

AN EXAMINATION OF HEALTHY BEHAVIORS IN VIRGINIA'S CHILDREN

2003

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EXECUTIVE SUMMARY

Highlights from the 2003 healthy behavior survey of 4th grade students in a sample of Virginia schools are provided below.

- Among 459 students who participated in the assessment, 28%, or 128 children, had Body Mass Indexes (BMIs) that categorized them as overweight (a category previously termed obese) for their sex and age. There is about a 10% difference in overweight among children by ethnicity, with minority children having higher incidence.
- Among the 459 students participating in the assessment, 17% had BMIs that categorized them as at risk for overweight (a category previously termed overweight)
- 74% of children reported eating breakfast daily while 22% reported sometimes eating breakfast. Of those categorized as overweight or at risk, 72.6% reported eating breakfast daily while 75.5% of those categorized as normal weight or underweight reported daily eating breakfast.
- 87% of children reported eating fruits daily and 81% reported eating vegetables daily.
- 84% of children reported drinking milk daily.
- Almost all children (94.5%) reported drinking water daily. Of those categorized as overweight or at risk, 62.8% reported drinking water three or more times a day compared to 52.0% of those children categorized as normal weight or underweight.
- More than half of the children (58%) reported they have recess every day at school.
- Of the total sample, 95% reported they have a safe place to play outside.
- About 81% of the children in this sample reported that they daily or sometimes play a team or individual sport.
- About 95% of children reported watching television daily, with the majority (54%) reporting one to two hours of daily viewing time. Of those categorized as overweight or at risk, 97.9% reported watching at least one hour of television a day whereas 92.3% of children categorized as normal weight or underweight reported watching television for a minimum of an hour a day.
- About 74% of children reported they play video games.
- 96% of children reported brushing their teeth daily.
- There were significant correlations between the children reporting eating fruits, drinking water and physical activity and their reports of these behaviors in their parent(s).

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- The majority of children reported eating three meals a day, eating fruits and vegetables, drinking water and milk and participating in physical activity on a regular basis regardless of their weight category. There are several reasons why the difference in weight could exist including those overweight or at risk consume more food in general or eat more unhealthy food along with the healthy food. A study needs to be done in order to assess the 4th graders unhealthy eating habits to get the full picture.

INTRODUCTION

Six years ago, the Virginia Department of Health (VDH) conducted a study on healthy eating and physical activity for fourth grade students in several schools throughout Virginia. Using surveys^{*1}, the researchers assessed the children's attitudes and beliefs about a) healthy eating and healthy foods, b) eating behaviors, c) level of physical activity and inactivity, and d) social support from parents, friends and teachers for engaging in healthy behaviors. In addition, the children were measured on height and weight to determine if they were currently overweight—that is, at risk for later cardiovascular disease in adulthood. Findings from the 1997 study indicated that a third (33.7%) of children who were surveyed were considered at risk (BMI between the 85th and 95th percentile) or overweight (BMI greater than the 95th percentile) for their age and sex (see CDC Web page for Body Mass Index information).

The 1997 study clearly indicated a problem among Virginia's children. In order to better address the problem the Division of WIC and Community Nutrition Services (DWCNS) administered a healthy behavior survey to fourth grade children and collected heights and weights of these same children. The purpose of this research was to determine if an increase in the number of healthy behaviors correlated with a decrease in BMI. This would help determine if current education methods are effective in teaching healthy eating habits and reducing the incidence of overweight or if a new direction needs to be pursued in an effort to decrease the problem of childhood overweight.

The National Health and Nutrition Examination Survey III (1988-1994) found that 22% of children and adolescents in the U.S. are “at risk” and that 11% are “overweight”.² The prevalence of children and adolescents with a BMI greater than the 95th percentile has doubled in the last two decades,³ with African-American and Hispanic children having higher rates of obesity than do Caucasian children attributed to the influence of low-income status and cultural traditions related to eating habits.⁴ As such, there is motivation to learn more about the healthy behavior of Virginia's children. From this, effective prevention and intervention programs to address overweight in children can be developed.

The terminology shown in the box below is provided for reference. The use of the term “obese” in reference to a person has been reported by a number of health and prevention specialists to be a stigmatizing barrier for engaging children and adults in behavior changes to promote healthy weight. As such, the CDC endorsed a change in the terminology for children and adolescents in the hopes of removing the stigma and thus allowing these children and adolescents to see the goal of obtaining a healthy weight as achievable. There continues to be some debate about this re-labeling of terms by a number of physicians and others. Prior to the change, “at risk” was termed “overweight” and “overweight” was termed “obese”. In this report the following terminology will be used.

Underweight	=	Student's BMI is below the 5 th percentile for gender and age
Normal weight	=	Student's BMI ranges from the 5 th to just below the 85 th percentile
At risk weight	=	Student's BMI ranges from the 85 th to just below the 95 th percentile
Overweight	=	Student's BMI is at or above the 95 th percentile

*The CATCH project is a multi-site health behavior intervention program, funded by the National Heart, Lung and Blood Institute, for the primary prevention of cardiovascular disease. The CATCH program includes a school food service intervention and a physical education and health education curricula.¹

METHOD

OVERVIEW

In this study, children enrolled in fourth grade from twelve (12) selected public elementary schools distributed throughout the Commonwealth of Virginia completed a brief (20-item) healthy behavior survey. The survey was provided by DWCNS staff at VDH. Questions were included on the child's consumption of healthy foods, participation in physical activity and other healthy behaviors. In addition, the children reported their perceptions of their parents' behavior with respect to eating and physical activity. Following completion of the survey, children's height and weight were measured to determine if their BMI placed them in the "at risk" or "overweight" category for their age and sex.

A summary of the results of the children's healthy behaviors, as well as comparisons by sex, race and geographic region, are provided.

SCHOOL SAMPLING

The investigators approached elementary schools that had previously shown interest in childhood weight issues, as well as several other schools, about participating in the current study. The goal in selecting the schools was to achieve a representative sample of Virginia fourth graders in terms of race, gender and region. However, there were limitations (e.g., schools from northern Virginia did not participate). While the data gathered is important, it cannot be generalized for all Virginia schools.

For the healthy behavior study, a project coordinator in VDH contacted the school superintendents by letter and a follow-up telephone call. The districts contacted were those that participated previously in a different VDH study. Each superintendent was informed about the purpose of the study. They were then asked if they would consent to their schools participating in the study. The local health district staff, with the consent of the superintendent of each participating school district, visited the selected schools to administer the survey and collect heights and weights among the schools' 4th grade students. At least one 4th grade classroom in each school was visited.

INFORMED CONSENT REQUIREMENTS

In previous studies conducted by the DWCNS, the investigators were permitted to obtain passive consent from the parents. This meant that the parents of students were notified that their child would be given a survey and measured for height and weight. Parents were asked to notify the school if they did not agree with having their child participate. Unless a telephone call or letter of refusal was received, the surveys were distributed to the students and height and weight information was obtained.

For this study, passive consent was not an option. Active consent by the parents was required. Parents of fourth grade students from each of the participating schools were sent a letter explaining the study. Only students who submitted a signed consent form were allowed to participate. In addition, children and/or parents had the right to withdraw consent at any time and not participate in the study.

The participating children were given a healthy behavior survey. Upon completion, trained health professionals measured the heights and weights of the children. Weights (in pounds) were measured on industry-standard SECA™ portable electronic scales. Confidentiality was insured by use of an electronic readout that was only visible to the evaluation staff. Standard procedure was followed when measuring weight (e.g., removal of shoes and any heavy item of clothing). Heights (in inches) were measured by using industry-standard portable SECA™ stadiometers. Standard procedure was followed when measuring height (e.g., removal of shoes). Upon completion of height and weight measures, every student, including those who opted to not participate in the study, received a jump rope to encourage physical activity.

HEALTH STATUS

In order to assess whether children were at risk or overweight for their height and weight, a weight-to-height ratio was calculated using the BMI formula.^{†5} Checking against gender- and age-specific cut-off scores, percentile scores for all children were computed. Using the BMI, each child was categorized into one of four groups:

- (1) those who were below the 5th percentile (BMI percentile score <5th), considered “**underweight**”
- (2) those who were between the 5th and 85th percentile ($5^{\text{th}} \leq \text{BMI Percentile Score} < 85^{\text{th}}$), considered “**normal**”
- (3) those who were between the 85th and 95th percentile ($85^{\text{th}} \leq \text{BMI Percentile Score} < 95^{\text{th}}$), considered “**at risk for overweight**” and
- (4) those who were at or above the 95th percentile (BMI Percentile Score $\geq 95^{\text{th}}$), considered “**overweight.**”

SURVEY

Items from the healthy behavior survey were selected to produce a relatively short 20-item measure (Appendix 1). This survey obtained information on the child’s reported intake of nutritious foods (e.g., fruits, vegetables, milk), participation in physical activity (e.g., playing during recess, organized sports) and involvement in sedentary activity (e.g., TV watching, playing computer video games). Children were asked:

- Whether or not they engaged in a particular behavior (“yes”, “no”, or “sometimes”)
- How frequently they engaged in a behavior (“none”, “1-2 hours”, or “3 or more hours”)
- How much they consumed of a particular food (“none”, “1-2”, or “3 or more”).

