



## Health and the Environment

## Whole health learning: The revolutionary child of integrative health and education



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EXPLORE's "Health and the Environment" column seeks to highlight areas of intersection between environmental issues and integrative health and healing.

"You say you want a revolution -  
Well, you know..."

We all want to change the world."

- John Lennon/Paul McCartney

engage in health-risk behaviors.<sup>11</sup> Compounding the above challenges, ACEs via toxic stress pathways also lead to widening health disparities.<sup>12</sup> ACEs are common, with nearly 2/3 of adults reporting at least one type of ACE in childhood and approximately 1/4 reporting experiencing at least three types,<sup>13</sup> and they are costly: the estimated price to families, communities, and society exceeds hundreds of billions of dollars annually.<sup>14</sup>

## The state of children's health in America

The United States currently leads the world in national health spending while lagging behind many developed nations in critical health measures. National health spending is projected to grow at an average rate of 5.5% per year for 2018-27 and to reach nearly \$6 trillion by 2027.<sup>1</sup> At the same time, rates of chronic health care conditions continue to rise.<sup>2</sup> Deteriorations in mental health status for our country are staggering, as incidences of anxiety, depression, and suicide are surging among adolescents and young adults.<sup>3</sup> Emotional, mental and behavioral conditions affect millions of children, with increasing prevalence.<sup>4,5</sup> The greatest burden falls on the most vulnerable, as all of these conditions are significantly impacted by social determinants of health. Children, long known to be victims of environmental injustice, are particularly at-risk.<sup>6,7</sup> According to current best estimates from the 2017 U.S. Census, nearly 13 million U.S. children now live in poverty,<sup>8</sup> and almost 10 million families with children rely on the federal Supplemental Nutrition Assistance Program for basic food needs.<sup>9</sup> It is likely that these numbers will rise dramatically as a result of the economic fall-out from the COVID-19 pandemic. The American Psychological Association notes that poor children are at increased risk for "poor academic achievement, school dropout, abuse and neglect, behavioral and socioemotional problems, physical health problems, and developmental delays."<sup>10</sup>

Adverse childhood experiences (ACEs), potentially traumatic events disproportionately affecting our most vulnerable children, greatly increase risk for poor physical and emotional health outcomes in adults. Toxic stress, triggered by ACEs-related trauma, significantly affects nervous, endocrine, and immune system functioning, even altering DNA and ultimately brain structure via epigenetic mechanisms. Clinical phenomena resulting include distractibility, impulsivity, emotional dysregulation and a multitude of learning difficulties. Children thus impacted are at higher risk for physical and emotional health challenges throughout their lifetimes and more likely to

## Impact on education

Exposure to early trauma affects brain development and reaction to stimuli, specifically in the limbic system and cortex.<sup>15</sup> This presents challenges to learning, most prominently in the child's executive function, language development, communication, and emotional regulation. A reciprocal effect occurs as the child has challenges not only in learning, but also in reactivity to stimuli in the classroom, such as rejection, failure, negative reinforcement, and punishment. A limbic system shaped by trauma makes the brain state one of constant "fight or flight", rather than the relaxed alertness necessary for learning. When the learning process is challenging, it is exacerbated by emotional reactivity, a struggle to regulate, and a perception of threat whether one exists or not. Thus, the impact on ACEs in the classroom can make obstacles to educational success seem insurmountable.

Responsive pedagogy and educator awareness of mental, emotional, and behavioral health have proven effective in mitigating ACEs in educational settings. The same limbic brain that perceives threat and activates fear also thrives in an environment rich with positive relationships, reinforcement, and support.<sup>15</sup> Although ACEs can hinder the academic performance and success of a child, academic growth can be facilitated with a supportive and safe learning environment, strong relationships in the classroom, and a concerted effort to keep the child in school. Reducing academic and attendance challenges contributes to greater academic success, attenuates the impact of adverse experiences into adulthood, and improves health outcomes across the lifespan.<sup>16</sup> Educational policy has become increasingly reflective of the need to consider the overall wellbeing of the child - physically, socially, and emotionally - with a focus upon systems and programs that support that holistic scope. An emphasis on social emotional learning (SEL) in schools has become an educational priority, as a way to reduce barriers to educational success and to build awareness and understanding of the role of emotional and community wellness in long-term learning and health outcomes. SEL, as defined by the Collaborative for Academic, Social, and Emotional Learning (CASEL), is "the process through which children and adults

