RESEARCH BRIEF

THE BENEFITS OF NEARBY NATURE IN CITIES FOR OLDER ADULTS

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How can we promote improved health and wellness for elders? For older adults, generally defined here as people who are 60 or older, the health benefits of being near urban green spaces can play a meaningful role in wellness and quality of life. Health is often believed to be the outcome of personal choices, such as one's diet, whether to drink bottled water, or how often to exercise. Yet health officials now recognize that one's surroundings, from home to neighborhood, are equally important in promoting health.

As people age they become more susceptible to health risks, particularly chronic and degenerative diseases. Population forecasts suggest the older adult demographic will continue to increase and diversify in the U.S. Persons of age 65 years or older numbered 44.7 million in 2013, or about 14% of the U.S. population. By 2060, there will be about 98 million older persons, more than doubling

"Never before have so many people lived for so long. Life expectancy has nearly doubled over the last century, and today there are 35 million Americans age 65 and older. The aging of the population—in past decades and in the foreseeable future—presents both a challenge and an opportunity."

—Director, National Institute on Aging

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current numbers.[1] In addition, more than eighty percent of the U.S. population now lives in cities and towns, and greater concentration in urban areas is projected.

The aesthetic value of parks, trees, and open space has been widely praised for centuries. In recent decades scientists have discovered a deeper level of impact. Studies have documented the connections between nature experiences and human health, wellness, function, and therapy. Evidence confirms that the experiences of city trees, parks, and gardens can aid with attention restoration and stress reduction, contribute to positive emotions, and can promote social engagement and social support (among neighbors, friends, family, and within local organizations).[2] For older adults, such outcomes are important for urban-based, healthy lifestyles.

This briefing is an overview of the health and wellness benefits of urban nearby nature, with special attention to the needs of people in their later years. There are general benefits from access to green spaces and neighborhoods. We also report on the specific health issues of aging, such as mobility, isolation, assisted living, physical therapy, depression and Alzheimer's.

In this report the terms '*nearby nature*' and '*green space*' refer to urban landscapes, gardens, parks or any private or public green spaces that include natural elements (such as trees, small plants, water features, and even potted plants). Some green spaces may also provide opportunities for people to interact with companion animals, urban wildlife and other people.

Community-Level Health Promotion

Studies point to the basics for good health. Spending time with family and friends, eating healthy, exercising regularly, and living in a community with accessible paths to parks and gardens are essential to maintaining good health and a positive mindset. Maintaining these opportunities is particularly important for older adults.

The Centers for Disease Control and Prevention uses a set of health indicators to monitor older adult health goals. In 2013 most U.S. states were on track or ahead on targets of individual actions such as physical activity, obesity, smoking, medication, mammograms and cancer screenings.[3]

But a progress report encouraged communities to take additional steps to improve health and well-being. At the community level, the report calls for improvements in mobility in physical spaces, programs that encourage brain health, and opportunities to decrease mental distress among elders.

A 2014 national U.S. survey explored aging preparedness.[4] Younger seniors are the most concerned about community support as they age. Nearly 4 in 10 of older adults ages 60-64 feel their communities are not doing enough to plan for the growing senior population. And low-income older adults are less convinced that their community is prepared for the needs of a growing senior population.

Meanwhile, research findings consistently show that positive mind-set and general well-being is gained from access to nearby nature in one's community:

- The designs of neighborhood environments facilitate older people's outdoor activities. The quality and character of a neighborhood environment (for example, places to sit outside) influences residents' actual outdoor activities and perceived quality of life (satisfaction and physical health).[5]
- The amount of green space in a neighborhood is positively associated with health status of older people. The effect of nearby nature on health is greater for older people if their outdoor exposure opportunities are limited to their immediate neighborhood or care facility.[6]
- The aesthetic quality of nearby open spaces is related to older people's life satisfaction. Having safe routes and paths to open spaces is correlated with more walking behavior, regardless of a person's age, physical ability, and education.[7]
- Older people in economically deprived neighborhoods are likely to experience difficulty getting access to and being able to spend time within green spaces.[5, 8]
- One study assessed well-being and sources of meaning among a racially diverse group of 70+ aged adults. Gardening was important because it connected them to their past and future generations, was a source of memories and social events, and brought opportunities for spiritual healing and therapy.[9]
- A study of people aged 50 and over who lived within walking distance of a park used parks significantly more than individuals not within walking range, and also had better perceptions of their physical and mental health. Considering demographics, those who did visit nearby parks were more likely to be employed full-time, Caucasian, married and have a higher education level.[10]

- In interviews with elderly apartment residents, satisfaction levels were significantly higher for those residents whose apartments overlooked natural settings, and for those who lived closer to certain kinds of outdoor settings.[11]

Nature and Health Benefits for Older Adults

Older people benefit from engagement with outdoor environments in three main ways: participation in outdoor physical activity, better mental health and function, and social interaction with others. Here is a review of the literature - a listing of studies that makes it abundantly clear why older adults need access to nearby nature, particularly if they live in cities.