In order to look at individual behavior, responses were unit-weighted (from zero to two points) with higher point value given to responses indicative of healthier behavior performed on a frequent or typical basis. For example, for “Do you eat breakfast?”, a response of “Yes”, which implies that the behavior is typical, would be scored two points, whereas a “No” response would be scored zero points, and “sometimes” would be scored one point. The more time that a

[†] Body Mass Index, or BMI, is calculated by dividing the child’s weight by the child’s squared height, then multiplying the product by 703: $\text{BMI} = 703 \times [(\text{Weight}) / (\text{Height})^2]$.

child engaged in a healthy behavior—such as playing outside or exercising for three hours or more—or the greater volume consumed of a particular healthy food, the larger the point value for the response.

Items reflective of unhealthy behavior—such as TV watching, or playing computer/video games—were reverse-scored so that higher point values were given to unhealthy behaviors. For example, for “How many hours do you watch TV a day?”, a response of “None” would be scored zero points, “1-2 hrs.” would be scored as one point and “3 hrs. or more” would be scored as two points.

Children’s scores on a group of interrelated behaviors were examined. A factor analysis was done on children’s responses on related individual behavior items. Global scores related to “healthy eating” (eating fruits, vegetables and drinking water), “eating regular meals” (eating breakfast, lunch, and dinner), and hours engaging in “inactivity” (watching TV, playing video/computer games) were computed. Items related to physical activity—such as playing outside or participating in sports—were not highly correlated and were not computed into a factor score. High scores on healthy eating and eating regular meals, together with a low score on inactivity, represented healthier behaviors. Factors were as follows:

- 1) **Healthy Eating:** eating more of healthy foods (e.g., fruits, vegetables);
- 2) **Eating Regular Meals:** eating meals (e.g., breakfast, lunch) regularly every day; and
- 3) **Inactivity:** being inactive (e.g., watching TV).

Group differences by health status and other variables will be discussed in the Results section. Group differences are reported as significant in an analysis if $p < .05$ for all chi-square and ANOVAs.

HEALTHY BEHAVIORS MODELED BY PARENTS

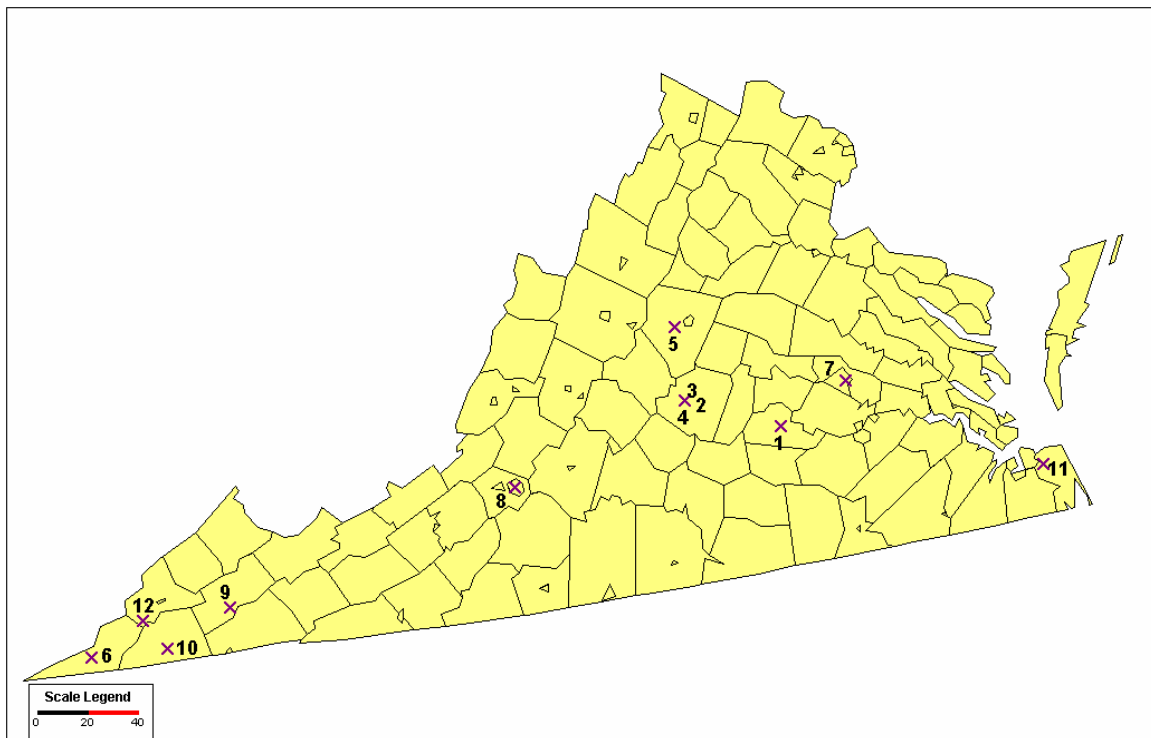
Children were asked to report if their parents (typically) engaged in the following behaviors: exercising or playing sports, drinking milk every day, eating fruits and vegetables every day, and drinking water every day. Response options were “yes”, “no”, and “sometimes”, with “yes” indicating that the behavior was typical. These questions were asked to determine if parents who model healthy behaviors, such as participating in exercise, might have children who emulate similar healthy behaviors.

RESULTS

SCHOOL SAMPLE

Twelve schools agreed to participate in the study. Across schools, 7 of the 12 have more than 40% of students who were of ethnic minorities. The majority of schools (8 of 12) in the sample come from rural areas of the state, with schools predominantly from southwest (five schools) and central regions (five schools) (Figure 1). See Table 1 (next page) for current school census figures and minority enrollment.

Figure 1. Location of Participating Schools



STUDENT SAMPLE

Participation. According to the state enrollment figures there are approximately 89,700 students in fourth grade in Virginia's public schools. The percentage of students statewide who are minority, or non-White, is 40%. The sample in this study is 44% minority (Table 1). Requests for consent were sent to parents of 919 students. The response rate for active consent from the parents was 50%.

Demographics. The final sample consisted of 459 4th grade students, 54% of whom are girls, and 46% are boys. The ages of these students range from 9 to 12 years, with the 62% of participants being 10 years old. Fifty-five percent (55.3%) of students are White, non-Hispanic ("Caucasian"). Almost thirty-six percent (35.5%) are Black, and approximately six percent (5.7%) indicated 'Other' on the ethnicity question. The remaining groups - Asian, American

Indian, and Hispanic - were individually comprised of less than 10 students per group. Five students did not report their race. For analyses by race, comparisons are made between three groups: White children, Black children and children from other racial/ethnic groups, including Asian, American Indian, and Hispanic children.

Table 1. Enrollment and Racial Diversity Characteristics of Sample Schools

District/ County	School	Rural vs. Urban	Map Code	District or County		School		Sample	
				# of 4 th grade students	% Minority [‡]	# of 4 th grade students	% Minority	# of 4 th grade students	% Minority
Amelia	Amelia County Elem.	R	1	124	40	124	40	23	39.1
Buckingham	Buckingham Primary	R	2	169	49	34	38	18	33.4
	Dillwyn Elementary	R	3			93	52	53	50.9
	Gold Hill Elementary	R	4			42	52	14	50.0
Charlottesville	Johnson Elementary	U	5	355	62	65	83	28	85.2
Lee	Flatwoods Elementary	R	6	269	3	60	2	37	8.1
Richmond City	Woodville Elementary	U	7	2,180	93	105	100	68	100.0
Roanoke	Highland Park Magnet	U	8	1,112	51	27	63	25	76.0
Russell	Lebanon Middle School	R	9	303	1	86	1	48	4.2
Scott	Shoemaker Elementary	R	10	285	1	58	3	24	4.2
Virginia Beach	Windsor Oaks Elem.	U	11	5,865	40	101	48	60	58.3
Wise	Powell Valley Primary	R	12	508	1	124	2	61	0.0
Virginia				89,743	40	919		459	44.0

[‡] "Minority" represents students who are African American, Asian or Pacific Islander, American Indian, Hispanic, and those who indicated "Unknown" or "Other".

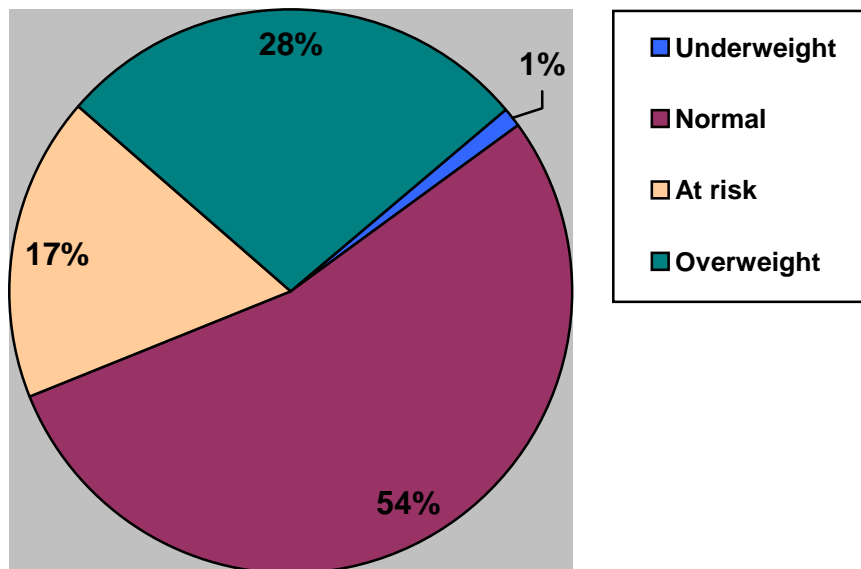
HEALTH STATUS AS DEFINED BY BODY MASS INDEX

In sampled 4th grade schools in Virginia, 28% of students are overweight.

