



Environmental Literacy and Health Outcomes



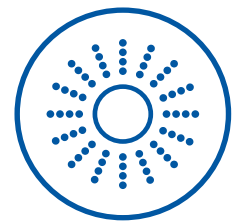
Environmental Literacy and Health Outcomes



Connecting people to nature and improving environmental literacy provides clear health benefits. For one thing, a healthier environment means healthier families, homes and communities. These programs also lead to more direct outcomes related to both physical and mental health. The studies summarized below highlight some of these health benefits.

Youth

- Seventh graders in the United Kingdom, who were identified as having social and emotional difficulties, participated in a school-sponsored outdoor education program that involved trust-building activities, group work, communication exercises, and a backpacking trip. Results from pre- and post-experience standardized assessments showed a significant **increase in self-concept**, indicating the potential for outdoor education programs to promote **positive mental health**. Qualitative data suggested other benefits such as improved emotional regulation, more positive interactions with family, and increased group cohesion. *(White, 2012)*
- Regular exercise is associated with a range of physical and mental benefits, and outdoor exercise is believed to enhance these. Given the immediate benefits of outdoor play and the fact that childhood physical activity is a good predictor of adult physical activity, researchers investigated whether urban programs connecting kids to nature in Milwaukee, Wisconsin, could influence outdoor play levels in fifth and sixth graders. Students participated in a yearlong program involving hands-on science activities and field trips. Following participation, students demonstrated a reduction in their fears of outdoor play, a potential barrier to increasing physical activity in nature. *(Beyer, Heller, Bizub, Kistner, Szaba, Shawgo, & Zetts, 2015)*



potential for outdoor education to promote mental health

- **Greening school grounds** involves increasing students' exposure to nature while at school through activities such as establishing gardens, restoring natural areas, planting trees, and expanding green spaces. Studies have reported on positive physical health impacts of greening school grounds such as increased sun protection, **increased physical activity of students**, decreased pesticide use, and improved nutrition and safety. Researchers have also shown **positive results affecting social, mental, and spiritual health**. (Bell & Dyment, 2008)



- A number of reviews of research have explored the evidence on the benefits of increasing young peoples' contact with nature. The research review found that children who spend time in natural areas may **experience physical health benefits** such as increased Vitamin D production, lower blood pressure, improved physical fitness and motor abilities, healthier weight, more energy, decreased respiratory problems, and overall better health. Mental health benefits may include **improved concentration**, more and enhanced play, **increased self-worth**, less depression, and overall improved psychological well-being. (Chawla, 2015)
- Noting overlap in the goals of environmental education and health promotion in schools, researchers have encouraged the use of programs that connect students to nature by school counselors and school nurses to support students' physical and mental health. (Flom, Johnson, Hubbard, & Reidt, 2011; Sendall, Lidstone, Fleming, & Domocol, 2013)



greening school grounds improved nutrition and safety

Adult



- As part of a study exploring the connection between nature relatedness (a measure of human-nature relationships) and well-being, researchers examined the influence of an environmental science class on undergraduate students at Carleton University in Canada. College students who completed a semester-long course had **increased nature relatedness and more vitality** when compared to students enrolled in other courses. Vitality is a measure of feeling alive and energetic and is associated with healthy individuals. (Nisbet, Zelenski, & Murphy, 2011)
- K-12 teachers in Arkansas participated in a two-day training that explored the environmental and health effects of pest management. Pre- and post-surveys indicated that the teachers increased their knowledge and **awareness of chemical use reduction and integrated pest management**. Survey results also supported the potential of knowledge and skill transfer into the classroom as a result of this training. (Ferguson, Kavouras, Ulmer, Harris, Rebecca, & Bursac, 2014)

