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COVID-19 Stress Reduction Technique: The Japanese Practice of Shinrin-yoku or Forest Bathing

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Introduction

Measures to prevent the spread of the virus that causes COVID-19, such as social distancing, force individuals to spend more time indoors, removed from the natural environment. Social isolation coupled with the lack of outdoor exposure to nature may have a negative impact on an individual's ability to cope with stress (Burtscher et al., 2020). Ongoing research indicates stress may reduce an individual's immunity to disease (Seiler et al., 2020).

The purpose of this extension bulletin is to explain the Japanese practice of Shinrin-yoku, also referred to as "forest bathing," to individuals interested in an academically researched and low-cost, natural stress reduction technique that may have positive health outcomes for individuals dealing with COVID-19 related stress factors. This educational bulletin may be of interest to extension personnel working with clientele in the programming areas of natural resources, family and consumer sciences and 4-H.

Background

The practice of Shinrin-yoku, which literally translates to "forest bath," was developed in Japan and promoted by the Japanese Forestry Agency in 1982 as an acceptable recreational activity to reduce stress (Furuyashiki et al., 2019). Forest bathing studies on humans determined that exposure to forest environments resulted in stress recovery and fatigue reduction. (Furuyashiki et al., 2019, Ulrich et al., 1991).

The practice of forest bathing involves walking in a forest environment while deeply breathing in the fragrance emitted by surrounding trees. Much like aromatherapy, trees emit woody essential oils called phytoncides, which may enhance immunity and cancer prevention (Lyu, 2019; Li, 2010). Phytoncides were first discovered in 1928 by a Russian scientist named B.P. Tokin (Roshchina and Roshchina, 1993). Researchers Vukin and Isailović (2018) called phytoncides, "air vitamins," stating that forest ecosystems have the ability to ionize air playing a potentially hygienic (cleansing) role in maintaining human health.

Phytoncides are produced by all plants and serve to protect the plant from microbial infection and infestation. Phytoncides are released by plants in a forest and remain in the air and soil surroundings. Since phytoncides are volatile, meaning these substances evaporate at a normal temperature, the leaves of forest tree species such as pine, can produce an aromatherapy effect over an extended distance of area.

For example, a forest area of 2.5 acres (1 hectare) has the ability to release approximately 6.6 pounds (3 kilograms) of antimicrobial phytoncides into the air in one day, resulting in a nearly sterile environment (200-300 bacterial cells per cubic meter) within the forest ecosystem (Vukin and Isailović, 2018; Chunyang et al., 2017). In light of the COVID-19 pandemic, this information could be vital to public health planners, health practitioners and the tourism industry.

Yu et al. (2017) described a forest bathing regimen involving tactile (touching), visual (seeing) and auditory (hearing) components, in addition to an olfactory (smelling) sensory experience.

Table 1. Example forest bathing components

Sensory Components	Example Experience
Olfactory	Inhaling deeply the smell of the trees, the air, the soil
Tactile	Touching plant leaves, bark on the trees, moss that may be on the bark and branches of trees. One may even attempt to wrap their arms around a tree as if to hug the tree.
Visual	Observing and taking in the changing scenery while walking through the forest. Taking time to notice the sky through the branches, insects on the forest floor and climbing on trees and plants, small animals scurrying along and the different plants scattered on the forest floor.
Auditory	Listening to the birds singing. Hearing the wind going through the forest or the sound of water from a forest stream or even raindrops.

Example Forest Bathing Program

A two-hour guided forest bathing program was described by Yu et al. (2017) as follows:

"This study was conducted from 8:30 a.m. to 12:00 p.m. from 15 to 27 July 2016. Pretest and posttest data were collected from 8:30 to 9:15 a.m. and 11:15 a.m. to 12:00 p.m. The investigation was conducted once a day in the morning to limit changes in temperature, humidity, wind speed, and light levels. A guided 2 hour forest bathing program (Sensory Forest) was organized to include the stimulation of four senses, namely visual (e.g., scenery), auditory (e.g., the sound of running streams or birds singing), olfactory (e.g., the smell of wood), and tactile (e.g., feeling the surfaces of leaves and trees) to facilitate the forest bathing experience. The total distance was 2.5 kilometers (1.5 miles), with an altitude of 1166–1192 meters (3661-3910 feet); the average walking speed was around 2 kilometers per hour (1.2 miles per hour) and the walking course had a slight slope (5%). All participants completed the short trip smoothly. Consumption of alcohol, tobacco and caffeine was prohibited during the study period."

