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From Early to Mid-Adolescence: A Three-Fold Increase in Sugar-Sweetened Beverage Consumption and Its Implications for Obesity in Malaysia

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Introduction:
Adolescence represents a critical window for dietary habit formation with lasting health effects. In Malaysia, the trajectory of sugar-sweetened beverage (SSB) consumption during this critical phase remains underexplored. This longitudinal study quantifies changes in SSB intake and evaluates its relationship with obesity status as adolescents aged from 13 to 16 years.

Methods:
This cohort study utilized data from baseline assessments conducted in 2016 and follow-up data from the 2019–2020 PUTRA-Adol study. Obesity status was defined using WHO BMI- for-age Z-scores (Non-Overweight vs. Overweight/Obese). Using Food Frequency Questionnaire (FFQ), SSB intake in weight (g/day) was quantified. Analyses included paired t-tests to compare intake over time and multiple linear regression to examine the SSB intake- BMI association while controlling for dietary misreporting status.

Results:
Mean SSB consumption increased significantly from 532.9 g/day to 1,708.9 g/day ($p < 0.001$), representing a 220% rise over the three-year period. Although obesity prevalence shifted from 34.6% to 27.9%, regression analysis revealed that SSB intake was not a significant predictor of BMI Z-score after adjusting for dietary misreporting ($\beta=0.111$, $p=0.187$). While adolescents with overweight/obesity consumed an average of 311.3 g/day more SSBs than their non-overweight peers in 2019.

Conclusion:
The lack of a significant association between SSB intake and BMI z-score after adjustment highlights the complex, multifactorial etiology of obesity beyond single dietary components. Nevertheless, the alarming three-fold increase in SSB consumption across the entire cohort indicates that SSB intake is a critical, widespread modifiable risk factor in Malaysian adolescents. Immediate public health action is required to address this trend, regardless of current weight status.