The height (in inches) of children in the sample ranged from 46 to 67 inches. Weights ranged from 48 to 285 pounds. The mean height was 56 inches, and the mean weight was 92 pounds. Boys and girls were comparable for height as well as weight. The mean height for boys was 56 inches (range = 48" to 67"), whereas the mean height for girls was 56 inches (range = 46" to 64"). The mean weight for boys was 91 pounds (range = 54 to 257 lbs), whereas the mean weight for girls was 92 pounds (range = 48 to 285 lbs).

The BMI scores, which are based on height and weight of the child, ranged from 13.2 to 50.5. Of the children in the sample, 17% were classified as "at risk" (having a BMI score between the 85th and 95th percentile). An additional 28% were classified as "overweight", having a BMI score greater than the 95th percentile (Figure 2). As such, 45% of children who participated in the survey from these schools were either "at risk for overweight" or "overweight".

Figure 2. Health Status of 4th Graders in Sample



Although more boys (49%) than girls (41%) were classified as at risk or overweight, it was not a statistically significant difference. Children of ethnic minority status were significantly more likely to be in the overweight category (Figure 3 on next page). Significantly more children from rural areas, like Lee, Wise, or Amelia counties, were at risk or overweight than children from urban areas (e.g., Richmond, Virginia Beach) (Figure 4 on next page).

Figure 3. BMI Category: Black vs. White vs. Other Race Children

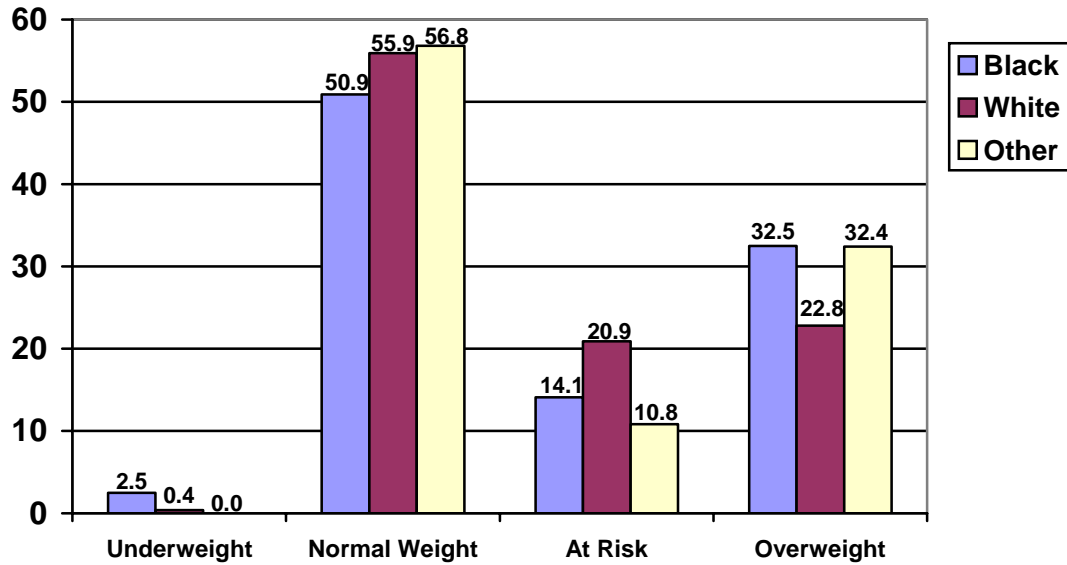


Figure 4. BMI Category: Rural vs. Urban Area Children

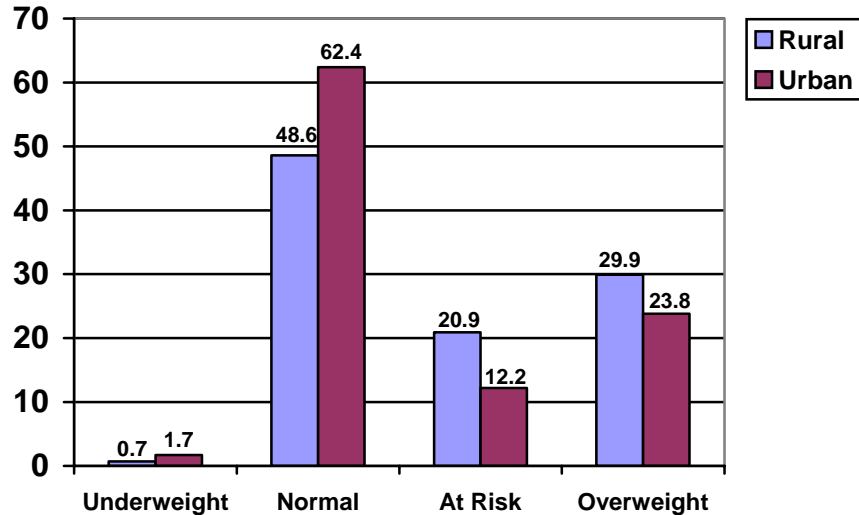


Table 2 (next page) shows the numbers and percentages of children who were at risk or overweight in the sampled counties. Caution must be taken in interpreting the data since the samples by school are too small to generalize the results to the entire school population.

Table 2. Percentage of Students at Risk and Overweight by Location

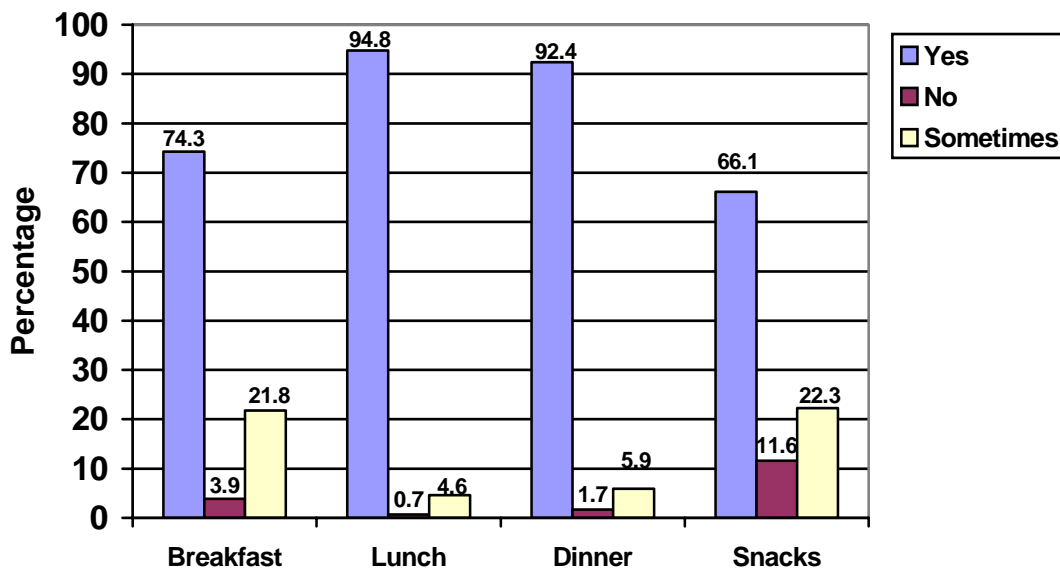
Location	% Overweight or At Risk (>85 th Percentile)
Russell County	41.7%
Roanoke	36.0%
Wise County	45.9%
Virginia Beach	36.7%
Scott County	54.2%
Charlottesville	28.6%
Richmond City	30.9%
Buckingham County	52.8%
Amelia County	34.8%
Lee County	32.4%

In the sections that follow, data on children who are in the “at risk” and “overweight” categories are combined and termed “overweight” in the charts to make comparisons on “overweight” vs. “non-overweight” unless otherwise noted.

REGULAR MEALS & SNACKS

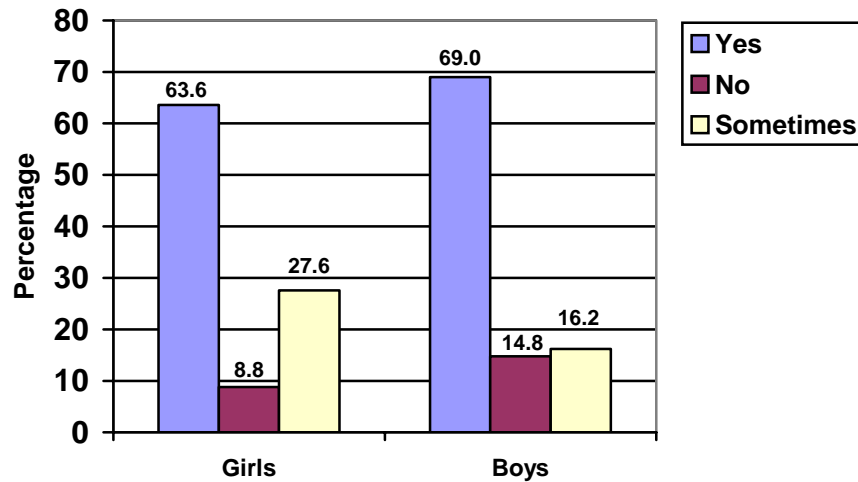
The children were asked if they (typically) eat breakfast, lunch or dinner and if they eat snacks after school. Typically is defined as responding ‘Yes’ rather than ‘Sometimes’ or ‘No’ on the questionnaire item. Almost all children in the sample reported they typically eat lunch (94.8%) and dinner (92.4%). Fewer children (74.3%) reported typically eating breakfast. Sixty-six percent (66.1%) of children reported typically eating snacks after school (Figure 5). Sixty-nine percent (69.3%) reported eating three meals a day.