The example from Yu et al. (2017) may be used as a practical example of a guided or self-guided forest bathing program that could be easily adapted to fit a specific forest setting and adjusted to an individual's needs in terms of time, environmental qualities (water features, vegetation, wildlife, etc.) and physical limitations (slope, altitude, distance, etc.).

Creating a Forest Bathing Map

To plan a forest bathing experience, begin by finding a forest near you to visit. To find a forest nearest you, go to https://discovertheforest.org.

After you have identified a forest near you, if it is a national forest, you can use the National Forest Service Interactive Map tool found at: https://www.fs.fed.us/ivm/index.html to view a map of the forest areas. You can print the map and draw on it the path you will take.

Another map tool to try is Google Earth: https://earth.google.com. In Google Earth, conduct a search for the name of the forest park you are interested in. After you have a map of your forest area, print the map and draw on it, indicating stops where you will incorporate olfactory, tactile, auditory and visual experiences (Figure 1).

In Figure 1., Google Earth was used to identify Pocahontas State Park in Chesterfield, Virginia. Using the Print-Screen key, a screen capture of the map was taken and pasted into Microsoft Word (MSWord). A forest bathing path was outlined, and using the insert menu, text boxes were inserted to identify the sensory components of the trail.

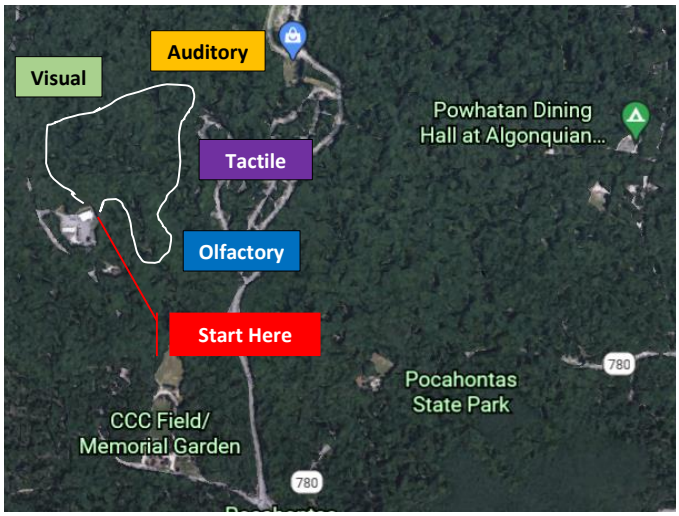

Figure 1. Example forest bathing walking map. (Theresa Nartea, Virginia Cooperative Extension)

Additional Suggestions

To fully experience the effectiveness of forest bathing, avoid using electronic devices, such as cellular phones. Placing phones and other devices on silence will prevent distractions. Refrain from talking on phone or taking photos until after the forest bathing experience is completed.

Focus on being present in the moment, taking in with your senses the smell, feel, sight and sounds of the forest environment. Focus on centering your thoughts on how the smells, sights, sounds and what you touch make you feel at the moment you experience them.

Another suggestion is to write in a journal or on a piece of paper all your thoughts and feelings before and after your forest bathing experience. Additionally, if you enjoy sketching, take time after your forest bathing experience to go to a peaceful place and fondly remember an object you saw in the forest. Imagine what it looked like and the colors of the object, then sketch the object you remembered. If you have colored pencils, markers or crayons, color your sketched object. Creative activities, such as journaling and coloring may reduce stress anxiety and elicit positive emotions of well-being (Riddell et al. 2020; Holt et al. 2019).

Consider varying the amount of time you spend in the forest. To begin forest bathing, start off for a short time, such as 30 minutes, and then increase your time spent as you become more comfortable with forest bathing.

