



IMPROVED HEALTH FROM THE NATURAL ENVIRONMENT WHERE'S THE EVIDENCE?

*“Time in nature is not leisure time; it’s an essential investment in our children’s health.”
Richard Louv, author of Last Child in the Woods [1]*

Current State of Children’s Health

Our children may be the first generation ever at risk of having a shorter lifespan than their parents [2]. Sedentary lifestyle and physical inactivity have contributed greatly to the numerous health problems plaguing today’s children. Chronic conditions such as childhood obesity, asthma, and attention-deficit disorder have all increased over the past few decades [3]. These chronic conditions may lead to pulmonary, cardiovascular, and mental health problems in adulthood. Outdoor activity in the natural environment has taken a back seat to television, video games, the computer, and a demanding schoolwork schedule. Today’s youth are losing the contact with the natural environment that is extremely beneficial for their health and well-being.

Childhood Obesity

Approximately 16% of US children (~ 9 million) aged 6-19 are overweight or obese [4]. According to the Institute of Medicine, childhood obesity had doubled over the past 30 years for preschoolers and adolescents, and more than tripled for children aged 6-11 years old [5].

Obesity-Related Diseases

Type-2 Diabetes: Due to the drastic increase in the prevalence of pediatric diabetes over the past few decades, the definition has changed from “adult-onset” diabetes to type-2 diabetes. Approximately 176,500 children and adolescents suffer from diabetes [6].

Asthma: Currently 9.4% of children in the US have asthma [7]. Overweight children are at an increased risk for developing asthma and other respiratory problems, and for being hospitalized for asthma [8, 9].

Hypertension: 1 in 10 children with a BMI* within or above the 95th percentile have hypertension (vs. only 2.6% with a BMI <85th percentile) [10].

Cardiovascular Disease: Overweight adolescents are at increased risk of coronary heart disease and earlier death [2]. Most overweight children have at least one risk factor for cardiovascular disease, including higher cholesterol levels, abnormal glucose tolerance, high blood pressure, and elevated triglycerides [11]. The American Academy of Pediatrics recommends screening overweight children for high cholesterol and prescribing cholesterol-lowering drugs if needed [12]

Attention-Deficit/Hyperactivity Disorder (ADD/ADHD)

According to the Centers for Disease Control and Prevention (CDC), ADD/ADHD is a serious public health problem that impacts approximately 4.3% of children aged 4-17 years old [13]. It impairs school performance and socialization, and may persist into adulthood.

Health Benefits of Nature: Key Studies

Unstructured outdoor play time is fundamental for children's overall well-being. How does nature play a role in children's health? Key peer-reviewed evidence linking the benefits of nature to children's health are highlighted below:

Nature and Physical Activity

Active Healthy Living: Prevention of Childhood Obesity Through Increased Physical Activity [14]

Allowing children free, unstructured outdoor play is an important way to help them get physically active. The American Academy of Pediatrics (AAP) issued a policy statement in 2006 to pediatric health care providers on ways to increase physical activity in children and adolescents. The authors stated that lifestyle-related physical activity, as opposed to aerobics or calisthenics, is critical for sustained weight loss in children, and recommended free, unorganized outdoor play as a method of physical activity. Infants and toddlers should be allowed outdoor physical activity, unstructured free play, and exploration. The AAP encourages parents to get their children outside as much as possible.

The Mental and Physical Health Outcomes of 'Green Exercise' [15]

One study showed the synergistic health effects between physical activity and exposure to nature ("green exercise"). In this study, subjects ran on a treadmill while being shown four different themes of pictures: (a) rural pleasant, (b) urban pleasant, (c) rural unpleasant and (d) urban unpleasant photographs (a control group ran without any photographs for comparison). The researchers measured subjects' blood pressure, self-esteem, and mood. The study concluded that the rural and urban pleasant nature picture not only showed a significant reduction in blood pressure, but also a more positive effect on mood. Furthermore, participants in the rural pleasant group had the largest reduction in blood pressure. The authors suggest that "green exercise" not only has a greater effect on your blood pressure than exercise alone, but also is beneficial for your mental health.

Nature as a Restorative and Therapeutic Mechanism

View Through a Window May Influence Recovery from Surgery [16]

Nature has always been known to have a restoring or therapeutic power on humans. There has been evidence showing that people can recover from a surgery or deal with pain better if exposed to a natural environment. A study published in *Science* compared 23 matched pairs of patients who underwent a cholecystectomy (a common type of gall bladder surgery). The post-surgery

patients were randomly-assigned to either rooms facing a brick building, or a room with a view of a natural environment (trees, grassy field). Investigators found that those facing nature had shorter post-operation stays, fewer negative comments from nurses, took less analgesics, and had decreased amounts of post-operative patients. The study concluded that viewing nature alone can aid in the path to recovery.