Physical Activity and Mobility

Regular participation in moderate physical activity generates substantial benefits for older people's health. Those who are more active may delay the onset of changes associated with aging and common chronic diseases. Participating in physical activity also improves balance and muscle strength, preventing accidental falls, a major cause of disabilities in older people.[12]

For older people, simply walking outside and staying outdoors for a brief time is beneficial. Gardening is an activity that contributes to overall health and perceived well-being. And even non-aerobic activities have positive effects on well-being.[13] Here we highlight the evidence-based benefits of spending time outdoors, including active and passive activities.

- For older adults, light exercise, such as taking short walks to a park or to do errands, greatly contributes to overall health. In a study of elderly people, those that had nearby parks, tree-lined streets, and space for taking walks showed higher longevity over a 5-year study period.[14]

- In a long term study, participants going for a daily outdoor walk at age 70 reported significantly fewer new complaints at age 77 concerning musculoskeletal pain, sleep problems, urinary incontinence, and decline in ability to do normal daily activities compared to those who did not go outside daily.[15]
- In a study of over 1,800 people over age 65 living in their own homes, limitations in daily tasks (such as bathing and dressing) were most strongly correlated with going outside the home less than once a week. Going outdoors in one's neighborhood at least once a week (and more often), is beneficial for maintaining physical function in physically limited elders.[16, 17]
- In a national survey more than one third of adults 60 years and older reported that they exercise every day. For many older adults, high activity levels correspond to a positive perspective on life. Those who exercise daily are much more likely than those who never exercise to say the past year of their life has been better than normal (28%) rather than worse (15%).[4]
- Older adults with hypertension participated in a three-day cognitive behavior therapy program in a South Korean forest. Participants walked, rested and meditated in the forest. Compared to a control group, these participants showed a significant decrease in cortisol levels (a stress indicator) and improvement in quality of life measures.[18]

- Older adults in a retirement community who routinely spent more than 30 minutes in outdoor physical activities were less likely to report depressive symptoms and fear of falling.[19]
- Older gardeners having a community garden allotment reported increased physical activity and better scores on a range of health and well being measures compared to a similar non-gardening group. This difference was found even after adjusting for income, education, gender, stressful life events, seasonal changes, and access to a home garden.[20]
- Older gardeners are more likely to consume vegetables compared to non-gardeners in their same age group.[21]
- Gardeners report better health status, improved hand and body strength and flexibility, increased physical functioning, decreased bodily pain, and reduced blood pressure.[22, 23, 24]

Mental Health & Well Being

The connection between nearby nature and active living has been studied extensively. Recent studies have focused on the relationships between nature encounters and mental health, cognitive function, and mood. Simply walking through a natural space or engaging in a calm activity, such as enjoying a patch of flowers or bird-watching, can support mental health and well-being. Here are some of the research highlights.

- Measures of people's responses before and after entering an urban green space revealed that both the amount of time spent in the green area and frequency of visits correlated with feelings of mental restoration. Staying an extra 30 minutes increased the restorative effect, and if someone entered with a high stress level their improvement was more dramatic.[25]
- The same study found those who had previous experiences in natural settings (such as nature hobbies or childhood exposure) had greater restorative experiences than individuals with limited prior nature experiences. Such a finding has implications across the life cycle, reinforcing the need for nature contact when we are children.[25]
- Regular physical activity in green spaces provides older people with mental health benefits. Numerous studies have shown extensive links between exercise and positive mood states, decreased likelihood of depression, lower incidence of stress, and improved cognition throughout the entire life span.[26]
- Viewing images of nature on a screen or through a window, or being outside in various types of green spaces contributes to stress recovery and cognitive health.[27, 28]
- Chronic stress (e.g. long-term disease) and stressful events (e.g. death of a spouse) can take a toll on older adult's health. Visiting parks has shown to be a positive way to cope with life stressors.[29, 30]
- In a study of 600 people (with 20% of age 55 or older), those who relocated to homes in greener areas had significantly better mental health for all of the 3 years of monitoring following the move.[31]
- Intellectual stimulation and creativity are frequently identified as perceived outcomes and benefits of gardening within a long-term care facility.[32]
- In interviews, low-income, minority older adults chose to participate in gardening because of perceived mental, physical and social benefits, the inherent beauty of nature, the value of fruits and vegetables, and increased self-efficacy.[33]

