

CATEGORY: POPULATIONS/PROGRAMS

Children, Youth & College Student Populations & Programs

Horticulture can impact children and youth on many levels from increasing physical activity through gardening, improving nutrition by growing, tasting and eating healthy produce, promoting resiliency at school gardens, after-school horticulture programs and wilderness camps, and connecting with nature and plants in support of environmental stewardship. Plant-based recreational and therapeutic activities are being used to address psychological impacts, adverse childhood experiences (ACE), trauma, family disruption, homelessness, early childhood development, and nutrition issues. Horticulture programs for this population are delivered at a variety of places including schools, treatment centers, camps, and public gardens.

Research focuses on child and youth attitudes, behavior, neurosequential development and how plants, gardens and nature can positively impact child and youth populations. The body of literature relating nature engagement with health benefits, particularly for young people, is increasing exponentially. Increasing attention is being paid to youth and college aged young people, recognizing that connections to nature and gardening can reduce their stress, improve attention and coping skills, and provide positive leisure activities. Resources in this document have separated out research with a distinct focus on college students using horticulture for positive health outcomes.

Newer initiatives are focusing on social emotional learning in gardens (Oh et al., 2020; Dankew et al., 2020; Mann et al., 2022), increasing nature exposure as antidote to digital screen time, and using nature connections to address high rates of obesity (American Academy of Pediatrics *Clinical Practice Guidelines*). The breadth of initiatives speaks to the broader framework FLHHN supports: *National Schoolyard Forest System* <https://www.greenschoolyards.org/schoolyard-forest-system> and Zeiger's study that found pediatric primary care providers want to include nature counseling, connections to nature and HT as part of their services.

For related resources refer to category Landscapes for Health: School Gardens and category Horticultural Therapy & Health Services: Autism populations

Key Organizations checked

[American Horticultural Society Youth Gardening](#)

[Children & Nature Network](#)

[Green Schoolyards America](#)

[Junior Master Gardener Program](#)

[Kids Gardening](#)

[National Schoolyard Forest System](#)

[Whole Kids Foundation](#)

Books, journals & epublications on children & youth horticulture programs

[Junior Master Gardener curricula](#)

Latane, C. (2021). *Schools that heal: Design with mental health in mind*. Island Press.

[National Agriculture in the Classroom](#). (2022). Agricultural literacy curriculum matrix (searchable data base).

National Wildlife Federation. (2022). [Growing a wild NYC \(a K-5 urban pollinator curriculum\)](#).
Rakow, DA. & Eells, GT. (2019). *Nature Rx: Improving college-student mental health*. Cornell University Press.
[Research Digest](#) (Children & Nature Network)
Wagenfeld, A. (2025). [Youth sensory gardening manual](#). American Horticultural Society.

***Research & articles on college students & horticulture programs is listed after this section.**

Research & articles on children & youth horticulture programs.

Recently published selected research & articles:

- Allah Yar, M., & Kazemi, F. (2020). The role of dish gardens on the physical and neuropsychological improvement of hospitalized children. *Urban Forestry & Urban Greening*, 53.
- Anaebo, J., Agbonome, P., Agu, A. et al. (2023). Exploring the use of landscape to enhance social interactions among the inmates of centres for destitute children. *Int J of Innovative Environmental Studies Research*, 11(3).
- Anwar, DR., & Selim, G. (2025). Integrating child-friendly green spaces into post-disaster recovery: Psychological, physical, and educational sustainability impact on children's well-being. *Sustainability*, 17(18).
- Bhatti, F., Leeuwerik, T., Savins, C., & Jackson, L. (2025). An interpretative phenomenological analysis of the experience of a nature-based therapy intervention for children with long-term health conditions and associated psychological difficulties. *Journal of Health Psychology*, 30(9).
- Baik, H., Choi, S., An, M. et al. (2024, April). Effect of therapeutic gardening program in urban gardens on the mental health of children and their caregivers with atopic dermatitis. *Healthcare*, 12(9).
- Barbieri, C., Oldfield, L., Norman, H., & Gould, G. (2026). Evaluation of a nature-based psychological intervention: Dose of Nature Young People's Programme. *Journal of Ecopsychology*.
- Bennett, A. (2023). [Gardening and sustainability lessons for kid](#). *Today's Homeowner.com*.
- Bell, K., & Bell, A. (2025). *Akeem keeps bees! Close-up look at the honey makers and pollinators of Sandofa Farms* (written by a child).
- Bølling, M., Niclasen, J., Bentsen P., & Nielsen, G. (2019). Association of education outside the classroom and pupils' psychosocial well-being: Results from a school year implementation. *Journal of School Health*, 89.
- Cai, C., Mei, Z., Wang, Z., & Luo, S. (2025). School-based interventions for resilience in children and adolescents: A systematic review and meta-analysis of randomized controlled trials. *Frontiers in Psychiatry*, 16.
- Chawla, L. (2021). Knowing nature in childhood: Learning and wellbeing through engagement with the natural world. In A. Schutte, J. Stevens & J. Torquati (Eds.), *Nature and psychology: How the natural world shapes our cognition*. Springer Science + Business Media.
- Chawla, L. (2020). Childhood nature connection and constructive hope: A review of research on connecting with nature and coping with environmental loss. *People and Nature*, 2(3).
- Chen, ML., Lo, LC., & Lou, SJ. (2018). Effects of strength-based approach horticultural therapy on primary students' resilience. *Creative Education*, 9(16).
- Choe, EY., & Sheffield, D. (2025). Rebuilding human-nature connections in children and adolescents: Insights from a meta-analysis. *Environmental Education Research*, 31(2).
- Clevenger, KA., McKee, KL., Harris, T., & Pfeiffer, KA. (2025). Schoolyard-redesign strategies and outcomes in children and adolescents: A systematic review. *Kinesiology Review*, 14(4).

