

Mental Health & Cognitive Benefits

- DRAFT -

2024

Overview

Exposure to quality trees, green space, and nature is emerging as an important public health solution in urban communities. This is especially important with over half of humanity now living in urban areas and growing evidence that urbanization is linked with mental disorders. Nearly 40 years of research confirms that nearby nature, including parks, gardens, urban forests, and green spaces, supports mental health and wellness as well as cognitive function. Green environments may also be effective in treating mental health challenges.

Interesting Information

Supporting Emotional Health

- There is evidence that people who live near green spaces tend to be less depressed and, on average, have better cognitive functioning than those who do not live near greenery. Some of the primary ways that nature may improve health is by helping people recover from psychological stress and encouraging people to be outside socializing with friends, both of which improve mental health (Jimenez, 2022).
- Some research suggests that even very quick visits outdoors can be beneficial. There are also indications that certain amounts and types of outdoor time may have greater impacts on well-being. A 2021 study found that 20 to 90 minute sessions in nature were most beneficial for mental health, with gardening, nature-based therapy, and exercise in green spaces being the most effective for adults (Gregory, 2024).
- Participants in a study with serious depression received significant mood improvements after a 50-minute walk in a natural setting relative to one in an urban setting (Berman et al., 2012).
- It appears that people who walk in green space instead of on a busy street appear to have fewer racing thoughts (Bratman et al., 2015).
- Marselle et al. (2020) studied the relationship between the presence of street trees and rates of antidepressant prescriptions in the German City of Leipzig. This study of nearly 10,000 people found that living in close proximity to trees may be associated with lower rates of antidepressant use.
- Douglas (2021) suggests that a reason why people seem to need to be around nature so much is that urban living is a relatively new experience for our species. Our species has existed for at least 300,000 years, but the oldest cities are only some 6000 years old. Edward O. Wilson's biophilia hypothesis argues that the environment in which humans

evolved has shaped our brain, priming it to respond positively to cues that would have enhanced survival for our ancestors. Therefore trees, savannah, lakes, and waterways make us feel good. Natural environments have a restorative advantage over artificial environments due to their role in our evolution as a species (Beatley, 2023).

Therapeutic Treatment

- Contact with nature can also provide relief, and perhaps healing, for those who suffer from short-term and chronic mental illness including depression, anxiety, and mood disorders (Berman et al., 2012).
- Research shows that *biodiverse* nature (for example, a forest containing many types of trees, dozens of bird species, and both big and small mammals) is especially beneficial for mental well-being. Multi-sensory experiences that include for example, bird or frog sounds or wildflower smells have beneficial effects on mental restoration, calm and creativity (Houyle et al. 2017).
- Increasing our interaction with natural elements through touch such as getting dirty gardening is associated with being therapeutic and nourishing to our nervous system (Deans, 2016).
- Prolonged immersion in nature and nature-based therapy programs have shown promise as a way of managing PTSD (Gregory, 2024).
- One recent method of promoting more time in nature is the use of formal nature prescriptions by physicians and other healthcare and social service providers. People have shown they are more likely to engage in a lifestyle or health-behavior change when given formal prescriptions. These methods are being increasingly adopted in countries like the UK, where the National Health Service has begun a 7 million “green social prescribing” program to improve health outcomes and address health inequalities. In the United States, resources like Park Rx America are facilitating the writing and inclusion of NR_x in patient EHR (electronic health record) charts (Beil, 2023).

Cognitive Health – The Thinking Part of the Brain`

- Contact with nature improves the ‘thinking’ part of our brain including our ability to pay attention, problem-solve, remember things, plan, and be creative.
- According to Attention Restoration Theory (ART), urban environments heavily tax a certain kind of brain functioning that require focused attention reacting to a huge amount of stimuli. This depletes us and impacts our cognitive functioning over time. Natural environments invoke a different sort of attention from people that may rest and replenish us. This, in turn, may lead to improved performance on tests that measure memory and attention (Bratman et al., 2015).
- “Nature breaks” can improve brain performance by providing a brain break from the focus required by the complex demands of modern life. Providing a rest period for the brain can be beneficial for mental health (Bratman et al., 2015).
- A Norway study found that participants who sat at a desk with plants performed better on a memory and attention test than those who sat at an empty desk with no natural stimuli (Raanaas et al. 2011).

