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A34: Factors to Indicate Overweight for Youth from 5-11-Year-Old: Data Mining Tree Regression Application

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A34: Factors to Indicate Overweight for Youth from 5-11-Year-Old: Data Mining Tree Regression Application

Abstract

Purpose: According to the World Health Organization, obesity has nearly tripled since 1975 in the U.S. (*Obesity*, n.d.). Considerable research was done to find reasons to deal with obesity. In last 10 year's obesity related research, the major focuses were metabolic syndrome, physical activity, and eating disorder. In this study, two subsets of the National Health and Nutrition Examination Survey (2013-2014 NHANES) were used to test what variables were critical to indicate overweight of youth from 5- to 11-year-old. Dietary subset reflected nutrients obtained from foods, beverages, and water. Physical activity subset based on the Global Physical Activity Questionnaire, meanwhile, including questions related to daily activities, leisure time activities, and sedentary activities. No obesity classification but Body Mass Index (BMI) was in the dataset. According to CDC, a high BMI can indicate high body fatness (CDC, 2022), which is related to overweight and obesity. BMI was selected as our dependent variable. **Methods:** Considering the relationship of some features and BMI was highly non-linear, tree regression was applied to analyze the data. R studio was used as the platform to grow trees. 1383 observations of 12 variables of physical activity subset, 1020 observations of 15 variables of dietary subset, and 934 observations of 24 variables of mix subset obtained after data was cleaned were put into analysis. After growing the trees, pruning was done to obtain a subtree with the lowest test error rate. **Results:** For dietary subset, age was critical to construct the tree. 2 terminal nodes indicated BMI equaled to 17.05 and 19.82 for age less or larger than 8.5, respectively. For physical activity subset, variables of age and days of daily physically active over 60 minutes in a week contributed to tree construction. It's outstanding that for youth age above 10.5, physically active days in a week popped out, BMI equaled to 23.02 and 20.25 for it less than 6.5 and larger than 6.5, respectively. The pattern of mixed subset was like dietary subset, age outstand. BMI equaled 17.36 and 19.72 for age less and larger than 8.5, respectively. **Conclusion:** For youth age from 5-11, daily nutrients intake played less important role than age in overweight indication. However, physical activity threw significant influence after youth age over 10. To be physically active for at least 60 minutes daily is important and reasonable to take into consideration when to intervene with youth who are overweight and obese with physical activity after 10.

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Keywords: factors, overweight, youth