Figure 5. Meals Eaten by 4th Graders



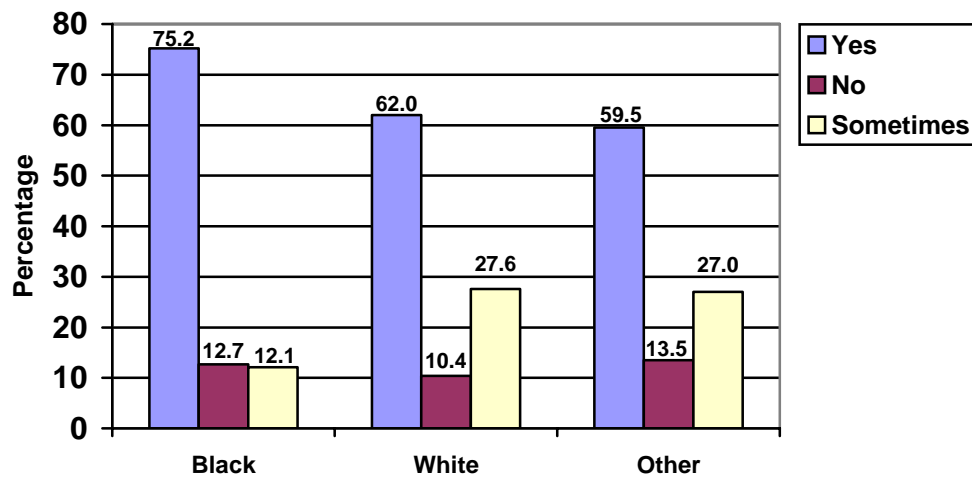
Gender Differences. Girls and boys were similar in terms of reporting whether or not they eat breakfast, lunch or dinner. Girls were significantly more likely than boys to report “sometimes” eating snacks after school (Figure 6).

Figure 6. Eating Snacks After School: Girls versus Boys



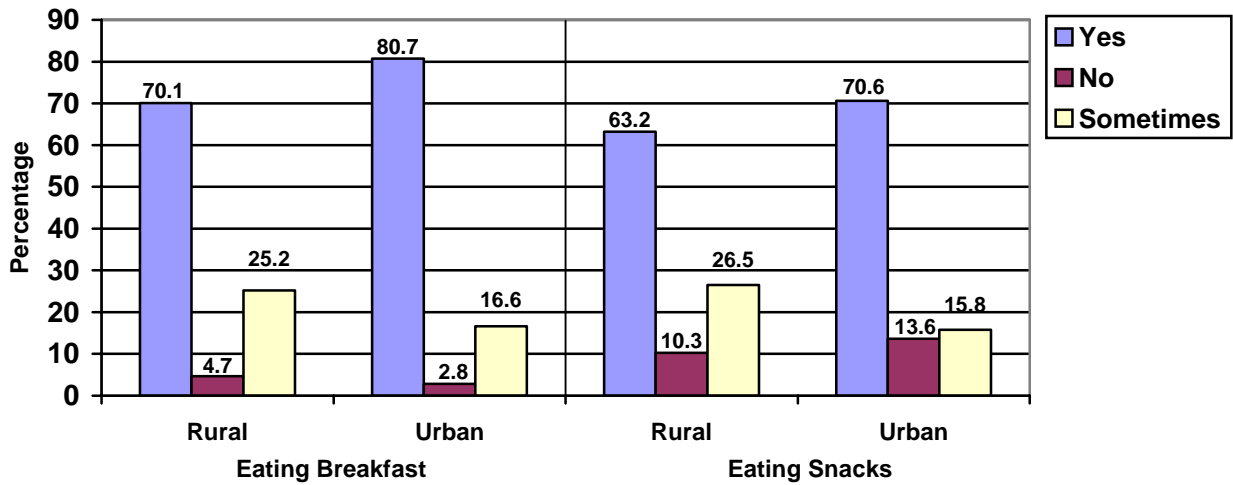
Racial Differences. There was little difference in reports of eating breakfast, lunch and dinner among children of different races. Black children were significantly more likely than White children and children from other racial/ethnic groups to report (typically) eating snacks after school (Figure 7).

Figure 7. Eating Snacks After School: Black vs. White vs. Other Race Children



Geographic Differences. Children from urban areas were more likely to report typically eating breakfast and snacking after school (Figure 8 on next page) than children from rural areas.

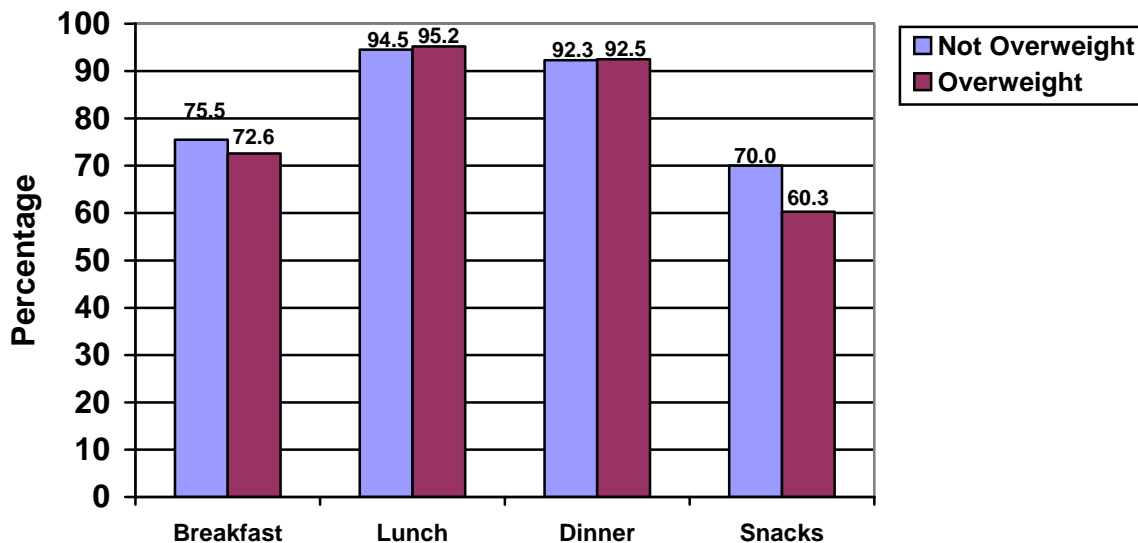
Figure 8. Eating Breakfast and Snacks: Rural vs. Urban Area Children



Dental Hygiene. Overall, 96% of children reported brushing their teeth at least once a day. In this sample, a higher percentage of girls than boys reported never brushing, but the numbers were small and the difference was not significant.

Health Status and Regular Meals Eaten. The number of overweight children was not significantly different from the number of non-overweight children in terms of who reported typically eating breakfast, lunch or dinner. Also, overweight children were no more likely than non-overweight children to report typically eating snacks after school (Figure 9).

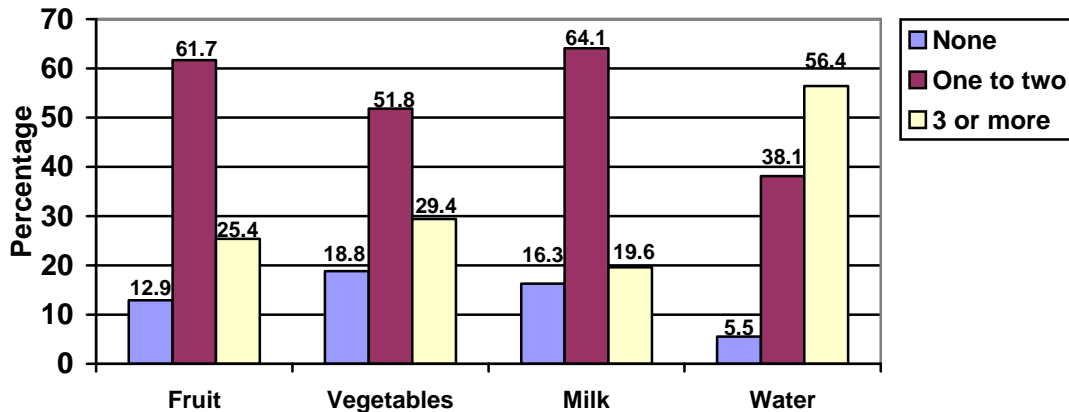
Figure 9. Meals Eaten: Overweight vs. Non-overweight Children



HEALTHY EATING: FRUIT, VEGETABLE, MILK & WATER CONSUMPTION

Children were asked how many consumed fruits, vegetables, milk and water each day. Figure 10 shows children’s reported consumption of each of these foods. The majority of fourth graders in the sample reported eating one to two fruits and one to two vegetables each day. They also reported drinking one to two glasses or cartons of milk each day and three or more glasses of water per day.

