Comparisons of body mass index, waist circumference, waist-to-height ratio and a body shape index (ABSI) in predicting high blood pressure among Malaysian adolescents: a cross-sectional study

ABSTRACT

Objective To compare the performance of different anthropometric indices including body mass index (BMI), waist circumference (WC), waist-to-height ratio (WHtR) and a body shape index to predict high blood pressure (BP) in adolescents using the 90th and 95th percentiles as two different thresholds. Design Cross-sectional study. Setting Probability proportionate to size was used to randomly select two schools in Selangor state, Malaysia. Participants A total of 513 adolescents (58.9% women and 41.1% men) aged 12–16 years were recruited. Primary and secondary outcome measures Weight, height, WC and BP of the adolescents were measured. The predictive power of anthropometric indices was analysed by sex using the receiver operating characteristic curve. Results BMI and WHtR were the indices with higher areas under the curve (AUCs), yet the optimal cut-offs to predict high BP using the 95th percentile were higher than the threshold for overweight/obesity. Most indices showed poor sensitivity under the suggested cut-offs. In contrast, the optimal BMI and WHtR cut-offs to predict high BP using the 90th percentile were lower (men: BMI-for-age=0.79, WHtR=0.46; women: BMI-for-age=0.92, WHtR=0.45). BMI showed the highest AUC in both sexes but had poor sensitivity among women. WHtR presented good sensitivity and specificity in both sexes. Conclusions These findings suggested that WHtR might be a useful indicator for screening high blood pressure risk in the routine primary-level health services for adolescents. Future studies are warranted to involve a larger sample size to confirm these findings.