

The Impact of Low Consumption of Vegetables and Fruits on the Prevalence of Overweight and Obesity in Adults

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Introduction

- Obesity is considered to be an epidemic of the 21st century and is among the most important medical problems in the United States. Over 66 % adults are overweight or obese
- Overweight / obesity is associated with increased risk of atherosclerosis, hypertension, diabetes, cardiovascular diseases, arthritis, certain cancers and a shorter life expectancy
- If the current trend of rise of incidence of obesity continues, it will account for more than \$860 billion in healthcare costs by 2030
- Diets high in vegetables and fruits can help lower chronic disease risk and aid in weight management because of their low energy density, fewer calories, high fiber and water content.
- Very few studies have studied the direct impact of low consumption of vegetables and fruits on prevalence of overweight or obesity

Study Purpose

To examine the impact of low consumption of vegetables and fruits on the prevalence of overweight and obesity in adults

Methods

Study Inclusion Criteria:

- Respondents to the 2007 Behavioral Risk Factor Surveillance System (BRFSS).
- Non-institutionalized adult population randomly selection from 50 states territories with phone-lines
- N = 351,358 subjects were included in the study

Determinant Definition:

- Consumption of less than 5 servings of vegetables and fruits per day
- Consumption of 5 or more servings of vegetables and fruits per day

Outcome Definition:

- Normal or Underweight according to BMI
- Overweight or Obese according to BMI
- BMI Categories classification :
 - Underweight or Normal Weight - less than 25
 - Overweight or Obese - 25 and above

Potential Confounders:

- Age
- Gender
- Income Levels
- Education Status
- Exercise in the past 30 days

Analysis

- Logistic regression models provided crude and adjusted estimates of the association between the consumption of vegetables and fruits and BMI.
- Potential confounders were retained in the model if their presence resulted in greater than 10% change in the estimate. Analyses were done using SAS v. 9

Results

Table 1. Study Population Characteristics by Consumption of Vegetables and Fruits

Exposure	Less than 5 servings N = 262670 WtN = 266994	5 or more servings N = 88688 WtN = 87324
	%	%
Body Mass Index (BMI)		
Overweight or Obese	77	23
Under or Normal Weight	72	28
Gender		
Male	53.48	41.61
Female	46.52	58.39
Age		
18-24 years	9.69	9.76
25-44 years	41.6	38
45-65 years	34.07	34.33
More than 65 years	14.63	17.91
Income Levels		
Less than 15,000\$	9.69	8.49
Less than 25,000\$	15.4	13.73
Less than 50,000\$	27.21	25.5
50,000\$ or above	47.7	52.29
Exercise		
No Exercise	25.04	16.12
Yes Exercise	74.96	83.88
Education Status		
High School or Less	39.76	31.83
College and more	60.24	68.17