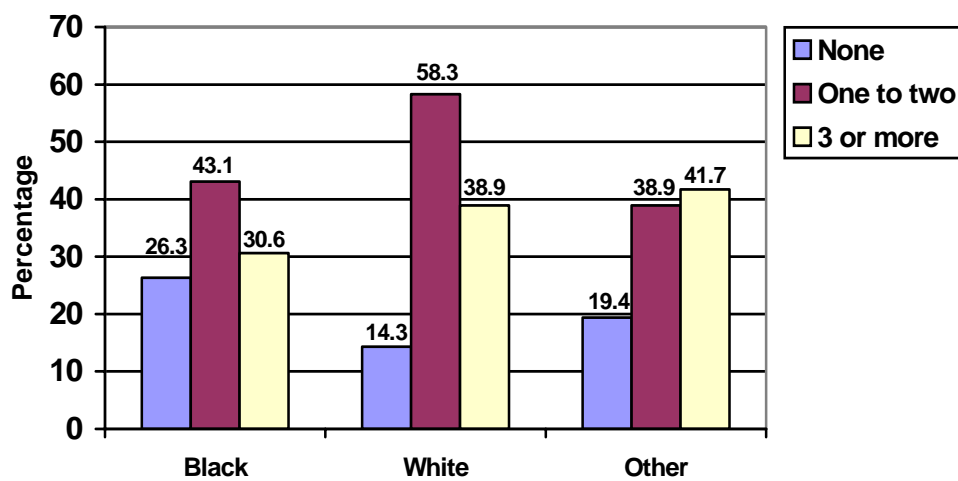
Figure 10. Consumption of Fruit, Vegetables, Milk and Water Each Day



Gender, Racial and Geographic Differences. There were no gender differences in the consumption of foods or beverages reported by students.

No differences among races were observed in reporting of fruit consumption. Black children were less likely than children in other ethnic groups to report eating vegetables in a given day (Figure 11).

Figure 11. Consumption of Vegetables Each Day: Black vs. White vs. Other Race Children



Black Children were also less likely to report drinking any milk (Figure 12) while white children were less likely to have the recommended three or more glasses of water a day (Figure 13).

Figure 12. Consumption of Milk Each Day: Black vs. White vs. Other Race Children

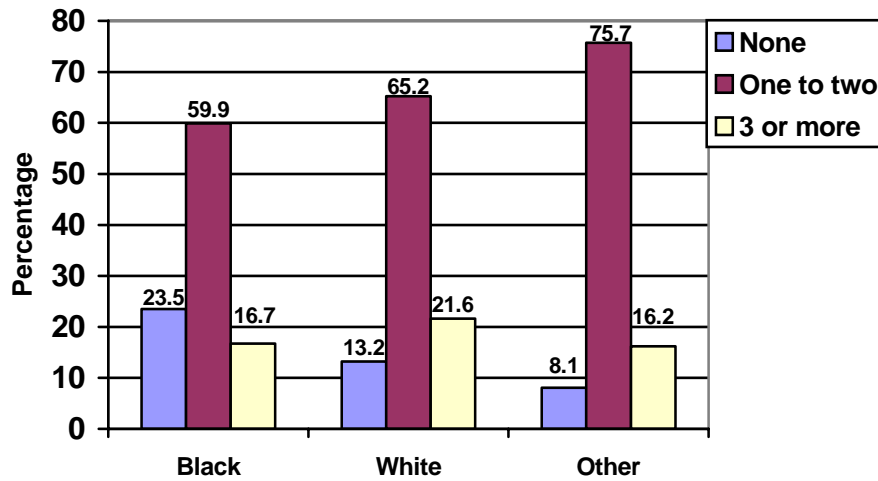
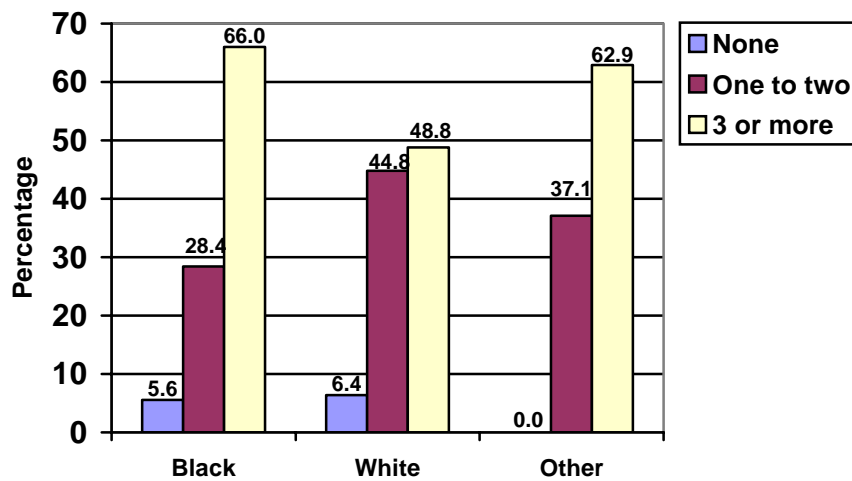
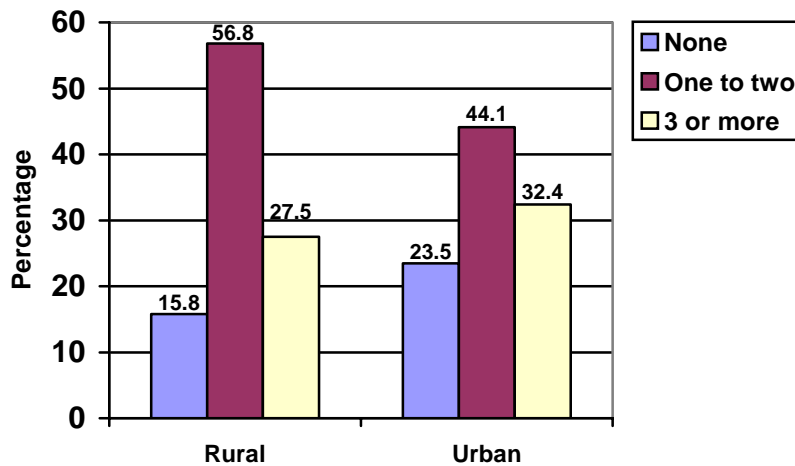


Figure 13. Consumption of Water Each Day: Black vs. White vs. Other Race Children



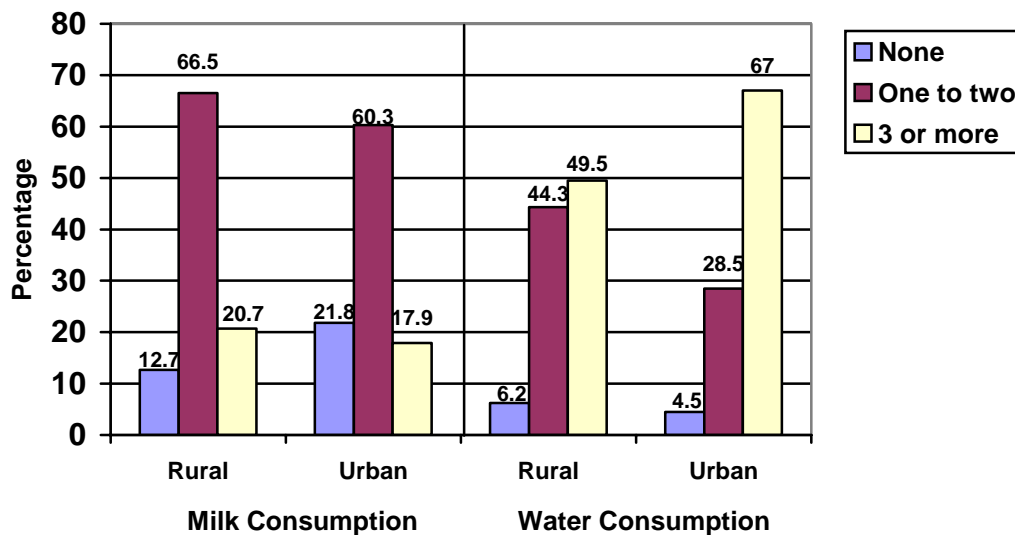
Consumption of vegetables was found to be associated with the geographical location of the school of the student. Children going to school in rural areas were more likely to report eating at least one vegetable in a day than children going to school in an urban area. (Figure 14 on next page).

