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Reliability of body mass index in predicting cardiovascular risk factors in overweight and obese children

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Introduction: Childhood overweight and obesity is in an increasing trend throughout the world. Distribution of body fat is an important determinant in predicting the future cardiovascular risk factors. Body Mass Index (BMI) is the commonly used tool in diagnosing overweight and obesity. Waist circumference (WC) percentile and waist height ratio (WHtR) demonstrated high sensitivity and specificity for detection of abdominal fat mass.

Aim: The aim of this cross sectional study involving children from an urban area, Sri Lankan aged 3-18 years was to investigate the reliability of BMI in predicting central adiposity.

Method: Weight, height, and WC were measured using standard methods and BMI, and WHtR were calculated. The BMI of 85th and 95th percentiles were adopted as cutoff points for overweight and obesity respectively and similar values were considered for WC to define obesity and overweight based on age and sex as per centre for disease control classification. WHtR 0.6 and 0.5 were considered as alert line and action line for interventions respectively.

Findings: Among 116 subjects, 29 (25%) were overweight and 87 (75%) were obese. According to WC percentile 9 (7.7%) were overweight while 107 (92.2%) were obese. Thus BMI has 77.7% (83/83+24) sensitivity and 55.5% (5/5+4) specificity to detect central obesity. The positive predictive value was 95.4% (83/83+4) while the negative predictive value was 17.2% (5/24+5). In our study, 83.7% of actually overweight population lied in alert line (Figure 1) and 43.7% of actually obese population lied in action line (Figure 2).

Conclusion: Even though BMI is a simple tool in detecting overweight and obesity it has low sensitivity and specificity to detect central fat distribution which is more important to predict the future cardiovascular risk factor in children.

Recommendation: Ethnic-specific cutoff value of WC and WHtR will help to identify future cardiovascular risk factors especially in children and adolescents.
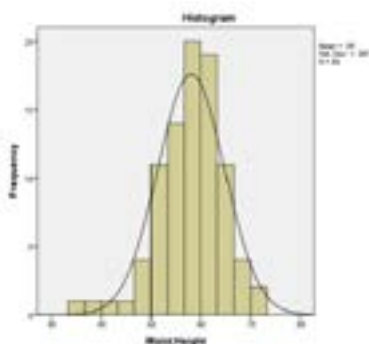

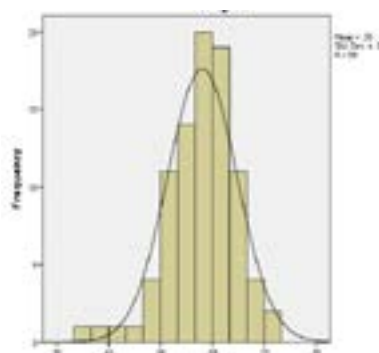**Figure 1:** 83.7% actually over weighted population lied between W/H ratio 0.49-0.59 (alert line)

Figure 2: 43.7% actually obese population lied between W/H ratio >0.59 (action line)

Biography

Vishnu Sivapatham is a Researcher with a strong background in Health Science especially in Pediatrics. He has his expertise in Evaluation and passion in improving the health and wellbeing. After completing his MBBS at Eastern University in 2012, he completed Post-graduate Diploma in Child Health in Sri Lanka. Currently, he is pursuing his MD in Pediatrics at Post-graduate Institute of Medicine, University of Colombo, Sri Lanka. He is a Lecturer in Pediatrics at Eastern University, Sri Lanka. He is also a member of Sri Lanka Medical Council (SLMC), Sri Lanka Medical Association (SLMA), Young Scientist Forum (YSF), Perinatal Society of Sri Lanka (PSSL) and Nutritional Society of Sri Lanka (NSSL).

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