ANDRÉ RAMALHO I JOÃO PETRICA

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GROWING GREEN

Nature-based physical activity
for aging gracefully

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Contents

Into the wild: An introduction to nature-based activities

Within the kaleidoscopic ecology of intertwined life forms and environmental elements, we are all interconnected creatures of nature, each playing a unique role in the dynamic and intricate web of interactions that shape the ecosystem. Yet the older we get and the more urbanised our society becomes, the more we move away from the natural world that nurtures us. We spend our days indoors, under the hum of artificial lights and the glow of screens, while our bodies and minds stagnate in idleness. Sometimes we have no choice, as in the case of many elderly people whose mobility is limited by health problems, cutting them off from the beauty of the world around them.

Amidst the hectic chaos of modern life, our bodies and minds long for nature. Physical and mental chronic illnesses plague us and the burden of stress weighs on our shoulders. But there is a solution within our reach. A solution that requires nothing more than a step outside, a breath of fresh air. Activities in nature have become a common escape from the urban jungle (Cox et al., 2017), a way to ease the burden of our modern problems. When we immerse ourselves in the natural world, we reap the rewards of better physical health, such as lower blood pressure and fewer allergies (Shanahan et al., 2016). But these are not all the benefits. The calming presence of nature can also soothe our troubled minds, reduce depression and anxiety, and increase social well-being (Cox et al., 2017; Shanahan et al., 2016). Research even suggests that the more frequently we connect with nature, the greater the benefits (Cohen-Cline et al., 2015).

It is a disheartening fact that we are moving further and further away from nature due to increasing urbanisation and the demands of modern life. But we must not forget that we are creatures of nature, and our existence is interwoven with the environment around us. We must listen to the call of nature and seek comfort in it. For only through this connection can we recover from the turbulence of modern life and find a path to greater health and well-being.

But why do we long for travel and discovery, to feel the ground beneath our feet and the sun on our skin? The solution lies in the beauty and power of nature. Immersing ourselves in nature through outdoor physical activities, such as gardening, hiking and fishing, is widely regarded as key to unlocking our physical and mental well-being (White et al., 2019). These nature-based activities place us in the heart of the wilderness and allow us to combine physical activity with the soul-nourishing experience of being surrounded by nature (Huang et al., 2022; Vilhelmson & Thulin, 2021). These activities are embedded in our social consciousness as an integral part of leisure and well-being policies (Vilhelmson & Thulin, 2021). They are also recommended by health authorities and professional associations as a preventive measure against diseases and as a restorative exercise for mental and physical fitness (Korpela et al., 2016).

When we spend time in nature, we not only strengthen our physical health and mental well-being, but also have a profound and transformative experience that can connect us to the essence of life itself. The joy and fulfilment that comes from spending time in nature is available to us at any age, regardless of our physical abilities (Zaidi & Howse, 2017). This is especially true for older adults who face a variety of chronic illnesses that weave the threads of life. Like the ebb and flow of the tide, the number of people aged 60 and older is rising to over one billion and will swell to two billion by 2050 (WHO, 2022). We must ensure that our society is able to meet the needs of our ageing population and provide them with the means and resources to live a life of joy and vitality. By immersing ourselves in nature, we can harness the healing power of nature potentially reduce the need for health and care services.

In the pages of this book, the authors highlight the importance of nature-based activities in improving the health and well-being of older people. The book begins with an introduction to the positive effects of spending time in nature, as well as the potential challenges that older people may encounter during such activities. The reader also learns about some theories that deal with the interaction between people and nature. The book then takes the reader through a variety of activities in nature, such as birdwatching or gardening. The benefits of these activities go beyond the physical, as they have the potential to strengthen the psyche, invigorate the body and strengthen social bonds. The authors also provide insights into inspiring nature-based programmes for older people. In addition, the book embarks on a journey into the world of nature-based activities in virtual reality and highlights the promise of such simulations as an alternative to physical engagement with nature.

All in all, this book is a valuable resource for older adults, carers and healthcare professionals. Packed with practical guidance, motivation and empirical knowledge, this book offers insights into the transformative potential of nature-based activities. So let us embark on a journey into the awe-inspiring splendour of activities in nature. For it is in the tranquil atmosphere of nature that we can discover relaxation, rejuvenation and a deep sense of connection with the universe.

The ecosystem within: Tracing the path of human-nature connection

In this chapter, the intricate relationships between humans and nature are viewed through the lens of various theoretical models. From the profound insights of the biophilic hypothesis to the stress recovery theory, these models offer us unique perspectives on the interconnectedness of humans and the environment. By scrutinising these models, we can better understand our relationship with nature and the impact of our activities on the environment. We can also look for methods to create more sustainable and harmonious relationships with the natural environment. Join us on a journey to explore these models that explain the dynamic and symbiotic connections between humans and the environment.

The biophilia hypothesis

The power of nature on our health is undeniable, but elusive in its complexity. Although how exactly nature benefits us remains a mystery, the biophilia hypothesis holds that within human biology lies a deep-rooted and instinctive attraction to nature and other living organisms. The term biophilia was originally introduced by Erich Fromm, who defined it as "the passionate love of life and all living things" (Fromm, 1973, p. 365). Later, Wilson (1984) described it as the "innate tendency to focus on life and life-like processes" (Wilson, 1984, p. 1). This innate tendency towards vitalism is thought to foster a psychological and emotional attachment that leads to complicated and diverse patterns of behaviour (Kellert & Wilson, 1993). This connection to nature is essential to human well-being and can have a healing effect on the mind and body.

Humans have an innate and indelible connection to other living things, a bond that is embedded in our biological disposition (Tidball, 2012). Because humans evolved in the natural world, it is assumed that all humans possess a biophilic tendency rooted in biology (Kellert & Wilson, 1993). When we contemplate the splendour of the natural world, we are reminded of our deep-rooted connection to nature.

Spending time in nature has long been recognised as an experience that has a positive impact on our physical, emotional and spiritual well-being. Such experiences enable individuals to "sense, think, feel and act as interdependent beings, interconnected in the whole community of life" (Conn, 1998, p. 181). As a product of millions of years of evolution, our minds and bodies have been shaped by the experience of living in small communities in the midst of nature (Kellert & Wilson, 1993).

The biophilia hypothesis has been empirically confirmed by scientific research and has revealed the effect of nature on human health. One of the first proofs of nature's regenerative effects was found in a ten-year study by Ulrich (1984). His research found that hospital patients who had a view of nature from their bed window recovered more quickly from surgery than those who had a view of the urban environment. This discovery was later replicated (Verderber & Reuman, 1987), including in prisons where a view of nature from the cell window was associated with less stress and physical discomfort (Moore, 1982).

Other experiments have also shown that immersion in a natural environment reduces stress and elevates mood (Berman et al., 2008; Bratman et al., 2012). It is clear, then, that the innate affinity between humans and nature holds immense potential for improving the quality of our existence.

These revitalising effects of nature can be explained using Bronfenbrenner's (1979) theory of ecological systems, which sets out how our individual characteristics interact with our immediate and wider environment to determine our growth and development. According to this model, our environment can be divided into five interconnected systems, from our microsystems, such as our family, friends and home, to our macrosystems, which include our social, cultural, political and ecological environments. In essence, the human being can be seen as a living cell that is in a reciprocal relationship with the living body of the earth. Our actions towards our external environment are reflected in our internal world (Roszak, 1992). This symbiosis was particularly pronounced among early humans, who interacted directly with nature to sustain their existence (Kellert & Wilson, 1993).

The profound concept of biophilia has far-reaching implications for urban planning, architecture and public health. Incorporating natural elements such as green enclaves and wooded groves into the fabric of our urban landscapes can have profound health and well-being benefits (Kuo & Sullivan, 2001). Integrating nature into the design of healthcare facilities such as hospitals and nursing homes has been shown to improve patient outcomes and promote well-being, as noted by Ulrich (1984).

The emergence of biophilic design (Kellert et al., 2008; Kellert & Calabrese, 2015) at the beginning of the twenty-first century was a defining moment in restorative environmental design. This approach aims to purposefully translate our understanding of humanity's inherent connection with organic systems and processes in nature into the architectural constructions we build (Kellert et al., 2008). The aim of biophilic design is to return to the inhabitants of man-made structures the vitality and living processes that can be observed in nature. This is in stark contrast to the current trend of building design that actively interferes with natural systems and separates the occupants from the natural world (Grahn & Stigsdotter, 2010).

Biophilic design led to the concept of the biophilic city, first introduced by Beatley (2010). He argued that urban areas can be intentionally designed to be more natural and organic, providing numerous opportunities for city dwellers to engage with the natural world in meaningful and profound ways. Beatley (2010) called for a fundamental restructuring of land use planning and regulatory systems to prioritise a biophilic orientation that would enable this vision. The author describes a biophilic city as a place that not only promotes biodiversity but also learns from nature, mimics natural systems and incorporates natural forms and imagery into its buildings and urban landscapes. Through this holistic approach, a biophilic city designs and plans with nature, not against it.

In summary, the biophilia hypothesis essentially states that humans are inseparable from nature because of their biological heritage and evolutionary history. The restorative influence of nature on human health and well-being is evidence of this deep relationship. When integrated in thoughtful ways into the built environment of cities and health facilities, nature can bring a wealth of benefits. The biophilia hypothesis has significant implications for public health, urban planning and architecture and requires a deeper understanding and appreciation of the inextricable link between humans and nature.