Essential Social Connections

In a national survey 21% of older adults reported feeling lonely or socially isolated.[4] National statistics show that about 28% (12.5 million) of non-institutionalized older persons in the U.S. live alone (8.8 million women, 3.8 million men). Almost half of older women (46%) aged 75 or older live alone.[1]

Older people have much to share and contribute in their communities. Ensuring their access to community green spaces, parks, and walkways provides a wealth of physical, mental and social benefits that not only benefit each individual but also improves community quality of life.

At the neighborhood level, having nearby nature facilitates informal social interactions. Residential common spaces having more trees and vegetation are associated with increased use of common spaces and stronger neighborhood social ties. Urban parks and greening projects can help create the environments that facilitate social contacts and community attachment.

- The importance of social interaction in fostering elder health has been supported by many studies.[34] Continued physical and mental activity, and sustained social connections are vital conditions for maintaining a healthy life. Nearby nature can aid both.
- Older adults, in general, are less mobile and thus may have more limited activity spaces and social networks. Having trees, grass and outdoor gathering spaces, especially if safe and maintained, encourages more contacts between neighbors.[35]
- Studies have shown that, in the elderly, decreased loneliness is correlated with lower rates of mortality, depression, and cognitive impairment.[36, 37]
- Natural elements encourage people to spend more time when outside, creating stronger social ties and friendships with neighbors through spontaneous face-to-face encounters.[38]
- Nearby nature may support a stronger social network for the elderly, which can help restore feelings of personal control and self-esteem by buffering the effects of aging - stress, poor health, and feelings of isolation.[39]
- Older adults who have more exposure to green common spaces report a stronger sense of unity among residents within their local neighborhood, and experience a stronger sense of belonging to the community.[40]
- Including older residents in the planning process for community projects not only contributes to the stability and relevance of the project, but contributes to enhanced well-being and increased socialization of the project participants.[41]

Cognitive Function & Dementia

A number of cognitive impairments, collectively termed dementia, afflict older persons. For example, in 2013 an estimated 5.2 million Americans were impaired by Alzheimer's disease. In addition, some older people experience some degree of depression. And depression among older adults is typically compounded by other health factors.[42]

The lifestyle choices we make in our mid-adult years can greatly impact our mental function and likelihood of decline in later years.[43, 44] Nature experiences can be part of long-term preventative strategies, and can be used as non-pharmacological therapy and treatment.

- Nature is an abundant source of sensory experiences and provides dementia patients with opportunities for relaxation, physical activity, connection to cultural heritage, enjoyment and stimulation of the senses.[45]
- Assisted living interventions that promote normal household life, encourage independence and mobility, and incorporate natural elements (including plants, trees, animals, daylight) in the lives of people with dementia are generally recommended.[46, 47]
- For those experiencing depression, a garden-walking program with a reflective journaling component can contribute to significant reduction in depression levels. Participants in one study greatly benefited from "being away" from daily pressures, experiencing the beauty of the garden, focused self-reflection and feeling gratitude.[48]
- In the Netherlands, live-at-home older people with dementia can attend "green care farms". These day care centers provide opportunities to help with easy but rewarding tasks like household chores, animal husbandry, and gardening, leading to multiple health and efficacy benefits.[49]
- Alzheimer's patients living in an urban nursing home attended horticultural therapy sessions; after 12 weeks the group displayed an overall higher functional level compared to non-participating residents.[50]

Gender Differences

Longevity differs by gender. In the U.S. in 2013 older women outnumbered older men (25.1 versus 19.6 million). Women 65 and older, compared to men of the same age, are less likely to go outside, tend to have less savings, and are more likely to be widowed.[51, 52]

Nature views and physical activity in green spaces can provide a number of benefits for older women.[53] Community planning and therapy programs should take into account the physical ability, physiological health differences, and social engagement needs of aging women.

