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The 2005 Iowa Child and Family Household Health Survey. Physical activity, weight, and eating habits. Fourth report in a series

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The 2005 Iowa Child and Family Household Health Survey

Physical activity, weight, and eating habits

Fourth report in a series

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Table of contents

Introduction..... 3
The Iowa Child and Family Household Health Survey..... 3
Methods..... 4
Weight issues among Iowa children..... 5
Eating patterns among Iowa children..... 7
Fruit and vegetable consumption..... 7
Breakfast..... 8
Soda consumption..... 9
Overall eating patterns..... 9
Physical activity..... 10
Screen time..... 11
Conclusions..... 12
Results tables by child's age..... 15
Results tables by parent report of child's relative weight..... 20

Table of figures

1. Parent perception of their child's weight..... 6
2. Fruit and vegetable consumption of children in Iowa, by age category..... 8
3. Percent of Iowa children who met healthy eating guidelines: always ate breakfast, ate 2 fruits and 3 vegetable servings daily, and did not drink soda, by age..... 10
4. Met exercise recommendations by age and gender (5 days of moderate or 2 days of vigorous activity)..... 11
5. Percent of children who use the computer or play video games daily, by age and gender..... 12

Introduction

This report on physical activity, weight, and eating habits of Iowa's children is the fourth in a series of reports from the 2005 Iowa Child and Family Household Health Survey (IHHS). The 2005 IHHS is the second comprehensive, statewide effort to evaluate the health status, access to health care, and social environment of children in families in Iowa. The first IHHS was conducted in 2000.

The Iowa Child and Family Household Health Survey

The 2005 IHHS was a collaboration between the Iowa Department of Public Health (IDPH), the University of Iowa Public Policy Center (PPC), and the Iowa Child Health Specialty Clinics (CHSC). Funding for the 2005 IHHS was provided primarily by the IDPH, with additional funding from the U.S. Department of Health and Human Services Maternal and Child Health Bureau (MCHB) and the Centers for Disease Control and Prevention (CDC).

The primary goals of the 2005 IHHS were to: 1) assess the health and well-being of children and families in Iowa, 2) assess a set of early childhood issues, 3) evaluate the health insurance coverage of children in Iowa and the features of the uninsured, 4) assess the nutrition and physical activity of Iowa children, and 5) assess the health and well-being of racial and ethnic minority children in Iowa.

Questions included a wide range of topic areas encompassing health, well-being, and family environment. General topic areas of the 2005 IHHS included:

- Demographics of Iowa families with children
- Health status
    - Functional health status
    - Children with special health care needs (CSHCN)
    - Additional emphasis on asthma
- Health insurance coverage of children and parents
- Health care issues
    - Medical care
    - Preventive care
    - Dental care
    - Behavioral/emotional health care
    - Prescription medication
    - Emergency room use
- Family and social environment
    - Behavioral/emotional health status
    - Parenting stress

This study includes information about weight physical activity, screen time and nutrition for kids 2-17

- Tobacco, alcohol, and drug use
- Gambling
- Marital satisfaction
- Nutrition and exercise
- Weight

This fourth report from the 2005 IHHS provides information about the nutrition and physical activity of Iowa children from interviews of families with children ages 2 and over, and includes the following topic areas: weight, physical activity, screen time, and nutrition. Throughout this report, we refer to 3 different age groups: 2-5 (youngest children), 6-11 (elementary school age), and 12-17 (teens).

Methods

The 2005 IHHS was a population-based statewide household telephone survey. The University of Northern Iowa Center for Social and Behavioral Research conducted the data collection for the survey. Interviews were completed with the parents of 3,674 children throughout the state of Iowa in the fall of 2005 and winter of 2006.

Phone numbers dialed included a combination of random-digit dial and targeted phone numbers obtained from a private vendor. Targeted lists came from a variety of sources including white pages and other lists (e.g., voter registration, magazine subscriptions, warranty cards, census data). Screening questions were asked to determine if the number was connected to a private residence, and if so, if there was at least one child living in the household. The 'adult most knowledgeable about the health and well-being' of one randomly chosen child in the household answered the survey questions, and the questions were asked about that child.