Attention restoration theory

In our daily lives, we are exposed to a number of stressors and participate in tasks that require our conscious concentration. Whether it is to complete an important task or to expedite an important movement, such undertakings require tremendous mental strength and stamina. This is because we must avoid all distractions and focus our undivided attention on the task at hand. However, prolonged engagement in such activities can lead to fatigue as our cognitive reserves are gradually depleted and our performance declines. This state of fatigue, called directed attention fatigue, means that our cognitive abilities decline over time (Kaplan, 1995).

Attention restoration theory (Kaplan, 1995; Kaplan & Kaplan, 1989) offers further insight into the healing effects of nature. This theory states that nature can help restore our attentional capacities, which are depleted after prolonged periods of directed attention. This last concept refers to the strenuous, focused attention we give when concentrating on a particular task, such as reading, studying or problem solving.

The human brain has a limited ability to focus on a single stimulus or activity, often leading to a state of directed attention fatigue (Kaplan, 1995). According to the theory, directed attention fatigue occurs when we use this type of attention for an extended period of time, leading to a decrease in our ability to focus and concentrate. Spending time in nature can promote a state of quiet cognitive activity that allows the mind to rest and recharge its capacity for directed attention (Kaplan & Kaplan, 1989).

In the embrace of nature, our minds can relax effortlessly, free from the stress of the demands of modern life. Unlike other environments that strain our cognitive resources, nature provides an environment where we can just be, where our minds can wander and our hearts can soar (Kaplan, 1995).

Attention restoration theory has elaborated four facets that give the environment a restorative quality. These facets are as follows: (1) fascination (nature must evoke a sense of awe and wonder that draws the individuals' attention to the environment and gives them a sense of mental stimulation); (2) seclusion (the environment must give the individuals a sense of having escaped the entanglements of everyday life and give them a sense of distance from worries and anxieties); (3) expansiveness (the sense of traversing the environment and connecting with the elements that make it up); (4) compatibility (the extent to which the environment matches innate human inclinations, fosters a sense of belonging, and helps people feel comfortable and secure in their environment) (Kaplan, 1995).

This combination of factors stimulates our involuntary or indirect attention, which in turn allows our voluntary or directed attention capacity to recover and rejuvenate (Kaplan, 1995; Ohly et al., 2016). While environments such as places of worship and activities such as sleep can provide restorative opportunities, this theory proposes that nature offers a unique advantage due to its inherent aesthetic qualities (Kaplan & Berman, 2010; Kaplan & Kaplan, 1989). Spending time in nature offers individuals the opportunity to reflect and contemplate on unresolved issues (Kaplan & Berman, 2010).

Extensive experimentation has repeatedly confirmed the attention restoration theory. Researchers have postulated that the natural environment has rejuvenating properties, as evidenced by its positive effects on human cognition. Indeed, studies have shown that spending time in a natural environment improves attentional performance (Tenneseen & Cimprich, 1995). For example, studies have shown that spending time in nature can improve cognitive performance, attention skills and mood. One study found that participants who took a 50-minute walk in a natural setting performed better on a cognitive task than those who walked in an urban setting (Berman et al., 2008).

Another study found that participants who viewed a nature scene for 40 seconds performed better on attention than those who viewed an urban scene (Li & Sullivan, 2016). In addition, the natural environment is able to replenish cognitive resources after a mentally demanding task (Berto, 2014). It has also been observed that the negative effects of stress due to life events can be mitigated by spending time in a natural environment (van den Berg & Custers, 2011).

In summary, attention restoration theory highlights the rejuvenating and revitalising properties of the natural environment. Scientific evidence supports the idea that the natural world can have a positive impact on human cognitive function and overall well-being.

Stress recovery theory

Nature gives us a vitality that we often lack in the city without chlorophyll. Research suggests that chronic exposure to urban landscapes can have negative effects on our physical and psychological well-being (Moudon, 2009; Sobngwi et al., 2004). Urban environments can be linked to obesity, diabetes and hypertension (Sobngwi et al., 2004). Traffic noise can lead to increased stress levels, which in turn can lead to poorer health and depression (Moudon, 2009). These findings explain why people place great value on access to green spaces and the opportunity to escape the concrete jungle.

According to stress recovery theory, the natural environment provides an important means of restoring human functioning and facilitates recovery from stress (Ulrich, 1981; Ulrich et al., 1991). The theory assumes that natural environments have therapeutic properties that can facilitate recovery from stress, whereas urban environments tend to hinder this process. The mere presence of natural elements such as bodies of water or green spaces triggers an immediate positive emotional response in people, leading to a reduction in blood pressure and heart rate – important physiological indicators of stress. In addition, spending time in nature promotes alertness and thus prevents negative thoughts and feelings from taking over. Therefore, this theory can be used as a framework to counteract the negative effects of prolonged exposure to the urban environment. Intervention strategies such as landscape design, interior design and therapy can draw on stress recovery theory (Honold et al., 2016; Sahlin et al., 2015) to create urban environments that promote human health and well-being.

Since humans evolved in a natural environment, contact with nature is considered adaptive. In contrast, humans are not naturally predisposed to respond positively to an urban environment. The sensory overload in cities, characterised by high levels of visual complexity, noise and movement, often leads to increased psychological and physiological arousal, which can have a negative impact on health. Nature, on the other hand, tends to be less complex in perception than urban environments, so it is more conducive to relaxation and stress reduction.

Ulrich's theoretical framework has been supported by numerous empirical studies in recent decades. In an experiment by Ulrich and colleagues (1991), for example, participants were shown a nerve-wracking video and then randomly assigned either a natural or an urban scene. The results showed that participants who saw the natural scene experienced a faster rebound in physiological arousal than those who saw the urban scene.

The evidence for the salutary effect of connecting with nature on improving self-reported stress indices is overwhelmingly positive. This is also true for empirical findings on various aspects of holistic well-being and overall quality of life (Corazon et al., 2019). In a single study, restorative potential was measured directly (Tyrväinen et al., 2014). A remarkable reduction in stress was found and a substantial effect size was identified. Another study by Oh and colleagues (2017) found that enjoying the tranquillity of a forest ecosystem led to a significant reduction in cortisol release, a hormone closely linked to stress, while increasing heart rate variability, an indicator of optimal cardiovascular well-being. This discovery underscores the restorative potential of the forest, where stress can be relieved and the heart revitalised.

Further research has shown that contact with nature can trigger pleasant emotions such as happiness and joy, which can act like a shield against the harmful effects of stress on mental health (Berto, 2014). Moreover, spending time in a natural environment has been linked to improved cognitive performance, including restoring attention and improving working memory (Berman et al., 2008).

Overall, Ulrich's stress recovery theory and the empirical evidence suggest that spending time in nature can be an effective means of promoting psychological and physiological well-being. By using natural environments, people can reduce their stress levels, recover from everyday stressors and improve their mental and physical health.

The nature's blueprint: Exploring nature-based activities

It is widely accepted that physical activities in nature such as gardening, walking in parks and forests, outdoor sports, hiking, camping and fishing have positive effects on an individual's health and well-being (White et al., 2019). These popular activities combine physical exertion with the enjoyable experience of a natural environment. Such active outdoor lifestyles are strongly advocated and expected by social and recreational policies, endorsed by health authorities and even called for by professional associations to prevent disease and improve mental and physical fitness (Korpela et al. 2016; Ottosson & Grahn, 2005).

This is precisely why outdoor physical activity is an integral part of the influential theory of active ageing, which emphasises that active behaviour in everyday life promotes and prolongs health and well-being in old age (Zaidi and Howse 2017). This theory predicts the emergence and prevalence of a "third age" in future generations of retirees, implying a longer period of active leisure between retirement and final withdrawal from life and sedentary activity (Wanka, 2019).

Walking and hiking

Walking and hiking are popular nature-based activities for older people that offer several health benefits. Walking is an easy exercise that can be done anywhere, but hiking requires more difficult terrain and can be more physically and mentally demanding. Although advancing age brings physical limitations that make it difficult to get around independently, older people can still enjoy the beauty of nature and participate in social activities with the help of experienced caregivers. Whether they need constant vigilance or occasional help with housework and physical activities, older people can participate in a higher standard of living thanks to the unwavering support of reliable home care workers.

Walking is a low-impact activity that offers a harmonious way to enjoy the scenic wonders of nature and experience the invigorating effects of physical activity. The therapeutic potential of landscapes and the value of walking together in nature have attracted the attention in recent years (Marcus & Sachs, 2014). The simple act of walking requires no financial outlay, no special paraphernalia and is a source of eternal joy. Older people can traverse the avenues of their neighbourhood, explore the trails of nearby tree preserves or immerse themselves in the greenery of nature.

Several studies have examined the benefits of walking in green (Barton et al., 2009; Doughty, 2013) and blue spaces (Pasanen et al., 2019), concluding that they can promote social interactions, enhance psychological well-being and improve quality of life. In particular, in the context of advanced age, walking in groups in a variety of settings has been associated with improvements in physical fitness, reductions in blood pressure and increases in psychological well-being (Hanson & Jones, 2015).

The ephemeral nature of walking groups fosters an open atmosphere that makes it easier for individuals to share personal anecdotes (Doughty, 2013; Ireland et al., 2018). Long-time participants confirm the deep relationships that develop in walking groups and describe their companions as their closest confidants. These people find these walks to be a liberating experience that facilitates supportive dialogue, thereby improving their overall well-being (Paddon, 2020). In addition, walking serves to enhance older people's perception of the natural world through their eyes while maintaining cognitive acuity (Orr et al., 2016).

A walk through the green paths of a garden has also been shown to have a therapeutic effect on seniors plagued by depression. Prolonged sojourns in greenery for the purpose of relaxation and introspection inspire a sense of awe at the splendour of the natural world and lead to a deep state of serenity. Such revelations demonstrate how garden walks create an intense connection between the mind, the body and the environment that surrounds us (Orr et al., 2016).