References

Burtscher, Johannes, Martin Burtscher, and Grégoire P. Millet. “(Indoor) Isolation, Stress, and Physical Inactivity: Vicious Circles Accelerated by COVID-19?” *Scandinavian Journal of Medicine & Science in Sports* 30, no. 8 (2020): 1544–45. https://doi.org/10.1111/sms.13706

Furuyashiki, Akemi, Keiji Tabuchi, Kensuke Norikoshi, Toshio Kobayashi, and Sanae Oriyama. “A Comparative Study of the Physiological and Psychological Effects of Forest Bathing (Shinrin-Yoku) on Working Age People with and without Depressive Tendencies.” *Environmental Health and Preventive Medicine* 24, no. 1 (2019). https://doi.org/10.1186/s12199-019-0800-1

Holt, N. J., Furbert, L., & Sweetingham, E. 2019.Cognitive and affective benefits of coloring: Two randomized controlled crossover studies, *Art Therapy*, 36:4, 200-208, DOI: 10.1080/07421656.2019.1645498

Li, Qing. “Effect of Forest Bathing Trips on Human Immune Function.” *Environmental Health and Preventive Medicine* 15, no. 1 (2009): 9–17. https://doi.org/10.1007/s12199-008-0068-3

Lyu, Bingyang, Chengcheng Zeng, Shouhong Xie, Di Li, Wei Lin, Nian Li, Mingyan Jiang, Shiliang Liu, and Qibing Chen. “Benefits of A Three-Day Bamboo Forest Therapy Session on the Psychophysiology and Immune System Responses of Male College Students.” *International Journal of Environmental Research and Public Health* 16, no. 24 (2019): 4991. https://doi.org/10.3390/ijerph16244991

Riddell, Tara, Jane Nassif, Ana Hategan, and Joanna Jarecki. “Healthy Habits: Positive Psychology, Journaling, Meditation, and Nature Therapy.” *Humanism and Resilience in Residency Training*, 2020, 439–72. https://doi.org/10.1007/978-3-030-45627-6_14

Roshchina, Victoria V., and Valentina D. Roshchina. “Biological Effects of Plant Excreta.” *The Excretory Function of Higher Plants*, 1993, 208–45. https://doi.org/10.1007/978-3-642-78130-8_8

Seiler, Annina, Christopher P. Fagundes, and Lisa M. Christian. “The Impact of Everyday Stressors on the Immune System and Health.” *Stress*

Challenges and Immunity in Space, 2019, 71–92. https://doi.org/10.1007/978-3-030-16996-1_6

Ulrich, Roger S., Robert F. Simons, Barbara D. Losito, Evelyn Fiorito, Mark A. Miles, and Michael Zelson. “Stress Recovery during Exposure to Natural and Urban Environments.” *Journal of Environmental Psychology* 11, no. 3 (1991): 201–30. https://doi.org/10.1016/s0272-4944(05)80184-7

Vukin, Marina., & Isailović, Gorana. 2018. “A Cure and Healing Forest of Goč Mountain – A New Approach to Health Tourism in Serbia.” *TISC - Tourism International Scientific Conference Vrnjačka Banja*, 3(2), 732-749. Retrieved from http://www.tisc.rs/proceedings/index.php/hitmc/article/view/85

Yu, Chia-Pin, Chia-Min Lin, Ming-Jer Tsai, Yu-Chieh Tsai, and Chun-Yu Chen. “Effects of Short Forest Bathing Program on Autonomic Nervous System Activity and Mood States in Middle-Aged and Elderly Individuals.” *International Journal of Environmental Research and Public Health* 14, no. 8 (2017): 897. https://doi.org/10.3390/ijerph14080897

Zhu, Chunyang, Peng Ji, and Shuhua Li. “Effects of Urban Green Belts on the Air Temperature, Humidity and Air Quality.” *Journal of Environmental Engineering and Landscape Management* 25, no. 1 (2017): 39–55. https://doi.org/10.3846/16486897.2016.1194276

Additional Resources

Forest Therapy Society - Official Website. Accessed October 28, 2020. https://www.fo-society.jp/en/index.html

Google Earth. Google. Accessed October 28, 2020. https://earth.google.com

“Interactive Visitor Map.” Forest Service Visitor Map. Accessed October 28, 2020. https://www.fs.fed.us/ivm/index.html

“Your Forest Is Ready.” Discover the Forest. Accessed October 28, 2020. https://discovertheforest.org/

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