- African American women aged 55-84 living in Texas were more likely to be physically active if their nearby environment (meaning the area within a half-mile from home) was greener.[54] In a similar study, older women who perceived that walking trails, parks and other amenities were located within a 20 minute walking distance from their homes walked longer distances compared to women who did not perceive their neighborhood as favorably.[55]
- Gardening provides cognitive stimulation, sensory and aesthetic experiences and connection to socio-emotional elements of life.[56]
- Elderly women in a Japanese healthcare facility entered a physiologically relaxed state (measured by heart rate variability) when in a specially designed rooftop forest.[57]
- Viewing a natural landscape through the windows of a retirement center also correlated with lower blood pressure and heart rate in a study of elderly Canadian women.[58]

Living Situations

As we age certain aspects of our lives can change dramatically, including housing status, social engagement, mobility, cognitive health and relationship status. Some of these changes result in special needs, and nature can be a positive aspect of new lifestyles.

Assisted Living Facilities

Adults between 60 and 75 may live in their home, with family members, or in a retirement community. Over half of people 65 and older live with a spouse and about 30% live alone in their home.

As they get older, many elders move into assisted living or nursing facilities. On average, residents in such facilities are 75% female, mobile and about 87 years old. In 2012 more than two million people in the U.S. lived in communities that provide more supportive and assisted living.[59] Assisted living facilities enable independent living and social opportunities but also offer residents daily assistance with bathing, dressing, medication, meals and/or transportation.

Access to indoor or outdoor nature is important for resident health, including "enabling" or "wander" gardens, and horticultural therapy programs:

- In a nursing home, residents in their early 80s participated in an indoor gardening health intervention. For participants in the 5-week program, compared to a 2-week program, physical and social health improved significantly.[60]
- Access to outdoor gardens have also been associated with improvements in the ambulatory capacity of elderly patients. In one institutional setting, patients with access to a garden had about 30% fewer falls, or if they did fall injury was less severe. In addition, there were significant reductions in the amount of medications used, partially because caregivers were administering less drugs to calmer patients.[61]
- In a low-income assisted living facility, residents who took care of plants indicated significant improvement in mastery, self-rated health, and self-rated happiness.[62]
- A garden may restore an elderly person with low psycho-physiological balance to a state of better harmony. Elderly people in care facilities showing low tolerance of other residents, less helpfulness in group activities and having a higher frequency of hospital visits, were most affected by a stay in a garden, as measured in changes in heart rate and blood pressure. [63]
- Researchers and designers recommend the following for assisted living care environments: smaller-scale living, more privacy (and thus more personal living space), attention to environmental ambiance (e.g. mealtime ambiance), incorporating more natural elements indoors, more possibilities to watch nature, and being active outdoors.[64]

- Outdoor areas in care facilities are commonly reported as being underutilized. When asked what features attract or deter them, residents mention accessibility, staff assistance, attractiveness, seating, shade, weather, plants and views.[65]
- Residents may have specific expectations and responses to gardens in their community or residential facility. The more complex and visually stimulating a green space, the more likely it will attract residents, encourage longer sustained mental focus, and induce a more calming state. Inspiring designs and a maintained, safe space can contribute to positive mood states, self-reported health and cardiac health.[66, 67, 68]

Horticultural Therapy

Horticulture and gardening are popular leisure activities for older Americans. As a therapeutic intervention, these activities also enhance physical and mental health.[33] Horticultural therapy includes those activities recommended by a medical or therapy professional to address diagnosed mental, physical, or emotional concerns. Activities may take place in one's own yard, in an organized program within a community center, or as part of a structured therapy program in a hospital or assisted living center. Recommended activities include sowing seeds, transplanting houseplants, growing plants in a community garden, watering, harvesting, or making flower arrangements.

In nearly all cases, spending time with living things and witnessing the results of one's efforts contributes to improved well-being, social engagement, mindset, sleep patterns, behavior, physical function, decreased falls, and medication use.[69, 70]

- Outdoor activities promote exposure to sunlight (improving bone density due to vitamin D absorption) and improve circadian rhythms and sleep cycles for older adults.[71]
- Gardening in community or institutional settings improves quality of life, fitness, cognitive abilities and socialization and may reduce the risks of dementia[72] and improve mobility and dexterity.[73, 74]
- For those who experience dementia, access to gardens and horticultural therapy appears to improve behavior and increase sense of well-being.[70]
- Indoor gardening is therapeutic for patients with mild-to-moderate dementia. Participants in an indoor gardening program showed significant improvement in cognition and sleep behaviors (frequency and duration of naps, nocturnal sleep time, and nocturnal sleep efficiency), and reduced agitation.[75]

- Benefits of gardens at dementia care centers may also extend to staff and visiting family members, reducing stress levels of formal and informal caregivers.[76]
- An enabling garden, a garden with raised beds and adaptive tools, can contribute to positive effects on resident quality of life, including more meaningful daily activities, enjoyment of daily life, social relationships, and functional competency.[77, 78]

