

## CATEGORY: HORTICULTURAL THERAPY & HEALTH SERVICES

### Nature-based Interventions

Included in this category are all types of nature-based therapies and interventions where horticulture plays a significant role in health including ecotherapy, ecopsychology, eco-wellness, wilderness camps, aromatherapy, veteran to farmer programming, nature Rx, forest bathing and forest therapy. These covers many types of interventions. A distinction is made between nature engagement and nature-based health interventions.

This content focuses on nature-based interventions. It identifies the scope, research and programs in this rapidly expanding area. The literature addresses a broad range of health challenges where nature interventions have been impactful including brain injury (Vibholm et al, 2020), veterans with PTSD (Bettmann et al., 2021), subgenual prefrontal cortex activation (Bratman et al., 2015), pregnancy (Sands et al., 2023), childhood obesity (Messiah et al., 2026), cardio-oncology health (Bikomeye et al., 2022), cancer (Blaschke et al., 2017; Morris et al., 2021), pain (Jones & Littzen, 2022), and mental health (Bratman et al., 2019; Engemann et al., 2019; Joschko et al., 2023).

Other topics of relevance include ecophobia (Morgan, 2024), HT nature tools for interventions addressing digital screen overload, children divorced from nature, nature prescriptions, factors like phytoncides and air quality that improve immune and other health conditions. Evident in the literature are techniques used in nature-based interventions like walk & talk sessions, use of awe, nature-based expressive arts therapy, and nature exposure counseling. A growing number of organizations have mandates integrating nature into health services - like the Center for Nature Informed Therapy and PaRx Prescription Program in Canada.

**For related resources refer to Landscapes for Health category: urban green spaces; Horticultural Therapy & Health Services category: horticultural therapy, allied therapeutic modalities.**

#### Key Organizations

[Alliance of International Aromatherapists](#)

[Association of Nature & Forest Therapy](#)

[Center for Health and Nature University of Texas](#)

[Campus Nature Rx](#)

[Children & Nature Network](#)

[Center for Nature Informed Therapy](#)

[Green4C Alliance](#)

[Green Spirit UK](#)

[National Environmental Education Foundation](#) (funding source)

[Nature and Health University of Washington](#)

[Nature Rx](#)

[PaRx Prescription Program Canada](#)

[The Collective for Nature Immersion Science and Practice \(cNISP\)](#)

[Wilderness Foundation UK](#)

#### Books, journals & epublications on nature-based therapies

*Aromatics in Action* journal from the *Alliance of International Aromatherapists*

- Atkins, S., & Snyder, M. (2017). *Nature-based expressive arts therapy: Integrating the expressive arts and ecotherapy*. Jessica Kingsley Publishers.
- Buzzell, L., & Chalquist, C. (Eds.). (2002). *Ecotherapy: Healing with nature in mind*. Sierra Club Books. [Ecopsychology](#) journal
- Garside, R, Orr, N. Short, R. et al. (2020). *Therapeutic nature: Nature-based social prescribing for diagnosed mental health conditions in the UK*. Defra. [Green Spirit Magazine](#)
- Harper, N.J. (2020). *Outdoor therapies*. Routledge.
- Harper, N.J., & Rose, K. (2019). *Nature-based therapy: A practitioner's guide to working outdoors with children, youth, and families*. New Society Publishers. [Int J Environ Res Public Health](#)
- Jordan, M. (2015). *Nature and therapy: Understanding counselling and psychotherapy in outdoor spaces*. Routledge. [Journal of Ecopsychology](#)  
[Journal of Environmental Psychology](#)
- Kotte, D., Li, Q., Shin, W.S., & Michalsen, A. (2019). *The international handbook of forest therapy*. INFTA.
- Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*.
- McGeeney, A. (2016). *With nature in mind: The ecotherapy manual for mental health professionals*. Jessica Kingsley Publishers.
- Nature Sacred. (2021). *The power of sacred places 25 years of science and evidence-based design of healing green spaces: A landscape architect's guide*.
- Rakow, D.A., & Eells, G.T. (2019). *Nature Rx: Improving college-student mental health*. Cornell University Press. [Research Digest](#) journal from Children & Nature Network
- Roe, J., & Sachs, N.A. (2021). Urban nature and the happiness hypothesis, Chapter 8. In Mahmoudi & Roe (Eds.), *Infrastructure, wellbeing, and the measurement of happiness*. Routledge.
- Stuart-Smith, S. (2022). *The well-gardened mind: The restorative power of nature*. Scribner.
- Williams, F. (2018). *The nature fix: Why nature makes us happier, healthier, and more creative*. W.W. Norton.
- Wilson, E.O. (1984). *Biophilia: The human bond with other species*. Harvard University Press.