In many urban and rural areas, numerous communal paths have been created, mainly for pedestrians and cyclists. Retirement homes or assisted living facilities have also invested in creating paved pathways that offer their residents the opportunity for a leisurely stroll. For seniors who are physically mobile, a walk on these paths is an ideal way to enjoy nature.

Hiking, on the other hand, is about much more than just walking. Climbing, descending, walking over rocks or tree roots, crossing uneven terrain and other challenges are all part of it. It involves walking a considerable distance in the great outdoors, usually over natural terrain where hazards such as rocks and tree roots must be avoided (Eastep & Goldenberg, 2008). When the topography is predominantly flat and level, we refer to walking, while traversing hilly or mountainous terrain is called hiking. The difference between these two modes of locomotion is that the latter gives the former a sense of passion and adventure, full of rugged terrain and vertiginous peaks, as if the earth has conspired to test the courage of the intrepid hiker.

Promoting hiking is a way for health professionals to increase the well-being and vitality of their patients in a way that is both proactive and therapeutic. Moderate-intensity physical activity has few adverse consequences and is a budget-friendly alternative to pharmaceutical solutions (Hallal & Lee, 2013). Health professionals looking for cost-effective remedies should consider hiking as a viable option. Hiking not only helps meet physical activity guidelines, but also offers the added benefit of being out in nature. The accessibility of hiking can be considered in terms of the modest skill and equipment requirements, coupled with the freedom for individuals to adjust the difficulty of the terrain and the pace of their gait (Mitten et al., 2018).

In addition to traditional physical activities such as working out at the gym, hiking is perceived by many as a leisure activity without the feeling of exertion or exhaustion (Thompson Coon et al., 2011). Hikers tend to burn more calories than runners or walkers because they tend to spend longer periods of time in nature. This preference is partly due to the fact that the physical component of hiking plays only a secondary role in interacting with the environment, socialising or experiencing the wonders of nature. Therefore, people are more inclined to continue the activity for a longer period of time and to extend their sessions (Wolf & Wohlfart, 2014).

It should be noted, however, that hiking is not for everyone and some people may not be able to engage in this activity due to logistical constraints such as transport limitations. In addition, the risk of falling is increased by the rough terrain and obstacles that hikers face, such as jagged rocks, sinewy roots and slippery foliage, which can cause them to slip or trip. Such falls can lead to injuries such as broken bones or head injuries caused by impact with unyielding surfaces such as boulders or trees. In addition, falls can increase the likelihood of developing osteoporosis in people who suffer from osteopenia due to their weak bones. Older people should therefore consider their physical abilities before going on a hike. They should also choose a moderate pace to avoid exhaustion. Indeed, hiking can be dangerous for older adults if they are not fit in this area (Mitten et al., 2016).

All in all, walking and hiking through natural landscapes are delightful pastimes for seniors, providing them with numerous physiological and psychological benefits while immersed in nature. By making a habit of walking and hiking, older adults can improve their holistic health and enhance their well-being.

Horticultural activities and gardening

Horticulture and gardening have long been a popular pastime for seniors seeking harmony with nature. This intense pursuit has several physical, mental and emotional benefits that enrich the human experience. Planting, pruning and harvesting is not only a therapeutic activity, but also a source of joy and happiness. These activities can promote health and well-being while providing a deep sense of satisfaction and tranquillity.

Horticulture, widely recognised as an activity for older people, has been defined as the science and art of growing fruits, vegetables, flowers and ornamental plants (Relf, 1992). It is distinct from botany, which is concerned solely with the scientific study of plants. Horticulture encompasses both the art and knowledge of growing and caring for plants. It is a form of cultivation, similar to breeding. For older people, the feeling of being useful is of paramount importance in their quest for a higher quality of life. The care and attention that the daily growth of plants requires can give older people a deep sense of satisfaction. In particular, people who are plagued by anxieties about their health and future prospects can experience new hope and relaxation when they see their plants growing (Blake & Mitchell, 2016).

Engaging in horticultural activities is a promising way for older people to improve their mental, social and cognitive abilities. Indeed, empirical research has shown that such activities significantly improve psychological well-being, interpersonal relationships and cognitive abilities, while reducing negative affective states such as anxiety and depression (Nicholas et al., 2019; Sia et al., 2020).

Horticulture promotes the creation of new memories and meaningful significance in the lives of nursing home residents (Perveen, 2013; Sempik et al, 2003). In addition, it offers benefits on a physical level as it promotes muscle strength, refines motor skills and improves balance (Perveen, 2013). These multiple benefits of horticulture should be further explored and considered as a therapeutic and enriching intervention for older people.

One of the most studied forms of horticulture is gardening, which is typically associated with leisure activities of older people. However, gardening offers more than just recreation, as it can also provide mental and physical stimulation and even have cognitive benefits (Infantino, 2004). Gardening can range from simple tasks such as planting and caring for houseplants to more elaborate and complicated gardening activities.

Over time, the therapeutic benefits of gardening and horticulture have been documented. These benefits include reducing feelings of loss, promoting creativity, self-expression, social interaction and sensory stimulation, and improving self-esteem, fine and gross motor skills and eye-hand coordination (D'Andrea et al., 2007; Soga et al., 2016).

The art of gardening, an activity closely associated with nature, provides both psychological and physical benefits to those who grow and harvest plants in a domesticated agricultural environment (Chalmin-Pui et al., 2021). Gardening has been shown to elicit a personal fascination and appreciation for the environment while promoting environmentally conscious behaviour by creating meaningful connections to the natural world (Winkler et al., 2019).

In addition, gardening at home and growing a vegetable garden are classified as moderate to vigorous forms of physical activity and are therefore highly recommended (Park et al., 2012). Recent studies have measured the physical benefits of certain gardening activities, such as improved hand strength and grip strength, especially in older adults. Gardening thus offers a unique blend of artistic and scientific elements, therapeutic properties and physical benefits that make it a meaningful and fulfilling activity (Wang & MacMillan, 2013).

Gardening is a versatile activity that can be done alone or in community, and can even be part of a larger, structured endeavour. Its ability to foster cooperation and partnership between different institutions and groups has already been suggested (Austin et al., 2006), while its intergenerational appeal makes it a powerful tool for promoting civic participation (Møller, 2005). By facilitating group activities, gardening can foster a sense of community and reduce feelings of isolation, which is important in this context.

Numerous studies have shown that gardening gives older people pleasure and improves their quality of life. It has also been found to promote physical vitality and mobility (Wang & MacMillan, 2013). Gardeners have reported remarkable improvement in their overall health, supported by improved dexterity and flexibility of their hands and body. In addition, their physical functionality has improved, accompanied by a decrease in physical discomfort (Park et al., 2009). These results suggest that gardening is an effective way to achieve and maintain a healthy and active lifestyle.

Cultivating physical vitality, stimulating the intellect and fostering creative expression are touted as plausible concomitants and benefits of practising horticulture and related activities (Wang & MacMillan, 2013). Reviving ancestral memories and connecting with the natural world are cited as inspirations for such activities.

Gardening has been shown to improve daily activities and social integration for people in care homes. In a study by Brown and colleagues (2004), significant improvements in skills related to transferring, eating and toileting were observed in the gardening group. People who engage in gardening feel connected to their loved ones, their past and the natural world (Infantino, 2004). Gurski (2004) found that gardening further improves social interaction, self-confidence, interest in the future and awareness of one's physical environment.

For people suffering from dementia, gardening is a useful way to promote participation in activities and improve emotional well-being (D'Andrea et al., 2007; Gurski, 2004). Moreover, D'Andrea and colleagues (2007) showed that gardening participants had higher overall levels of functioning than the control group after a 12-week period.

Numerous research papers on the practise of garden therapy have demonstrated its many benefits for people with dementia. Detweiler and colleagues (2012) confirmed that growing plants in therapeutic gardens is effective in relieving pain, improving attention, reducing stress, decreasing medication use and alleviating depressive symptoms. Jarrot and Gigliotti's (2010) study in eight nursing homes found that groups engaged in gardening showed more favourable adjustment behaviour. Similarly, Yasukawa (2009) found that Alzheimer's patients who participated in gardening activities over a three-month period had higher levels of communication, interaction and cognitive skills than their non-participating peers (Tse, 2010).

A review of qualitative studies highlighted the multiple benefits of gardening as an occupation and showed its significant influence on the development of professional practise. It urged occupational therapists to promote collaboration with horticultural organisations to effectively use their particular services to improve therapeutic outcomes (York & Wiseman, 2012).

It has been proven that engaging in gardening, even a little, is beneficial to the health of people of all ages. However, older people in particular can achieve remarkable results when they engage in gardening. Engaging with green spaces has been linked to lowering blood pressure, providing opportunities for physical activity, improving motor skills, reducing stress and much more. This extensive list of benefits that gardening brings has led many senior living communities to create community gardens on their premises.

Birdwatching and wildlife observation

Among the whirring sounds of nature lies a realm of benefits for seniors who indulge in wildlife watching. Scientific studies have shown that spending time in the great outdoors and observing thriving flora and fauna can have a number of positive effects on physical and mental health.

Birdwatching, also called birding, is the most common form of wildlife observation. It involves the observation and appreciation of winged creatures in their natural habitats or amidst the busy urban landscape. This exquisite activity is one of the most fulfilling and tranquil pursuits, especially for people in the second half of life. Their wisdom and experience are complemented by the awe-inspiring beauty of our planet's feathered inhabitants, making birdwatching a true balm for the soul.

