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Growth-and-Obesity Roadmaps of Children

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*'G*rowth-and-Obesity Profiles' of a family were first introduced in Kamal-Jamil-Khan model. The first author put forward the concept of 'Optimal Mass' https://www.ngds-ku.org/Papers/J29.pdf in 2011. For parent's calculations, linear interpolation was applied to gender-specific height and mass tables at the age of 20 years to compute height and mass percentiles of parents. Optimal mass, the mass corresponding to height percentile, was compared with net mass (mass with zero clothing on). Father or mother was classified as obese (wasted) if the incumbent's net mass was more (lesser) than the corresponding optimal mass. Obesity profile included a percentage indicating degree of severity, with 1% tolerance. Body-mass index, *BMI*, was computed by dividing the net mass (*kilograms*) with square of height (*meters*). Estimated-adult *BMI* (with mass and height of a child replaced by estimated-adult values) https://www.ngds-ku.org/Papers/J30.pdf may be used to, roughly, classify a child as obese or wasted. Target-height (adult-mid-parental-height) percentiles were obtained using procedures similar to those for obtaining parental-height percentiles. Son's or daughter's height (mass) percentile was calculated by first computing height at the given age using box-interpolation technique. Constant-age route was used to compute optimal mass and, then, determine obesity profile. Mid-parental height at current age was computed by a similar procedure. Comparing measured heights and current-age-mid-parental heights, one was able to conclude if the child was tall or stunted, again, with 1% tolerance. For under-21 fathers and under-19 mothers, estimated-adult heights (instead of measured heights) of parents were used to compute target heights of boys and girls. 'Growth-and-Obesity Roadmap' of a child was generated by listing more than one profiles (corresponding to different checkups, preferably six-month apart), and including recommendations to increase height and gain or lose mass (weight), which could be computed from the most-recent profile. If a child's measured height exceeded the current-age-mid-parental height, the former was taken as reference and optimal mass, 6 months down the road, was calculated based on the estimated value of height after 6 months. On the other hand, if the measured mass was lesser than the current-age-mid-parental height, the later was taken as reference and optimal mass, 6 months down the road, was calculated based on the estimated value of mid-parental height after 6 months. In the first case, difference of estimated height (after 6 months, based on percentile of current height) and the measured height (current value) might be taken as a guideline to gain height, within the next 6 months; while in the second case, difference of estimated-mid-parental height (after 6 months) and the measured height (current value) might act as guideline. In both of the above cases, difference of optimal mass (after 6 months) and the measured mass (current value) might be used as a target to gain (lose) mass within the next 6 months, if the difference is positive (negative). To compute these roadmaps, software was developed and tested by running more than 1500 cases. If the software suggested losing weight, it was recommended not to lose more than one pound per week. Losing weight rapidly might deteriorate health of a child. In order to compute growth-and-obesity roadmaps, which could be, gainfully, used by pediatricians, nutritionists and physical-education instructors, it becomes mandatory that measurements of height and mass be conducted according to internationally agreed-upon standards with equipment calibrated; reproducibility of measurers ascertained and child barefoot and completely undressed except short underpants https://www.ngds-ku.org/ngds_folder/M02.pdf. **Michelle Obama**, First Lady of United States of America, declared childhood obesity as a national epidemic for her country. This paper attempted to provide quantitative recommendations and set 6-*month* targets for gaining height and maintaining optimal weight using the technique of box interpolation https://www.ngds-ku.org/Papers/J29.pdf

Keywords: Box interpolation • Estimated-adult *BMI* • Growth modeling • Mid-parental height • Optimal mass
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