



# After School Physical Activity and Eating Behaviors of Rural and Urban Middle School Students



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## Background

Two major factors that have contributed to the increase in childhood obesity over the past three decades are: a community environment that discourages physical activity and healthy eating, and a family environment where adults are less able to supervise childhood behaviors. Therefore, to influence/impact rates of childhood obesity, one must examine the children's environment, with particular focus on how children spend their time. Better understanding of how children spend their time, and under what circumstances they participate in healthy or unhealthy behaviors will help in the design of more effective childhood obesity interventions.

## Purpose

The purpose of this study was to examine the physical activity patterns, eating behaviors, and social environment of overweight (OW) and normal weight (NW) middle school children, in rural and urban settings, between the hours of 3:00 PM and 12:00 AM, when children are most likely to engage in behaviors unsupervised by adults.

## Hypotheses

1. During after-school hours OW children are less active, have poorer eating behaviors, and have a weaker social environment for health behaviors than NW children.
2. Rural children are less active, have poorer eating behaviors, and have a weaker social environment for health behaviors than urban children.

## Methods

- Eating and physical activity behaviors of 141 students, ages 10-14 were monitored for 4 weekdays.
- One middle school was selected from the inner city of Washington, DC; a second school was selected from a rural blue collar town in northern VA, and a third school was selected from a rural agricultural town in GA.
- Students completed a diary documenting type of activity, location, adult supervision, accompanying participants, and eating habits from 3:00 p.m. until 12:00 a.m.
- Energy expenditure was measured through accelerometry.
- BMI, estimated energy expenditure, eating behavior, active time, sedentary time, and supervised time were all measured.

## Results

Figure 1: Group Mean Physical Activity Levels

There were no significant differences in physical activity accelerometer counts or calculated energy expenditure among the sexes, ages, ethnic groups, or rural versus urban children.

Figure 2: Physical Activity Levels across Time

Physical activity was highest between 3:00 p.m. and 6:40 p.m., declining gradually until 11:00 p.m.

Table 1: Percent Use of After School Time for Middle School Students

Category	All	NW	OW	OW Boys	OW Girls
% Time spent eating	9.0	9.6	7.3	5.4	8.3†
% Time spent with a family member	36.8	39.2	29.2*	30.6	28.5
% Time spent with friends	18.9	19.7	16.5	12.6	18.5†
% Time spent alone	44.3	41.1	54.3*	56.8	53.0†
% Time spent sedentary	76.0	77.3	70.1*	78.4	68.6†
% Time spent being active	24.0	22.7	29.9*	21.6	31.4†
% Time spent supervised	83.7	85.8	77.5*	78.9	76.8
% Time spent outside	15.1	15.5	14.6	15.6	14.1
% Outside time being active	60.6	61.4	58.6	65.3	56.2†
% Eating time eating healthy food	59.1	55.0	71.9*	56.9	76.7†
% Eating time eating unhealthy food	40.9	45.0	28.1*	43.1	23.3†
% Eating time supervised	85.2	85.7	83.4	78.5	80.4
% Supervised eating time eating unhealthy	21.1	20.7	22.0	26.2	19.4†
% Eating time with a family member	70.2	70.6	69.1	64.6	70.4
% Family eating time eating unhealthy food	25.6	25.7	25.1	23.8	25.6
% Eating time alone	18.9	18.7	19.5	30.8	15.8†
% Alone eating time eating unhealthy food	60.8	59.9	61.2	61.0	61.4
% Sedentary time eating	10.9	11.5	9.9*	6.8	10.3†
% Sedentary time supervised	86.6	87.7	83.3*	82.3	83.8

75% of after school time is sedentary. About 80% of sedentary time was spent under adult supervision. 85% of eating time was supervised by an adult, while 19% to 26% of supervised eating was spent eating unhealthy. OW spent more time active while less time sedentary and less time supervised than the NW. OW spent less time eating unhealthy than the NW. OW spent less time supervised and less sedentary time supervised than NW. OW girls spent more time being active, but also more time eating than OW boys. OW girls spent more of their eating time consuming healthy foods than OW boys.

## Conclusions

Children should be given access to healthy foods and encouraged to eat healthy when alone and with friends. Adults should be more physically engaged with children. Children should be encouraged to eat under adult supervision and with their families.