For centuries, the art of birdwatching has been a pleasure for many. Today, in an increasingly complex and fast-paced world, birdwatching has become a popular pastime, especially for the elderly. It allows people to immerse themselves in the beauty and stillness of nature while providing a mentally stimulating and rewarding experience. The National Audubon Society conducted a study showing that birdwatching is the second most popular outdoor activity in the United States, with over 46 million followers (Berger, 2021).

Recent scientific research has shown that birdwatching can increase our mental well-being. One study looked at the effects of watching and listening to birds on human emotions. The study involved nearly 1,300 people who used a smartphone application to record their mood, depending on whether birds were present or not. The results showed that the psychological well-being of those who encountered our feathered friends lasted for up to eight hours. Interestingly, the study showed that the positive results were not due to other environmental elements such as foliage, water or trees. These variables were controlled for, suggesting that birds have a unique ability to improve our emotional well-being. Furthermore, the study showed that these benefits were perceived by both those who were affected by depression and those who were not (Hammoud et al., 2022).

Other studies support the claim that birdwatching can have a positive effect on mental state and general well-being. They report an association with lower levels of stress, anxiety and depression (Cox et al., 2017; Hedblom et al., 2018; Ratcliffe et al., 2013) and increased feelings of awe, which are linked to improved well-being (Richardson & Sheffield, 2017). These findings suggest that the presence of these winged creatures has a calming and restorative effect, potentially reducing the negative effects of urban stressors.

Birdwatching has many benefits for people of all ages, especially the elderly. It is an inexpensive pastime that requires minimal equipment and makes getting started easy and effortless. All you need is a pair of lightweight binoculars, an identification book and birdseed to attract the feathered creatures. By setting up a bird feeder or scattering seeds on the lawn, you can attract a variety of birds to watch.

The appeal of birdwatching lies in its remarkable flexibility, especially when it comes to meeting the needs of seniors who may be limited by various health problems. Whether they are bedridden or confined to a wheelchair for extended periods of time, people with varying degrees of mobility can participate in this birding experience in a variety of ways. Even for people who are permanently housebound, caregivers can create a habitat for observing feathered friends by placing a bird feeder outside the window. For seniors with low mobility impairments, observing feathered visitors in their garden can be an enjoyable experience.

Indeed, birdwatching provides a number of benefits to the physical and mental health of older people by reducing stress, preventing pessimistic feelings and increasing overall well-being (van den Berg & Custers, 2011). Birdwatching is particularly attractive to seniors because it is a relaxing and low-impact experience in nature. With the help of binoculars and cameras, seniors can engage in this activity regardless of their physical abilities. In addition, birdwatching can improve seniors' knowledge and appreciation of nature as they learn about the different behaviours and characteristics of different bird species.

Apart from the individual benefits, birdwatching can also foster a sense of community among seniors. Clubs and groups are often formed to share experiences and knowledge and provide a social outlet for those who feel isolated or lonely (Berger, 2021). Group outings to different natural areas can further promote physical activity and social interaction.

In addition to the mental and social benefits, birdwatching has also been linked to improving the physical health of seniors. Research has shown that spending time in nature can lower blood pressure, reduce stress and improve overall well-being (Bratman et al., 2012). While seniors are looking for different types of birds, they can also go for a walk or hike, which further promotes physical activity. This has also been shown to provide a sense of purpose and accomplishment (Kuo & Sullivan, 2001).

Overall, the research findings suggest that birds and their natural sounds can improve people's mental health and well-being by mitigating the negative effects of urban stressors and increasing feelings of happiness. For older people, this not only improves physical and mental health, but also strengthens social relationships and gives them a sense of purpose and fulfilment. These findings have remarkable implications for the design and planning of urban environments and highlight the importance of incorporating green spaces and biodiversity into our built environment. Because it is easily accessible and simple, birdwatching is a leisure activity that can be enjoyed by people from all walks of life.

Mind-body practices

As the clock continues to tick, individuals may experience a range of physical, mental and emotional changes that can affect how they feel. Physical and spiritual practises, from the contemplative arts of yoga and tai chi to the introspective techniques of meditation and mindfulness, have become increasingly popular in recent times. These practises have been shown to offer a variety of benefits to older people, including improved physical function, less pain, reduced stress and anxiety, and better mental health. In this chapter, we look at the benefits of these mind-body practises for seniors.

When we get older, our bodies become less flexible and our balance can suffer, leading to increased health risks. However, yoga and tai chi have proven to be valuable tools to address these issues and promote overall well-being. Practising yoga and tai chi improves balance and flexibility in older people and reduces their risk of falls (Bagiartana & Huriah, 2021; Lomas-Vega et al., 2017; Youkhana et al., 2016). Similarly, yoga can improve cognitive function and reduce symptoms of anxiety and depression (Hoy et al., 2021). In addition, nature itself has been linked to numerous health benefits, such as lowering stress levels and improving emotional state. Li and colleagues (2008) found that combining tai chi exercises with nature led to better improvements in physical and mental health than indoor exercises. The added benefit of being outdoors reinforces the positive effects of tai chi on seniors, as contact with nature has been shown to improve mood and lower stress levels (Bowler et al., 2010).

The social aspect of outdoor yoga and tai chi group exercise is also noteworthy for seniors, as it provides a sense of community and support. Many seniors feel isolated or lonely, especially if they live alone or have limited mobility. Yoga and tai chi as a group activity offers the opportunity to socialise and meet new people. Older people who participate in group yoga and tai chi exercises seem to show an increase in social support and an improvement in their overall quality of life (Gour et al., 2020; Koren et al., 2020; Kukihara et al., 2020).

Overall, outdoor yoga and tai chi are a treasure trove for seniors' health and well-being. They can improve physical and cognitive function, enhance quality of life, and foster a deeper sense of community and connection to the natural world. It is a timeless form of exercise for seniors who want to enrich their lives and stay active.

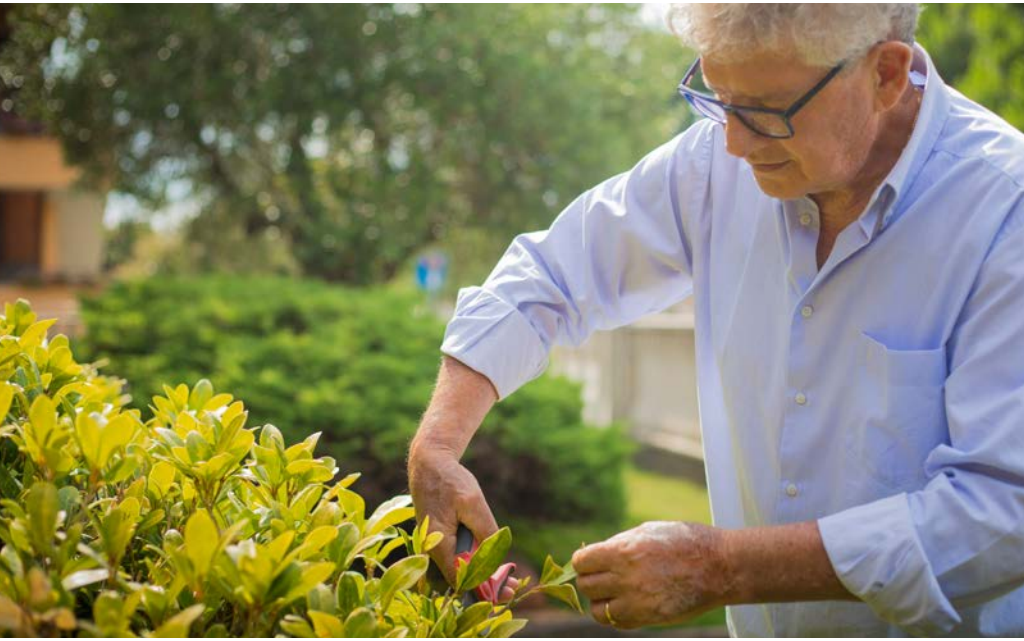
Mindfulness and meditation are also increasingly popular these days and have been shown to have a positive effect on people of all ages. Seniors in particular can benefit from these practises, especially when combined with spending time in nature. Recent research shows that mindfulness and meditation can help seniors manage stress and anxiety, alleviate symptoms of depression and promote overall mental health. In addition, these practises may also have physical benefits, such as lower blood pressure and reduced inflammation. When seniors meditate mindfully in a natural setting, they can reap even more benefits. Spending time in a quiet, natural environment can lift mood, lower stress levels and potentially improve cognitive function and memory (Geiger et al., 2016; Keng et al., 2011).

Mindfulness training, as defined by Kabat-Zinn (1982), involves cultivating a unified awareness within a structure of non-reactivity and acceptance. This training involves focusing one's attention on single or multiple phenomena as they unfold. These techniques are usually divided into three main categories: (1) focused attention meditation, which requires sustained concentration on a single object while detaching from and monitoring distractions (Lutz et al., 2008); (2) the meditation of open observation, in which one focuses one's attention on the intricate details of fleeting phenomena without selectively focusing on one object (Lutz et al., 2008); and (3) the meditation of loving-kindness, in which one cultivates a universal state of love and compassion for self and others (Salzberg, 2002). The practise of mindfulness thus requires either narrowly focused concentration (e.g., breath awareness or body scan) or wide-ranging receptive attention (e.g., indiscriminate awareness or gratitude exercises).

It is scientifically proven that mindfulness brings a wealth of benefits and improves humanity in every way. From lightening the weight of the world on our shoulders to sharpening our cognitive abilities and improving our overall well-being. Recent studies are looking at this phenomenon and exploring the link between mindfulness and nature in older people. A study by Cervinka and colleagues (2012) found that seniors who practised mindfulness while walking in nature reported an increase in positive emotions while experiencing a decrease in negative emotions, in contrast to those who did not. The authors theorised that this may be due to the ability of mindfulness to heighten our awareness of the present moment and dampen the noise of rumination, allowing us to better perceive the magnificence of nature and its benefits.