Parents were asked about one child in the household

The dispositions of calls made to complete the interviews were as shown in Table 1.

Table 1. Participation Rate for 2005 Iowa Child and Family Household Health Survey

Number completing the interview	3,674
Number of refusals or unable to complete interview	1,097
Participation rate	77%

Respondents were primarily mothers (77%) and fathers (18%). The other 5% of respondents included grandmothers (2%), stepparents (2%), and other relatives and guardians (1%). Because 95% of the respondents were either a mother or father, respondents will be referred to as 'parents' throughout this report. Among the final respondents, 78% were identified from the targeted sample and 22% from randomly dialed numbers.

In order to account for biases related to design and data collection factors, the data used in this report were weighted to provide a representative view of children in Iowa. Weighting first consisted of accounting for biases related to family size (i.e., the sampling design originally biased the sample toward children in smaller families because the chances of being the child chosen for the survey were much higher. A child in a one-child household was twice as likely to be the 'chosen' child as a child in a two-child household, etc.).

3,350 interviews about Iowa children age 2 and over are included in this report

Also factored into the weighting were biases related to having a partially targeted sample as opposed to a totally random sample. Results from the targeted calls were compared with random digit dial data, and both were compared to externally collected data sources. The data were then weighted to match the income and age distribution from the 2000 Census.

Finally, a weight related to the design effect was added for the analysis in order to make statistical testing more accurate. Weights for individual cases ranged from 0.51 to 5.09, with a mean weight of 0.6163.

For the analyses in this report, only data for children age 2 and over were included because the topics covered were not appropriate for infants. Thus, 3,350 of the 3,674 family interviews were used in these analyses.

Weight issues among Iowa children

Overweight among children is a serious policy concern. The CDC reports a 45% increase in the prevalence of overweight in children and adolescents between 1988 and 1999. In this study, several questions were asked to help assess the weight status of children in Iowa. Parents were asked:

- their child's height and weight
- to rate their child's weight status compared to other children (does the child weigh 'the right amount,' 'too much,' or 'too little'?)

Parent-reported height and weight were collected in an attempt to calculate children's Body Mass Index (BMI), a common measure of a person's appropriate weight. However, parent-reported heights and weights appeared inconsistent with measured norms and could not be used for these analyses. BMI is calculated using a formula that requires precision in measurement. Differences of a few reported pounds (e.g.,

Parents often misclassify their child's weight status

rounding 87 lbs up to 90 lbs) can make a big difference in BMI calculations. The data collected in this study showed that parents were likely to estimate child weight and height. The resulting distribution of BMI for children statewide was thus inaccurate. This imprecision in parent-reported height and weight is consistent with many other research studies.

Another measure of child weight status is to study parent perception of their child's weight compared to other children. Relevant literature indicates that parents generally do not accurately report their child's relative weight status, either. Parents of overweight children tend to underestimate weight, and parents of underweight children tend to overestimate weight.[1, 2, 3, 4] However, even if a parent misclassifies child weight status, perception of a child's weight could be an important factor in family emphasis on physical activity and eating behaviors.

Parent perception of child weight was thus used as the dependent variable when evaluating factors related to the child's weight. In this study, relationships were evaluated between perception of relative child weight and 1) activity levels, 2) eating habits, and 3) other psychosocial factors for children in Iowa.

As shown in Figure 1, 75% of children were reported to weigh 'the right amount,' 13% 'too much,' and 12% 'too little.'