### **Research & articles on nature-based therapies**

Recently published selected research & articles:

- Adewuyi, FA., Knobel, P., Gogna, P., & Dadvand, P. (2023). Health effects of green prescription: A systematic review of randomized controlled trials. *Environ Res.*, 236(Pt 2), 116844.
- Alexander, G.K., & Brooks, V. (2022). Nature-based therapeutics: A collaborative research agenda promoting equitable access and environmental stewardship. *Collegian*, 29(1), 119-124.
- Ameli, R., Skeath, P., Abraham, P.A. et al., (2021). A nature-based health intervention at a military healthcare center: A randomized, controlled, cross-over study. *Peer J.*, 9, e10519.
- Antonelli, M., Barbieri, G., & Donelli, D. (2019). Effects of forest bathing (shinrin-yoku) on levels of cortisol as a stress biomarker: A systematic review and meta-analysis. *International Journal of Biometeorology*, 63(8), 1117–1134.
- Bang, K.S., Lee, I., & Kim, S. (2017). The effects of a campus forest-walking program on Undergraduate and graduate students' physical and psychological health. *International Journal of Environmental Research and Public Health*, 14(7).
- Barragan-Jason, G., Loreau, M., de Mazancourt, C. et al. (2023). Psychological and physical

- connections with nature improve both human well-being and nature conservation: A systematic review of meta-analyses. *Biological Conservation*, 277, 109842.
- Barnes, M.R., Donahue, M.L., Keeler, B.L. et al. (2019). Characterizing nature and participant experience in studies of nature exposure for positive mental health: An integrative review. *Front. Psychol.*, 9, 2617.
- Bentley, P.R., Fisher, J.C., Dallimer, M. et al. (2022). Nature, smells, and human wellbeing. *Ambio.*, 18, 1–14.
- Bettmann, J.E., Prince, K.C., Ganesh, K. et al. (2021). The effect of time outdoors on veterans receiving treatment for PTSD. *J Clin Psychol.*, 77(9), 2041-2056.
- Bikomeye, J.C., Beyer, A.M., Kwarteng, J.L., & Beyer, K.M.M. (2022). Greenspace, inflammation, cardiovascular health, and cancer: A review and conceptual framework for greenspace in cardio-oncology research. *Int J Environ Res Public Health.*, 19(4), 2426.
- Blaschke, S., O'Callaghan, C.C., Schofield, P., & Salander, P. (2017). Cancer patients' experiences with nature: Normalizing dichotomous realities. *Social Science & Medicine*, 172, 107-114.
- Blaschke, S., O'Callaghan, C.C., & Schofield, P. (2017). Identifying opportunities for nature engagement in cancer care practice and design: Protocol for four-round modified electronic Delphi. *BMJ Open*, 7(3), e013527.
- Bonham-Corcoran, M., Solovyeva, A., O'Brian, A. et al. (2022). The benefits of nature-based therapy for the individual and the environment: An integrative review. *Irish Journal of Occupational Therapy*.
- Bratman, G. et al. (2021). The effective benefits of nature exposure. *Social and Personality Psychological Compass*, 15(8).
- Bratman, G.N., Anderson, C.B., Berman, M.G. et al. (2019). Nature and mental health: An ecosystem service perspective. *Science Advances*, 5, 1-14.
- Bratman, G.N., Hamilton, J.P., Hahn, K.S. et al. (2015). Nature experience reduces rumination and subgenual prefrontal cortex activation. *Proc Nat Acad Sci USA.*, 112, 8567–72.
- Burke, H.K., Burke, L.M., Hacker, C.G., & Lane, S.J. (2024). Nature-based pediatric occupational therapy: A scoping review. *Phys Occup Ther Pediatr.*, 44(1), 96-109.
- Catissi, G., Gouveia, G., Saviato, R.M. et al. (2024). Nature-based interventions targeting elderly people's health and well-being: An evidence map. *Int J Environ Res Public Health.*, 21(1), 112.
- Chang, Y.C., Tseng, T.A., & Chiu, S.C. (2018). The effect of nature therapy for stress, anxiety, depression and demoralization on breast cancer patients. *GSTF J. Nurs. Health Care*, 5.
- Chaudhury, P., & Banerjee, D. (2020). Recovering with nature: A review of ecotherapy and implications for the COVID-19 pandemic. *Frontiers in Public Health*, 10.
- Clarke, F.J., Kotera, Y., & McEwan, K. (2021). A qualitative study comparing mindfulness and shinrin-yoku (forest bathing): Practitioners' perspectives. *Sustainability*, 13(12), 6761.
- Cleary, A., Dean, J., Pollock, D. et al. (2022). Nature-based interventions for bereavement care: A scoping review protocol. *JBIM Evid Synth.*, 20(5), 1344-1352
- Corazon, S.S., Nyed, P.K., Sidenius, U. et al. (2018). A long-term follow-up of the efficacy of nature-based therapy for adults suffering from stress-related illnesses on levels of healthcare consumption and sick-leave absence: A randomized controlled trial. *Int J Environ Res Public Health.*, 15(1), 137.
- Corazon, S.S., Sidenius, U., Vammen, K.S. et al. (2018). *The Tree Is My Anchor*: A pilot study on the treatment of BED through nature-based therapy. *Int J Environ Res Public Health.*, 15(11), 2486.
- Coventry, P.A., Brown, J.E., Pervin, J. et al. (2021). Nature-based outdoor activities for mental and physical health: Systematic review and meta-analysis. *SSM Popul Health*, 16, 100934.
- Crnica, M., & Kondo, M.C. (2019). Nature Rx: Reemergence of pediatric nature-based therapeutic programs from the late 19th and early 20th centuries. *Am J Public Health.*, 109, 1371–8.

