

Differences in body composition, body proportions and timing of puberty between stunted and non-stunted adolescents

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Abstract

The purpose of this study was to assess differences in body composition, body proportions and timing of puberty between stunted and non-stunted South African adolescents in the North West Province, South Africa. A total of 259 black adolescents (118 boys, 141 girls), aged 13-18 years were measured. The following data were collected: height-for-age z-scores (HAZ), height, mass, waist circumference (WC), waist-to-height ratio (WHtR), waist-to-hip-ratio (WHR), body mass index (BMI), percentage body fat (%BF), Tanner stage, armspan and skinfolds. Data of growth stunted (GS) and non-stunted (NS) groups were compared using the Mann-Whitney U-test. There were significant differences between mass, height, HAZ, armspan, WC, hip circumference and lean mass of GS and NS children. %BF, WHR and physical maturation were similar in the two groups, but lean mass was smaller in the GS groups indicating proportionally more fat and less lean mass in the GS groups. WHtR of GS children was significantly greater than WHtR of NS children, indicating a more central fat distribution in GS children. Only 3.5% of children had a WHtR >0.5, indicating abdominal obesity, but 54% of children had a %BF above 20% in boys and 25% in girls. A WHtR cut-off of 0.5 may not be appropriate for these African children.

Key words: *Adolescents, body composition, stunting, fat percentage, puberty, South Africa.*

Introduction

The World Health Organization (WHO) has determined that there is approximately 230 million children worldwide that are growth stunted (GS) (Height-for-age z-value (HAZ) < -2). The worldwide problem of GS or malnutrition can be ascribed to social, economic and cultural problems, especially in developing countries (Michaelsen, Weaver, Branca & Robertson, 2000). In the North West Province of South Africa 19% of children between the ages of 10-15 years are GS (Mukuddem-Petersen & Kruger, 2004). Pre-school children, especially in the African populations, are exposed to malnutrition and this has a huge impact on growth and development (Bènéfice, Garnier, Simondon & Malina, 2001). Possible causes of GS in South Africa are unemployment and poverty (Erik & Gericke, 2000; Napier & Albertse, 2000).