- Cueva, K., Speakman, K., Neault, N. et al. (2020, June). Cultural connectedness as obesity prevention: Indigenous youth perspectives on Feast for the Future. *J Nutr Educ Behav.*, 52(6).
- Curzio, O., Billeci, L., Belmonti, V., Colantonio, S. et al. (2022). Horticultural therapy may reduce psychological and physiological stress in adolescents with anorexia nervosa: A pilot study. *Nutrients*, 14(24).
- D'Amore, C., & Chawla, L. (2020). Significant life experiences that connect children with nature: A research review and applications to a family nature club. In A. Cutter-Mckenzie, K. Malone & E. Barratt Hacking (Eds.), *International research handbook on childhood nature* (pp. 799-825). Springer.
- Dankiw, KA., Tsiros, MD., Baldock, KL., & Kumar, S. (2020). The impacts of unstructured nature play on health in early childhood development: A systematic review. *PLoS ONE*, 15(2).
- Diehl, L. (2021). The effect of therapeutic horticulture on student wellbeing. *AHTA Magazine*, 49(3).
- Dunker, C., Gray, CE., & Kahn Jr, PH. (2025). Coding manual for adolescent-nature interactions at a youth group home.
- Edwards, G. (2025). Using photovoice to explore students' experiences with a hydroponic shipping container Farm. *Journal of Experiential Education*, 48(3).
- Elten, M., Benchimol, El., Fell, DB. et al. (2021). Residential greenspace in childhood reduces risk of pediatric inflammatory bowel disease: A population-based cohort study. *Am J Gastroenterol.*, 116(2).
- Engemann, K., Pedersen, CB., Arge, L. et al. (2019). Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *Proc Natl Acad Sci U S A.*, 116(11).
- Fleming, L., & Sterling, S. (2024). [Students, school gardens and mental health](#). *Cultivate*, 4(2).
- Fleming, L., & Sterling, S. (2024). [School gardens: Platforms for learning, therapy & community involvement](#). *Cultivate*, 4(2).
- Fury, E. (2025). [Sensory gardens for students with visual and multiple impairments: Cultivating inclusive learning environments](#). *Paths to Literacy*.
- Gigliotti, F. (2025). 'Growing in nature': Evaluating the impact of a nature-based intervention on sensory, emotional, social, and adaptive functioning in children with autism spectrum disorder.
- Gillies, C., & Baay, C. (2025). Gardening initiatives as an approach to cancer prevention for children and youth. *Public Health*, 242.
- Greenschoolyards.org. (2024). [Experiencing nature supports social-emotional health and well-being](#).
- Grimes, KE. (2021). The Wild Earth Preschool. *AHTA Magazine*, 49(1).
- Guo, L., Xu, W., Shi, Y. et al. (2024). Which horticultural activities are more effective for children's recovery from stress and mental fatigue? A quasi-experimental study. *Front Psychol.*, 5.
- Harris, NM., Hartwell, B., Thomas, L., & Grace, M. (2025). How can nature connectedness and behaviours for learning be deliberately developed in children, adolescents and young adults? A systematic literature review. *Child Adolesc Ment Health.*, 30(2).
- Hollis, A., & Bruno, B. (2021). The effects of horticultural therapy on at-risk youth. *ISHS Acta Horticulturae 1330: XV International People Plant Symposium and II International Symposium on Horticultural Therapies: The Role of Horticulture in Human Well-being and Social Development*.
- Howe, M., & Robinson, J. (2025). Urban agriculture education for teens: A multidimensional study of positive psychosocial and metacognitive outcomes. *Journal of Agriculture, Food Systems, and Community Development*, 14(2).
- Hux, GE., Rice, S., Wagenfeld, A., & Schoen, SA. (2025). Garden on the Go: A feasibility study of a gardening program to support mental health and resilience in youth with adverse childhood experiences. *Children*, 12(11).
- Jeong, S., Moon, J., Yoo, E. et al. (2025). Effect of gardening activities in early childhood education institutions. *Acta Psychol (Amst)*, 260.