Overall, the combination of mindfulness, meditation and time in nature can have a powerful effect on the physical and mental well-being of seniors. By using mindfulness techniques in natural settings, seniors can enjoy the physical and psychological benefits of meditation while immersing themselves in the natural world. With an ageing population, research into such practises can be invaluable in promoting healthy ageing and improving the quality of life for older people.

Benefits of nature-based activities for older adults



The main theories about the benefits of connecting with nature come from a variety of fields of study. These theories, which include the restoration of attention theory (Kaplan & Kaplan, 1989), the stress reduction theory (Ulrich et al., 1991) and the biophilia hypothesis (Kellert & Wilson, 1993), state that contact with nature improves mental and physical health by altering the functions of the neuroendocrine, immunological and autonomic nervous systems. In addition, emerging concepts show that cultural learning and place attachment contribute to the positive effects of nature (Beery et al., 2015; Joye & De Block, 2011; Knez et al., 2018).

In the burgeoning field of psychobiological pathways, there is a body of evidence that supports the existence of direct physiological pathways, such as the inhalation of phytoncides. These exhalations of flora are known to confer enhanced immune function to the inhaler (Oh et al., 2017). Vegetation has also been shown to bestow its invaluable blessings upon us. As an absorber of urban heat and air pollution, it contributes significantly to our well-being (Dadvand et al., 2015; Donovan et al., 2013).

In addition, contact with nature has a positive effect on our endogenous microbiome and leads to a change in our state of health (& Logan, 2016). In many ways, the Covid 19 pandemic has highlighted the need for research into the impact of our natural and built environment on our physical activity and susceptibility to disease transmission. The wealth of evidence we have gathered so far provides an exciting context in which to explore the interplay between the location of physical activity and the role of nature in protecting our public health (Christiana et al., 2021).

Physical health benefits

In the midst of the hectic pace of our modern lives, it is easy to lose sight of the healing power of nature. For centuries, people have sought refuge in the embrace of the natural environment and found solace in the restorative power of the great outdoors. Spending time in nature actually has the ability to heal and renew our spirit (Ottosson & Grahn, 2005).

In recent years, scientific studies have confirmed what our intuition has always known. Research proves the positive effects of outdoor activities on our health and well-being (Boyes, 2013; Gagliardi et al. 2007; White et al., 2019). These activities can take place in a variety of natural settings, from remote forests to urban green spaces, parks and even home gardens. White and colleagues (2019) have found that as little as 120 minutes of spending time in nature per week is associated with good health and high well-being. This pattern holds across all age groups, including older adults and people with long-term health conditions. Interestingly, the study found that the way people engage with nature or the specific place where they spend time have no influence on the positive outcomes.

Older people who spend time in green environments tend to be more active than people in barren landscapes (Ottosson et al., 2015) and have better self-rated health (Dahlkvist et al., 2016). In the tranquillity of nature lies a possible cure for people suffering from Parkinson's disease.

A study conducted by Ottosson and colleagues (2015) found that natural environments have a therapeutic effect on patients with Parkinson's disease. The study found that natural environments reduce gait freezing, a common symptom of Parkinson's disease, compared to built environments. This suggests that spending time in nature can provide patients with recreation and therapeutic benefits.

The therapeutic potential of nature for older people has been widely studied and documented, with gardening emerging as the preferred nature-based activity for older people (Tan et al., 2019). Gardening has been associated with various benefits, including improved physical health (Wang & MacMillan, 2013).

An extension of gardening is therapeutic horticulture, where plants and plant-related activities are encouraged to improve participants' well-being. This treatment has gained prominence due to documented positive outcomes and is now offered in various health, rehabilitation and residential settings around the world. A systematic review of studies on therapeutic horticulture found improved outcomes in areas such as functional abilities (Nicholas et al., 2019).

For older people, gardening can be a fulfilling physical activity. Recent studies have shown that maintaining a home garden and growing vegetables not only improves overall health but can also be considered moderate physical activity for people over 65 (Park et al., 2008; Park et al., 2012). The study participants had metabolic equivalent values (MET) for different gardening activities. This showed that activities involving both upper and lower body movements (such as planting a vegetable garden) were moderately intense physical activities, while those involving mainly the upper body (such as planting and transplanting) were less intense. Gardening can therefore be an appropriate activity for people with different physical needs, as it provides an opportunity for physical activity in a natural environment.

Studies have shown that older people who garden daily can improve their balance and walking speed and possibly avoid the risk of falls (Chen & Janke, 2012). In addition, daily gardening has been associated with increased life expectancy and lower mortality rates in older adults with mobility impairments (Lêng & Wang, 2016). A randomised trial showed that gardening in the park lowered plasma levels of IL-6, an inflammatory marker associated with chronic disease (Ng et al., 2018). In addition, a garden intervention in older women at a community centre improved muscle mass, aerobic endurance, hand dexterity, cognitive ability and reduced waist circumference (Sin-Ae et al., 2017). The older women in the garden intervention group also reported higher daily physical activity. In a randomised cross-over trial with depressed older women, Hassan and colleagues (2018) found a significant difference in systolic and diastolic blood pressure after gardening. Home gardening has also been found to improve the quality and quantity of sleep in older people (Sia et al., 2020), including people with dementia (Lee & Kim, 2008).

A group of older people struggling with dementia found a source of nourishment and vitality in the lush pastures of green care farms. A comparative study between green care farms and traditional day care facilities found a marked difference in daily food intake between the two groups, with the former having significantly higher energy and fluid consumption (de Bruin et al., 2010). In another study comparing nursing homes and green care farms, residents of the latter showed a greater propensity for active engagement, particularly outdoor and green exercise, leading to higher levels of social interaction and better quality of life (de Boer et al., 2017).

Green urban landscapes seem to promote health and well-being, as empirical studies show. Living in lush green spaces correlates with a lower risk of cardiovascular disease (Kardan et al., 2015), obesity (Halonen et al., 2016), diabetes (Astell-Burt et al., 2014), asthma-related hospitalisation (Alcock et al., 2017) and even mortality (Gascon et al., 2016). Moreover, the abundance of natural landscapes in the neighbourhood correlates positively with self-reported health and subjective well-being in older people.

So let us not overlook the restorative power of nature, because the evidence is clear: spending time in nature can reduce the risk of chronic diseases such as obesity, cardiovascular disease and diabetes, while increasing overall well-being. When we enjoy nature, we can harness its powerful, restorative energy that invigorates our minds and soothes our spirits. So let us get outside so nature can heal us and nourish us from the inside out.

Mental health benefits

The therapeutic efficacy of activities is well documented in the scientific literature, confirming their numerous mental health benefits. Immersion in nature has been shown to alleviate mental health problems by reducing stress, anxiety and depression while providing a deep sense of joy and well-being. Let us take a closer look at some of the scientific data that supports these claims and sheds light on the complex effects of nature on human mental health.

The therapeutic effects of nature-based activities for older people go beyond the physical benefits. These activities provide a sense of purpose and meaning that enriches the spirit and elevates the mind. Caring for plants and animals can provide a sense of responsibility and accomplishment that gives deeper meaning to life. In addition, immersion in the natural world can evoke a deep sense of awe and wonder that stimulates the senses and uplifts the soul. Such experiences have been scientifically linked to a greater sense of happiness and life satisfaction (Tse, 2010; Yao et al., 2021).

The idea of "forest bathing" is a method by which nature can have a good influence on mental health. Forest bathing is a technique for relaxation and stress reduction through immersion in nature, especially forests or other natural environments. This technique has been shown to lower cortisol levels and improve overall mood (Lee et al., 2011).

In addition to forest bathing, outdoor activities such as hiking, gardening or simply sunbathing in a green park have also been linked to better mental health. A British study found that people who frequently spend time outdoors experience a greater sense of vitality and well-being than those who do not engage in such activities (Barton & Pretty, 2010). Furthermore, the study postulated that contact with nature has a positive effect on mood and cognitive functions, which underlines the healing effect of spending time in nature.

Furthermore, activities in nature have shown a remarkable ability to alleviate the suffering of people with mental disorders. Nature-based therapies such as ecotherapy, gardening and horticultural therapy have shown positive outcomes for people struggling with depression, anxiety and a range of other mental health conditions (Soga et al., 2016; Yao & Chen, 2017)). Overall, nature-based therapies can have a positive impact on depression, anxiety, mood and feelings of hope (Garside et al., 2020).

Gardening, for example, is associated with lower levels of depression, anxiety and stress and higher life satisfaction in older adults (Chen & Ji, 2015; Coventry et al., 2021). According to a review of the effects of gardens and gardening on health and well-being, visiting gardens, participating in gardening or engaging in therapeutic activities were associated with greater well-being, more physical activity and less social isolation (Howarth et al., 2020). A review of quantitative and qualitative research on different groups, including older adults, found that social and therapeutic gardening is associated with significant mental and physical health benefits, including for people with obesity and schizophrenia (Annerstedt et al., 2013).

Dementia patients have been found to improve their mood after spending as little as 20 minutes in a nature garden, with the greatest impact associated with spending 80-90 minutes in nature (White et al., 2018). Spending 120 minutes a week in nature has also been associated with excellent health and satisfaction at a population level (White et al., 2019).

The improvement in mental health through exercise in green spaces and, to a lesser extent, gardening, could also be related to the antidepressant and anxiety-relieving effects of physical activity (Kvam et al., 2016). Physical activity outdoors has already been shown to be associated with greater well-being and lower feelings of tension and anxiety than indoors, implying that physical activity in nature has additional benefits (Thompson Coon et al., 2011).

