Green space and heart health: What’s the connection?

Elizabeth Moxley
Northern Illinois University, emoxley@niu.edu

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Prescribing Green Space to Promote Heart Health

While cardiovascular professionals across the globe are well-versed in applying guidelines-based care to help their patients prevent, or manage, cardiovascular disease, one important therapy may come not from a prescription bottle, but from just outside the front (or back) door. According to recent research, the key to improved cardiovascular health may be as simple as spending more time in nature. In fact, the health benefits from green space exposure are significant enough for practitioners and policymakers to recommend spending more time in nature.1-8 It is becoming more common for health care providers in the U.S., Canada, and beyond to ‘prescribe’ time in the out of doors; licensed health care providers in four provinces of Canada, for example, can now prescribe a free pass to Canada’s national parks.9
Grounded in Science

There is a growing appreciation that social determinants of health – those areas where individuals are born, live, work, play, and age – collectively have a considerable impact on health outcomes, starting in childhood. Healthy People 2030 has specified the goal: “Create neighborhoods and environments that promote health and safety,” to acknowledge the inextricable link between the environment and health. While creating safe outdoor spaces often requires collaborative efforts among members of the community along with city/regional representatives, the end result can significantly impact the health and well-being of individuals in the area.

Natural environments are often referred to as green spaces – areas with vegetation associated with natural elements. In addition to the physical elements of natural spaces, there is also a benefit from greenspace interventions (GSI), which are nature-based activities providing positive therapeutic associations with health. GSIs include a range of activities from those that individuals can do on their own to those facilitated by professionals. Examples include, but are not limited to:

- Horticulture therapy, using plants and gardening in a professional practice to improve mental and physical health
- Gardening (such as in the backyard or community garden)
- Forest bathing (also known as Shinrin-yoku), is an experience in the forest atmosphere and a type of preventive medicine.

Determining the amount of access that individuals have to green spaces includes mapping and other quantitative data. Measuring greenspace exposure includes a normalized difference vegetation index (an indicator for greenspace that estimates the density of vegetation using the difference in reflected light intensities in the red and near-infrared range divided by the sum of these intensities, tree canopy cover (the leaves, branches, and stems that provide the tree coverage of the ground when viewed from above), or distance to nature (which quantifies the anthropogenic influence on a landscape by considering the degree of habitat change caused by anthropogenic land use and the spatial distance to the nearest natural habitat).

For individuals living in urban environments (the majority of the world’s population and a sector that continues to grow), urban vegetation provides important ecosystem services to residents. Along with stormwater management and support for biodiversity, green views (as we’ll explore more in the next section) can reduce stress, improve psychological well-being, and aid in lowering CVD risk. Despite the clear positive influence of green space, the distribution of urban vegetation is not equitable in all cities and may contribute to health inequalities for those unable to access these spaces.

Greenspace Mitigates the Etiology of Cardiovascular Disease

It is well established that cardiovascular disease results from the complex interplay between genetic predisposition and environmental influences. Environment and lifestyle are considered
Maintaining normal blood pressure begins in childhood and is enhanced from exposure to natural environments; several key features of the natural environment have been linked to cardiovascular disease risk. Elevated blood pressure during childhood contributes to hypertension and cardiovascular disease in adulthood, but even the presence of greenness or vegetation is thought to promote health, especially in older individuals residing in poor neighborhoods.

Beneficial associations were found between greenspace and all-cause and stroke-specific mortality, cardiovascular disease morbidity, cardiometabolic factors, low birth weight, physical activity, sleep quality, and urban crime in Yang et al.'s recent umbrella review examining the effect of exposure to greenness. Furthermore, green space exposure has been associated with other cardiovascular benefits, including a decrease in heart rate, systolic and diastolic blood pressure, low-frequency heart rate variability (HRV), type 2 diabetes, stroke incidence, dyslipidemia, and all-cause mortality, and improved HDL cholesterol levels.

The cardiovascular benefits from exposure to greenspace may be related to increased time spent outdoors and proximity to areas conducive to physical activity which likely decrease stress levels. Lowering stress improves quality of life and prognosis in those with cardiovascular disease. Greenspace interventions (GSI) reduce the physiologic burden of stress across the lifespan by reducing cortisol production. In a recent scoping review involving an analysis of the findings from twenty trials and 732 participants who engaged in forest bathing, blood pressure significantly decreased compared to those who experienced a non-forest environment.

**Strategies to Promote Exposure to Greenspace**

Cardiovascular nurses should recommend and prescribe greenspace exposure for patients whenever possible. To identify key areas for activity and exposure to greenspace, Geographical Information System (GIS) data preparations and calculations are beneficial, although it may be necessary to consult with a forest guide or naturalist, especially in more challenging locations or urban areas. Depending on the neighborhood, greenspace access may be limited.

To escape to nature, nurses should emphasize the following strategies for their patients at risk for, or with, cardiovascular disease:

- Taking a walk in the woods or on a nearby path in the neighborhood
- Planting native flowers to attract butterflies or bees by grouping according to color
- Starting a small garden and spending time in it
- Leaving technology behind
- Touching nature: tree bark, water, or leaves and breathing in the scent of flowers and air
- Noticing the beauty of nature as it is experienced
Consulting with a forest guide or naturalist to identify ideal settings in unfamiliar areas

Nurses can also advocate for environmental justice where everyone has the opportunity to experience the health benefits of green space. Whether from exposure to an urban park or a national forest, nature has a nurturing effect for individuals of all ages and persistent exposure to greenness improves heart health.

References

8. Twohig-Bennett C and Jones A. The health benefits of the great outdoors: A systematic review and meta-analysis of greenspace exposure and health outcomes. Environmental research 2018;166:628-637. doi:10.1016/j.envres.2018.06.030