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understand and manage emotions, set and achieve positive goals, feel and show empathy for others, establish and maintain positive relationships, and make responsible decisions.”<sup>17</sup> The five key components of SEL are self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. While educators inherently recognize the value of educating the whole student by attending to their mental, emotional, and behavioral needs, it has only become a curriculum requirement in recent years, and in certain states. Additionally, many schools have independently implemented facets of SEL-enabling pedagogy in place, drawing from various health promoting domains such as mindfulness programs, nature education, nutrition learning including teaching kitchens, schools gardens, and cognitive-based physical education. While these initiatives have shown promise, they are staggered and siloed, implemented and evaluated inconsistently across schools, districts, and states. The Centers for Disease Control and Prevention support school wellness policies in theory but only cite nutrition and physical activity as critical components.<sup>18</sup> The Whole School, Whole Community, Whole Child (WSCC) model recognizes the need for improved collaboration between health and education systems to best serve students.<sup>19</sup> While the WSCC paradigm broadens the scope of health promotion to include psychosocial concerns and encourages family and community involvement, it leaves out other promising pieces of a comprehensive integrated program, like mindfulness and the other domains cited previously. Though ACEs and SEL have risen to the forefront of educational policy awareness, actually building comprehensive programs can be quite challenging, particularly when educators may be fully aware of the need but lack the time and support to implement and study interventions.

### The revolution: Whole Health Learning

The complex interplay between health and educational challenges demands creative new collaborations between both spheres. The siloed solutions of yesterday no longer adequately serve, and the choreographed coordination of health promotion components is needed. Access to an integrated, comprehensive, and customizable SEL-based wellness studies program, designed to mitigate ACEs and improve long term health via self-care competency, would greatly benefit students, educators, families, and communities. Furthermore, it would complement and amplify existing successful school and community initiatives, creating an accessible, proactive, and holistic wellness creation model for children and families. We call this approach “Whole Health Learning” (WHL). At its core, WHL represents the application of core pediatric integrative health principles<sup>20</sup> to the educational environment, including these four key values:

- *Preventive*: Focus on health promotion and creation, favoring proactive strategies to reactive solutions.
- *Context-centered*: Children are nurtured within the context of healthy families, communities, and schools.
- *Relationship-based*: Only through open communication and building trust are we best able to work together to ensure each child’s optimal wellbeing.
- *Participatory*: Creating health should be a collaborative process, actively encouraging participation and putting children in control of their own health.

Delivered via an integrated framework of whole health domains, WHL best addresses the complex needs of today’s students, serving as a bridge to sustainable, life-long emotional and physical wellbeing. When students graduate high school with a competency in Wellness Studies, they will have established a foundation for life-long behavioral habits that optimize health outcomes. These habits are what we term “lifestyle prescriptions” – nutrition, exercise, sleep, mindfulness, nature - the bedrock of integrative health practice.

As a proof of concept, the inaugural WHL pilot program was implemented in Lakeside Middle School, in Millville, New Jersey in December, 2018 under the direction of Dr. Kate Tumelty Felice. Millville is a city of predominantly low socioeconomic status residents, in a county where the health outcomes are ranked the lowest in the state.<sup>21</sup> The WHL pilot - named the “Wellness Studies Program” - engaged middle school students (grades 6-8) and included mindfulness, nutrition, cognitive fitness, and nature education components. It was informed by NJ SEL standards,<sup>22</sup> as well as best practices of partner organizations assisting in program delivery. Created by and supplemented with feedback from both educators and students, the program was implemented as a series of workshops introducing specific wellness concepts, each building successively upon the other through reinforcement and experiential learning. The pilot program ran until June, 2019 and was funded for re-implementation for the 2019–2020 school year. The Wellness Studies Program is among the earliest known efforts to integrate a set of distinct wellness programs into a unified learning experience designed to meet academic and SEL goals. Program metrics have been collected and are currently in analysis. The goal is to refine the program and expand to a number of other schools in different geographic regions throughout the U.S. over the next several years. Perhaps one day, wellness studies programs will be fully embedded within all U.S. schools as part of a national public wellness initiative. There may be no better method to effectively and equitably improve the health of our nation while simultaneously reducing health care costs.

### Call for a national public wellness infrastructure

Over the past twenty years, integrative health experts have recognized the emerging cascade of socially-determined illnesses and their long-term effects, issuing repeated warnings about the need for urgent action to prevent further erosion of the physical and mental health and wellbeing of our nation’s children. Despite significant investments by healthcare entities and philanthropic organizations, children’s health has continued to deteriorate. The circular impact of poor health on education, and of learning challenges on short- and long-term health, is magnified by the increasing toll of ACEs and resulting toxic stress on our most vulnerable youth. Yet there is hope; evidence suggests that proactive, participatory, community-based interventions are effective strategies to mitigate health risks. Recently, several national entities have recognized the value of infusing more holistic health learning in schools, perhaps the most accessible and cost-effective environments in which to teach lifelong habits leading to positive health behaviors and, ultimately, health outcomes.