- Crossan, C., & Salmoni, A. (2021). A simulated walk in nature: Testing predictions from the attention restoration theory *Environ. Behav.*, 53(3), 277-295.
- Cutillo, A., Rathore, N., Reynolds, L. et al. (2015). A literature review of nature-based therapy and its application in cancer care. *Journal of Therapeutic Horticulture*, 25(1), 4-15.
- de Bruin, S.R., Pedersen, I., Eriksen, S. et al. (2020). Care farming for people with dementia; What can healthcare leaders learn from this innovative care concept? *J Healthcare Leadership.*, 12, 11-18.
- Djernis, D., Lerstrup, I., Poulsen, D. et al. (2019). A systematic review and meta-analysis of nature-based mindfulness: Effects of moving mindfulness training into an outdoor natural setting. *International Journal of Environmental Research and Public Health*, 16(17), 3202.
- Dennis, M., Henderson-Wilson, C., Watson, J., & Lawson, J. T. (2024). Nature-based interventions for adults with developmental disabilities: A scoping review centering autistic adults. *Sustainability*, 16(3), 1077.
- Engemann, K., Bocker Pedersen, C., Arge, L. et al. (2019). Residential green space in childhood is associated with lower risk of psychiatric disorders from adolescence into adulthood. *PNAS*, 116(11), 5188-5193.
- Eskilsson, R., & Palsdottir, AM. (2021). Qualities for rest and recovery in nature-based rehabilitation at Grona Rehab, Sweden. *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*.
- Fleming, L. (2015). Veteran to farmer programs: An emerging nature-based programming trend. *Journal of Therapeutic Horticulture*, 25(1), 27-48.
- Freedle, LR., & Slagle, T. (2018). Applications of the neurosequential model of therapeutics in an integrative outdoor behavioral healthcare program for adolescents and young adults. *Proceedings of the Second International Neurosequential Model Symposium*. CF Learning Press.
- Griffin, C. (2023). [Embracing nature connectedness to enhance horticultural therapy interventions](#). HTI.
- Gritzka, S., MacIntyre, T.E., Dörfel, D. et al. (2020). The effects of workplace nature-based interventions on the mental health and well-being of employees: A systematic review. *Front Psychiatry.*, 11, 1-23.
- Guenther, M.E.L. (2021). An investigation into the potential of horticultural and nature-based interventions for change. *Journal of Undergraduate Social Work Research*, 5(1).
- Haas, B.W., Hoeft, F., & Omura, K. (2021). The role of culture on the link between worldviews on nature and psychological health during the COVID-19 pandemic. *Per Individ Differ*, 170, 110336.
- Hansen, M.M., & Jones, R. (2020). The interrelationship of shinrin-yoku and spirituality: A scoping review. *J Altern Complement Med.*, 26(12), 1093-1104.
- Hall, C., & Knuth, M. (2019). An update of the literature supporting the well-being benefits of plants: A review of the emotional and mental health benefits of plants. *Journal of Environmental Horticulture*, 37(1), 30-38.
- Harrison, H., Burns, M., Darko, N., & Jones, C. (2023). Exploring the benefits of nature-based interventions in socio-economically deprived communities: A narrative review of the evidence to date. *Perspectives in Public Health*, 143(3), 156-172.
- Harper, N.J., Fernee, C.R., & Gabrielsen L.E. (2021). Nature's role in outdoor therapies: An umbrella review. *Int J Environ Res Public Health.*, 18(10), 5117.
- Hart, B., & Zanskas, S. (2021). Cultivating care: Trauma, homeless veterans, and nature-based therapy. *Journal of Therapeutic Horticulture*, 31(1), 25-38.