Another way to harness the healing power of plants is through therapeutic horticulture, a guided process that enables participants to enhance their well-being through plant-based activities. The impact of this approach was examined in a systematic review that found significant improvement in well-being, anxiety, depression, cognitive and functional outcomes before and after treatment (Nicholas et al., 2019).

In a study by Han and colleagues (2018), older people with mental health problems such as depression or anxiety and cognitive impairment found comfort in farm garden therapy. The study found a significant decrease in cortisol levels in the therapy group, highlighting the benefits of outdoor activities in improving mental health and well-being. In these green oases, older adults can find solace, nourishment and a renewed sense of vitality amidst the nature that surrounds them.

Similarly, a study by Sia and colleagues (2020) shows the powerful effects of a 24-session therapeutic gardening programme in which older adults grew plants. Using a rigorous pre-test-post-test design, they found that participants not only maintained healthy mental health, but also experienced a reduction in anxiety and an improvement in cognitive function. And if that was not enough, these older people also reported a significant increase in their sense of happiness after each session.

The flowering landscapes of gardens also hold a therapeutic treasure for our psyche. Research has shown that gardening can help improve cognitive abilities (Wang & MacMillan, 2013). The human mind is a wondrous machine capable of numerous skills, such as attention, learning, thinking, reasoning, remembering, problem solving and decision making. These mental abilities are related to contact with nature and physical activity. Scientific experiments have shown that immersion in nature improves memory function, increases direct attention, increases neural activity related to deep meditative states and daydreaming, increases intelligence and academic performance, and reduces restlessness and frustration (Christiana et al., 2021).

A natural environment with elements that promote involuntary attention and recovery from cognitive fatigue can help restore attentional capacity (Kaplan, 1995). It has been scientifically proven that creating a therapeutic garden in an inpatient facility and implementing an indoor gardening programme has a calming effect on patients (Lee & Kim, 2008).

Spending time in "close nature" (e.g., a garden at home) is associated with improved concentration (Ottosson & Grahn, 2005) and lower agitation (Whear et al., 2014), ultimately leading to improved quality of life. It is worth noting that the quality of gardening in these studies is directly related to reductions in agitation and cognitive decline (D'Andrea et al., 2007; Lee & Kim, 2008).

Even people with dementia have been shown to benefit from such a natural environment (Whear et al., 2014). A group of older people with dementia took part in a programme of 16 garden therapy sessions. Through plant care, these people experienced remarkable improvement in their cognitive functions, with attention, memory and visuospatial perception showing signs of improvement. It is thought that the cognitive benefits of gardening are due to the focused attention and careful consideration that tending plants requires.

From adjusting watering schedules to considering weather conditions and the nutritional needs of individual plants, gardening provides opportunities for engagement and guidance (Bryant, 1991; Hass et al., 1998). These findings not only underscore the value of outdoor activities for cognitive health, but also offer insight into the profound connections that can be forged between people and the natural world.

Horticulture has also shown promise in reducing the incidence of agitation in people with severe cognitive impairment, indicating its potential as a late intervention. An investigation of the effectiveness of gardening activities as part of a comprehensive dementia care programme supplemented with cognitive stimulation exercises, music and art resulted in remarkable improvements in cognitive abilities, psychological well-being and depressive symptoms (Kang et al., 2010).

In summary, activities in nature have been shown to have a kaleidoscope of mental health benefits. From a simple walk in the park to structured activities such as forest bathing or outdoor adventure programmes, the positive effects of nature on mental health are clear. By immersing ourselves in nature's embrace, we can transform our overall well-being and transform our lives into happiness and health.

Social benefits

The older you get, the more likely you are to suffer from a protracted illness, to lead a lonely life and to be housebound. As you grow older, your social circle shrinks, a phenomenon that is exacerbated in older people. As a result, they find it harder than younger people to leave the house, interact with their surroundings and spend time in nature – all things that have been shown to increase well-being.

Activities in nature are not only good for physical and mental health, but also foster a sense of belonging among people and lead to a network of community relationships. Gardening and bird watching bring people together and create a sense of belonging in the social fabric. Spending time in nature is associated with a lower risk of social isolation and loneliness in older adults (Chen & Ji, 2015; Tse, 2010). Activities in nature provide opportunities for social interaction and engagement and help develop a sense of meaning and purpose in life. Older people who participate in nature activities experience significantly higher levels of social support and cohesion than their peers who do not. These enriching activities foster a sense of connection and belonging to their respective communities, and thus a deeper and more lasting sense of community engagement (Irvine et al., 2022).

According to Tse (2010), only eight sessions of a gardening programme led to remarkable improvements in the social relationships of 26 elderly residents of a nursing home. Similarly, Scott and colleagues (2020) concluded that home gardens are a promising bastion for physical and mental well-being, as well as an opportunity for social and productive engagement. Gardens are places that naturally lend themselves to social interaction. It is a place where friends and family can come together to enjoy the fruits of their labour and forge lasting bonds and memories that will endure for years to come. These findings highlight the potential of a prolonged and tailored gardening programme that addresses individual characteristics as an effective means of improving social relationships among older people.

Remarkable improvements in the overall well-being and social connectedness of guests have been observed through the implementation of gardening programmes in residential facilities (Chen & Ji, 2015; Tse, 2010). This harmonious fusion of science and art has a profound impact on people's holistic health as they immerse themselves in the tranquil beauty of nature and engage in the nurturing process of cultivating life.

The growing fascination with the salutogenic influence of the natural environment on human health is increasingly evident in contemporary literature. Various international strategies to promote health and improve the quality of life in old age consider the fusion of natural environments with community interactions as a key initiative. A viable intervention for social seclusion could therefore well take the form of group walks amidst the green expanse of nature in close proximity.

Participating in outdoor group walks is a promising way to become a member of a collective and to address the needs of beginners or physically impaired people. Participation in collective hikes promotes casual interpersonal exchange through spontaneous encounters during and after the hike. This well-designed arrangement counteracts the feeling of seclusion, cultivates the pleasant expectation of consistent interaction with peers, promotes physical activity and strengthens group solidarity. These elements, in turn, enrich the social well-being of individuals by expanding social networks, developing meaningful relationships, creating a sense of belonging and generating empathy for others. Therefore, they have the potential to mitigate social isolation (Irvine et al., 2022).

Purposeful activities are of great importance in fostering interpersonal bonds and are inextricably linked to the development of community and structural resources, which are crucial for promoting well-being and mitigating depressive tendencies (Forsman et al., 2011). This is consistent with an emerging literature suggesting that contact with nature can cultivate social capital, reduce feelings of isolation and provide a sense of belonging (Maas et al., 2009; de Vries et al., 2013).

In summary, creating and implementing nature-based activities for seniors can provide numerous benefits, including improved physical vitality, cognitive abilities and community harmony. By tailoring such activities to participants' abilities and preferences, providing them with natural elements, ensuring safety and availability, and soliciting feedback, we can create positive and engaging outdoor experiences for older adults. Contact with nature and physical activity thus have a profound impact on the human mind and body. As we continue to explore the relationship between nature and human behaviour, we are reminded of the intricate and beautiful ways in which our environment shapes us.

Thriving in nature's embrace: Programmes for the elderly

Nature centres and environmental institutions have long recognised the importance of reconnecting people with nature, but many of their efforts are aimed at the younger generation who have the energy to hike, bike and kayak. Older adults who struggle with health, mobility and fitness issues feel marginalised and excluded as a result. A glimmer of hope, however, is the emergence of specially designed programmes that cater to the needs of older people and allow them to enjoy the benefits of nature in an accessible and enjoyable way.

Opportunities to actively connect with nature are rapidly diminishing in today's society, and our alienation from nature is a major cause of a number of health problems. Therefore, introducing tailor-made programmes for seniors is a crucial step to ensure access to the gifts of nature for all, regardless of physical ability or age. By giving seniors access to programmes tailored to their specific needs, we can promote their holistic health and inspire a deeper sense of belonging and community of destiny between generations.

Stroll for Well-being

The Stroll for Well-being is an innovative programme designed to balance the physical and mental aspects of ageing in older adults. It is the brainchild of Ruth McCaffrey, a professor at the College of Nursing at Florida Atlantic University, and was introduced at Morikami Park in Florida. The programme is based on scientific evidence and combines the therapeutic power of nature with the benefits of being outdoors. It creates a distinctive space for participants to improve their overall health and well-being. For more information on this programme, please visit: https://morikami.org/stroll/.

Through a peaceful and guided walk in a garden, the Stroll for Well-being programme enables participants to connect with nature and experience its calming effects. The programme promotes sociability and a supportive environment and has been shown to have significant positive effects on participants' mental health (McCaffrey et al., 2010). The programme is designed to provide a comprehensive and restorative experience. It aims to reduce stress and promote relaxation - a particularly valuable experience for older adults who are struggling with health issues or life transitions.

The success of the programme is well documented. For example, walking in the garden and keeping a diary have been found to reduce depressive symptoms in older adults. Those who walked in nature had a significantly higher memory span, despite suffering from major depressive disorder, than those who walked in the city. In addition, spending time in green spaces was associated with a reduction in stress levels and physical malaise, accompanied by increased performance in mental matters (McCaffrey et al., 2010).

As part of the Stroll for Well-being programme, people are invited to immerse themselves in the tranquil beauty of Morikami Garden in Florida and Bloedel Reserve on Bainbridge Island in Washington. A study by McCaffrey and colleagues (2017) has shown that this initiative not only improves life perspectives and quality of life, but also promotes personal maturation in people struggling with difficult life situations (McCaffrey et al., 2017). The programme consists of a sequence of 12 themed walks over an eight-week period, allowing participants to enjoy the pleasures of nature at their own pace. On each walk, participants are confronted with pithy texts in a guidebook at several predetermined stopping points, which encourage them to reflect on the theme and record their reflections.