- Jeong, Y., Kim, M., Chang, T., & Yun, S. (2021). Components for early childhood horticultural education program derived from expert delphi research. *Journal of People, Plants, and Environment*, 24(2).
- Johnson-Jennings, M., Paul, K., Olson, D. et al. (2020). Ode'imin Giizis: Proposing and piloting gardening as an indigenous childhood health intervention. *Journal of Health Care for the Poor and Underserved*, 31(2).
- Jordaan, M., & Falk, AF. (2025). Sensory gardens in under-resourced early childhood development centers. *International Journal of Early Childhood Learning*, 32(1).
- Jung, SM., & Lee, S. (2021). Effects of interpersonal caring horticultural activities program on interpersonal caring need, aggression, depression and life respect consciousness in high school students. *ISHS Acta Horticulturae 1330: XV International People Plant Symposium and II International Symposium on Horticultural Therapies: The Role of Horticulture in Human Well-being and Social Development*.
- Karthikeyan, V. (2023). Horticultural therapy activities can reduce stress and enhance the social and cognitive skills in autism children. *International Journal of Intellectual Disability*.
- Kellstedt, DK., Suess, CS., & Maddock, JE. (2024). Influences of outdoor experiences during childhood on time spent in nature as an adult. *American Journal of Preventative Medicine Focus*.
- Kim, S., Yang, S., Lee, D. et al. (2025). Plant-mediated therapy program reduced aggression and improved psychological well-being in elementary school students. *HortScience*, 60(10).
- Kim, J., Yun, S., & Chang, TA. (2023). Meta-analysis of horticultural therapy programs for children: Focusing on journal articles. *Journal of People, Plants, and Environment*, 26(5).
- Kim, YK., Ryu, JY., Yun, SY., & Choi, BJ. (2020). Relationship satisfaction and emotional change between parents and children through the Agro-Healing Program. *Journal of People, Plants, and Environment*, 23(5).
- Kim, HR., Kim, SO., & Park, SA. (2021). The effects of horticultural activity program on vegetable preference of elementary school students. *Int J Environ Res Public Health.*, 18(15).
- Kim, SO., Oh, YA., & Park, SA. (2020). Foliage plants improve concentration and emotional condition of elementary school students performing an intensive assignment. *HortScience*, 55(3).
- Kim, SO., Jeong, JE., Oh, YA. et al. (2021). Comparing concentration levels and emotional states of children using electroencephalography during horticultural and nonhorticultural activities. *HortScience*, 56(3).
- Kirk, G., & Jay, J. (2018). Supporting kindergarten children's social and emotional development: Examining the synergetic role of environments, play, and relationships. *Journal of Research in Childhood Education*, 32(4).
- Kumbham, R. (2025). Transforming barren land into green learning spaces: The cognitive and emotional impact of low-cost greening interventions in Indian Government Schools. *International Journal on Science and Technology*, 16(3).
- Küpeli, K., & Bayındır, D. (2025). Preschool outdoor education environment quality predicts children's environmental attitude, awareness and affinity towards nature (biophilia). *Early Years*.
- Kwack, HR. (2021). Development and application of horticultural kit for children's horticulture education. *Journal of People, Plants, and Environment*, 24(6).
- Lee, S., & Park, S. (2024). Psychophysiological and psychological responses of teenage students conducting computer programming activities combined with horticultural activities. *HortTechnology*, 34(3).
- Lee, SY., Jang, EJ., & Kim, J. (2023). Analysis of horticultural activity programs in research articles on horticultural therapy for children in Korean journals. *Journal of People, Plants, and Environment*, 26(3).

- Lee, AY., Kim, HR., Kwon, HJ. et al. (2021). Improving children's emotional health through installing biowalls in classrooms. *Journal of People, Plants, and Environment*, 24(1).
- Lee, AY., Kim, SO., Gim, GM. et al. (2020). Care farming program for family health: A pilot study with mothers and children. *International Journal of Environmental Research and Public Health*, 17(1).
- Lorimer, J., Menon, S., Polgreen, K. et al. (2025). A scoping review of nature-based programmes in schools for mental health and wellbeing in young people. *Oxford University Research Archive*.
- Mann, J., Gray, T., Truong, S. et al. (2022). Getting out of the classroom and into nature: A systematic review of nature-specific outdoor learning on school children's learning and development. *Front Public Health*, 10.
- Mason, L., Mastromatteo, LY., Rocchi, C., & Scrimin, S. (2025). Affect and conceptual learning in indoor and green outdoor school environments: Psychophysiological self-regulation matters. *British Journal of Educational Psychology*.
- Mason, T. (2024). Campus nature Rx. *Digging In*, 10(2).
- Mayne, SL., Kelleher, S., Hannan, C. et al. (2022). Neighborhood greenspace and changes in pediatric obesity during COVID-19. *Am J Prev Med.*, 50749-3797(22).
- McCoy, AR. (2025). Exploring the therapeutic potential of a school-based ecotherapy intervention on the emotion regulation of elementary students. Dissertation: *University of Dayton*.
- McFarland, A., Sommerfeld, A., Waliczek, TM., & Zajicek, J. (2023). Use of gardening programs as an intervention to increase children's ability to delay gratification. *HortTechnology*, 33(1).
- McQuay, C., Olmstead, C., Reamy, T. et al. (2020). Exploring the impact of nature-based intervention on the physiology, emotions, and ability to self-regulate in at-risk preadolescent youth. *American Journal of Occupational Therapy*, 74(4).
- McVeigh, M., Kassiotis, E., & McVeigh, CG. (2026). Therapeutic gardening groups with children and young people who have experienced maltreatment. *Australian Social Work*, 79(1).
- Miller, CT. (2019). Plant madness: A classroom game using bracketology for horticulture plant identification courses. *HortTechnology*, 29(2).
- Monsur, M., Hefner, T., Van Allen, J. et al. (2024). Effects of childcare hands-on gardening on preschoolers' (3-5 Years) physical activity in semi-arid climate zone. *Int J Environ Res Public Health*, 21(5).
- Moran, M., Brown, C., Hernandez, AA. et al. (2025). Farm-based therapy: An innovative treatment approach for children, adolescents and young adults. *Complementary Therapies in Clinical Practice*, 59.
- Muhl, CS. (2025). Moving health care upstream to advance health, health quality, and health equity: Defining social prescribing and exploring the impact on children and youth. *Queen's University*.
- Muzaffar, H., Guenther, E., Bosse, O. et al. (2023). Effectiveness of gardening-only, cooking-only and combined cooking and gardening programs in elementary schools to improve fruit and vegetable intake: A systematic review. *Nutrients*, 15(13).
- Mygind, L., Kjeldsted, E., Hartmeyer, R. et al. (2019). Mental, physical and social health benefits of immersive nature-experience for children and adolescents: A systematic review and quality assessment of the evidence. *Health & Place*, 58.
- Neshteruk, CD., Skinner, AC., Counts, J. et al. (2023). Translating knowledge into action for child obesity treatment in partnership with Parks and Recreation: Study protocol for hybrid type II trial. *Implementation Science* 18(6).
- Norwood, MF., Lakhani, A., Fullagar, S. et al. (2019). A narrative and systematic review of the behavioural, cognitive and emotional effects of passive nature exposure on young people: Evidence for prescribing change. *Landscape and Urban Planning*, 189.