- Hassink, J., Vaandrager, L., Buist, Y., & de Bruin, S. (2019). Characteristics and challenges for the development of nature-based adult day services in urban areas for people with dementia and their family caregivers. *Int J Environ Res Public Health*, 16(8), 1337.
- Hatala, A., Morton, D., Njeze, C., Bird-Naytowhow, K., & Pearl, T. (2019). Reimagining miyo-wicehtowin: Human-nature relations, land-making, and wellness among indigenous youth in a Canadian urban context. *Social Science & Medicine*, 23, 122-130.
- Heckmann, J.G., Kiem, M., & Immich, G. (2024). Forest therapy as a nature-based intervention: An option for neurological rehabilitation? *Complement Med Res*, 31(1), 56-63.
- Helbich, M., Klein, N., Roberts, H. et al. (2018). More green space is related to less antidepressant prescription rates in the Netherlands: A Bayesian Geospatial Quantile Regression Approach. *Environ. Res.*, 166, 290–297.
- Hernandez-Garcia, E., Chrysiou, E., & Kalea, A. Z. (2021). The interplay between housing environmental attributes and design exposures and psychoneuroimmunology profile—an exploratory review and analysis paper in the cancer survivors' mental health morbidity context. *International Journal of Environmental Research and Public Health*, 18(20), 10891.
- Heród, A., Szewczyk-Taranek, B., & Pawłowska, B. (2024). Enhancing self-esteem, well-being, and relaxation in the elderly through nature-based interventions. *Int J Environ Res Public Health*, 21(7).
- Hinde, S., Bojke, L., & Coventry, P. (2021). The cost effectiveness of ecotherapy as a healthcare intervention, separating the wood from the trees. *Int J Environ Res Public Health*, 18, 11599.
- Ho, P.L., Li, T.W., Liu, H. et al. (2022). Testing a new protocol of nature-based intervention to enhance well-being: A randomized control trial. *Int J Environ Res Public Health*, 19(7), 3931.
- Jiang, H., Eaglestone, G., McCrone, P. et al. (2024). How are nature-based interventions defined in mild cognitive impairment and dementia studies? A conceptual systematic review and novel taxonomy. *Dementia*, 14713012241261788.
- Jimenez, M.P., DeVille, N.V., Elliott, E.G. et al. (2021). Associations between nature exposure and health: A review of the evidence. *Int. J. Environ. Res. Public Health*, 18, 4790.
- Jones, R.J.F., & Littzen, C.O.R. (2022). An analysis of theoretical perspectives in research on nature-based interventions and pain. *Int J Environ Res Public Health*, 19(19), 12740.
- Jones, R., Tarter, R., & Ross, A.M. (2021). Greenspace interventions, stress and cortisol: A scoping review. *Int J Environ Res Public Health*, 18(6), 2802.
- Joschko, L., Pálsdóttir, A.M., Grahn, P. et al. (2023). Nature-based therapy in individuals with mental health disorders, with a focus on mental well-being and connectedness to nature-A pilot study. *Int J Environ Res Public Health*, 20(3), 2167.
- Kang, M., Yang, Y., Kim, H. et al. (2023). The mechanisms of nature-based therapy on depression, anxiety, stress, and life satisfaction: examining mindfulness in a two-wave mediation model. *Front Psychol*, 14, 1330207.
- Kaplan, S. (1995). The restorative benefits of nature: Toward an integrative framework. *Journal of Environmental Psychology*, 15(3), 169–182.
- Kondo, M.C., Oyekanmi, K.O., Gibson, A. et al. (2020). Nature prescriptions for health: A review of evidence and research opportunities. *Int J Environ Res Public Health*, 17, 4213–4228.
- Kumari, A., Sarkar, S., Ranjan, P. et al. (2020). Interventions for workplace violence against health-care professionals: A systematic review. *Work*, 73(2), 415-427.
- Kurth, A.M., Narvaez, D., Kohn, R., & Bae, A. (2020). Indigenous nature connection: A 3-week intervention increased ecological attachment. *Ecopsychology*, 12(2), 101-117.
- La Puma, J. (2019). Nature therapy: An essential prescription for health. *Alternative and Complementary Therapies*, 25(2), 68-71.