Distraction Therapy with Nature Sights and Sounds Reduces Pain During Flexible Bronchoscopy: A Complementary Approach to Routine Analgesia [17]

Natural environments can also act in reducing pain. A randomized controlled trial used distraction therapy (in the form of sights and sounds of nature) in the operating room during a flexible bronchoscopy through conscious sedation. Patients then rated the level of pain and anxiety they experienced during the operation. The authors found that pain control was much better for the intervention group than the control groups [OR: 4.76]. The study suggests that clinicians should supplement analgesic medication with an inexpensive, non-invasive method of distraction therapy.

Nature and Childhood Stress

Nearby Nature: A Buffer of Life Stress Among Rural Children [18]

Childhood stress has become an increasing issue of concern for pediatricians in America. The workload of school and extracurricular activities has the potential to create more stress upon a child, which can affect the child's development. It is not surprising that there is evidence showing that the outdoors is a stress reliever. A study examined whether nearby nature acts as a buffer of life stress among rural elementary school children. The authors determined if the child lived near a natural environment, and then examined the child's self-worth and levels of psychological distress. Contact with nature not only decreased their stress, but higher amounts of exposure to natural environments indicated lower levels of stress in a child.

Nature and Children with ADD/ADHD

Coping with ADD: The Surprising Connection to Green Play Settings [19]

An increasing amount of evidence is showing that exposure to natural environments can mitigate a child's attentional disorder. Experimenters of a 2001 study analyzed this concept by surveying parents to compare their child's attentional functioning when engaging in leisure activities in indoor vs. outdoor settings. Results were that children had better attentional functioning after activities in greener settings. The greener the setting, the less severe the child's attentional disorder.

A Potential Natural Treatment for Attention-Deficit/Hyperactivity Disorder. Evidence from a National Study [20]

A follow-up nationwide study, conducted by the same authors in 2004, examined if "green" settings reduced symptoms of ADHD. Green outdoor after-school and weekend activities were

compared to activities that were in built indoor and outdoor settings. They found that “green outdoor activities reduced symptoms significantly more than did activities conducted in other setting, even when matched across all settings”. However, this study was not randomized, not controlled, and the “green activities” were not uniformly defined. Further research on this subject will help us better understand the true impact of the natural environment on attentional functioning.

Unorganized Play and Childhood Development

The Importance of Play in Promoting Healthy Child Development and Maintaining Strong Parent-Child Bonds [21]

The AAP also released a Clinical Report in 2007 on the importance of free play in the development of healthy children. Free play aids in physical, emotional, cognitive, and social development of a child. They stated that the benefits of play include health brain development, a more developed imagination, dexterity, emotional strength, and physical strength. The AAP suggests to parents and pediatricians to allow children to have more unstructured play.

Nature and Children with Asthma

Children Living in Areas with More Street Trees Have Lower Prevalence of Asthma [22]

A recent ecological study conducted in New York City has suggested that being exposed to a natural environment may be protective against early childhood asthma. Streets with a high tree density were positively associated with a lower prevalence of early childhood asthma in 4-5 year olds. Further research is currently being conducted to determine the extent to which the trees play a role in pediatric asthma.

Asthma and Atopy in Rural Children: Is Farming Protective? [23]

A meta-analysis of published research on the frequency of asthma and related disorders in rural children was conducted in 2003. It was found that early-life exposure to rural environments, especially in a farm environment, contained protective properties against asthma and related disorders compared to non-rural children. Although causality could not be determined in the study, exposure to a farm environment may confer some protection against asthma and atopy in children.

Recommendations

The American Academy of Pediatrics recommends that pediatricians promote free, unstructured play and discourage excessive passive entertainment such as TV, internet, and video games. In addition, parents are advised to record the number of times each week that their child spends outdoors for at least 30 minutes. The 2007 AAP Clinical Report on the importance of play for children is available [here](#), and the AAP Policy Statement on increasing physical activity in

children is available [here](#). The CDC encourages children to get at least 60 minutes of physical activity most days of the week, preferably daily (more information [here](#)). A program was launched by the American Medical Association and the American College of Sports Medicine to encourage physicians to prescribe exercise to their patients. Two-thirds of patients from a survey suggested that they would be more inclined to exercise if told by a physician. The program recommends 30-40 minutes of physical activity, five days a week. For more information, click [here](#).

There is ample evidence attributing improved health with physical activity. In addition, there is some evidence suggesting that nature specifically can improve attention and other psychological aspects of health. Playing in nature can positively impact children's health and well-being. We encourage parents and caregivers to get your children out into the natural environment. Together we can teach them how to protect their health and the environment.

Sources

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*BMI = Body-mass index; calculated using the formula: weight (lb) / [height (in)]² x 703. To calculate BMI for children/adolescents, click [here](#).

