

ORIGINAL RESEARCH

Neck Circumference as an Anthropometric Screening Tool for Diagnosis of Malnutrition in Primary School Children in Gqberha, South Africa

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Abstract

Background: The global prevalence of malnutrition is high, with obesity rates being 10% while South Africa exceeds this with an obesity rate of 13.5% in schoolchildren. There is a need for a simple, quick, reliable method for screening for underweight, overweight and obesity in children at the primary healthcare level, allowing for quicker, easier, and more accurate identification and better screening and referral for appropriate treatment. **Aim:** The aim of this study was to determine the suitability of neck circumference, compared to the body mass index (BMI) and mid-upper-arm circumference (MUAC), in measuring malnutrition in primary school children in Gqeberha, South Africa. The suitability of the international neck circumference cut-off values, currently available, in measuring malnutrition was also evaluated. **Methods:** In this descriptive, cross-sectional study, anthropometrical and demographical data was obtained, including weight, height (to determine BMI), MUAC and neck circumference, from 493 children. The classification of BMI and MUAC was compared to the participants' neck circumference classification to determine whether neck circumference is a suitable method for screening for under- or overweight and obesity. **Results:** While 4.06% of the children were underweight, 86.21% had a normal weight, and 9.74% of the children were overweight or obese according to the World Health Organization's BMI for age classification (gold standard). Against this standard, neck circumference cut-off values had a sensitivity and specificity of 56.25% and 61.57% respectively. In females, there was a significant association with BMI-for-age ($X^2(8) = 23.545$, $p = 0.003$, Cramer's $V = 0.202$) and for males it was also significant ($X^2(4) = 17.192$, $p = 0.002$, Cramer's $V = 0.290$). However, according to the ROC curves, there was less specificity for males. **Discussion and conclusion:** A key observation was the variation in overweight and obesity prevalence, depending on which neck circumference cut-off reference was applied. This inconsistency highlights the potential risks of using international reference values without validating them in local populations. The moderate sensitivity and specificity observed suggest that while neck circumference shows promise as a screening method, existing cut-off values may not be optimal for a South African child population.

Key words: Body mass index, Neck circumference, Obesity, Overweight, Primary school children.