- Nurses and other healthcare professionals attended a one-day workshop in Charleston, West Virginia that focused on local environmental issues. Pre- and post-workshop **surveys revealed an increase in participants' knowledge of environmental health issues** and an increase in awareness of local and national resources that address environmental health. Additionally, workshop participants noted an intention to share what they learned with their colleagues upon their return to work. (Mujuru & Niesen, 2004)
- Faculty members from medical, nursing, and physician's assistant schools in the United States took part in a one-day train-the-trainer workshop on children's environmental health that focused on topics such as how to take environmental histories, influence of the environment on pediatric asthma, and childhood exposure to lead and mercury. Pre- and post-workshop tests revealed increased content knowledge for the environmental health topics covered in the workshop. Over the next 12 months, workshop participants went on to train 1,559 additional health professionals. Follow-up interviews with participants suggested that, as a result of the workshop, participants were engaging in a range of environmental health activities from influencing changes in curriculum, affecting changes in attitudes, and direct involvement in community projects to address pediatric environmental health. (Rogers, McCurdy, Slavin, Grubb, & Roberts, 2009)
- Researchers investigated the effects of an **environmental health** kiosk targeting Latino women at a prenatal clinic in Salinas, California. The interactive computer program presented information on everyday environmental exposures such as indoor and outdoor air pollution, landscaping and food-related pesticides, hazardous household cleaners, and lead exposure. Quantitative and qualitative data indicated that users of the kiosk **increased their knowledge of environmental exposures** and reinforced existing environmental health knowledge. (Rosas, Trujillo, Camacho, & Madrigal, 2014)



addressing pediatric environmental health issues through involvement in community projects



School and Community Gardens

- Fourth and fifth grade students in Berkeley, California, participated in a school lunch initiative that included gardening, nutrition, and other activities that promoted environmental literacy. Data from surveys, interviews, and food diaries indicated a positive effect on students' knowledge of nutrition, preference for and eating of healthy foods, and attitudes about food. (Rauzon, Wang, Studer, & Crawford, 2010)

- Students in grades two through five took part in a summer garden program in four counties in Texas. Evaluation results demonstrated an increase in students' knowledge about the health benefits of fruits and vegetables and also showed that participating students were **eating healthier** snacks after completion of the program. *(Koch, Waliczek, & Zajicek, 2006)*
- Youth, ages 10 to 14, who identified as African American, Puerto Rican, Dominican, or Guyanese, participated in a six-week summer gardening program that involved organic gardening, collaborative cooking, and conducting research at a botanic garden in Brooklyn, New York. Interviews and focus groups with the students and their parents suggested that the youth increased their **preference for raw vegetables**, developed more positive attitudes about eating vegetables, and acquired cooking skills. *(Libman, 2007)*
- As part of their normal science curriculum, sixth graders in San Francisco took part in **garden-based learning sessions** that included time in the classroom and doing actual gardening. Pre- and post-tests assessed knowledge, attitudes, and behavior towards vegetables. Results indicated that students increased their knowledge of vegetables, preference for vegetables, consumption of vegetables, and consumption of a greater variety of vegetables, both in school and at home. *(Ratcliffe, Merrigan, Rogers, & Goldberg, 2011)*
- As part of a case study of a community kitchen and garden project with Aboriginal people in Vancouver, Canada, participants shared that they **increased their physical activity and intake of healthy foods**. Beyond these direct health outcomes, as a result of their garden participation, participants also enjoyed enhanced social interactions, which support general health and lead to increased access to health resources. Gardeners also described how health benefits extended beyond individuals creating benefits for community health and ecosystem health. *(Mundel & Chapman, 2010)*
- In Port Melbourne, Australia, adult participants in an urban community garden reported a number of physical and mental health benefits resulting from their garden experience, including improved nutrition, fitness, and emotional well-being. Community garden members described **increased social interactions and community connectedness and viewed the garden as a restorative sanctuary**. *(Kingsley, Townsend, & Henderson-Wilson, 2009)*
- Interviews with participants in an urban garden in Denver, Colorado, revealed that **community gardening facilitated numerous social interactions among community members**. Researchers hypothesized that these social processes lead to collective efficacy, a group's belief that it can work together to make positive change in a community, a factor shown to have positive impacts on health. This research suggests that community gardens contribute to personal health by increasing collective efficacy. *(Teig, Amulya, Bardwell, & Buchenau, 2009)*
- Members of fifteen urban community gardens in Toronto, Canada, provided data for a case study that looked at the health impacts of community gardening. Although the gardens differed in terms of size and organization, and the gardeners came from varied cultural backgrounds, common themes emerged suggesting a range of health benefits: **easier access to fresh vegetables that were cheaper and more culturally appropriate than store-bought produce**, improved nutrition from eating more organic vegetables and fruits, higher levels of physical activity, and improved mental health due to the restorative effects of nature. *(Wakefield, Yeudall, Taron, Reynolds, & Skinner, 2007)*