- Leavell, M.A., Leiferman, J.A., Gascon, M. et al. (2019). Nature-based social prescribing in urban settings to improve social connectedness and mental well-being: A review. *Curr Environ Health Rep.*, 6(4), 297-308.
- Lewis, O., Ohrt, J., Toomey, T. M. et al. (2022). A systematic review of nature-based counseling interventions to promote mental health and wellness. *Journal of Mental Health Counseling*, 44(3).
- Li, Q. (2022). Effects of forest environment (Shinrin-yoku/Forest bathing) on health promotion and disease prevention - the establishment of "Forest Medicine". *Environ Health Prev Med.*, 27, 43.
- Li, Q. (2010). Effect of forest bathing trips on human immune function. *Environmental Health and Preventative Medicine*, 15, 9-17.
- Lu, N., Song, C., Kuronuma, T. et al. (2020). The possibility of sustainable urban horticulture based on nature therapy. *Sustainability*, 12(12), 5058.
- Makram, OM., Nwana, N., Nicolas, C. et al. (2023). Favorable neighborhood walkability is associated with lower burden of CV risk factors among patients within an integrated health system. *Current Problems in Cardiology*, 48(6).
- Mancus, G., Hill, S.V., Carter, P. (2021). Nature-based therapies for sleep disorders in people living with human immunodeficiency virus. *Nurs Clin North Am.*, 56(2), 189-202.
- Maud, P.R., Irvine, K.N., Reeves, J. et al. (2019). Wetlands for wellbeing: Piloting a nature-based health intervention for the management of anxiety and depression. *International Journal of Environmental Research and Public Health*, 16(22), 4413.
- Menhas, R., Yang, L., Saqib, ZA. et al. (2024). Does nature-based social prescription improve mental health outcomes? A systematic review and meta-analysis. *Front Public Health.*, 12, 1228271
- Mental Health Foundation. (2021). [Nature – How connecting with nature benefits our mental health.](#)
- Meredith, G.R, Rakow, D.A, Eldermire, E.R.B. 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.
- Messiah, S.E., Jiang, S., Kardys, J. et al. (2016). Reducing childhood obesity through coordinated care: Development of a park prescription program. *World J Clin Pediatr.*, 5, 234-43.
- Moeller, C., King, N., Burr, V. et al. (2018). Nature-based interventions in institutional and organisational settings: A scoping review. *International Journal of Environmental Health Research*, 28(3), 293-305.
- Morgan, S. (2024). [Using the 5-4-3-2-1 sensory exercise in therapeutic horticulture activities.](#) *Cultivate*, 4(1).
- Morris, S.L., Newhouse, I., Larocque, T. et al. (2021). Becoming one with nature: A nature intervention for individuals living with cancer participating in a ten-week group exercise and wellness program. *International Journal of Exercise Science*, 14(3), 498.
- Moyers, S.I., Abildso, C.G., & Kelley, G.A. (2022). Context, classification and study methodologies in research into nature-based therapies: Protocol for a scoping review. *BMJ Open*, 12(4), e060734.
- Nadkarni, N.M, Thys, T.M., Ruff, J.S. et al. (2021). Providing virtual nature experiences to incarcerated men reduces stress and increases interest in the environment. *Ecopsychology*, 13(2), 71-83.
- Naor, L., & Mayselless, O. (2021). Therapeutic factors in nature-based therapies: Unraveling the therapeutic benefits of integrating nature in psychotherapy. *Psychotherapy (Chic)*, 58(4), 576-590.
- Noushad, S., Ansari, B., & Ahmed, S. (2022). Effect of nature-based physical activity on post-traumatic growth among healthcare providers with post-traumatic stress. *Stress Health*, 38(4), 813-826.
- Oh, K.H., Shin, W.S., Khil, T.G., & Kim, D.J. (2020). Six-step model of nature-based therapy process. *International Journal of Environmental Research Public Health*, 17(3), 685.
- Olson, ET., Mathiason, MA., Vermeesch, A., & Bliss, D. (2024). A nature-based intervention to support the well-being of baccalaureate nursing students. *J Nurs Educ.*, 63(2), 116-119.