Figure 14. Consumption of Vegetables Each Day: Rural vs. Urban Area Children

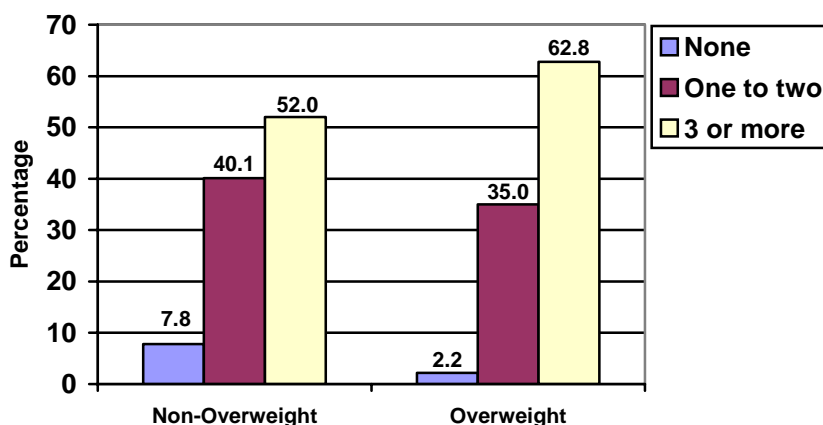


Rural area children were also more likely to report drinking milk than children going to school in urban areas. However, more children from urban schools reported drinking three or more glasses each day than children going to school in a rural setting (Figure 15).

Figure 15. Consumption of Milk and Water Each Day: Rural vs. Urban Area Children



Health Status and Healthy Eating. More overweight children reported drinking three or more glasses of water than children who were not overweight (Figure 16 on next page).

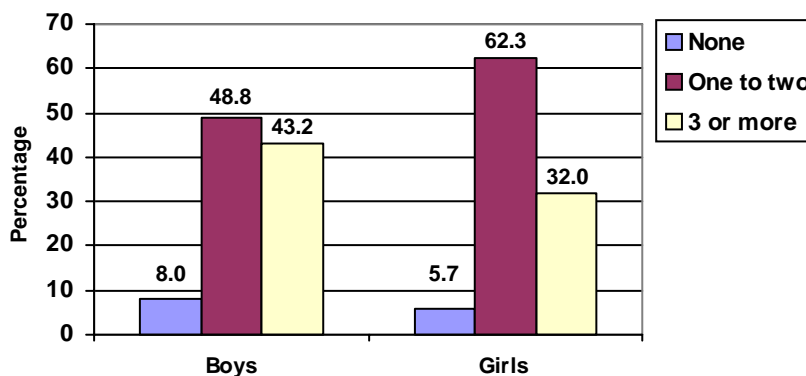
Figure 16. Consumption of Water Each Day: Non-overweight vs. Overweight Children

The associations between consuming vegetables, milk and fruit and a person's overweight status were not statistically significant. However, there were some trends with BMI and the consumption of these foods that proved interesting. Overweight children were slightly more likely to report three or more fruits, vegetables and milk every day than non-overweight children. Due to the lack of significance, these trends could be due to chance and/or insufficient sample size.

PHYSICAL ACTIVITY: RECESS, SPORTS & EXERCISE

Fifty-eight percent (58.1%) of fourth graders in the sample reported having recess every day at school. Sixty-seven percent (67.0%) reported they typically play either individual or team sports, 14% reported "sometimes" playing sports, and 19% reported that they do not play sports. Thirty-seven percent (37.2%) reported they play outside or exercise three or more hours a day, whereas 56% reported playing one to two hours per day. Almost seven percent (6.8%) reported they do not play outside or exercise any hours during the day.

Gender, Racial and Geographic Differences. Boys were more likely than girls to report that they play outside or exercise three or more hours a day (Figure 17). However, boys and girls were similarly likely to play individual or team sports.

Figure 17. Hours of Play Each Day: Boys vs. Girls

Fewer Black children (48%) reported having recess every day at school than White children (63%) or children from other racial or ethnic groups (65%). However, Black children

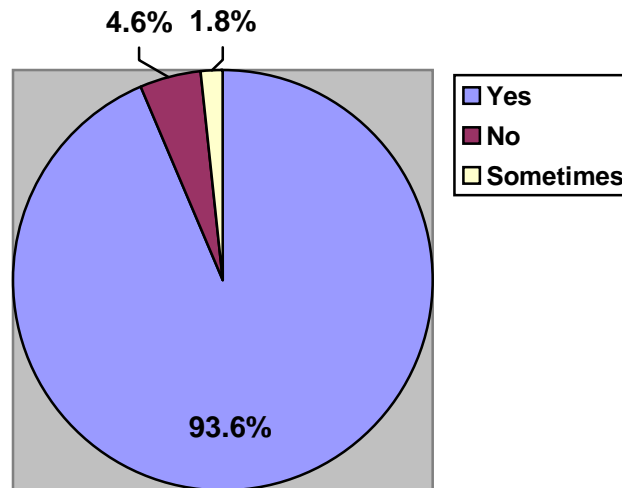
were just as likely as White children or children from other racial or ethnic groups to report playing sports and playing outside or exercising for three hours or more each day.

Children going to school in urban areas were just as likely as children from rural areas to have recess every day at school, to play sports, and to play outside or exercise for three or more hours a day.

PERCEPTIONS OF SAFE AREAS FOR PLAY

Safe Play. Most children reported they have a safe place to play outside. Only about five percent reported they do not have a safe place to play outside (Figure 18).

Figure 18. Children Who Report Having a Safe Place to Play Outside

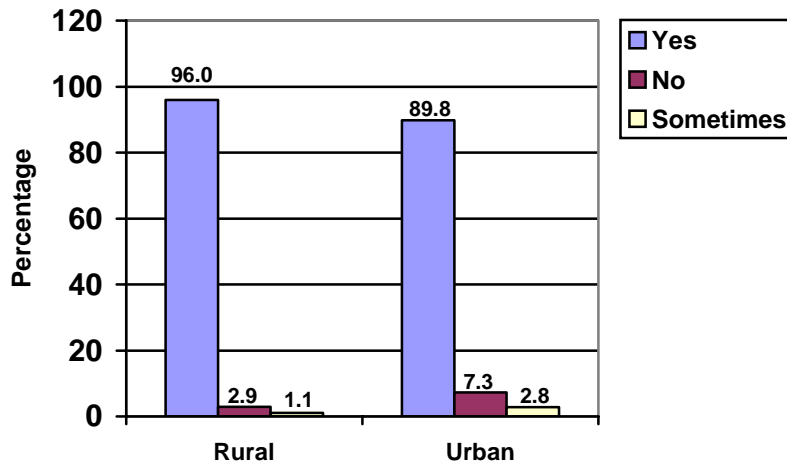


Gender, Racial and Geographic Differences. Slightly more girls (96%) than boys (91%) reported having a safe place to play outside.

There was a tendency for more Black children (8.2%) than White children (3.1%) or other children from other racial or ethnic groups (0%) to report not having a safe place to play. However, this trend did not reach statistical significance.

Significantly fewer children going to school in urban areas reported having a safe place to play outside than children going to school in rural areas (Figure 19 on next page).

Figure 19. Safe Place to Play Outside: Rural vs. Urban Area Children

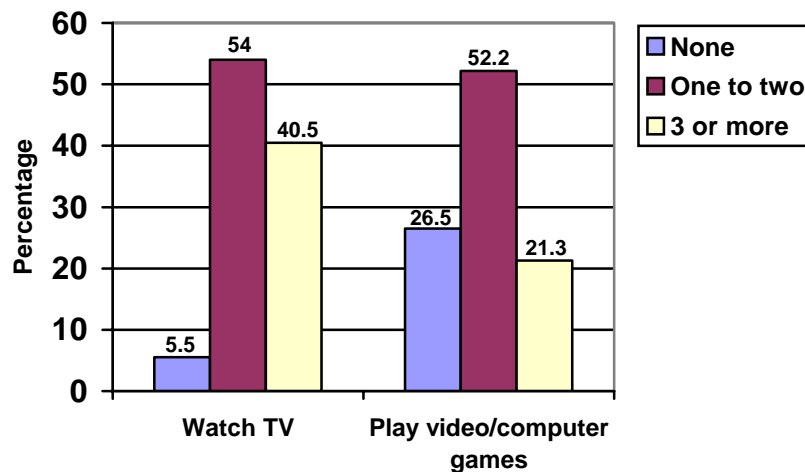


Health Status and Physical Activity. Children who were at risk or overweight were no less likely to report a safe place to play outside, having recess each day, playing team or individual sports, or playing outside/exercising for three or more hours a day. There were no reports of duration or type of sports or play reported, which may explain the lack of difference found.

INACTIVITY: TELEVISION & VIDEO/COMPUTER GAMES

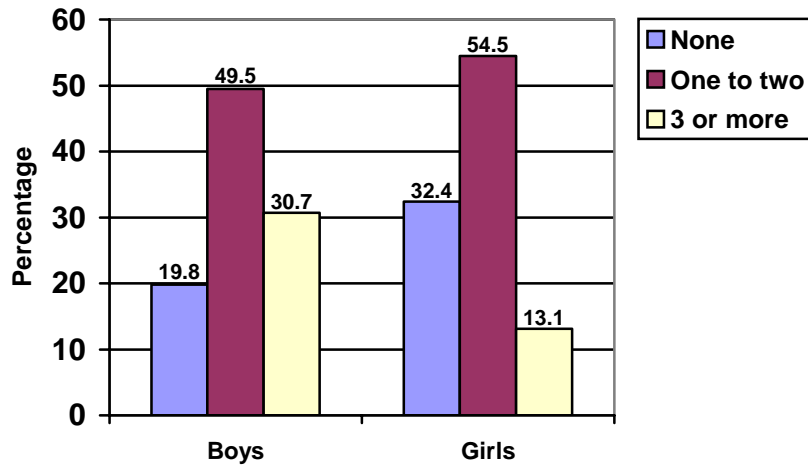
Over half of the children (54.0%) reported spending one to two hours a day watching television. Slightly less than half reported (40.5%) watching for three or more hours (Figure 20). Also, more than half of the children (52.2%) reported spending up to one to two hours per day playing video or computer games. However, over a quarter of the children in the sample (26.5%) reported not playing computer or video games at all.