3/4 of those interviewed thought their child weighed the right amount

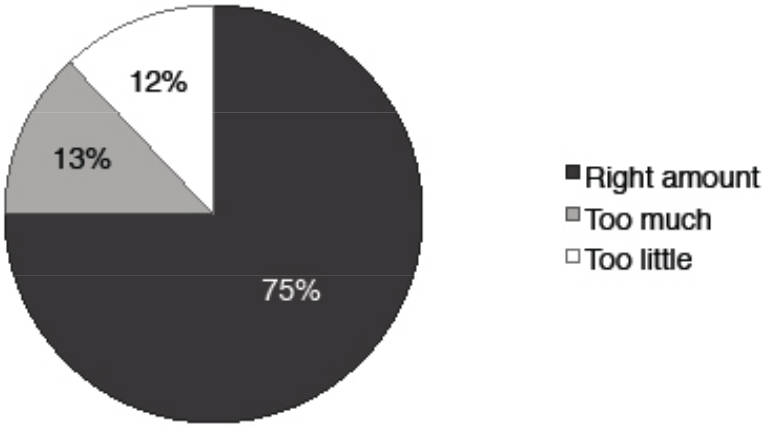

Figure 1. Parent perception of their child's weight

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[1] Miller, J.C., Grant, A.M., Drummond, B.F., Williams, S.M., Taylor, R.W., & Goulding, A. (2007). DXA Measurements Confirm that Parental Perceptions of Elevated Adiposity in Young Children are Poor. *Obesity,* 165-171.
[2] Huybrechts, I., De Bacquer, D., Van Trimpont, I., De Backer, G., & De Henauw, S. (2006). Validity of Parentally Reported Weight and Height for Preschool-Aged Children in Belgium and Its Impact on Classification Into Body Mass Index Categories. *Pediatrics,* 2109-2118.
[3] Dubois, L., & Girad, M. (2007). Accuracy of maternal reports of pre-schoolers' weights and heights as estimates of BMI values. *International Journal of Epidemiology,* 132-138.
[4] Eckstein, K.C., Mikhail, L.M., Ariza, A.J., Scott, T.J., Millard, S.C., & Binns, H.J. (2006). Parents' Perceptions of Their Child's Weight and Health. *Pediatrics,* 681-690.

Parent perception that their child was the correct weight declined with age. Eighty-three percent of children ages 2-5 were reported to weigh 'the right amount' compared to just fewer than three-quarters of children ages 6-17. The youngest children were also much less likely to be reported as weighing 'too much.'

Parents who reported high parenting stress levels on a 4-question parenting stress scale were less likely to report that their child weighs 'the right amount,' and were over twice as likely to report that their child weighs 'too little' (stress questions included: child is harder to care for than most, does things that really bother you, feel you are giving up more of your life to meet child's needs than expected, and felt angry with child).

State and national goals call for increasing daily fruit and vegetable intake

Parents who rated their child as having a high level of behavioral and emotional problems were also far less likely to report that their child weighed 'the right amount.' Those children were over 3 times as likely to be reported as weighing 'too little.' Perception of child weight status was also related to several nutritional factors, including frequency of breakfast eating and fruit and vegetable consumption, as well as physical activity and television watching (although not video game/computer time). These relationships will be discussed further in other sections of this report.

Eating patterns among Iowa Children

Fruit and vegetable consumption

Healthy eating patterns are important for both weight control and the healthy development of children. State and national health goals and recommendations call for increasing the number of children who eat 2 servings of fruits and 3 servings of vegetables daily.[5,6,7] According to the national Healthy People 2010 goals for health, baseline data collected in 1996 showed that 28% (goal 75%) of children ages 2 and over ate 2 servings of fruit daily, and 3% (goal 50%) ate 3 servings of vegetables daily. As Figure 2 shows, Iowa children do not meet targets for consumption of fruits and vegetables. In this study, 64% of children ate 2 or more servings of fruit on an average day, and 25% of children ate 3 or more vegetable servings. Figure 2 shows differences in fruit and vegetable consumption between age groups. Parents reported that 65% of kids would eat more fruits if offered, and 42% would eat more vegetables.

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[5] Iowans Fit for Life. Iowa's comprehensive nutrition and physical activity plan. (2006). http://www.idph.state.ia.us/iowansfitforlife/. Accessed 10/31/2007.