- Overbey, T.A., Diekmann, F., & Lekies, K.S. (2021). Nature-based interventions for vulnerable youth: A scoping review. *Int J Environ Health Res.*, 11, 1-39.
- Owens, M., & Bunce, H.L.I. (2022). Nature-based meditation, rumination and mental wellbeing. *Int J Environ Res Public Health.*, 19(15), 9118.
- Owens, M., & Bunce, H.L.I. (2022). The potential for outdoor nature-based interventions in the treatment and prevention of depression. *Front Psychol.*, 13, 740210.
- Pálsdóttir, A.M., Spendrup, S., Mårtensson, L., & Wendin, K. (2021). Garden smellscape-experiences of plant scents in a nature-based intervention. *Front Psychol.*, 12, 667957.
- Pichler, C., Freid, I.J., Bischof, M. et al. (2022). Mountain hiking vs. forest therapy: A study protocol of novel types of nature-based intervention. *Int J Environ Res Public Health.*, 19(7), 3888.
- Pirchio, S., Passiatore, Y., Panno, A. et al. (2021) The effects of contact with nature during outdoor environmental education on students' wellbeing, connectedness to nature and pro-sociality. *Frontiers in Psychology*, 12.
- Polit, M., Friso, F., & Mabit, J. (2019). Plant based assisted therapy for the treatment of substance use disorders part 2: Beyond blurred boundaries. *Cultura y Droga*, 24(28), 19-42.
- Poulsen, D.V., Pálsdóttir, A.M., Christensen, S.I. et al. (2020). Therapeutic nature activities: A step toward the labor market for traumatized refugees. *International Journal of Environmental Research and Public Health*, 17(20), 7542.
- Poulsen, D.V., Stigsdotter, U.K., & Refshage, A.D. (2015). Whatever happened to the soldiers? Nature-assisted therapies for veterans diagnosed with post-traumatic stress disorder: A literature review. *Urban Forestry & Urban Greening*, 14(2), 438–45.
- Pretty, J., & Barton, J. (2020). Nature-based interventions and mind-body interventions: Saving public health costs whilst increasing life satisfaction and happiness. *Int J Environ Res Public Health.*, 17(21).
- Rai, S., Kangas, K., Turtiainen, K. et al. (2023). Nature-based integration of migrants: A cross-national systematic literature review. *Urban Forestry & Urban Greening*, 128089.
- Rakow, D.A., & Ibes, D.C. (2022). Campus Nature Rx: How investing in nature interventions benefits college students. *Frontiers in Psychology*, 13, 960370.
- Razani, N., Morshed, S., Kohn, M. A. et al. (2018). Effect of park prescriptions with and without group visits to parks on stress reduction in low-income parents: SHINE randomized trial. *PLoS ONE*, 13, e0192921.
- Reese, R.F. (2016). EcoWellness and guiding principles for the ethical integration of nature into counseling. *International Journal for the Advancement of Counselling*, 38(4), 345–357.
- Reese, R.F., & Myers, J.E. (2021). Ecowellness: The missing factor in holistic wellness models. *Journal of Counseling and Development*, 90(4), 400–406.
- Reis, A., Gray, T., Mann, J. et al. (2023). Measuring nature-based health interventions—a rapid review of instrumentation and outcomes. *Journal of Outdoor and Environmental Education*, 1, 130.
- Richardson, M., Richardson, E., Hallam, J., & Ferguson, F. J. (2020). Opening doors to nature: Bringing calm and raising aspirations of vulnerable young people through nature-based intervention. *The Humanistic Psychologist*, 48(3), 284.
- Sachs, N.A. (2020). Access to nature has always been important; With COVID-19, it is essential. *HERD*, 13(4), 242-244.
- Sands, G., Blake, H., Carter T., & Spiby, H. (2023). Nature-based interventions to support mental health and well-being of young women in pregnancy: Exploratory work for future feasibility RCT. *Public Health Res.*, (Southampt), 1-23.
- Seale, B., Davis, A., Lawson, J. et al. (2024). Nature-based design in stroke rehabilitation environments: A scoping review. *HERD: Health Environments Research & Design Journal*, 19375867241251832.

