

THE IMPACT OF A 10-WEEK PHYSICAL ACTIVITY INTERVENTION PROGRAMME ON SELECTIVE METABOLIC SYNDROME MARKERS IN BLACK ADOLESCENTS

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ABSTRACT

The purpose of this study was to determine the effects of a 10-week physical activity (PA) intervention on selective metabolic syndrome markers in black adolescents. All available adolescents (194 subjects), boys and girls, in the grade 9 class (15-19 years) attending a secondary school were recruited for the experimental group. A control group consisting of 57 adolescents from grade 9 of another secondary school in the same area was also recruited. The experimental group participated in a 10-week PA intervention. Body mass index (BMI), fasting insulin, fasting glucose, homeostasis model assessment of insulin resistance (HOMA-IR), systolic blood pressure (SBP), diastolic blood pressure (DBP), Windkessel arterial compliance (C_w), total peripheral resistance (TPR) and waist circumference were measured. After the 10-week PA intervention, adolescents from the control group had a significantly lower DBP compared to the intervention group ($p=0.00005$) and adolescents from the intervention group had a significantly lower SBP compared to the control group ($p=0.000061$). There was also a tendency towards a higher C_w and lower HOMA-IR in the intervention group compared to the control group. The findings of this study suggest that black adolescents had significantly lower SBP and a trend of lower HOMA-IR after a 10-week PA intervention.

Key words: Physical activity; Metabolic syndrome; Adolescents.

INTRODUCTION

Adolescents are no longer as physically active as a few decades ago (Deckelbaum & Williams, 2001; Dwyer *et al.*, 2009). Low levels of physical activity (PA) are widely assumed to be involved in the etiology of obesity and underlie public health messages globally (Must & Tybor, 2005). In South Africa the occurrence of obesity is two to three times higher in the black population than in the white population (Punyadeera *et al.*, 2000). This significantly higher rate of obesity in the black population is of serious concern, because the metabolic syndrome (MS) is high among obese children and adolescents (Weiss *et al.*, 2004). The MS is defined by the clustering of metabolic abnormalities, primarily overweight and more specifically central obesity, insulin resistance, dyslipidaemia and hypertension (Klein-Platat *et al.*, 2005; Jennings *et al.*, 2009). The MS affects a great number of adolescents (Jessup & Harrell, 2005; Day *et al.*, 2009) and is related to cardiovascular risk (Klein-Platat *et al.*, 2005; Day *et al.*, 2009; Leite *et al.*, 2009). However, studies designed to