[6] Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services. Healthy People 2010. http://www.healthypeople.gov/Document/HTML/Volume2/19Nutrition.htm#_Toc490383124. Accessed 10/31/2007.

[7] U.S. Department of Health and Human Services and U.S. Department of Agriculture. Dietary Guidelines for Americans, 2005. 6th Edition. Washington, DC: U.S. Government Printing Office, January 2005. http://www.Health.gov/dietaryguidelines/dga2005/document/default.htm

Teens were least likely to eat breakfast regularly

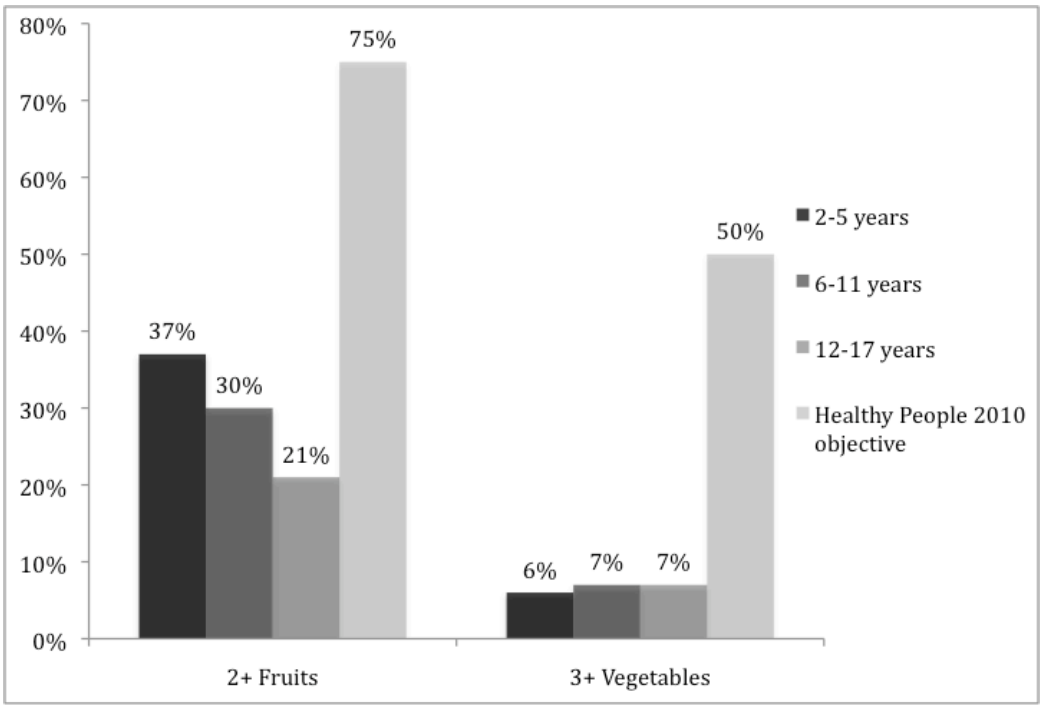

Figure 2. Fruit and vegetable consumption of children in Iowa, by age category

Breakfast

In the United States, breakfast consumption among children and adolescents has decreased in the last four decades, while the prevalence of being overweight has doubled in children and nearly tripled in adolescents in the past two decades. There is inconclusive evidence surrounding hypotheses that body weight or BMI and breakfast eating are causally linked. However, research indicates that eating breakfast is highly correlated with other healthy decisions and outcomes. Factors relating to breakfast consumption include consuming more fruits, vegetables, and calcium; reaching nutritional recommendations for minerals and vitamins; increased activity levels; decreased snacking; consuming less fat and cholesterol; better performance and concentration at school; and others.[8, 9, 10, 11, 12] Eating breakfast is

Two-thirds of Iowa children did not drink soda

[8]Rampersaud, G.C., Pereira, M.A., Girard, B.L., Adams, J. & Metzl, J.D. (2005). Breakfast habits, nutritional status, body weight, and academic performance in children and adolescence. *Journal of the American Dietetic Association,105*(5), 743-760.