- The NCCIH in 2018 hosted a roundtable on “Emotional Well-Being: Emerging Insights and Questions for Future Research.”<sup>23</sup> Several model programs profiled included school interventions aimed at students and teachers. One initiative, MindUP,<sup>24</sup> a highly innovative mindfulness education program, aims to “move away from deploying interventions after damage occurs and more toward prevention—that is, to build a ‘life jacket’ that can serve to boost resiliency through SEL.”<sup>23</sup>
- The CDC, in its 2019 report, “Preventing Adverse Childhood Experiences (ACEs): Leveraging the Best Available Evidence,” included “teaching skills to help parents and youth handle stress, manage emotions, and tackle everyday challenges” via SEL in schools as a key strategy.<sup>11</sup>
- Also in 2019, the National Academies Press released, “Fostering Healthy Mental, Emotional, and Behavioral Development in Children and Youth: A National Agenda,” co-sponsored by the CDC, NIH and several other government agencies.<sup>25</sup> The report highlights three key promotion and prevention strategies, one being programs delivered in school settings. Notable is a priority “to

teach children in preschool and grades K–12 social and emotional skills, including mindful awareness practices.”

This expressed support of whole health learning programs within schools as effective means to ameliorate the impact of ACEs on education and health is welcome. However, educators alone cannot be asked to solve the immense challenges inherent in creating and sustaining an optimally effective and cost-effective health promotion system. The Institute of Medicine, in a 1997 report titled “Schools & Health: Our Nation’s Investment,”<sup>26</sup> cautioned, “The schools of yesterday were not expected to solve the health and social problems of the day by themselves; the medical, public health, social work, legislative, and philanthropic sectors all pitched in. Given the scope and complexity of the health problems of today’s children and young people, it is again likely that schools will not be able to provide solutions without the cooperation and support of families, community institutions, the healthcare enterprise, and the political system.” This remains the case, nearly a quarter of a century later. The IOM report noted that “a strong interconnected infrastructure will be essential if CSHP [coordinated school health programs] are to become established and flourish.”<sup>26</sup> What was needed then is as urgently needed now. Educators, and particularly the courageous teachers doing this work today, classroom by classroom, deserve our support. Establishing a national public wellness infrastructure to foster health-education partnerships nurturing whole health promoting habits throughout the lifespan, must be a priority.