Results

Table 2. Crude and Adjusted Logistic Regression Analyses

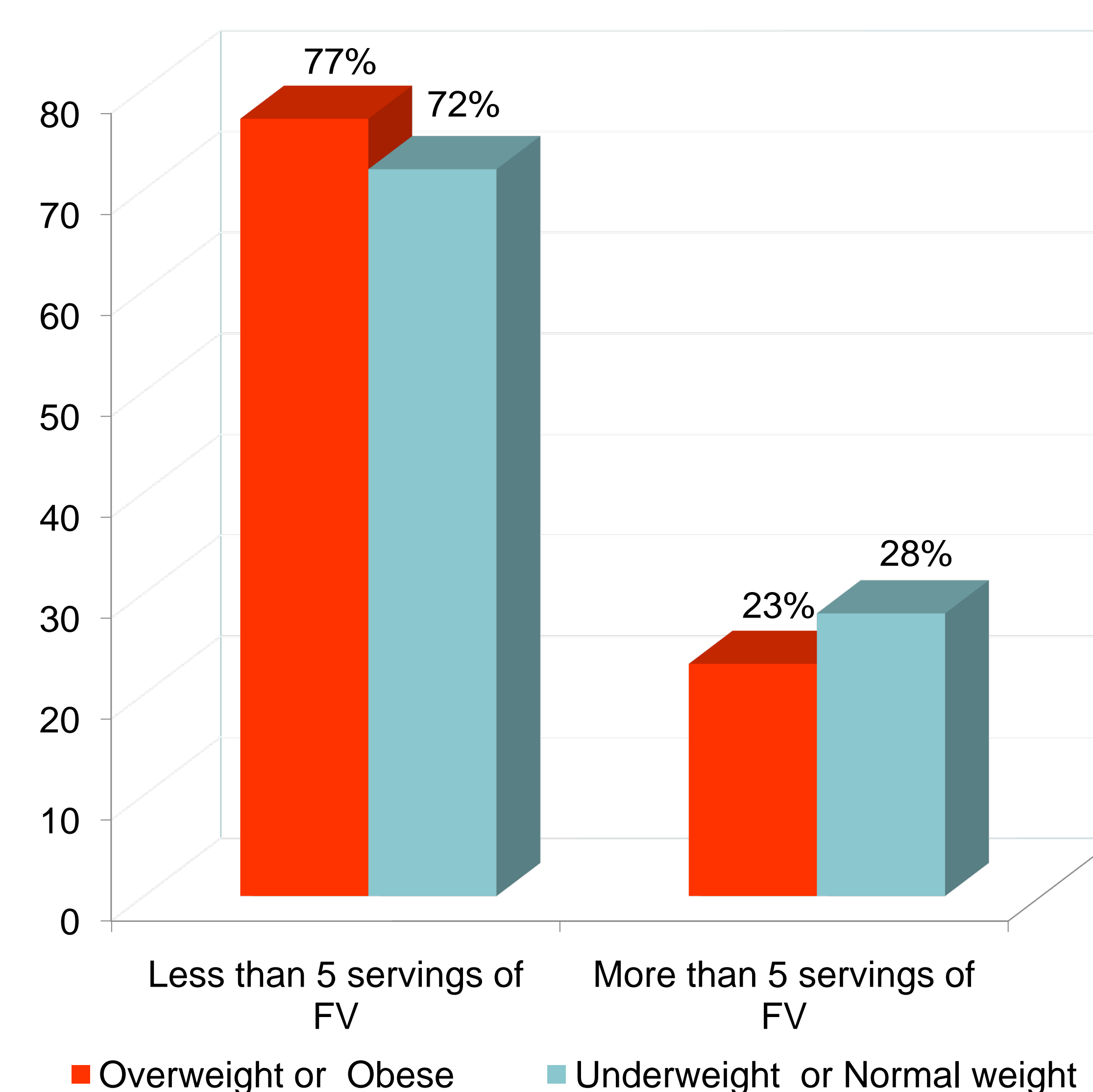
Exposure	Crude OR (95%CI)	Adjusted OR* (95% CI)
Less than 5 servings of FV	1.28 (1.26, 1.29)	1.13 (1.12, 1.15)
More than 5 servings of FV	1.00	1.00

*Adjusted for Age, Income Levels, Gender, Exercise and Education Status
FV = Fruits and Vegetables

Main Findings:

- People who consumed less than 5 servings of vegetables and fruits were 1.28 times more likely to be overweight or obese
- After adjusting for age, income levels, gender, exercise and education status, people who consumed less than 5 servings of vegetables and fruits were only 1.13 times more likely to be overweight or obese
- In the overweight / obese group, 23% consumed more than 5 servings of vegetables and fruits as compared to 28% in the underweight / normal weight group
- 58% of the females consumed more than 5 servings of vegetables and fruits compared to 42% of the males.
- 56% of the females were overweight or obese as compared to 71% of the males
- In the group of participants who had exercised in the past 30 days, 27% consumed more than 5 servings of vegetables and fruits as compared to the 17% in the group that had not exercised in the past 30 days

Figure 1 . Characteristics of Vegetable and Fruits Consumption of the population by BMI



Discussion

- Sixty-four percent of the study population is overweight or obese
- Only twenty-five percent of the entire study population consumed more than 5 servings vegetables and fruits
- The study shows that people who consumed less than 5 servings of vegetables and fruits were 13% more likely to be overweight or obese.
- Consuming more than 5 vegetables and fruits per day may reduce the prevalence of obesity
- Income levels, education status, exercise, gender, other lifestyle and dietary factors can affect the relationship between consumption of vegetables and fruits and BMI
- Healthy People 2010* and Public Health Strategies have two prominent objectives:
 - To Reduce the Obesity epidemic
 - To Increase the consumption of vegetables and fruits to at least 5 servings per day
- Prospective studies or interventional trials are needed to see the direct impact of low or high intake of vegetables and fruits on prevalence of overweight or obesity

Strengths / Limitations

Strengths:

- Generalizable to the US population
- Large national probability sample
- One of the very few studies that assesses the impact of low consumption of vegetables and fruits on the prevalence of overweight and obesity

Limitations:

- The measures of consumption of fruits and vegetables and exercise in the past 30 days was determined based on self-report by the subjects. Non-differential misclassification could have diluted estimates of effect. Recall bias may have also occurred.
- People suffering from hypo- or hyper-thyroidism and eating disorders were not excluded.

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* Healthy People 2010 is a set of health objectives for the Nation to achieve over the first decade of the new century