[9]Utter, J., Scragg, R., Mhurchu, C.N. & Schaaf, D. (2007). At-home breakfast consumption among New Zealand children: Associations with body mass index and related nutritional behaviors. *Journal of the American Dietetic Association, 107*(4), 570-576.

[10]Fiore, H., Travis, S., Whalen, A., Auinger, P. & Ryan, S. (2006). Potentially protective factors associated with healthful body mass index in adolescents with obese and nonobese parents: A secondary data analysis of the Third National Health and Nutrition Examination Survey, 1988-1994. *Journal of the American Dietetic Association, 106*(1), 55-64.

[11]Alberson, A.M., Anderson, G.H., Crockett, S.J. & Goebel, M.T. (2003). Ready-to-eat cereal consumption: Its relationship with BMI and nutrient intake of children aged 4 to 12 years. *Journal of the American Dietetic Association, 103*(12), 1613-1619.

[12]Affenito, S.G. (2007). Breakfast: A missed opportunity. *Journal of the American Dietetic Association, 107*(4), 565-569.

associated with many lifestyle choices that are predictive of a healthy BMI/weight.

Findings in this study indicate that in Iowa, 85% of children were reported to 'usually' or 'always' eat breakfast. Younger children were more likely to eat breakfast: over 90% of children ages 2-11 compared with 75% of teens were reported to 'usually' or 'always' eat breakfast. Parents who perceived their child to weigh 'too much' were least likely to indicate that their child usually or always ate breakfast.

Soda consumption

Consumption of soda and other sugared beverages has been shown to decrease diet quality in children and contribute to dental caries. Sixty-six percent of children in Iowa had parents who reported that, on average, their children did not drink soda. One-quarter of parents reported that their child drank one soda per day, and 10% reported consumption of more than one soda per day. Soda consumption varied greatly by age; younger children were reported to drink far less soda than older children. Eighty-eight percent of children ages 2-5 drank no soda, compared with 72% of children ages 6-11, and 45% of children over age 12.

Overall eating patterns

While it is important to look at individual factors such as fruit and vegetable consumption, soda drinking and eating breakfast, it is also important to look at these factors together to better understand the way Iowa's children are eating. To this end, a scale was constructed combining the three factors related to eating patterns together into one variable. This scale measured whether children met standard dietary guidelines for the following factors: 1) always ate breakfast, 2) ate 2 fruit servings daily, 3) ate 3 vegetable servings daily, and 4) did not drink any soda. Factors were each dichotomized (0 = didn't meet recommendation, 1 = met recommendation) and then summed to create a 5-point scale (0-4). The mean was 2.6, standard deviation was 1.13.

Thirteen percent of Iowa's children met all four standard recommendations for healthy eating, while 9% met none of the requirements. This varied significantly by age; younger children were much more likely to be reported to meet all of the recommendations (Figure 3). Seventeen percent of children ages 2-11 were reported to meet all of the recommendations, compared with 6% of children over age 12.

Differences in eating patterns among young children in daycare centers versus home-based child care settings were examined. No statistically significant differences related to eating habits were found between children in these two types of child care settings.