- Nunez, GH., & Neves da Silva, M. (2021). At-home plant growing kits foster positive student experiences in an online horticulture course. *HortTechnology*, 31(6).
- Obeng, JF., Kangas, K., Stamm, I., & Tolvanen, A. (2023). Promoting sustainable well-being through nature-based interventions for young people in precarious situations: Implications for social work. A systematic review. *Journal of Happiness Studies*, 24.
- Oh, YA., Lee, AY., An, K., & Park, SA. (2020). Horticultural therapy program for improving emotional well-being of elementary school students: An observational study. *Integrative Medicine Research*, 9(1).
- Oh, YA., Kim, SO., & Park, SA. (2019). Real foliage plants as visual stimuli to improve concentration and attention in elementary students. *Int J Environ Res Public Health*, 16(5).
- Overbey, TA., Diekmann, F., & Lekies, KS. (2023). Nature-based interventions for vulnerable youth: A scoping review. *Int J Environ Health Res*, 33(1).
- Padial-Ruz, R., Puga-González, ME., Céspedes-Jiménez, Á., & Cabello-Manrique D. (2021). Determining factors in the use of urban parks that influence the practice of physical activity in children: A systematic review. *Int J Environ Res Public Health*, 18(7).
- Paquet, S., Struthers, NA., Gunz, A., & Gittings, L. (2025). Barriers and facilitators to implementing nature prescriptions for child and youth health: A scoping review. *Health Promotion International*, 40(2).
- Park, KH., Kim, SY., & Park, SA. (2022). Efficacy of a horticultural therapy program designed for emotional stability and career exploration among adolescents in juvenile detention centers. *Int J Environ Res Public Health*, 19(14).
- Park, YH., Yung, SY., Choi, BJ., & Choi, HS. (2019). Floral design courses to build self-esteem in children enrolled in the Community Child Care Center for low-income families: Focused on the accreditation process of the Junior Florist Certification. *J People Plants Environ*, 22(4).
- Passy, R., & Gilchrist, M. (2025). Maximising project sustainability: The children and nature outdoor learning programme in England. In *Risk and outdoor play: Listening and responding to International voices: Part 1* (pp. 57-68). Springer Nature Singapore.
- Pentz, T., & Straus, M. C. (2024). Children and youth and horticultural therapy practice. In *Horticulture as Therapy* (pp. 199-230). CRC Press.
- Psychology Tools. (2024). [Psychological assessment tools for mental health: OCD](#) [& other areas like anxiety, body dysmorphia, self-esteem].
- Qianqian, Z., & Hassan, A. (2025). The power of plants: Physiological and psychological relaxation through horticultural activities in children. *Child Indicators Research*, 18(6).
- Rees-Punia, E., Holloway, A., Knauff, D., & Schmidt, MD. (2017). Effects of school gardening lessons on elementary school children's physical activity and sedentary time. *Journal of Physical Activity and Health*, 14(12).
- Rigillo, G., Blom, JM., Cocchi, A. et al. (2025). Medicinal plants for child mental health: Clinical insights, active compounds, and perspectives for rational use. *Children*, 12(9).
- Rowley, M., Topciu, R., & Owens, M. (2022). A systematic review of mechanisms underpinning psychological change following nature exposure in an adolescent population. *Int J Environ Res Public Health*, 19(19).
- Ryu, JY., Yun, SY., & Choi, BJ. (2020). Effects of horticultural therapy on the emotions and stress index of trainees entrusted to the Juvenile Classification Review Center. *Journal of People, Plants, and Environment*, 23(1).
- Sääkslahti, A., & Niemistö, D. (2021). Outdoor activities and motor development in 2–7-year-old boys and girls. *Journal of Physical Education and Sport*, 21(S1).

