

## The influence of physical activity on components of metabolic syndrome and vascular function in adolescents: A narrative review

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### Abstract

Inactivity causes obesity which is related to insulin resistance, hypertension, diabetes mellitus, dyslipidemia, poor vascular health and the metabolic syndrome (MS). The MS has recently been observed in youth, and if left untreated can lead to cardiovascular diseases. The aim of this research was to determine the influence of physical activity (PA) on the MS components and vascular function in children and adolescents by means of a narrative review of available studies (26 studies) focusing on habitual PA and physical interventions related to the MS and vascular function. The literature review was extensive, employing NEXUS, Science Direct, PubMed and Medline. The available evidence from studies suggests that increased PA and decreased sedentary behaviour may protect against the development of arterial stiffening, high blood pressure, -triglyceride levels, -glucose levels, -waist circumference and low high-density lipoprotein cholesterol values, all of which are associated with components of the MS.

**Key words:** Physical activity, metabolic syndrome, adolescents.

### Introduction

Adolescents are no longer as physically active as a few decades ago, with their lifestyle having become more sedentary (Deckelbaum & Williams, 2001). In South Africa, as in many other parts of the world, decreasing physical activity (PA) levels are contributing to the escalating trend in obesity (Kruger, Puoane, Senekal & Van Der Merwe, 2005), which in turn is a major risk factor for the development of many chronic diseases. Obesity plays a central role in the metabolic syndrome (MS), which includes hyperinsulinemia, hypertension, hyperlipidemia, Type 2 diabetes mellitus and atherosclerotic cardiovascular disease (Kelishadi, 2007). Conversely, research has shown that regular PA assists in lowering the chances of developing Type 2 diabetes and preventing cardiovascular diseases, hypertension and obesity (Ritenbaugh *et al.*, 2003). The purpose of this literature review was to determine the influence of PA on components of the MS and vascular function in children and adolescents by means of a narrative review of available studies (26 studies), focusing on habitual PA and PA interventions. It is necessary to undertake this review in