesity according to international body mass index (BMI) cut-off points in a multiracial group of urban adolescents in the Cape Metropole area of the Western Cape. This regional study highlights the fact that in addition to national studies, in-depth studies are needed in the different regions of South Africa to improve understanding of the weight status of specific population groups based on demographics. Consistent with other South African studies,<sup>5,6</sup> in this study, more adolescent boys than girls were underweight (17.3% vs. 9.9%) and more adolescent girls than boys were overweight (7.7% vs. 3.5%). Interestingly, the 14-year-old boys had the highest prevalence of underweight (55.2%), whereas the highest prevalence of obesity was found in the 15-year-old boys (11.1%). The latter is different from other South African studies,<sup>5,6,8</sup> but may be an artefact given the relatively small number of children per age-sex group categorised in four different weight groups.

However, available evidence indicates that overweight in girls increases with age, while overweight increases in boys up to the age of approximately 15 years, and decreases thereafter.<sup>9</sup> The 17-year-old girls had the highest prevalence of overweight (22%) in the study from the Cape Metropole.<sup>7</sup> The authors state that differences between studies may be owing to differences in the racial composition of the study populations, and/or their access to food. It is also true that different cut-off points were used in the studies, and that the same number of adolescents may not be classified as underweight or overweight, respectively, according to the internationally accepted BMI cut-off points for children, as would be the case if the World Health Organization z-scores for weight for age or BMI for age were applied.<sup>10,11</sup>

It is interesting that there was a similar percentage of underweight, normal weight and combined overweight and obese adolescents

across school quintiles of socio-economic status. The results show that underweight, as well overweight, may be present in adolescents of all socio-economic groups. Access to food may not be an important determinant of weight status in these children, but the energy balance and micronutrient content of the diet may differ across groups.

The appropriateness of the international BMI cut-off points for children from all South African race groups should be established to determine the body fat percentage of adolescents in the different weight categories. It is important to note that the data used by Cole et al<sup>12</sup> to construct the BMI cut-off points showed more variation in boys in different countries than in girls.<sup>12</sup> Furthermore, studies to determine the weight status of children and adolescents should comply with strict quality control measures, and have a sufficiently large sample size before the results can be generalised.<sup>12</sup>

The high prevalence of underweight in adolescent boys in the study in the Western Cape is of concern, and the results need to be investigated further. According to national statistics, 8.5% of youth aged 15-24 years were living with human immunodeficiency virus in 2013.<sup>13</sup> Food insecurity may also play a role in underweight.<sup>14</sup> The study results confirm the high prevalence of combined overweight and obesity in adolescent girls reported in the SANHANES.<sup>5</sup> South Africa is also one of the countries with the highest prevalence of combined overweight and obesity in adult women.<sup>5,15</sup> The tracking of obesity from adolescence to adulthood has been reported,<sup>16</sup> and adolescent obesity has been shown to increase the risk of short-term and future cardiovascular risk.<sup>3,4,17</sup> The high prevalence of obesity in young women may have adverse health effects for the mother and foetus during pregnancy, and also increase the risk of macrosomia, obesity and future cardiovascular disease in their offspring.<sup>18</sup> The public health burden of obesity in South African women does not appear to be a current priority for policy-makers. Health professionals should continue with advocacy to increase awareness of this challenge. Ideally, nutritionists and dietitians should become more involved in early and timely obesity-prevention interventions. All available opportunities to help children and their caregivers to establish healthy eating and activity habits must be utilised.

**Salome Kruger**, PhD (Nutrition), RD(SA)

Professor of Nutrition, Centre of Excellence for Nutrition, North-West University, Potchefstroom

**E-mail:** salome.kruger@nwu.ac.za

## References

1. Overweight and obesity among children. OECD Library [homepage on the Internet]. 2011. Available from: [http://dx.doi.org/10.1787/health\\_glance-2011-19-en](http://dx.doi.org/10.1787/health_glance-2011-19-en)
2. Frank LK, Heraclides A, Danquah I, et al. Measures of general and central obesity and risk of type 2 diabetes in a Ghanaian population. *Trop Med Int Health*. 2013;18(2):141-151.
3. Valerio G, Maffei C, Balsamo A, et al. Severe obesity and cardiometabolic risk in children: comparison from two international classification systems. *PLoS One*. 2013; 8(12):e83793.
4. Slyper AH, Rosenberg H, Kabra A, et al. Early atherogenesis and visceral fat in obese adolescents. *Int J Obes (Lond)*. 2014 [E-pub ahead of print].
5. Shisana O, Labadarios D, Rehle T, et al. South African national health and nutrition examination survey (SANHANES-1). Cape Town: HSRC Press; 2013.
6. Reddy S, Panday S, Swart D, et al. *Umthente Uhlaba Usamila: The South African Youth Risk Assessment Survey, 2002*. Cape Town: Medical Research Council; 2003.
7. Van Niekerk S-M, Grimmer K, Louw Q. The prevalence of underweight, overweight and obesity amongst a multi-racial group of urban school-based adolescents in the Cape Metropole area of Cape Town, South Africa. *S Afr J Clin Nutr*. 2014;27(1):xx-xx.
8. Kimani-Murage E, Kahn K, Pettifor J, et al. The prevalence of stunting, overweight and obesity, and metabolic disease risk in rural South African children. *BMC Publ Health*. 2010;10:158.
9. R Kruger, HS Kruger, UE MacIntyre. The determinants of overweight and obesity among 10 to 15 year old school children in the North West Province, South Africa: the THUSA BANA (Transition and Health during Urbanisation of South Africans; BANA, children) study. *Publ Health Nutr*. 2006;9(3):351-358.
10. Abrantes MM, Lamounier JA, Colosimo EA. Comparison of body mass index values proposed by Cole et al (2000) and Must et al (1991) for identifying obese children with weight-for-height index recommended by the World Health Organization. *Publ Health Nutr*. 2003;6(3):307-312.
11. Butte NE, Garza C, de Onis M. Evaluation of the feasibility of international growth standards for school-aged children and adolescents. *Food Nutr Bull*. 2006;27(4):169-174.
12. Cole TJ, Bellizzi MC, Flegal KM, et al. Establishing a standard definition for child overweight and obesity worldwide: international survey. *BMJ*. 2000;320(7244):1-6.
13. Stats SA. Mid-year population estimates. Pretoria: Stats SA; 2013.
14. De Klerk M, Drimie S, Aliber M, et al. Food security in South Africa: key policy issues for the medium term. Human Sciences Research Council; 2004.
15. Ogden CL, Carroll MD, Kit BK, et al. Prevalence of obesity in the United States, 2009-2010. Centers for Disease Control and Prevention [homepage on the Internet]. 2012. Available from: <http://www.cdc.gov/nchs/data/databriefs/db82.pdf>
16. Guo SS, Chumlea WC. Tracking of body mass index in children in relation to overweight in adulthood. *Am J Clin Nutr*. 1999;70(1):145-148.
17. Zeelie A, Moss SJ, Kruger HS. The relationship between body composition and selected metabolic syndrome markers in black adolescents in South Africa: the PLAY study. *Nutrition*. 2010;26(11-12):1059-1064.
18. Gaillard R, Durmus B, Hofman A, et al. Risk factors and outcomes of maternal obesity and excessive weight gain during pregnancy. *Obesity (Silver Spring)*. 2013;21(5):1046-1055.