Figure 20. Hours Watching TV and Playing Video/Computer Games Each Day



Gender, Racial and Geographic Differences. Girls and boys were similarly likely to watch three or more hours of television. However, boys were significantly more likely than girls to play three or more hours of video or computer games (Figure 21).

Figure 21. Hours Playing Video/Computer Games Each Day: Boys vs. Girls



Over 90% of fourth grade students, regardless of ethnic background, reported watching television at least one hour a day. Black children were significantly more likely than White children or children from other racial or ethnic backgrounds to watch television three or more hours per day (Figure 22) and play video or computer games for three or more hours a day (Figure 23 on next page).

Figure 22. Hours Watching TV Each Day: Black vs. White vs. Other Race Children

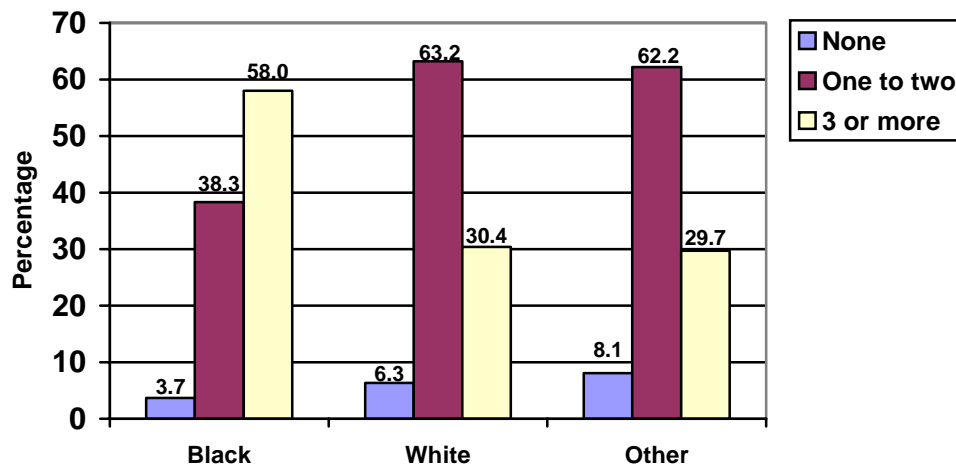
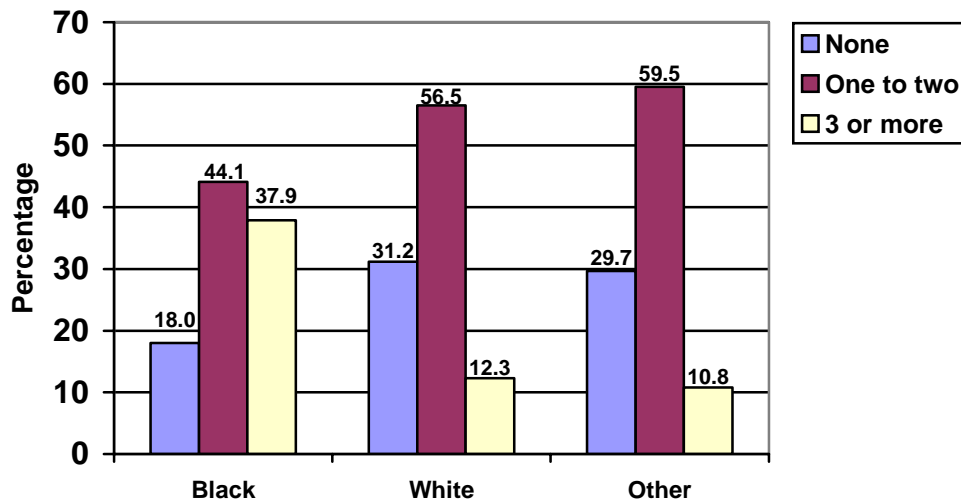
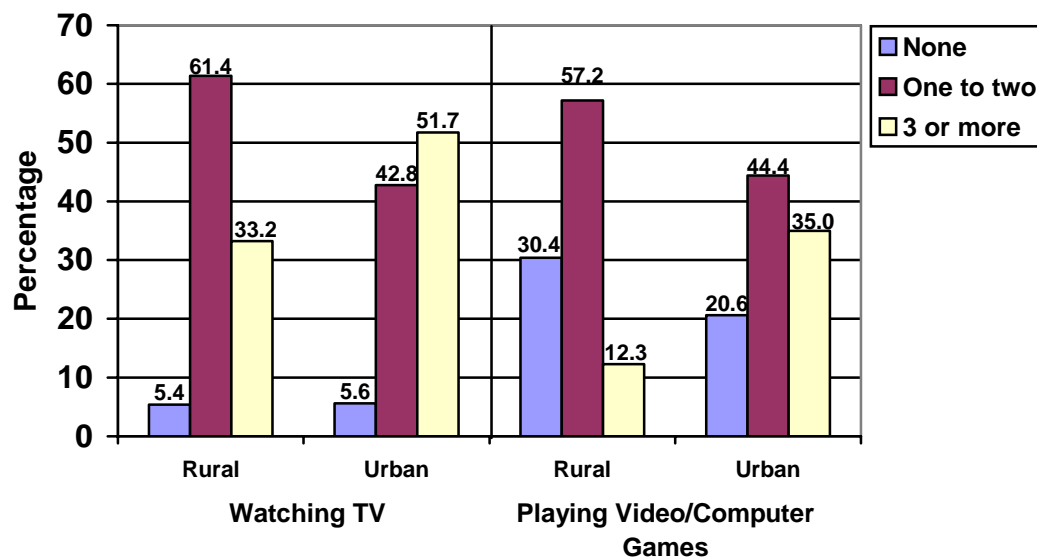


Figure 23. Hours Playing Video/Computer Games Each Day: Black vs. White vs. Other Race Children



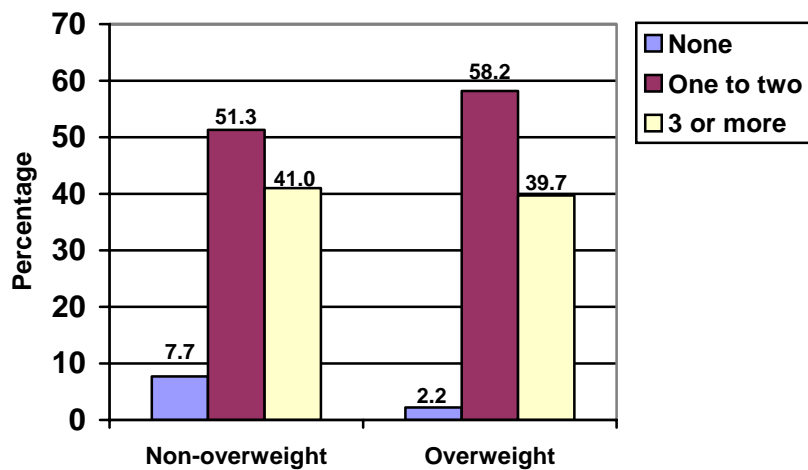
Children from schools in urban areas were significantly more likely than children from schools in rural areas to report watching television and playing video or computer games (Figure 24) for three or more hours a day.

Figure 24. Hours Watching TV and Playing Video/Computer Games Each Day: Rural vs. Urban Area Children



Health Status & Inactivity. Overweight children were more likely to report spending more time a day watching television (Figure 25 on next page). There were no differences between overweight children and non-overweight children in terms of time reported spent playing video or computer games.

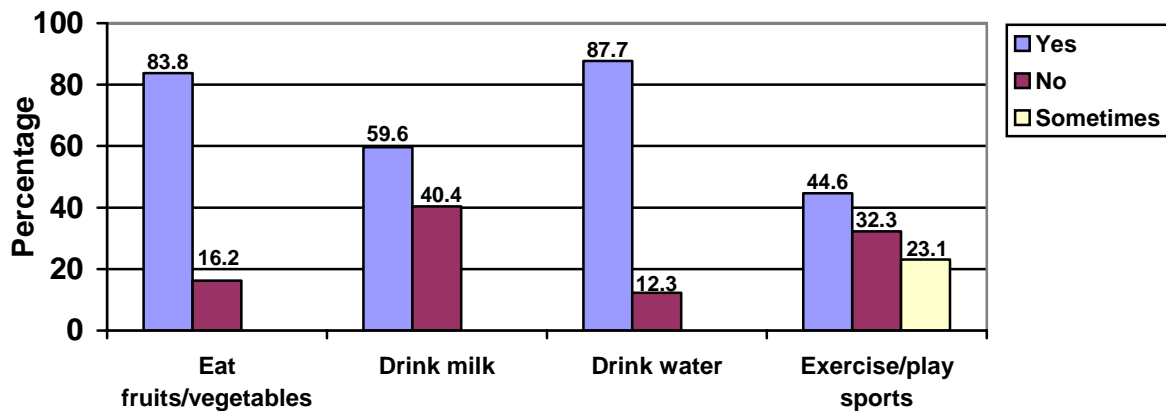
**Figure 25. Hours Watching TV Each Day:
Non-Overweight vs. Overweight Children**



REPORTS OF PARENTS' BEHAVIORS BY CHILDREN

The majority of children reported that their parents drank milk and water and ate fruits and vegetables every day (Figure 26). Almost half of parents were reported by their children to typically participate in sports or exercise.