In addition, the programme includes three group sessions, the first of which serves to familiarise participants with the themes of the walks and the overall programme, and the last two of which provide a platform for participants to describe their impressions and experiences during the walks, although this is optional. Nevertheless, it is worth mentioning that many participants found it enjoyable to share their thoughts with like-minded people.

Using pre- and post-programme assessments, empirical data show that the 8-week Stroll for Well-being programme, when adopted, has the potential to increase ambition, inspire a desire for personal growth and improve participants' overall quality of life. This experiential programme can be conducted in any green space with convenient walking paths and has already been extended to other botanical gardens across the country.

In summary, the Stroll for Well-being programme is a valuable initiative that has proven to be an effective means of improving the physical and mental well-being of older people. It serves as a shining example of how nature-based programmes can be of great benefit to seniors by improving their quality of life and promoting overall well-being.

Fontenelle Forest Nature Centre's SUN program

The Fontenelle Forest Nature Centre in Bellevue, Nebraska, is an excellent example of a programme that brings seniors to nature and nature to seniors. The on-site programme, known as SUN (Seniors Understanding Nature), has been running since 2002 and attracts many seniors to each monthly session. Some of them are seasoned veterans who have been attending the meetings for many years and are attracted by new discoveries every time. The programme was started by a naturalist and remains a true bastion of vitality among the many offerings. For more information, visit the website https://fontenelleforest.org/sun-seniors-understanding-nature/.

Fontenelle Forest embodies a belief in lifelong learning, cultivating an everlasting connection with the natural world while being a pleasure in itself, fostering human connection and evoking memories of past experiences. Previous programmes have focused on the study of Nebraska's native flora and fauna, ecological topics such as wetland flooding, historical knowledge of people who lived in or migrated through the region, and visual journeys to a variety of fascinating places around the globe.

A typical session of SUN includes an engaging nature-based programme, such as an interactive presentation on native plants, specifically tailored to the needs of senior citizens. This educational component of the programme provides seniors with the knowledge they need to appreciate the natural environment. This is followed by light refreshments and a social gathering where seniors can interact while enjoying the natural environment. To enhance the experience, the SUN sessions are usually followed by an optional guided walk through the forest or along the river. These walks offer seniors the opportunity to enjoy the beauty of nature and exercise at the same time.

The SUN programme has proven to be very successful over the years. Many seniors report that it has improved their mental and physical health. One of the main benefits of the programme is that it gives seniors a sense of purpose and community. This is a shining example of the benefits of nature-based programmes for older adults. It combines education, socialising and physical activity in a natural setting, giving seniors the knowledge, community and sense of purpose they need to stay healthy and happy.

Road Scholar programme

Tourism is an often-overlooked opportunity to promote the health and well-being of older people. By enhancing the cognitive, emotional and physical abilities of older people, tourism has proven to be a hidden treasure that delivers on the promise of positive ageing. Tailored tourism programmes that address the specific needs of older people and demonstrate the potential of positive ageing through tourism are crucial (Qiao et al., 2022).

Road Scholar is a beacon in the world of educational travel, offering older adults a unique opportunity to embark on a journey of intellectual and cultural exploration. The programme has its roots in the pioneering work of Elderhostel, which began offering affordable, non-credit courses to seniors in 1975. Today, Road Scholar is a dynamic programme that offers more than 5,500 hands-on learning experiences each year in every state in the US, in 150 countries around the world, and even aboard ships on rivers and oceans. For more information about the Road Scholar programme, visit https://www.roadscholar.org/. The information contained in this chapter is based on official sources.

Road Scholar's learning adventures are carefully crafted to inspire and stimulate seniors. They provide a platform for them to broaden their horizons and learn about new cultures and ideas. These experiences are intellectually stimulating and culturally enriching, offering seniors a unique opportunity to gain hands-on experience in a supportive and vibrant environment. As the programme has grown, it has become an example of the power of education to change lives. With a focus on lifelong learning and an unwavering commitment to quality, Road Scholar has become an example of hope and inspiration for seniors around the world.

The programme is a great opportunity for people of advanced age to embark on a journey of discovery and explore new destinations in the company of like-minded people. This programme provides a supportive environment for seniors who may be afraid to travel alone. By travelling in a group, this programme serves as a catalyst for the formation of new friendships by bringing seniors together with people from different backgrounds and providing a sense of connection to humanity in general.

As the sun begins to set on their lives, older people often long for a life of meaning and fulfilment, a life that matches their deepest passions and desires. Road Scholar's mission is to address the holistic needs of seniors and provide them with a variety of opportunities that meet their intellectual, physical, cultural and social needs. Through these enriching experiences, seniors are empowered to explore the vastness of the world around them, immerse themselves in the wonders of different cultures and discover new and meaningful ways to engage with the world.

Road Scholar's educational programmes are a perfect blend of science and adventure, offering seniors the opportunity to learn about art, history and culture while exploring exotic locations.Each tour is carefully crafted and led by experts in the field. It offers seniors a rare vantage point to immerse themselves in the mythologies and stories of different cultures. Road Scholar not only offers educational programmes for seniors, but also takes care of their physical well-being with a wide range of sports activities. From kayaking to hiking, seniors can explore the beauty of nature while staying active and healthy.

Road Scholar also offers seniors the opportunity to immerse themselves in local customs and traditions through meaningful interactions with people and communities. Participants can take part in a range of activities such as cooking classes, captivating dance lessons and engaging language classes that stimulate both the mind and the senses. In addition, there are volunteer programmes for seniors who want to make a positive impact on the world. These programmes focus on a range of issues such as environmental protection, community development and healthcare. Through volunteering, seniors can find meaning and purpose in their lives while making a difference in society.

In summary, Road Scholar's programmes offer seniors the opportunity to explore the world around them, stay healthy and active, and engage in meaningful activities that add purpose and joy to their lives. With its commitment to quality and safety, Road Scholar has earned the trust and respect of seniors, making it a leader in senior travel and education. Overall, Road Scholar provides seniors with an excellent opportunity to further their education and discover the world. Its commitment to providing meaningful educational experiences has made the company a popular choice among older adults looking to enrich their lives.

Eldergrow

Eldergrow, a Seattle-based company, provides therapeutic gardening programmes that harness the healing power of nature for older people in retirement homes and long-term care facilities. This goal grew out of the vision of Orla Concannon, a horticulture and therapeutic gardening professional who founded the company in 2015. Eldergrow's mission is to enrich the lives of older people through engaging, hands-on gardening. Eldergrow's philosophy is based on the intrinsic value of nature. By integrating plants, flowers and other natural elements, Eldergrow brings the splendour of the natural world into living spaces and encourages residents to experience the life-affirming benefits of interacting with the green world. To learn more about Eldergrow and its impactful programmes, visit https://www.eldergrow.org/.

According to scientific research (e.g., Nicklett et al., 2016), therapeutic horticulture is a true panacea for seniors and offers a variety of benefits that promote their well-being. For example, it reduces stress and anxiety, improves cognitive function and promotes socialisation. Eldergrow's programmes aim to achieve these positive effects through activities such as creating and maintaining indoor gardens, learning about different plants and their uses, and practising garden-inspired crafts.

The company provides different services, including interactive gardening classes, a complete garden kit and ongoing support to help seniors cultivate their green thumbs and reap the benefits of this healing art. At Eldergrow, participants learn how to sow, tend and harvest a variety of plants, from spicy herbs to lush vegetables and blooming flowers. What sets Eldergrow apart is its ability to tailor programmes to the individual needs of each senior living community. Whether a community has a green outdoor garden or a cosy indoor space, Eldergrow can design a programme that fits the available space and resources, ensuring that every participant can immerse themselves in nature.

Eldergrow's commitment to therapeutic horticulture programmes for seniors has made it a company that enriches the lives of older people. Its innovative programmes to improve the well-being of seniors have gained recognition in both academic research and the senior living industry. Eldergrow's commitment to innovation and evidence-based care has made it a leader in senior care, providing seniors with meaningful experiences. Through these programmes, seniors can maintain their physical and mental health, find a sense of purpose and belonging, and develop a deeper connection to nature.

In summary, as our population ages, it is important to recognise the importance of promoting nature-based programmes for older adults. Eldergrow's commitment to improving the well-being of older adults is an example of the importance of providing enriching experiences for seniors.

The creation of virtual environments has become commonplace in today's world. Through the use of real-time 3D graphics and omnidirectional cameras, we can create immersive worlds that feel like reality. This feeling of "being there" is what we call presence, and it is a crucial concept in virtual reality theory (Slater, 2018). But not all immersive technologies are the same. Head-mounted displays are one type of immersive technology that can greatly enhance the sense of presence compared to non-immersive technology such as a single TV or a computer screen (Slater, 2018; Shu et al., 2018). In addition, the sense of agency, which refers to the viewer's feeling of causing an action, can also enhance the sense of presence. Through active decision-making, viewers can engage with the virtual world and feel like they are truly a part of it (Jeunet et al., 2018).

Technology as a bridge to nature: Senior care for the modern age

In the field of virtual reality, research has uncovered this phenomenon: the more immersive the virtual experience, the more likely users are to embrace it and reap its benefits (Riva et al., 2016). And when the virtual reality experience reaches a certain level of immersion, users even feel as if they are really present in the virtual world or inhabiting a virtual body. This heightened sense of embodiment results from the interplay of cognitive factors that regulate our perception of the body and physical space through sensory information.