- Sachs, AL., Coringrato, E., Sprague, N. et al. (2022). Rationale, feasibility, and acceptability of the meeting in nature together (MINT) program: A novel nature-based social intervention for loneliness reduction with teen parents and their peers. *Int J Environ Res Public Health.*, 19(17).
- Shao, Y., Elsadek, M., & Liu, B. (2020). Horticultural activity: Its contribution to stress recovery and wellbeing for children. *Int J Environ Res Public Health.*, 17(4).
- Shinde, S., Wang, D., Moulton, GE., & Fawzi, WW. (2025). School-based health and nutrition interventions addressing double burden of malnutrition and educational outcomes of adolescents in low-and middle-income countries: A systematic review. *Maternal & Child Nutrition*, 21.
- Slagle, T. (2019). Program example: Neurosequential approach to horticultural therapy. In Haller, Kennedy & Capra (Eds.) *The profession and practice of horticultural therapy*. CRC Press.
- Sommerfield, A., McFarland, A., Wilczek, T., & Zajicek, J. (2021). Use of gardening programs as an intervention to increase children's visual-motor integration. *HortTechnology*, 31(5).
- Son, HJ., & Park, SA. (2025). The impact of an agro-healing program on family resilience, parental stress, and social skills of children with developmental disabilities. *Heliyon*, 1(4).
- Stevenson, MP., Dewhurst, R., Schilhab, T., & Bentsen, P. (2019). Cognitive restoration in children following exposure to nature: Evidence from the Attention Network Task and Mobile Eye Tracking. *Front. Psychol.* 10.
- Stluka, S., McCormack, LA., Burdette, L. et al. (2019). Gardening for health: Using garden coordinators and volunteers to implement rural school and community gardens. *Prev Chronic Dis.*, 16.
- Sullivan, A., Parsons, K., Therrien-Genest, M., & Yerxa, K. (2025). Cooking up knowledge: Empowering high school students through a food literacy boot camp. *American Journal of Lifestyle Medicine*.
- Tseng, TA., Chang, JJ., & Chang, YC. (2023). Green experience: The effect of horticultural activities on children's physical and mental health and dietary behavior. *HortScience*, 58(6).
- van den Berg, A., Warren, JL., McIntosh, A. et al. (2020). Impact of a gardening and physical activity intervention in Title 1 schools: The TGEG study. *Child Obes.*, 16(S1).
- van Dijk-Wesselius, JE., van den Berg, AE., Maas, J., & Hovinga, D. (2020). Green schoolyards as outdoor learning environments: Barriers and solutions as experienced by primary school teachers. *Front Psychol.*, 10.
- Wale, A., Khatoun, S., Morgan, C. et al. (2025). What is the effectiveness of interventions to support the mental and emotional health and wellbeing of young people who are not in education, employment or training (NEET)? A Rapid Evidence Review. *medRxiv*.
- Wang, EZQ., Jones, HM., Carus, A. et al. (2025). Ecotherapy for adolescents experiencing mental health challenges: Qualitative exploration of perspectives of adolescents and parents. *Journal of Creativity in Mental Health*, 20(3).
- Woolhouse, C., Zerbi, CE., & McFarlane-Troy, C. (2025). Addressing a youth mental health crisis; Utilising therapeutic landscapes and creative approaches in an English school. *Journal of Outdoor and Environmental Education*.
- Wortzel, JD. (2025). Nature nurtures: Evaluating the impact of nature-based therapies on pediatric mental health. *Journal of the American Academy of Child & Adolescent Psychiatry*, 64(10).
- Yates, J. (2022). Cultivating potential at The Children's Center. *AHTA Magazine*, 50(1).
- Yihan, W., Zhao, X., & Chiu, MYL. (2025). Horticultural therapy for enhancing children's body-mind-spirit holistic health: A randomized controlled trial. *Social Work and Social Sciences Review*, 26(1).
- Zhang, Y., Mavoas, S., Zhao, J. et al. (2020). The association between green space and adolescents' mental well-being: A systematic review. *Int J Environ Res Public Health.*, 17(18).
- Zuiker, SJ., & Riske, AK. (2021). Growing garden-based learning: Mapping practical and theoretical work through design. *Environmental Education Research*, 27(8).