Figure 26. Children's Reports of Parents' Participating in Healthy Behaviors



Gender, Racial and Geographic Differences.

Physical activity: Black children (40%), in comparison to either White children (28%) or children from other racial backgrounds (30%), were more likely to report that their parents do not exercise or play sports. Likewise, children going to school in urban areas (41%) were more likely than children going to school in rural areas (27%) to report that their parents did not exercise or play sports.

Milk: More White children (65%) than Black children (53%) or children from other races (50%) reported their parents drank milk.

Fruits and vegetables: Fewer Black children (75%) than White children (89%) or children from other races (86%) reported that their parents ate fruits and vegetables. Likewise, children going to school in urban areas (79%) were less likely than children going to school in rural areas (87%) to report that their parents ate fruits and vegetables.

There was no relationship between a child's report of his parents engaging in healthy behaviors and the child's BMI category. However, there was a significant correlation between the child's eating fruits, drinking water, and exercising and these behaviors being reported for the parent.

HEALTHY BEHAVIORS & OVERWEIGHT

Cumulative or total scores were computed on survey responses for interrelated questionnaire items. These total scores measure (1) healthy eating, (2) eating meals regularly, and (3) inactivity on a global level. Scores for healthy eating and eating meals regularly range from zero to 6, whereas scores for inactivity range from zero to 4 points. The mean scores for children in the sample on healthy eating ($M=3.7$, $s=1.4$), eating meals regularly ($M=5.6$, $s=0.8$), and inactivity ($M=2.3$, $s=1.0$) suggest that:

- Children typically report that they eat three meals a day;
- Children report that they eat healthily (e.g. eat fruits and vegetables daily)
- Children report that they tend to be somewhat inactive (e.g., watch television or play with computers rather than play sports)

There does not appear to be a relationship between any of the global self-reported behaviors—eating healthily, eating meals regularly and being inactive—and health status.

FACTORS ASSOCIATED WITH OVERWEIGHT

Although no individual global behavior alone correlates strongly with healthy weight, when combined with other factors, such as gender, race, geographic differences, and parent modeling, some of these variables predict health status. Regression analyses[§] show that geographic differences, healthy eating and the child's race combined were associated with overweight. In this sample, geographic differences were most related to overweight. Children who went to school in more rural locations were more likely to be overweight than children who went to school in urban areas.

DISCUSSION

OVERVIEW

The majority of fourth graders surveyed reported healthy eating behaviors. More than two thirds reported typically eating three meals a day while almost all children reported eating

[§] A logistic regression analysis on health status—overweight versus not overweight—was performed using a forward stepwise method to enter possible significant factors.

lunch and dinner every day. The majority of children reported regularly consuming fruits, vegetables, milk and water. The unexpected finding was that at risk and overweight children reported drinking significantly more water and showed a trend in consuming more fruits, vegetables and milk. There are several possible reasons for this finding. First, the children are self-reporting their behavior. An overweight child may give the desirable answer, or what they know as the healthy behavior answer as opposed to giving the answer that best represents their true eating behavior in order to make it appear as though they have healthy habits. Second, an at risk or overweight child could be eating more food altogether. This would account for eating more fruits and vegetables and drinking more milk and water. Finally, as an extension of the last point, at risk or overweight children could have many unhealthy habits as well as healthy habits that contribute to their BMI classification. This means that besides eating the healthy foods in the survey all other foods are also consumed in excess including “junk food”. This would lead to a high calorie intake and over time could result in an overweight child. The survey only provided a brief look at the healthy eating behaviors. The total food consumption and unhealthy behaviors were not addressed. The main point we can draw from this information is that the majority of children surveyed reported following most healthy eating recommendations. However, the number of at risk and overweight children is still increasing. This in turn forces a re-evaluation of teaching methods. The focus has consistently been to educate children on healthy eating behaviors – eating fruits and vegetables; drinking milk and water. While these are important and appear to be effective, an additional education component is currently missing. Children also need to be educated on how to identify unhealthy eating behaviors and how to eliminate them in order to effectively battle overweight.

The majority of children surveyed are active whether it is during recess, on a sport’s team or playing outside. There is only a very small percentage that reported no play during the day. While this is encouraging, the number of children who reported watching a minimum of one hour of television was an overwhelming majority with those reporting at least one hour of video or computer games being just under three quarters of children surveyed. Children and parents need to be educated not only on the importance of increasing physical activity but also decreasing sedentary activities in an effort to increase overall health and decrease overweight.

The last finding of interest was the children’s reports of their parents’ behavior. A majority of children did report their parents consumed fruits, vegetables, milk and water. Slightly less than half reported that their parents typically exercised. It was found that a child’s eating fruits, drinking water and exercising were positively correlated with their parent’s behaviors in the same activities. This indicates that while educating the child on healthy behaviors is very important, involving the whole family might be a more effective way to get the recommendations into actions.

LIMITATIONS

While the study provides useful information on the healthy behaviors of children there are many limitations. First, with the standards of learning (SOLs) being the primary concern in schools, there were a limited number of schools that agreed to participate in the study due to the concern it would take away too much teaching time. This resulted in a small sample of twelve schools that did not adequately represent all of the areas of Virginia. Therefore, the study cannot be generalized to all fourth graders in Virginia. Second, active consent from the parent was used. While a 50% response rate is acceptable there were 50% of children that were not

surveyed. This could result in a biased study as there are a number of reasons for people not responding to the consent request. Some of these reasons could potentially affect the results of the study. It is impossible to speculate if and how passive consent may have changed the results, but it most likely would have resulted in a bigger, more representative sample. Third, the children were self-reporting their answers to the survey questions. With this type of study the participants may be tempted to give the desirable healthy behavior answers rather than the answers actually representing their behavior. This could skew the results. Also, no reference was made to serving size. While one person may have had an eight ounce glass of milk for breakfast and another child had a four ounce glass, they would both have reported this as one where the first child actually had twice the volume of milk. Last, the study only referred to healthy behaviors. While this is important information, it only provides half the picture of the children's lifestyles. To get a complete look at the problem of "at risk" and "overweight" in Virginia the unhealthy habits in addition to the healthy habits must be studied.

Virginia is currently taking steps to address this problem, in part through the activities of the Virginia Healthy Weight Task Force. In addition, the Virginia WIC Program is taking action now in counseling clients on nutrition and physical activity in an effort to increase awareness and to encourage behavior change to promote a healthy lifestyle for young children and their families.

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Appendix 1. Healthy Behavior Survey

**Nutrition and Physical Activity Survey
Of Fourth Graders
FOR STAFF ONLY**

Location: _____

Date: _____



Mark the correct response:

1. Years old:

8 9 10 11 12 13

2. Gender: Girl or Boy

3. Ethnicity. (Please choose only one.)

- American Indian or Alaskan*
- Asian
- Black or African-American
- Latino or Hispanic
- White or Caucasian
- Other



Please have the child move to the appropriate station and complete the following:

4. Height: _____

(To be calculated later) BMI: _____

5. Weight: _____

Appendix 1. Healthy Behavior Survey (cont.)

**Nutrition and Physical Activity Questions
Nutrition and Physical Activity Survey
Of Fourth Graders**

1. Do you eat breakfast?	Yes	No	Sometimes
2. Do you eat lunch?	Yes	No	Sometimes
3. Do you eat dinner?	Yes	No	Sometimes
4. Do you eat snacks after school?	Yes	No	Sometimes
5. How many fruits do you eat a day?	None	1-2	3 or more
6. How many vegetables do you eat a day?	None	1-2	3 or more
7. How many glasses or cartons of milk do you drink each day?	None	1-2	3 or more
8. How many glasses of water do you drink each day?	None	1-2	3 or more
9. Can you drink water in your classroom?	Yes	No	Sometimes
10. Do you have recess every day at school?	Yes	No	
11. How many hours do you play outside or exercise a day?	None	1-2 hrs.	3 hrs. or more
12. Do you play sports (team or individual)?	Yes	No	Sometimes
13. Do you have a safe place to play outside?	Yes	No	Sometimes
14. How many hours do you watch TV a day?	None	1-2 hrs.	3 hrs. or more
15. How many hours do you play computer or video games a day?	None	1-2 hrs.	3 hrs. or more
16. How many times a day do you brush your teeth?	None	1-2	3 or more
17. Do your parents exercise or play sports?	Yes	No	Sometimes
18. Do your parents drink milk every day?	Yes	No	
19. Do your parents eat fruits and vegetables every day?	Yes	No	
20. Do your parents drink water each day?	Yes	No	