- Serrat, M., Almirall, M., Musté, M. et al. (2020). Effectiveness of a multicomponent treatment for fibromyalgia based on pain neuroscience education, exercise therapy, psychological support, and nature exposure (NAT-FM): A pragmatic randomized controlled trial. *J Clin Med.*, 9(10), 3348.
- Shanahan, D.F., Astell-Burt, T., Barber, E.A. et al. (2019). Nature-based interventions for improving health and wellbeing: The purpose, the people and the outcomes. *Sports (Basel)*, 7(6), 141.
- Shuda, Q., Bougoulas, M.E., & Kass, R. (2020). Effect of nature exposure on perceived and physiologic stress: A systematic review. *Complement. Ther. Med.*, 53, 102514.
- Simon-Friedt, BR., Pan, AP., Nisar, T. et al. (2022). Effects of trail and greenspace exposure on hospitalizations in a highly populated urban area: Retrospective cohort study of the Houston Bayou Greenways 2020 program. *Local Environment*, 28(3), 365-378.
- Struthers, NA., Guluzade, NA., Zecevic, AA. et al. (2024). Nature-based interventions for physical health conditions: A systematic review and meta-analysis. *Environ Res.*, 258, 119421.
- Summers, J.K., & Vivian, D.N. (2018). Ecotherapy-A forgotten ecosystem service: A review. *Frontiers in Psychology*, 9(1389).
- Tambyah, R., Olcoñ, K., Allan, J. et al. (2022). Mental health clinicians' perceptions of nature-based interventions within community mental health services: Evidence from Australia. *BMC Health Serv Res.*, 22(1), 841.
- Taylor, E.M., Robertson, N., Lightfoot, C.J. et al. (2022). Nature-based interventions for psychological wellbeing in long-term conditions: A systematic review. *International Journal of Environmental Research and Public Health*, 19(6), 3214.
- Toews, B., Wagenfeld, A., & Stevens, J. (2018). Impact of a nature-based intervention on incarcerated women. *Int J Prison Health.*, 14(4), 232-243.
- Uldall, S.W., Poulsen, D.V., Christensen, S.I. et al. (2022). Mixing job training with nature-based therapy shows promise for increasing labor market affiliation among newly arrived refugees: Results from a Danish case series study. *International Journal of Environmental Research and Public Health*, 19(8), 4850.
- Van Houwelingen-Snippe, J., Ben Allouch, S., & Van Rompay, T.J.L. (2021). Virtual reality representations of nature to improve well-being amongst older adults: A rapid review. *J Technol Behav Sci.*, 6(3), 464-485.
- Verzwyvelt, LA., McNamara, A., Xu, X., & Stubbins, R. (2021). Effects of virtual reality v. biophilic environments on pain and distress in oncology patients: A case-crossover pilot study. *Scientific Reports*, 11(1), 1-7.
- Vibholm, A.P., Christensen, J.R., & Pallesen, H. (2020). Nature-based rehabilitation for adults with acquired brain injury: A scoping review. *Int J Environ Health Res.*, 30(6), 661-676.
- Vibholm, A.P., Christensen, J.R., & Pallesen, H. (2022). Occupational therapists and physiotherapists experiences of using nature-based rehabilitation. *Physiother Theory Pract.*, 10, 1-11.
- Weeland, J., Moens, M.A., Beute, F., Assink, M. et al. (2019). A dose of nature: Two three-level meta-analyses of the beneficial effects of exposure to nature on children's self-regulation. *Journal of Environmental Psycholo.*, 65(101326).
- Weir, K. (2020). Nurtured by nature. *American Psychological Association Journal*, 51(32).
- Wichrowski, M.J., Cocoran, J.R., Haas, F. et al. (2021). Effects of biophilic nature imagery on indexes of satisfaction in medically complex physical rehabilitation patients: An exploratory study. *Health Environments Research & Design Journal*, 14(3), 288-304.
- Winkels, R.M., Artrip, R., Tupinio, M., & George, D.R. (2020). Sowing connections in a community garden: An intergenerational partnership between young adult cancer survivors and master gardeners. In *Intergenerational Contact Zones* (pp. 117-126). Routledge.



Woo, C., Miranda, B., Sathishkumar, M. et al. (2023). Overnight olfactory enrichment using an odorant diffuser improves memory and modifies the uncinate fasciculus in older adults. *Front. Neurosci.*, 17.

Yang, Y., Kim, H., Kang, M. et al. (2023). The effectiveness of nature-based therapy for community psychological distress and well-being during COVID-19: A multi-site trial. *Scientific Reports*, 13(1), 22370.

Zeiger, A. (2023). Digital tools to connect with nature. *AHTA Magazine*.

Zeng, C., Lyu, B., Deng, S. et al. (2020). Benefits of a three-day bamboo forest therapy session on the physiological responses of university students. *Int J Environ Res Public Health.*, 17(9), 3238.

### **Examples of nature-based therapies & interventions using plant-based activities**

*10 examples of nature therapy* online article from Natural Wellness Academy, author C. Cameron lists types of nature therapy: meditation, ceremonies, arts & crafts, HT, care farming, green exercise, adventure therapy and more.