Research & articles on college students & horticulture programs

- Baur, J. (2020). Campus community gardens and student health: A case study of a campus garden and student well-being. *J Am Coll Health.*, 5.
- Bedolla, V. (2025). A horticultural approach to emerging first-generation college students' mental health. Thesis: *California State University, Long Beach*.
- Ciraulo, OR., Moreno, CE., & Mraz, A. (2025). Beekeeping as a therapeutic modality to address stress and increase well-being for undergraduate students. *Occupational Therapy in Mental Health*, 41(4).
- Coffino, JA., Spoor, SP., Drach, R., & Hormes, JM. (2021). Food insecurity among graduate students: Prevalence and association with depression, anxiety and stress. *Public Health Nutr.*, 24(7).
- Collins, D., & Newman, L. (2024). Growing seeds and students: Therapeutic horticulture programs and the involvement of university students. *Journal of Environmental Health*, 86(6).
- Colon, J., Tiernan, N., Oliphant, S. et al. (2020). Bringing botany into focus: Addressing plant blindness in undergraduates through an immersive botanical experience. *Bioscience*, 70(10).
- Diehl, RM., Diehl, DC., & Tham SY. (2025). The effects of therapeutic horticulture on student well-being and academic resilience. *Frontiers. Psychol.*, 16.
- Etheredge, CL., Waliczek, TM., & Sudakaran, PO. (2020). Measuring the economic and educational value of a university-based service-learning floral and plant program. *HortTechnology*, 30(3).
- Fleming, L. (2024). University students' health & well-being supported by nature engagement & campus gardens. *Digging In*, 10(2).
- Guo, C., Zhang, C., Meng, Z. et al. (2026). Plant landscapes and student health: In-depth impact analysis and strategic design proposal. *Landscape Architecture and Sustainability*, 100023.
- Guo, S., Li, T., Lai, CKY., & Xue, B. (2025). Natural restorative environment intervention for positive psychological outcomes of college students: A meta-analysis of randomized controlled trials. *Adolescent Research Review*.
- Guo, S., Li T., Xue, B., & Yang, X. (2023). Horticultural activities participation and college students' positive mental characters: Mediating role of academic self-efficacy. *Horticulturae*, 9.
- Holt, E., Lombard, Q., Best, N. et al. (2019). Active and passive use of green space, health, and well-being amongst university students. *Int. J. Environ. Res. Public Health.*, 16.
- Ibes, DC., & Forestell, CA. (2022). The role of campus greenspace and meditation on college students' mood disturbance. *Journal of American College Health*, 70.
- Larson, LR., Mullenbach, LE., Browning, MHEM. et al. (2022). Greenspace and park use associated with less emotional distress among college students in the United States during the COVID-19 pandemic. *Environ Res.*, 204(Pt D).
- Lewis, O., Ohrt, J., & Wolfe, K. (2025). EcoWellness counseling intervention for college students with an intellectual and developmental disability. *Journal of Mental Health Research in Intellectual Disabilities*, 18(4).
- Li, T., Guo, S., Xue, B., & Yang, W. (2024). Connecting college students with nature: An evaluation indicator system for the implementation of horticultural therapy programmes on university campuses. *Folia Horticulturae*, 36(2).
- Li, YL., Gui, F., & Gao, WB. (2022). Promoting effect of horticultural therapy on college students' positive psychological quality. *Front Psychol.*, 26.
- Loso, J., Staub, D., Colby, SE. et al. (2018). Gardening experience is associated with increased fruit and vegetable intake among first-year college students: A cross-sectional examination. *J Acad Nutr Diet.*, 118(2).
- Macchi, A., & Coccia, C. (2022). Effects of a cooking and gardening nutrition intervention in food insecure college students. *J. Acad. Nutr. Diet.* ,122 Supplement: A60.

- Matias, S., Bacon, K., Hee, A., & Deshpande, A. (2023). A mixed-methods explorative study on gardening and wellbeing among college students. *J. Nutr. Educ. Behav.*, 55.
- Meredith, GR., Rakow, DA., Eldermire, ERB. et al. (2020). Minimum time dose in nature to positively impact the mental health of college-aged students, and how to measure it: A scoping review. *Front. Psychol.*, 14.
- Murphy, D., Delucio, K., D'Eloia, MH., & Poynter, L. (2025). The development and impact of a college peer-based outdoor wellness program. *Ecopsychology*.
- Ruhl, J., & Lordly, D. (2021). University students harvesting the benefits of a garden laboratory. *Can J Diet Pract Res.*, 82(3).
- Stepansky, K., Delbert, T., & Bucey, JC. (2022). Active student engagement within a university's therapeutic sensory garden green space: Pilot study of utilization and student perceived quality of life. *Urban For. Urban Green*. 67.
- Sun, Y., Chen, L., Chen, R. et al. (2025). Exploring the preferences of college students for horticultural therapy activities based on a new classification framework. *Sci Rep.*, 15(1).
- Trauth, JN., Harris, K., & Jackson, N. (2023). Using trauma-informed care and horticulture therapy with college students: A counseling approach modeled after a refugee resettlement community. In *Practical strategies to reduce childhood trauma and mitigate exposure to the school-to-prison pipeline* (pp. 66-82). IGI Global.
- Wang, H., Cai, L., Yue, C., & Qi, M. (2026). The pathways and efficacy of horticultural therapy in promoting college students' mental health: An explanatory sequential mixed-methods study. *Journal of Visualized Experiments*, 27.
- Wang, H., Cai, L., Qi, M. et al. (2025, May). Path analysis of life education curriculum based on horticultural therapy on the promotion of college students' mental health: A grounded theory study. In *International Journal of Psychiatry in Medicine*, 60(3).
- Wang, H., Qi, M., Chen, Y. et al. (2025). Effects of a single session of horticultural therapy on emotional state in university students: Physiological and psychological indicators. *International Journal of Psychophysiology*, 213.
- Zhang, X., Chen, HN., Cai, Y. et al. (2025). Study on the physiological and emotional recovery effect of *Mentha Spicata* L. to college students under visual-olfactory interaction. *Applied Ecology and Environmental Research*, 23(6).

Examples of children, youth & college student horticulture programs

A Day at Forest School demonstrates outdoor learning, importance of access to nature.

<https://www.youtube.com/watch?v=-9ADLZv7jms>

Anne and Robert H. Lurie Children's Hospital of Chicago uses a garden play area Crown Sky Garden to deliver treatment and services to pediatric patients.

<https://www.luriechildrens.org/en/patients-visitors/visiting-lurie-childrens/tour-the-hospital/family-community-destinations/crown-sky-garden/>

Charles R. Drew Transition Center and its school-based horticulture program in Detroit teaches horticulture skills for young people with disabilities addressing childhood obesity, early-onset diabetes and food insecurity using hydroponics, in-ground gardens.