Younger children were more likely to meet standard dietary recommendations

Most Iowa children participate in physical activities

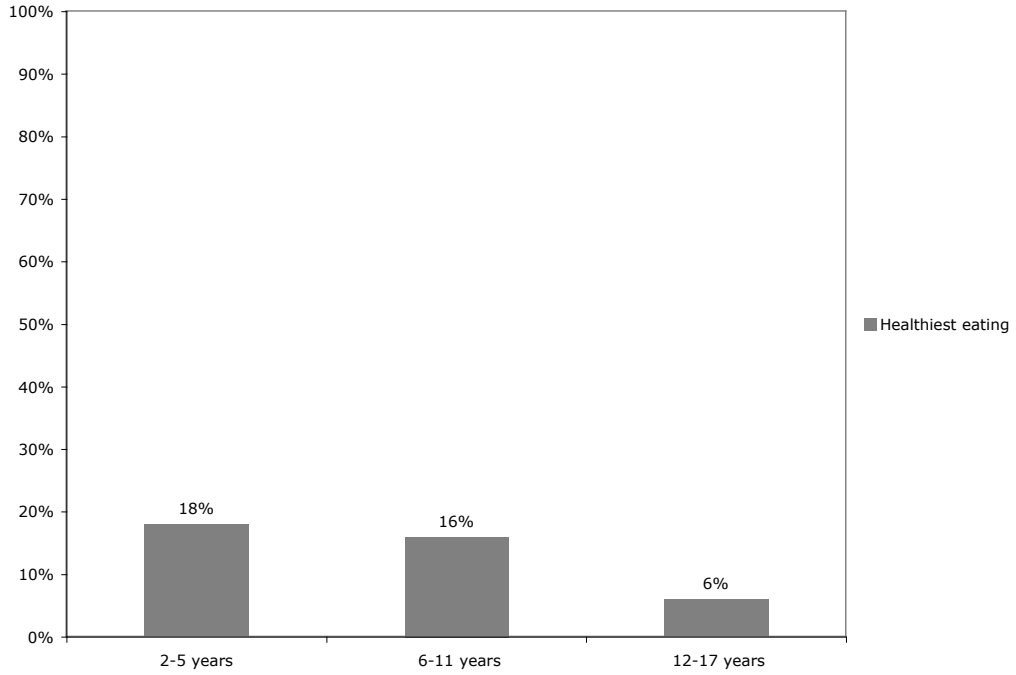

Figure 3. Percent of Iowa children who met healthy eating guidelines: always ate breakfast, ate 2 fruit and 3 vegetable servings daily, and did not drink soda, by age

Physical Activity

The children of parents reporting that their children weigh "too much" were least likely to meet physical activity guidelines

Increasing the rate of physical activity among children is another goal area outlined by the State of Iowa.[5] In the IHHS, parents were asked the number of days per week their children participated in 30 minutes of moderate levels of activity; parents were also asked the number of days their children participated in 20 minutes of vigorous activity. Most children in Iowa participated in some level of physical activity. Sevnty-five percent of children in Iowa participated in at least 5 days of moderate activity or 3 days of vigorous activity per week. Gender differences were found for children ages 12 and over, but for 2-5 year old children the differences were not statistically significant (Figure 4). Seventy-seven percent of males and 64 percent of females over age 12 participated in at least 5 days of moderate activity or 3 days of vigorous activity per week. Parents who perceived their child to weigh 'too much' were least likely to indicate that their child met the recommended physical activity requirements.