- Wander gardens are therapeutic gardens designed to promote independence but ensure the safety of residents with cognitive or physical impairments. Residents who regularly use wander gardens are likely to benefit from pain reduction, improvement in attention, decreased sympathetic stress response, reduced aggression and tension, improved healing, increased autonomy, vitamin D intake, reduction in falls, reduction in anti-psychotic medication, and the benefits of light exercise.[79, 80, 81]

Planning & Design

Decades of research suggest evidence-based guidelines for supportive outdoor spaces, that are beneficial to people of all ages.[82, 83] A restorative environment should be visually stimulating; it should include the nuanced complexity and opportunity to access information about one's surroundings that is experienced in well-designed gardens and parks. An environment that readily supports one's movements and intentions is also more likely to move your body from a stressed state to a relaxed state. A restorative green space should have slower movement in the visual field, and sensory stimulation that one associates with pleasant memories.

The proximity and ease of access to green spaces in neighborhoods, retirement centers or assisted living residences is especially critical for the elderly due to their limited mobility, with all the benefits described in this briefing. Here are some final findings that indicate important considerations when planning for nearby nature in the lives of older adults.

- A 5 year longitudinal study in Japan investigated the association between older people's longevity and the existence of green areas that are nearby and easy to walk to. Those who live closer to green spaces lived longer.[84]
- Health researchers and caregivers consistently endorse therapeutic gardens as a necessary feature in places that are caring for people with cognitive decline.[85, 86]
- In a study of British adults aged 60 and older, researchers assessed environmental attributes relevant to older people's park preferences. Several factors prevented potential park users from visiting the space. Nuisances include signs of vandalism or dog fouling, and deterrents such as heavy traffic en route to an open space. Elements that attract older users are cafes and toilets, trees and plants, things to watch, and good maintenance.[87]
- For older adults whose youth was spent in other cultures, nearby nature should be culturally meaningful to provide the most benefit. If a place feels familiar and has features that connect to one's cultural roots, people may be more likely to walk to the area, maintain interest and engagement, and derive meaning and satisfaction from their time spent in the space.[88]

In the book, *Therapeutic Landscapes: An Evidence-Based Approach to Designing Healing Gardens and Restorative Outdoor Spaces*, authors Cooper Marcus and Sachs provide design guidelines for spaces that support well being for the elderly, mobility-impaired, or those facing cognitive decline. Highlights from their recommendations include:

- A restorative space should have the look of a domestic garden that makes one feel "at home". Most importantly, consider the culture and attitude of the users.
- There should be appropriate destination points for those who need to take short sitting breaks. Spaces should provide shelter and shade.

- Provide plenty of choice.
- Provide garden spaces both at the back of an assisted living facility and the front. For those who have limited mobility, green spaces should be clearly visible from inside. Design needs to account for multiple levels of view (wheelchair height, for example) of plants and wildlife.
- Designs should encourage visitors, family, and children to use the spaces too.
- Provide areas specifically designed for assisted gardening.
- Walking path design is critical. Entry into green spaces should be ADA accessible, and the transition space between door frames should be considered. Level, glare free paths with good traction, handrails and consistent color and lighting are also critical elements to encourage use and exploration.

Closing Thoughts

People have sensed for decades that access to green space benefits all people. Many Americans cherish nature experiences in their lives, and enjoy getting away from it all in the great outdoors, often beyond the city. But we now know that brief encounters within the city, within public spaces and in our personal gardens, provides many benefits.

Those individuals who are more vulnerable benefit the most, including some older adults. Evidence of green space health benefits for elders extends across the social, mental, and physical domains. Walkability and community amenities that strengthen people's minds, bodies and spirits are essential in the design of future urban places. As we age we may become less mobile, and we must rely on the nature experiences that are closest to home.

As communities plan and design for nature access for residents, age-based considerations should be on the checklist. Integrating the generations, by way of well-designed green spaces, provides opportunity for older adults to enrich their lives and connect with younger people who might benefit from their experiences and insights. In addition, the special or unique needs of older adults should be considered. Intergenerational differences are recognized within racial or ethnic groups, and the difference in needs between a person who is 65 versus 75 is equally important. Older people living in dense cities may have quite different experiences in transportation and community engagement than those in more rural communities. Older adults are an ever-growing segment of American society and they, as do people of all ages, need high quality, well-designed nearby nature for better health and well-being.

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