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## References

- Centers for Medicare & Medicaid Services. National health expenditure projections 2018–2027. 2020. Available at: <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/Downloads/ForecastSummary.pdf>, Accessed April 8, 2020.
- Raghupathi W, Raghupathi V. An empirical study of chronic diseases in the United States: a visual analytics approach. *Int J Environ Res Public Health*. 2018;15(3):431. <https://doi.org/10.3390/ijerph15030431>. Published Mar 1 2018.
- Twenge Jean M, Cooper ABell, Joiner Thomas E, Duffy Mary E, Binou Sarah G. Age, period, and cohort trends in mood disorder indicators and suicide-related outcomes in a nationally representative dataset. *J Abnorm Psychol*. 2019;2005–2017. <https://doi.org/10.1037/abn0000410>.
- Ghandour RM, Sherman LJ, Vladutiu CJ, et al. Prevalence and treatment of depression, anxiety, and conduct problems in US children. *J Pediatr*. 2019;206:256–267. <https://doi.org/10.1016/j.jpeds.2018.09.021>. Mare3.
- Bitsko RH, Holbrook JR, Ghandour RM, et al. Epidemiology and impact of health care provider-diagnosed anxiety and depression among US children. *J Dev Behav Pediatr*. 2018;39(5):395–403. <https://doi.org/10.1097/DBP.0000000000000571>.
- Rosen LD, Imus D. Environmental injustice: children’s health disparities and the role of the environment. *Explore*. 2007;3(5):524–528. Review. PubMed PMID: 17905366.
- Rosen LD, Imus D. The growing pediatric health gap: environmental injustice threatens our future. *Explore*. 2016;12(5):302–307. <https://doi.org/10.1016/j.explore.2016.06.008>.
- The Annie E. Casey Foundation. 2019 kids count data book: state trends in child well-being. 2020. Available at: <https://www.aecf.org/m/resourcedoc/aecf-2019kidscountdatabook-2019.pdf>, Accessed April 8, 2020.
- Feeding America. Understanding SNAP, the supplemental nutrition assistance program. 2020. Available at: <https://www.feedingamerica.org/take-action/advocate/federal-hunger-relief-programs/snap>, Accessed April 8, 2020.
- American Psychological Association. Effects of poverty, hunger and homelessness on children and youth. 2020. Available at <https://www.apa.org/pi/families/poverty>, Accessed April 8, 2020.
- Centers for Disease Control and Prevention. Preventing Adverse Childhood Experiences (ACEs): leveraging the best available evidence. 2020. Available at: <https://www.cdc.gov/violenceprevention/pdf/preventingACEs-508.pdf>, Accessed April 8, 2020.
- Shonkoff JP, Garner AS; committee on psychosocial aspects of child and family health; committee on early childhood, adoption, and dependent care; section on developmental and behavioral pediatrics. The lifelong effects of early childhood adversity and toxic stress. *Pediatrics*. 2012;129(1):e232–e246. <https://doi.org/10.1542/peds.2011-2663>.
- Merrick MT, Ford DC, Ports KA, et al. Prevalence of adverse childhood experiences from the 2011–2014 behavioral risk factor surveillance system in 23 states. *JAMA Pediatr*. 2018;172(11):1038–1044. <https://doi.org/10.1001/jamapediatrics.2018.2537>.
- Centers for Disease Control and Prevention. Preventing adverse childhood experiences. Available at: <https://www.cdc.gov/violenceprevention/childabuseandneglect/aces/fastfact.html>, Accessed April 8, 2020.
- Van der Kolk, Bessel A. *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*. New York: Viking; 2014.
- Dube SR, McGiboney GW. Education and learning in the context of childhood abuse, neglect and related stressor: the nexus of health and education. *Child Abuse Negl*. 2018;75:1–5. <https://doi.org/10.1016/j.chiabu.2017.09.029>.
- Collaborative for Academic, Social, and Emotional Learning. What is SEL? Available at: <https://casel.org/what-is-sel/>, Accessed April 8, 2020.
- Centers for Disease Control and Prevention. Local school wellness policy. Available at: <https://www.cdc.gov/healthyschools/npao/wellness.htm>, Accessed April 8, 2020.
- ASCD. Whole school, whole community, whole child. Available at: <http://www.ascd.org/programs/learning-and-health/wssc-model.aspx>, Accessed April 8, 2020.
- Esparham A, Misra SM, Misra S, et al. Pediatric integrative medicine: vision for the future. *Children*. 2018;5(8). <https://doi.org/10.3390/children5080111>.
- County Health Rankings & Roadmaps. New Jersey. Available at: <https://www.countyhealthrankings.org/app/new-jersey/2019/rankings/cumberland/county/outcomes/overall/snapshot>, Accessed April 8, 2020.
- State of New Jersey Department of Education. Social and emotional learning. Available at: <https://www.state.nj.us/education/students/safety/sandp/sel/>, Accessed April 8, 2020.
- National Institutes of Health. Emotional well-being: emerging insights and questions for future research. Available at: [https://files.ncch.nih.gov/s3fs-public/Emotional%20Well-Being%20Roundtable%20Summary%20MASTER%20FINAL%20September2018\\_508.pdf?eq0JqgpH\\_u5wb.rYnOoikp6iI2Th05Wh](https://files.ncch.nih.gov/s3fs-public/Emotional%20Well-Being%20Roundtable%20Summary%20MASTER%20FINAL%20September2018_508.pdf?eq0JqgpH_u5wb.rYnOoikp6iI2Th05Wh), Accessed April 8, 2020.
- The Goldie Hawn Foundation. MindUP. Available at <https://mindup.org/>, Accessed April 8, 2020.
- National Academies of Sciences, Engineering, and medicine; division of behavioral and social sciences and education; board on children, youth, and families; committee on fostering healthy mental, emotional, and behavioral development among children and youth. *Fostering Healthy Mental, Emotional, and Behavioral Development in Children and Youth: A National Agenda*. Washington (DC): National Academies Press (US); 2019 Sep 11. <https://doi.org/10.17226/25201>. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK551842/>.
- Institute of Medicine. Evolution of school health programs. In: Allensworth D, Lawson E, Nicholson L, Wyche J, eds. *Schools & Health: Our Nation’s Investment*. Washington, DC: National Academies; 1997:48–50. Available at: <http://www.nap.edu/openbook.php?isbn=0309054354>, Accessed April 8, 2020.

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