<https://www.naturalwellnessacademy.org/2019/07/14/what-is-nature-therapy-10-examples-of-nature-therapy-approaches/>

*Connecting Veterans to Outdoor Peer Support Activities* to improve their quality of life through One-Stop Center of WNY, Buffalo, NY partners with the US Forest Service to take local veterans on weekend outdoor retreats.

*Graduate Certificate Program in Nature-based Therapy* offered by East Tennessee State University's Dept. of Counseling and Human Services 15 credit program focuses on physical and psychological benefits of engaging with nature.

<https://www.etsu.edu/etsu-news/2022/03-march/nature-based-therapy.php>

*Heroic Gardens* in Elkins Park, PA 501c3 coordinates volunteers undertaking gardening, property beautification, educational courses and special events promoting the healing power of nature and service to the community.

<https://heroicgardens.org/volunteer>

*Medical College of Wisconsin (MCW) Institute for Health & Equity's* project is using an innovative nature-based therapy based on AHW-supported study 'Impacts of Nature in Proactive and Responsive Behavioral Health Treatment of Urban Latins Youth' with curriculum and assessment tools.

<https://blog.ahwendowment.org/innovative-nature-based-therapy-to-support-urban-latino-youth>

*Nature Therapy Program* in St. Augustine, F L. uses nature therapy along with other modalities in addiction recovery.

<https://pearlofthesearetreat.com/nature-therapy-program/>

*Nature-Based Therapeutics* at Minnesota Landscape Arboretum delivered with the University of Minnesota Bakken Center for Spirituality and Healing offers direct service programs based on American Horticultural Therapy Association and National Council of Therapeutic Recreation.

<https://arb.umn.edu/learn/about-nature-based-therapeutics>

<https://csh.umn.edu/academics/focus-areas/nature-based-therapeutics>

Source One Serenity non-profit in Oregon uses a variety of programs for veterans including nature-based activity, land stewardship, trail work in parks, in recognition of the power of nature connections.

<https://sourceoneserenity.org/>

The Veterans Florida Agriculture Program in Gainesville, FL. is a six-month training fellowship for transitioning veterans as vocational education for agribusiness, and other agriculture careers.

<https://www.veteransflorida.org/agriculture/>

### **Videos, webinars & websites on nature-based therapies & interventions using plant-based activities**

Children Nature Network's Research Library offers extensive research papers with a searchable database.

<https://research.childrenandnature.org/>

Green4c organization's website identifies its mandate, network partners, and practices at the EU level in the field of Green Care including forest-based care, urban green care, social agriculture and green care tourism.

<https://www.greenforcare.eu/>

Healing Nature 2012 video documentary examines how nature contributes to healthy living, health improvements.

<https://www.cultureunplugged.com/documentary/watch-online/play/53691/Healing-Nature>

Healthline site's "Ecotherapy and the healing power of nature" offers descriptions of types, benefits, research references, and techniques for using nature to improve health.

<https://www.healthline.com/health/mental-health/ecotherapy#techniques>

*Making the Case: Community Engagement for Equitable Access to Nature*

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

*Nature Rx Guide for First Year College and University Students* by Joly, Kuhlken and Rakow offers concepts, rationale and tips for promoting nature engagement for this population.

[https://drive.google.com/file/d/1d5f6Qav3jmMitBUD8X7J4IPwohxPR-\\_7/view](https://drive.google.com/file/d/1d5f6Qav3jmMitBUD8X7J4IPwohxPR-_7/view)

*Prescribing Nature for Health* TedxNashville

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

*Ecopyschology: Reinventing the Human-nature Relationship in the Digital Age Part 1*

<https://www.youtube.com/watch?v=18ZPpHUAowM>

*Science Pub – EcoWellness: Optimizing Time Outdoors*

<https://www.youtube.com/watch?v=KGUcb7zPPYM>

*Ten Principles: How and Why They are so Effective – EcoPsychology Initiative*

<https://www.youtube.com/watch?v=QuXQHKq3PQE>

*The Art and Science of Forest Bathing with Dr. Quing Li*  
<https://www.youtube.com/watch?v=12CCjoixpkA>

University of Florida IFAS Extension epublication “Why is exposure to nature important in early childhood”.  
<https://edis.ifas.ufl.edu/publication/FR394>

**Related organizations**

[International Ecopsychology Society \(IES\)](#)  
[International Nature and Forest Therapy Alliance \(INFTA\)](#)  
[National Association for Holistic Aromatherapy Ecopsychology Initiatives](#)

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