- There is evidence that association with nature helps our brain to develop white and gray matter in various parts of the brain. This supports our memory and cognitive performance (Sakhvidi et al. 2023).

Stress

- Contact with nature is associated with greater stress regulation. For example, more access to trees, green spaces and nature appears to reduce our levels of cortisol (a stress hormone), blood pressure and heart rate. One study suggested that the stress reduction benefits from spending time in nature were more striking for those who experience chronic stress (Bratman et al., 2015).
- Research suggests that people who spend at least 2 hours in nature each week report significantly better health and wellbeing. Sitting in a forest for just 15 minutes significantly reduces your cortisol levels and heart rate variability—while sitting on an urban street does nothing (Hiromitsu, 2015).
- Studies have also indicated that parents/caregivers who live in greener neighborhoods are less stressed, and presumably bring less stress home to their children. Reduced parenting stress can significantly improve child behavior and development (UNICEF, N. D.)

Youth

- Trees, green spaces, and nature appear to bring significant benefits to youth by reducing stress, restoring attention, increasing physical activity and mitigating exposure to urban-related environmental hazards such as air pollution, noise, and heat (Sakhvidi et al., 2022).
- Green exposure is associated with improving children’s emotional wellbeing, self-discipline, goal motivation, and emotional regulation (including anger and stress regulation). It may also increase positive social interactions such as cooperation with peers and adults and reduce ADHD symptoms (Sakhvidi et al., 2022).
- Studies have indicated that children who view nature outside of their apartment windows instead of concrete perform better on tasks that measure memory, impulse control and concentration. Other studies indicated that older dormitory students who had views of nature through their windows performed better on tasks that require concentration than students without such views (Bratman, 2015).
- Children who live with higher levels of green space may experience less risk of serious mental health problems, including psychosis and schizophrenia, later in life (Sakhvidi et al. 2023).

Elderly

- Time spent in parks and gardens can improve quality of life and function of dementia patients by reducing negative behaviors up to 19 percent, improving sleep patterns and improving hormone balance (Chalfont, 2009).
- “Wander gardens” are confined outdoor spaces that enable activity without restraint but prevent departure. Access to these spaces is associated with improvements in the mobility of elderly patients (Detweiler et al., 2012).

Something Bigger than Us

- Trees and forests can help us transcend day to day life by giving us perspective and helping us to overcome narrow self-interest. Nature can allow us to see and feel like a part of something bigger, provoking a feeling of awe. A large old oak, for example, can be inspiring because it has lived over a hundred years and is vast in scale. Vastness can take many forms but often includes physical and temporal elements (Beatley, 2023).
- A 15-minute stroll through the woods can increase connectedness to nature, and the ability to reflect on life problems more constructively than a walk through an urban setting. (Mayer et al. 2009).
- The connection between nature and spirituality is a core tenet of many Native American beliefs. They believe that every aspect of nature, from the soil that nourishes plants to the air we breathe, is sacred. This way of life teaches respect for all living things and promotes balance within the ecosystem (Justo, 2023).
- Kimmerer (2013) in her book, *Braiding Sweet Grass* explained that for Native Americans nature is not just an external environment but is also intertwined with the spiritual essence of existence. Everything is connected. She writes about the importance of reciprocity, respect for all living beings and balance. She advocates for a reciprocal relationship with plants, where humans give back to the natural world as much as they receive.