<https://kidsgardening.org/garden-story-empowering-hydroponics/>

Culinary Arts Program for youth 12-18 years can participate in an afterschool weekly program led by Chef and Manager of Food Programs at Hope Blooms based on Culinary Institute's first-year course, and includes food literacy skills, meal preparations for community, and culinary competitions.

<https://hopeblooms.ca/impact-2/programs/food-culture/>

From Apples to Acorns at Hillcrest Elementary School Oak Harbor Washington is a partnership with the school, local garden club and community improving the school courtyard.

<https://kidsgardening.org/garden-stories-apples-to-acorns/>

Gardening with kids/dinosaur garden/teaching children the joy of gardening.

<https://www.youtube.com/watch?v=Oe6rX6sasDY>

Garden Grants for schools, nonprofits and communities to address food insecurity including Growing Spaces in-kind grants. Links to garden grants are included (Captain Planet Foundation, Herb Society of America, National Head Start Assoc, Big Green Real Food Grow Here).

<https://growingspaces.com/gardening-grants/>

Groundwork program at University of North Carolina Chapel Hill delivers hands-on wellness focused activities in the Edible Campus Main Garden for students to support mental health, social connections and growing of fresh food.

<https://ncbg.unc.edu/2025/07/30/groundwork-student-gardening-wellness-group/>

Hershey School's Sensory Garden engages students including trauma informed theory.

<https://www.youtube.com/watch?v=pvlsbp98KSI>

Junior Master Gardener Learn, Grow, Eat & Go program is an interdisciplinary program with academic focus, gardening, nutrient-dense food experiences & physical activity.

<https://imgkids.us/lgeg/>

Kids on the Hill Sculpture Garden in Baltimore City seeks to create community through a children's garden where kids' creativity, design and participation empowered them, taught teamwork and used garden design elements for a safe space.

https://naturesacred.org/case_study/kids-on-the-hill-sculpture-garden/

Mala'ai Middle School's Hawaiian Culinary Garden is a one-acre ecosystem classroom with native, endemic edibles and craft crops, part of Hawai'i Island School Garden Network.

<https://malaai.org/>

Monarch School of New England uses therapeutic gardens for learning and vocational training for elementary and high school students who have significant special needs.

<https://www.youtube.com/watch?v=goVNY7doTEU>

National Children & Youth Garden Symposium annual event is hosted by the American Horticultural Society.

<https://ahsgardening.org/gardening-programs/youth-gardening/ncygs/>

National Garden Clubs' Children and Youth Programs include youth pollinator gardens, youth garden clubs, ecology warriors workbook, contests, scholarships and grants.

<https://gardenclub.org/youth-and-scholarships-o>

National Schoolyard Forest System initiative seeks to create schoolyard forests to directly shade and protect students from extreme heat related to climate change. A resource library has been started in support of this work with lectures, videos

<https://www.greenschoolyards.org/schoolyard-forest-system>

<https://www.greenschoolyards.org/schoolyard-forest-design-lecture-series/>

North Carolina Botanical Garden's Youth & Family Programs include nature activities, camp flytrap, Little Sprouts preschool program, family workshops, children's wonder garden and *Nature Play at Home* guide.

<https://ncbg.unc.edu/learn/youth-family/>

Pacific Quest outdoor behavioral health care program for adolescents uses neurodevelopmental approach, horticultural therapy and nature connections.

<https://pacificquest.org/adolescents/>

The Kindergarten STEMM Gardening Initiative in Memphis uses vegetable growing, planting seeds and STEMM education, in collaboration with St. Jude and Ron Findley Project as part of a strategy for infectious disease and wellness promotion.

[Kindergarten garden initiative plants seed for the future](#)

The Children's Center @ The Centers for Exceptional Children in Winston-Salem, NC delivers horticultural therapy and nature-based programs to children with physical disabilities, orthopedic challenges & other health issues.

<https://www.thecfec.org/therapies>

The Wild Earth Preschool at the Dallas Zoo provides nature experiences for this age group.

<https://www.dallaszoo.com/wildearthpreschool/>

USDA Department of Defense Fresh Fruit and Vegetable Program provides entitlement dollars to schools for purchase of fresh produce.

<https://www.fns.usda.gov/usda-foods/usda-dod-fresh-fruit-and-vegetable-program>

Seed your Future organization seeks to inspire and educate students about horticulture careers, with career exploration, scholarships, summer camps, green career week, and DIY plant videos.

<https://www.seedyourfuture.org/students>

Southern Boone Learning Garden in Ashland Missouri has a variety of programs for students pre-k -4th grade, with direction from the Southern Boone County School District.

<https://www.sblearninggarden.org/lessonplans>

Urban Roots, UK uses gardening, cooking, creative natural art and conservation tasks working closely with primary and secondary schools and plant nurseries to support outdoor learning on school grounds and local greenspaces.

<https://www.urbanroots.org.uk/children-young-people-1>

Youth Organic Urban Agriculture Program, through Hope Blooms non-profit NS, learn to grow organic food in a 4,000 sq foot food garden, using STEM education, acquiring skills for future careers, with support from Halifax [city] Community Investment Fund.

<https://hopeblooms.ca/impact-2/programs/urban-agriculture/>

Youth Programming Toolkit from Children & Nature organization, Outdoor Foundation, Search Institute, and Fresh Tracks provides resources re nature-based programming and youth.

