Physiological Outcomes Based on Fruit and Vegetable Consumption of Adolescents

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MCORRP MICHIGAN CLINICAL OUTCOMES RESEARCH AND REPORTING PROGRAM

ABSTRACT

Background: Prior studies have identified health benefits and socioeconomic barriers to fruit and vegetable (F/V) consumption. This study describes characteristics and physiological outcomes based on F/V consumption of adolescents participating in Project Healthy Schools (PHS).

Methods: Data from middle-school students who were enrolled in PHS and completed an optional health behavior questionnaire and physiological screening were analyzed. Students were divided into two groups based on the number of servings of F/V they consumed the previous day: "high consumers," ≥ 3 servings or "low consumers," < 3 servings. Demographics and physiological measures were compared between groups.

Results: Of 2813 students, 1457 (51.8%) were high consumers. High consumers were less likely to be Black and more likely to be Asian than low consumers. High consumers were also more likely to be from high SES school districts and less likely to be from middle or low SES school districts than low consumers. High consumers had higher triglyceride levels and lower recovery heart rates than low consumers.

Conclusions: Demographic and socioeconomic factors were associated with variations in F/V consumption in this adolescent population. High F/V consumers had lower recovery heart rates, which may indicate better health and fitness. Future studies should investigate the integration of F/V into cultural dietary practice as well as methods to improve the affordability and attainability of F/V in order to reduce health disparities.

BACKGROUND

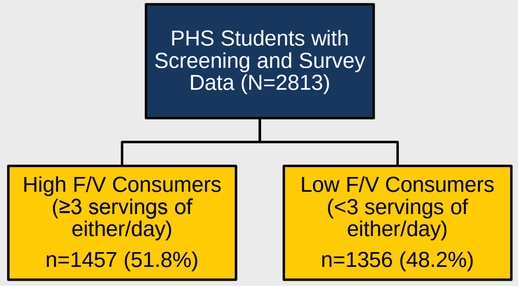
- 31.7% of children and adolescents (ages 2-19) fall at or above the 85th percentile for BMI
- Being overweight is associated with increases in blood pressure, cholesterol, triglycerides, and blood glucose levels
- Fruit and vegetable consumption has been associated with:
  - ↓ systolic blood pressure
  - ↓ triglycerides
  - ↓ rates of abdominal obesity and metabolic syndrome
  - ↑ HDL cholesterol

OBJECTIVE

- To examine the demographic and physiological differences between students based on their consumption of fruits and vegetables

METHODS

- Data collected from students who participated in Project Healthy Schools from 2004-2016 and completed both a baseline health behavior questionnaire and a physiological screening were analyzed.
- Demographics and physiological measures were compared between students based on their self-reported consumption of fruits and vegetables (F/V) pre-PHS intervention.



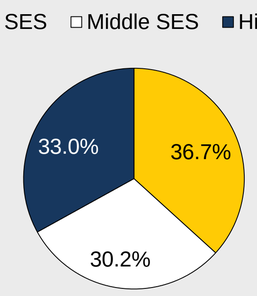
Socioeconomic status (SES) as determined by the median household income within the school district	
Low SES	<300% above the poverty line
Middle SES	<400% and ≥300% above the poverty line
High SES	≥400% above the poverty line

RESULTS

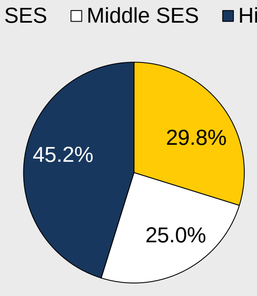
Table 1. Demographics of High and Low Fruit and Vegetable Consumers

	High F/V Consumers (n=1457)	Low F/V Consumers (n=1356)	p-value
Sex- Male, n (%)	678 (46.6)	620 (45.8)	0.656
Race, n (%)			
White	727 (54.9)	631 (51.8)	0.112
Black	315 (23.8)	385 (31.6)	<0.001
Asian	121 (9.1)	57 (4.7)	<0.001
Hispanic	42 (3.2)	44 (3.6)	0.542
Native American	18 (1.4)	19 (1.6)	0.675
Other	101 (7.6)	83 (6.8)	0.425
Physiological Measures, median (25th, 75th percentile)			
BMI, kg/m^2	19.5 (17.2, 22.9)	19.6 (17.3, 23.3)	0.435

SES of Low F/V Consumers (n=1356)



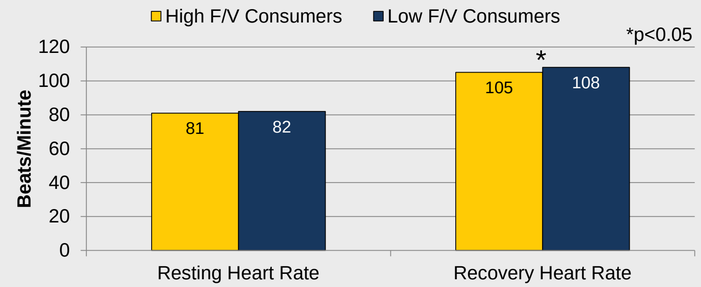
SES of High F/V Consumers (n=1457)



- SES was significantly different ($p<0.05$) between high and low F/V consumers for all groups (Low, Middle, and High SES).

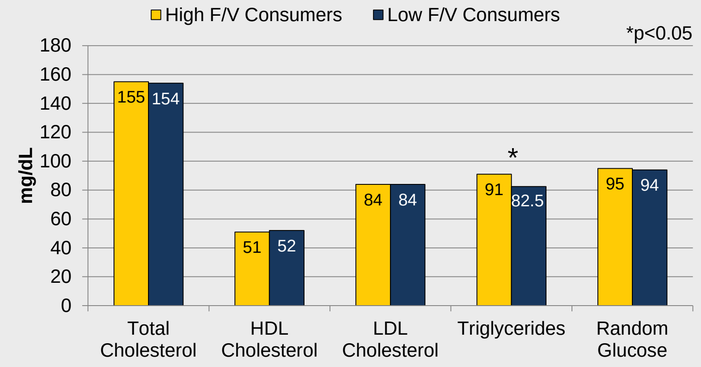
RESULTS

Median Heart Rate of High and Low F/V Consumers



- No differences were seen in blood pressure between high and low F/V groups.

Median Lipid Levels of High and Low F/V Consumers



- Students were not required to fast for lipid panel collection

CONCLUSIONS

- Fruit and vegetable consumption varied significantly by race and SES.
- Higher triglyceride levels in high fruit and vegetable consumers contradicted previous studies; however, lipid panels were taken in a non-fasting state.
- Lower recovery heart rate (an indicator of fitness) was seen in high fruit and vegetable consumers.
- Efforts should be made to increase the accessibility of fruits and vegetables in low SES communities.