References

Beatley, T. (2023). *Canopy Cities: Protecting and Expanding Urban Forests (1st ed.)*. Routledge.
<https://doi.org/10.4324/9781003377344>

Beil, K. (2023). Prescription: Nature. *Natural Medicine Journal*.
<https://www.naturalmedicinejournal.com/journal/prescription-nature>

Berman, M. G., Kross, E., Krpan, K. M., Askren, M. K., Burson, A., Deldin, P. J., Kaplan, S., Sherdell, L., Gotlib, I. H., & Jonides, J. (2012). Interacting with nature improves cognition and affect for individuals with depression. *Journal of Affective Disorders*, 140(3), 300–305.
<https://doi.org/10.1016/j.jad.2012.03.012>

Bratman, G. N., Daily, G. C., Levy, B. J., & Gross, J. J. (2015). The benefits of nature experience: Improved affect and cognition. *Landscape and Urban Planning*, 138, 41–50.
<https://doi.org/10.1016/j.landurbplan.2015.02.005>

Chalfont G. et al., (2009). *Understanding Care Homes: A Research and Development Perspective*. Jessica Kingsley.

Deans, E. (2016). Microbiome and mental health in the modern environment. *Journal of Physiological Anthropology*, 36(1). <https://doi.org/10.1186/s40101-016-0101-y>

Detweiler, M (2021). What Is the Evidence to Support the Use of Therapeutic Gardens for the elderly? *Psychiatry Investigation*. <https://doi.org/10.4306>

Douglas et.al, K. (2021, March 24). *Green spaces aren't just for nature – they boost our mental health too*. New Scientist. <https://www.newscientist.com>

Gregory, S. (2024, March 4). *The mental health benefits of nature: Spending time outdoors to refresh your mind*. Mayo Clinic Press. <https://mcpres.mayoclinic.org/mental-health/the-mentalhealthbenefitsof-nature-spending-time-outdoors-to-refresh-your-mind/>

Hirimitsu, K. et al. (2015). Analysis of Individual Variation in Autonomic Responses to Urban and Forest Environments. *Evidence-Based Complementary and Alternative Medicine*. <https://doi.org/10.1155>

Houyle, H. et al. (2017). All about the "wow factor -factor"? The relationships between aesthetics, restorative effect and perceived biodiversity in designed urban planting. *Landscape and Urban Planning*. <https://doi.org/10.1016>

Jiménez, M. P., Aris, I. M., Rifas-Shiman, S. L., Young, J., Tiemeier, H., Hivert, M., Oken, E., & James (2021). Early life exposure to greenness and executive function and behavior: An application of inverse probability weighting of marginal structural models. *Environmental Pollution*, <https://doi.org/10.1016/j.envpol.2021.118208>

Justo (2023, September 23). *Exploring Native American Spirituality: Nature's Connections*. Native Tribe. nativetribe.info.com

Keltner, D. (2023). *Awe: The new science of everyday wonder and how it can transform your life*. Penguin.

Kimmerer, R. (2013). *Braiding Sweetgrass: Indigenous Wisdom, Scientific Knowledge, and the Teachings of Plants*. Milkweed Editions.

Marselle, M. R., Bowler, D. E., Watzema, J., Eichenberg, D., Kirsten, T., & Bonn, A. (2020). Urban street tree biodiversity and antidepressant prescriptions. *Scientific Reports*, *10*(1). <https://doi.org/10.1038/s41598-020-79924-5>

Mayer, S. et al. (2009). Why Is Nature Beneficial? *Sage Journal*. <https://doi.org/10.1177>

Raanaas, R. K., Evensen, K. H., Rich, D., Sjøstrøm, G., & Patil, G. G. (2011). Benefits of indoor plants on attention capacity in an office setting. *Journal of Environmental Psychology*, *31*(1), 99–105. <https://doi.org/10.1016/j.jenvp.2010.11.005>

Sakhvidi Z et al., Z. (2022). Greenspace exposure and children's behavior: A systematic review. *Total Sci Environ*. <https://doi.org/10.1016>

Sakhvidi, M. J. Z., Mehrparvar, A. H., Sakhvidi, F. Z., & Dadvand, P. (2023). Greenspace and health, wellbeing, physical activity, and development in children and adolescents: an overview of the systematic reviews. *Current Opinion in Environmental Science & Health*, 100445.

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