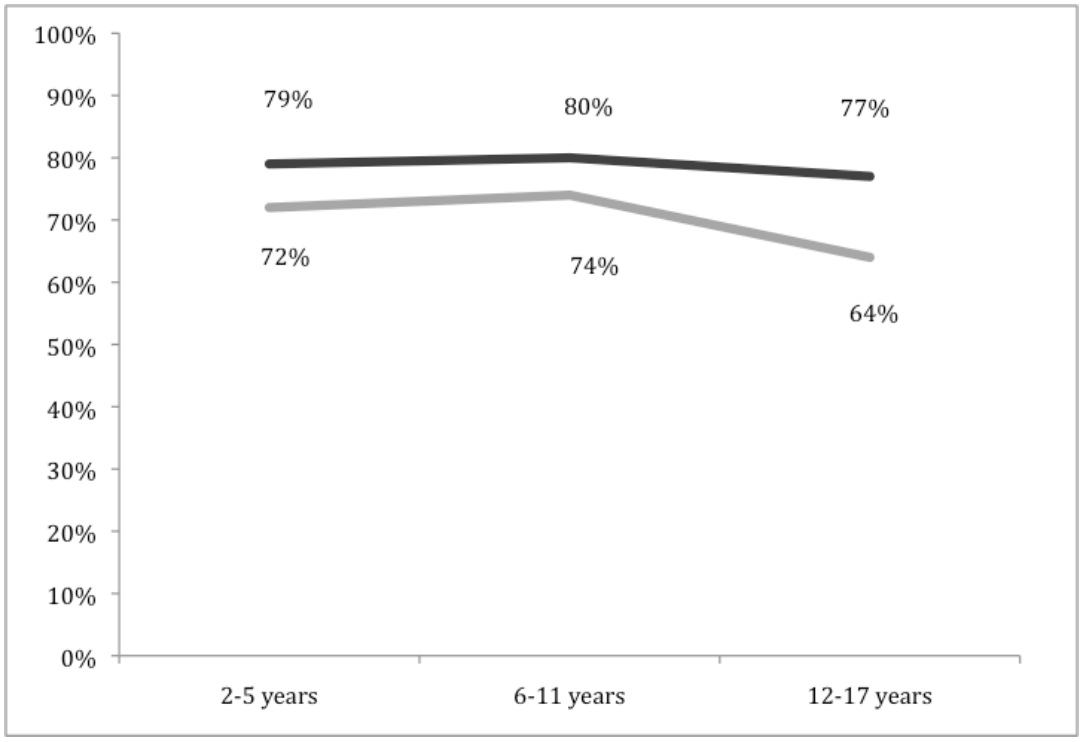

Figure 4. Met exercise recommendations by age and gender (5 days of moderate or 3 days of vigorous activity)

This study revealed no statistically significant differences related to physical activity between children in daycare settings and home-based child care settings.

Screen Time

Screen time is a phrase used to describe the amount of time a child spends in front of a computer or television. Parents in this study were asked 'On an average day, about how many hours does your child usually watch TV, videos, or movies?' Ninety-five percent of children in Iowa watched at least some TV, videos, or movies on an average day. Of this 95% of children who watch some TV, 2 hours per day was the average watching time. Males tended to watch slightly more TV each day, an average of 2.10 hours, compared with 1.96 hours for females. Children ages 6-11 watched the least amount of TV, 1.93 hours compared to 2.06 hours for children aged 2-5, and 2.11 hours for children ages 12 and over. Parents who perceived that their child weighed 'too much' were most likely to indicate that their child watched 2 or more hours of TV per day.

Almost all children in Iowa spend time watching TV, playing video games, or using a computer daily

Another aspect of screen time is video games or playing on the

Few Iowa children met standard dietary recommend-ations

computer. Parents were asked 'On an average day, about how many hours does your child use the computer or play video games?' Sixty-four percent of Iowa's children used the computer or played video games on an average day. Males were more likely than females, and older children were more likely than younger children to have this type of screen time daily. Figure 5 shows these differences.

