



## Physical Activity Research Summary

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Ruckus Nation is an idea competition that aims to increase physical activity among middle school-aged kids. We have chosen this goal because research shows the following:

- Physical activity reduces the risk of poor health outcomes associated with obesity;
- Obesity rates are on the rise among young people globally;
- People who are physically active have better physical and mental well-being;
- Physical activity levels start to decrease in middle school.

The following is a brief summary of this research.

### Physical activity reduces the risk of poor health outcomes associated with obesity

Obesity has a profound influence on young people's quality of life<sup>1</sup> and also contributes to a broad range of adverse health outcomes. For example, obesity has been associated with hypertension, glucose intolerance, insulin resistance, and chronic inflammation, which give rise to type 2 diabetes<sup>2</sup>. Obesity during childhood often persists into adulthood, where it is also associated with heart disease and premature mortality<sup>3-5</sup>.

Interventions involving physical activity have been found to prevent the onset of type 2 diabetes<sup>6,7</sup>. In one study, participants at high risk for type 2 diabetes were randomly assigned to a lifestyle intervention involving endurance training and dietary counseling or to a control group. Those who were assigned to the intervention showed a decline in body weight, glucose, and insulin and were significantly less likely to develop a new case of diabetes<sup>8</sup>. A follow-up analysis elucidated whether weight loss or physical activity was the critical ingredient<sup>9</sup>. Participants in the intervention were divided into three groups based on how much their physical activity increased during the study. The group with the greatest increase in activity was 49% less likely to develop type 2 diabetes than the group with the smallest increase in physical activity.

Physical activity can also reduce the risk of negative outcomes associated with coronary heart disease. Patients who participate in cardiac rehabilitation programs involving physical activity have reduced risk for mortality, and greater reductions in total cholesterol level, triglyceride level, and systolic blood pressure<sup>10,11</sup>.

### Obesity rates are on the rise among young people globally

The prevalence of overweight and obesity has increased over time among children and adolescents in the United States, as well as in many parts of the world<sup>4,12-14</sup>. In the United States, research from the American National Health and Nutrition Examination Surveys (NHANES) shows that the prevalence of overweight has more than doubled among children and adolescents between NHANES II (1976-1980) and NHANES III (1988-1994)<sup>15</sup>. Rates of overweight have also increased since NHANES III. Data from NHANES III show that the prevalence of overweight was 11.3% for 6-11 year olds and 10.5% for 12-19 year olds. This increased to 15.3% and 15.5% respectively in 1999-2000<sup>16</sup>. By 2004, 17.1% of children and adolescents were categorized as overweight<sup>17</sup>.

Increases in overweight and obesity<sup>†</sup> has been shown in many other countries<sup>2</sup>. For example, between 1985 and 1995, the prevalence of overweight among young people in Australia almost doubled, and the

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## Physical Activity Research Summary Page 2 of 4

prevalence of obesity almost tripled<sup>4</sup>. Increasing rates of overweight and obesity have also been found among children and adolescents in a variety of countries, including Brazil<sup>18</sup>, Britain<sup>12</sup>, China<sup>18</sup>, Costa Rica<sup>19</sup>, Egypt<sup>19</sup>, Ghana<sup>19</sup>, Haiti<sup>19</sup>, Japan<sup>20</sup>, and Taiwan<sup>21</sup>.

### **People who are physically active have better physical and mental well-being**

Numerous studies have pointed to the physical health benefits of physical activity<sup>7, 22-26</sup>. Physical activity is also associated with mental health benefits such as reduced anxiety, stress, depression, and improved self-esteem, self-concept, and health-related quality of life<sup>27-30</sup>.

In fact, according to the U.S. Surgeon General's Report on Physical Activity<sup>30, 31</sup>, regular physical activity improves health because it:

- Reduces the risk of dying prematurely
- Reduces the risk of dying from heart disease
- Reduces the risk of developing diabetes
- Reduces the risk of developing high blood pressure
- Reduces the risk of developing colon cancer
- Reduces feelings of depression and anxiety
- Helps control weight
- Helps build and maintain healthy muscles
- Promotes psychological well-being<sup>30</sup>

### **Physical activity levels start to decrease in middle school**

Research has shown that physical activity rates decline with age among young people<sup>32, 33</sup>. In one large-scale U.S. study of 5<sup>th</sup>-8<sup>th</sup> graders, the percent of time spent in moderate activity decreased as grade level increased, with 7<sup>th</sup> and 8<sup>th</sup> graders having a significantly lower percent of moderate activity than 5<sup>th</sup> and 6<sup>th</sup> graders<sup>34</sup>. Another U.S. study revealed a 50% reduction in physical activity among girls prior to puberty<sup>35</sup>, and a separate study revealed that median activity scores for girls decreased by 83% between the ages of 9-10 and 18-19<sup>36</sup>. By the ages of 18 or 19 years, the majority of girls in this study engaged in virtually no habitual physical activities outside of what was required at school<sup>36</sup>.

In the United Kingdom, older students in grades 10-12 were significantly less likely than their younger counterparts in grades 1-9 to participate in 30 minutes or more of moderate exercise on five or more days per week. Although 100% of students in grades 1-3 participated in one hour or more of physical activity on five or more days a week, by grades 10-12, only 34.1% of males and 25.1% of females met this guideline. This large difference in activity levels between elementary school and high school suggests that the middle school years may be particularly important in initiating efforts to boost physical activity<sup>33</sup>.

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‡ Note: "Overweight" and "obesity" are defined differently in various studies. For example, the NHANES studies characterize "overweight" as being in the top 95% percentile for Body Mass Index specific to age and sex from the National Health Examination Surveys conducted between 1963-1970. Other studies use different definitions, such as a weight-for-height distribution that is more than 2 standard deviations greater than the NCHS/WHO resource median.



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