<https://www.childrenandnature.org/resources/youth-development-and-nature-toolkit/>

Videos, websites & webinars on children, youth & college student horticulture programs

Big Green resource database for educators, parents, school gardens

<https://biggreen.org/thegreenhouse/>

Career Exploration Lessons connecting science and horticulture careers for high school level, offers 25 lessons involving hands-on content, from Seed Your Future.

<https://www.seedyourfuture.org/career-exploration-lessons>

Children and Nature Network website offers a variety of resources including a resource library, youth leadership development, parent ideas like Families Together newsletter, nature adventure cards, schoolyard programs and events, and webinars.

<https://www.childrenandnature.org/resource-hub/resources/>

Conscious Discipline Methodology is being integrated into settings where self-regulation is being addressed with its emphasis on internal controls vs external imposed controls. Now being introduced into HT/TH, schools, and family settings.

<https://consciousdiscipline.com/methodology/#fourcomponentsofconsciousdiscipline>

Cultivating Resiliency in Youth with Deep Nature Connections youtube webinar by Joanna Yates, HT practitioner discusses ways to develop this connection.

<https://youtu.be/ppWSeB8EEKY>

Healing Gardens: Dell Children's Medical Center has 7 different gardens on the campus with a focus on behavioral health, lifestyle changes, sensory garden, maze, labyrinth and nature connections.

<https://www.youtube.com/watch?v=oll4Q-prnkM>

Healing Garden Virtual Tour – Golisano Children's Hospital of SW Florida showcases the outdoor garden built in 2017.

<https://www.youtube.com/watch?v=7jMYBaqbpmk>

Honey Bees, a downloadable learning and sensory activity guide for students of Overbrook School for the Blind, is relevant for all populations and ages.

<https://www.phillyorchards.org/wp-content/uploads/2018/11/Honeybee-Sensory-Lesson-Book.pdf>

Kids Garden Community offers many resources for child and youth gardening including Sustainability via Active Garden Education (SAGE), The Easy Peasy Guidebook for Place-Based Outdoor Learning, S.O.W.: food Gardening with Justice in Mind, and many more.

<https://community.kidsgardening.org/resources/resource-library>

Kids Gardening website provides resources for educators and parents based on garden-based learning, hands-on activities with info on grants, contests, webinars, curriculum, interactive discussion sessions.

<https://kidsgardening.org/for-educators/#>

Lesson plans on flowers, bees and other horticultural issues are available online, free from the site Know It All and South Carolina ETV Commission.

<https://www.knowitall.org/collections/environmental-awareness/national-plant-flower-day#:~:text=Celebrated%20on%20March%2012%2C%20National,%2C%20religion%2C%20traditions%20and%20inspiration>

Loveland Youth Gardeners in Colorado serv youth with programs like Green Adventures, LEAD exploration program, Repair to Grow HT program among others.

<https://www.lovelandyouthgardeners.org/programs-1>

National Outdoor Learning Library, part of Greenschoolyards.org has resources: living schoolyards and climate resilience, health benefits, teaching, school gardens, enriching play and social spaces.

<https://www.greenschoolyards.org/library>

Nature nurtures - How gardening and outdoor play support kids mental and emotional wellbeing. [Youtube] presented by Dr. Charlie Hall and the *American Horticultural Therapy Association*.

Need to Know Developments in HT & Horticulture for Health youtube video discusses children's social and emotional learning in garden and green space settings by HT practitioner Lesley Fleming, 2023.

[New Developments in Horticultural Therapy and Horticulture for Health - YouTube](#)

New Jersey Agricultural Experiment Station and Rutgers University Gardening with Youth website offers resources with online links on starting school gardens, and webinars (starting an indoor garden, 4-H Victory Garden STEP club), gardening activities for youth, and family fun pages.

<https://njaes.rutgers.edu/home-lawn-garden/gardening-with-youth.php>

Nierenberg, D. (2023). When we talk about college campuses, we're forgetting food insecurity. *Food Tank*.

<https://foodtank.com/news/2022/08/when-we-talk-about-college-campuses-were-forgetting-food-insecurity/>

Plant Heroes website from the American Public Gardens Association has hands-on materials, educator resources with a focus on nature-based education related to forest health, ecology and plant conservation.

<https://plantheroes.org/>

School Garden Forum from Florida Horticulture for Health Network in 2022 raises topics where these settings can promote health, education.

<https://www.youtube.com/watch?v=khgyNZEIDlc>

Schoolyard Activity Guides website from [greenschoolyards.org](https://www.greenschoolyards.org) offers free activity guides in multiple languages.

<https://www.greenschoolyards.org/guides>

THAD (Therapeutic Horticulture Activity Database) offers TH activities across populations including children and youth ([alphabet garden](#), [bats](#), [bird feeder](#), [celery shenanigans](#), [conflict resolution sensory pathway](#), [cordage with plant fibers](#), [games with weird & wonderful names](#), [lavender wand](#), [pita pizzas](#), [nature's colors game](#))

<https://hos.ifas.ufl.edu/therapeutic-horticulture-activities-database/>

University of Florida Student Therapeutic Horticulture Program at Wilmot Botanical Gardens hosts hands-on gardening activities as relief from stress and wellness strategies in collaboration with the university's Counseling and Wellness Center.

<https://www.youtube.com/watch?v=qmLgiXOUHoo>

Related organizations

[Plant a Seed Foundation](#)

Written & compiled by Lesley Fleming Dec 2021; revised by Lesley Fleming & Erin O'Connor 2024.

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