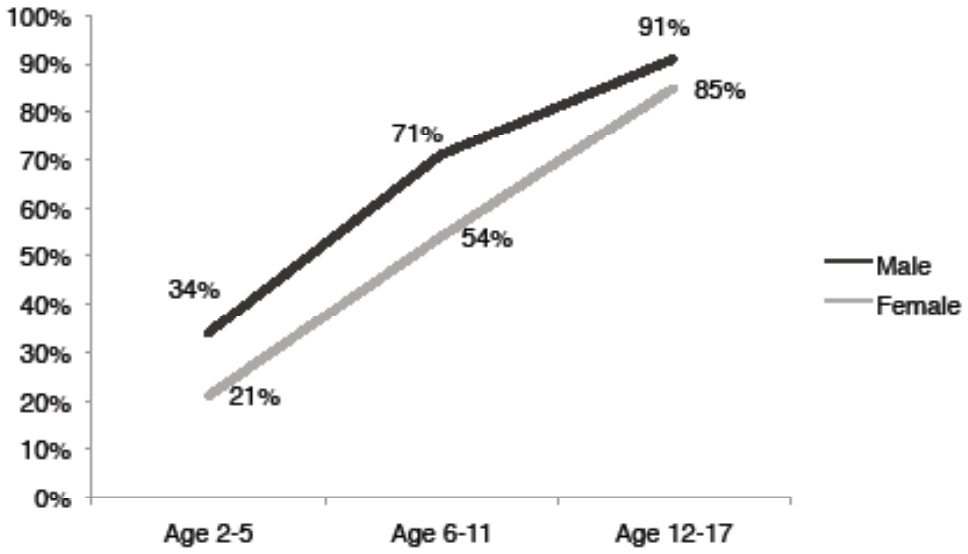

Figure 5. Percent of children who use the computer or play video games daily, by age and gender

Many children would eat more fruits and vegetables if they were offered

Among the 64% of Iowa children who use the computer or play video games on an average day, the mean time for doing so is 1.5 hours. Males played an average of 1.54 hours, and females 1.46 hours. Older children spent more time on the computer or playing video games. Children ages 2-5 had a mean video game/computer time of 1.23 hours, while those ages 6-11 had a mean time of 1.29 hours, and those ages 12 and over, 1.71 hours. There were no significant differences in the amount of computer/video game time when compared by relative weight status.

Conclusions

Among the issues evaluated in this report, the nutrition of Iowa's children was of most concern. Thirteen percent of children had parents who reported that their child met all of the healthy eating guidelines studied. Parents of older children, along with those who perceive their children to be overweight, were more likely to report less than ideal eating habits among their children. Because eating habits are correlated with BMI, it is fair to assume that some change in diet could help to encourage healthy weight in children.

Most children in Iowa had parents who reported them to be physically active. However, there was a significant drop in reported physical activity levels between 7-11 year-old girls and teenage girls (ages 12+); such a drop was not seen among boys or younger girls. This finding points toward a need for developing interventions designed to increase physical activity among teenage girls. Almost all children in Iowa watch television, movies, or play video games on an average day, although younger children were less likely to participate in these screen activities.

Physical activity levels in girls declined with age

In this study, comparisons were made regarding parent perception of child body weight and other factors, where there were many statistically significant differences. This may imply that interventions directed toward parents could include information about healthy body mass indexes, as well as interventions differentially directed towards increasing rates of healthy eating habits, physical activity, and setting guidelines for time spent in front of screens.

All data collected in this report relied on parent perception and recollection. This proved problematic when trying to use information on height and weight for calculating BMIs. Other issues may also have been affected by the use of parent-reported data. For example, parents are not specifically aware of food that their children eat at school, or what activities they are participating in during physical education classes. Further research on this topic may need to focus more specifically on collection of data that does not rely on parent perception and recollection. In order to measure rates of healthy BMI, studies would have to involve actual population-based measurements of height and weight. This data would allow analyses to include correlations between BMI and eating habits, physical activity, and screen time, as well as other characteristics. However, correlating factors relating to a parent's perception of the appropriateness of their child's weight is an important indicator of the dynamic between the parent and child regarding the child's weight.

The State of Iowa has set goals and defined interventions for healthy nutrition and physical activity levels for children in Iowa. A few resources based on past work are listed below.

*Iowans Fit For Life: Iowans Fit for Life is a joint statewide initiative between the Iowa Department of Public Health and its partners. This initiative promotes increased opportunities for physical activity and healthy eating for Iowans of all ages: http://www.idph.state.ia.us/iowansfitforlife/

*The Iowa Department of Education has an extensive listing of resources relevant to this topic based on participation in the USDA Team Nutrition program. Learning tools can be found at: http://www.iowa.gov/educate/content/view/431/446/

*The Iowa Department of Public Health has a position paper from November, 2000, that provides detailed nutrition, physical activity, and child nutrition guidelines for preventing overweight in home, child care, school, community, and health care settings. Prevention of Child and Adolescent Obesity in Iowa: Iowa position paper is available at: http://www.idph.state.ia.us/wic/common/pdf/obesity.pdf.