Waist-to-Height Ratio as a possible Health Index for Swedish Children

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Backgroud: Central body fat has been reported to better predict risk for cadiometabolic diseases than total body fat. Recently, Waist-to-Height Ratio (WHtR) has been proposed to be a conveniently age-independent, simple and rapid screening tool for assessing this kind of risk in different populations.

Aims: To investigate whether WHtR is age or gender dependent; to describe the prevalence of Swedish children at risk using 0.5 as a cutoff point; to examine the relationship between this index and Body Mass Index (BMI).

Methods: The study was a cross-sectional design and included a random sample of 1804, 7-9 year old Swedish children (53% boys and 47% girls) from 45 primary schools. WhtR was calculated by waist circumference divided by height on the bases of standard anthropometric measurements. *Independent Sample t test* were performed to determine whether WHtR was gender dependent. *Pearson's correlation* between WHtR and age was assessed. The number of Swedish children at risk according to this method (using 0.5 as a cutoff point) was described and these results were then compared with the number of children considered at risk by using BMI as a risk assessment tool. The level of agreement between the two indexes was obtained by *Cohen's k.*

Results: No significant differences for WHtR between genders were found. There was a very week correlation between WHtR and age ($r = - 0.061$, $p=0.01$). Much fewer children were considered at risk according to WHtR (6.8%) compared to BMI (22.1%). The level of agreement between these two indexes was low ($k=0.382$, $p<0.001$). Nevertheless, after merging the overweight children together with the ones classified by BMI as having a normal weight, there was a much higher agreement between this index and WHtR ($k=0.693$, $p<0.001$).

Conclusions: WHtR was found to be age and gender independent in the evaluated Swedish population and therefore may be a simple health index for children. However, WHtR and BMI may produce differing predictions for disease risks. Hence, longitudinal data are needed to examine WHtR's relation to disease.

Keywords: Waist-to-Height ratio, Body Mass Index, Children, Abdominal obesity, Risk