As we continue to push the boundaries of what is possible in virtual reality, we need to consider the impact of these technologies on our perception of reality. In this context, virtual reality programmes that use 360-degree videos of nature are a convenient and cost-effective way to provide access to the natural world (Depledge et al., 2011; Smith, 2015). Remarkably, studies have shown that the immersive sensory information delivered by virtual reality headsets can provide many of the same benefits as experiencing nature in vivo (Browning et al., 2020).

In terms of the effectiveness of 360-degree video technology in virtual reality, research has found that integrating the natural environment into the virtual reality experience is a promising approach (Depledge et al., 2011; Smith, 2015). A growing body of literature points to the therapeutic efficacy of 360-degree nature videos (Maples-Keller et al., 2017; Jerdan et al., 2018; White et al., 2018). These videos have been demonstrated in experimental studies with healthy community-dwelling young and middle-aged adults (Anderson et al., 2017) and university students (Yu et al., 2018). Exposure to 360-degree nature videos can improve cognitive function and reduce stress levels (Chung et al., 2018; Gerber et al., 2017).

As for the ageing population, they may not be able to reap the associated benefits because they may have limited access to the natural environment. However, researchers have been looking at the potential of virtual reality representations of nature to address this issue. Virtual reality technology can simulate natural environments such as forests, oceans and mountains with an amazing degree of realism. This innovative approach offers seniors a safe, controlled way to experience the wonders of nature, even when it is not possible to venture outdoors.

For seniors who are unable participate in outdoor activities due to physical limitations, virtual reality representations of nature are a promising alternative. Virtual reality technology, for example, can provide seniors with mobility issues a safe and accessible way to experience outdoor environments that would otherwise be difficult or impossible to access. Given the potential challenges associated with using virtual reality technologies with older people, one promising strategy for promoting mental health and well-being is to develop virtual reality programmes that take place in natural environments.

In a study by Lundstedt and colleagues (2023), the aim was to investigate the preferences and perceptions of older adults when designing virtual natural environments. An iterative process was used in which older adults were invited to participate in the design of a virtual natural environment. Using thinking logs, qualitative content analysis and elaborated questionnaires, data was collected to inform design decisions while a prototype was progressively implemented. The prototype included features such as an effective sedentary method of locomotion, animals, traces of human activity, a boat ride and apple picking, which were positively received by the participants. The study highlights the need for designers to consider both the larger and smaller scale, as well as active and passive use, while providing environments, activities and a level of realism that users can identify with. The findings also suggest that a virtual natural environment should offer a variety of content and activities to accommodate the heterogeneity of older people's preferences. Sedentary locomotion techniques may be an accessible means of locomotion in virtual environments. Overall, the study provides useful insights that could contribute to the development of a framework for designing virtual natural environments for older adults.

To date, there are few studies in the scientific research community that address the potential benefits of nature-based virtual reality interventions for older people's well-being (Baños et al, 2012; Bruun-Pedersen et al, 2016; Moyle et al, 2018; Reynolds et al, 2018; Ludden et al, 2019). Most studies examine healthy, non-clinical populations (Baños et al, 2012; Bruun-Pedersen et al., 2016). However, others place a particular focus on individuals with signs of cognitive decline or dementia (Moyle et al, 2018; Reynolds et al, 2018; Ludden et al, 2019).

In recent years, scientific research has shown that immersive simulations of natural environments can provide benefits comparable to reality. Empirical studies have shown that such virtual nature experiences can improve muscle strength and balance (Park & Yim, 2015; Sakhare et al., 2019), reduce stress and anxiety (Reynolds et al., 2018), enhance emotional well-being and improve cognitive abilities (Annerstedt et al., 2013; Browning et al., 2020). Furthermore, computer-generated nature experiences can be adapted to individual needs and desires, giving older people the opportunity to explore different landscapes that may not be accessible to them in reality (Van Houwelingen-Snippe et al., 2021)

While some studies investigated activities such as kayaking (Park & Yim, 2015), cycling (Bruun-Pedersen et al., 2016; Sakhare et al., 2019) or interacting with objects in the virtual environment through hand and arm movements (Moyle, 2018), many of the virtual reality technologies used in these studies were non-head-mounted displays that had only one screen or were non-interactive.

However, Bruun-Pedersen and colleagues (2016) ventured to investigate the potential of virtual nature environments to increase motivation to exercise. They discovered that seniors' participation in virtual bike rides through virtual nature environments had a profound effect on their willingness to exercise. They drew on virtual reality-specific sources, including examples from urban design and planning in virtual environments and spatial recognition for navigation in virtual natural environments. Through the innovative use of virtual environments, the authors demonstrated that even the most limited people among us can experience the uplifting power of nature.

As if transported to another realm, older adults immersed in nature-based virtual reality environments experienced a remarkable transformation. Scientific studies have shown the great potential of virtual reality to improve the mood and cognitive engagement of seniors (e.g., Baños et al., 2012; Kalantari et al., 2022). For example, a study conducted by Baños and colleagues (2012) examined the effects of virtual reality nature walks on a small group of 18 healthy older adults. Participants reported significant increases in feelings of pleasure and relaxation, while sadness and anxiety decreased. In addition, participants found the virtual environments easy to navigate, satisfying to use and remarkably immersive. They had the feeling of being truly present in the virtual world, surrounded by the sights, sounds and smells of nature.

In the quest for greater health and well-being, nature-based virtual reality environments offer a new way to relax, engage and connect with the natural world. A study conducted by Lundstedt and colleagues (2021) explored the potential of integrating virtual reality technology and virtual natural environments in care settings for older people. The virtual natural environment programme consisted of a series of stunning natural scenes displayed on a large screen, accompanied by ambient sounds and scents that mimicked the essence of a natural environment, eliciting joy and wonder in participants. As the study progressed, participants' confidence and skills grew and they enjoyed the immersive experience, while the audience was intrigued and encouraged to engage in the adventure. Staff found that the virtual natural environments had incredible potential to reduce anxiety, decrease the need for medication, promote exercise and provide a refreshing outdoor experience. All residents were able to explore the virtual reality themselves or seek assistance when needed, which gave them a sense of independence and autonomy.

Amidst the growing shadow of dementia, there is a glimmer of hope in the form of virtual reality technology. Studies are beginning to demonstrate the therapeutic potential of simulated natural environments to improve the quality of life of people with this debilitating disease. Dementia patients' engagement, apathy and mood have been shown to be fundamentally altered by immersion in virtual natural landscapes. A study by Moyle and colleagues (2018) demonstrates this remarkable change, showing significant improvement in patients' emotional state and engagement. Similarly, the study by Ludden and colleagues (2019) highlights the potential of virtual reality-based nature videos to improve the well-being of older adults with dementia. A sense of serenity and calmness is created, which promotes relaxation and lifts mood. Both participants and caregivers confirm the benefits of the intervention.

The use of virtual natural environments is an innovative and novel approach to alleviating some of the symptoms of dementia. By evoking the calming presence of nature, these interventions offer a touch of tranquillity amidst the chaos of cognitive decline. As research continues to uncover the potential of virtual reality technology, we can hope for ever greater advances in improving the lives of dementia patients and their caregivers.

As we venture into uncharted territory, a new horizon of possibilities opens up, namely the combination of mindfulness and immersive virtual reality. From this synergy emerges a powerful tool, a gerontechnological intervention that supports the mental health and well-being of older people. For those hesitant to engage with the wonders of technology, virtual reality's potential to activate mindful states is a pathway to curiosity and openness (Bercovitz & Pagnini, 2016; Sadowski & Khoury, 2022).

The evidence is clear – mindfulness through virtual reality can enhance our well-being and promote compassion for ourselves and others. It enables us to stay true to the path of therapy and experience relief from pain (Tong et al, 2015; Navarro-Haro et al, 2019; Sadowski & Khoury, 2022). These interventions have been shown to not only sharpen our cognitive skills, but also increase our overall life satisfaction. They give us hope and a renewed sense of positivity that benefits both those struggling with the disease and the wider community (Tong et al., 2015).

Looking more closely at the empirical results, we find that virtual reality mindfulness benefits both novice and experienced meditators. It fosters a sense of presence and immersion that allows us to truly engage in the practise and connect with ourselves and the world around us. In a world that often feels disconnected, these virtual reality mindfulness practises offer a way to experience oneness, peace and harmony no matter where we are (Chandrasiri et al., 2020).

Amidst the vast amount of scientific literature, certain areas remain shrouded in mystery. One of these is the potential benefits of virtual reality mindfulness exercises for older adults, an area that has yet to be explored. While the current findings offer a hopeful outlook, the true potential of virtual reality remains largely unexplored and requires further investigation.

In the field of virtual nature, frequent reference is made to the theories of natural environment restoration (Frost et al., 2022). These theories encompass a number of concepts, including the restoration of attention theory (Kaplan, 1995), the stress reduction theory (Ulrich et al., 1991) and the biophilia hypothesis (Kellert & Wilson, 1993), which offer valuable insights for the design of restorative environments. Kaplan's (1995) four components – fascination, seclusion, expansiveness and compatibility – derived from the theory of restful attention are particularly useful for designing restful environments. The interplay of these components can create a restful environment that is both nurturing and rejuvenating.

A recent study by Nukarinen and colleagues (2022) presents a framework that bridges the gap between theories of restoration and health outcome measurement in virtual natural environment studies. This framework combines theories of restoration with the practical aspects of health outcome assessment to provide a more holistic understanding of the restoration potential of electronic system design.

Although some studies (Kjellgren & Buhrkall, 2010; Annerstedt et al., 2013; Calogiuri et al., 2018; Browning et al., 2020) have shown that virtual reality nature experiences are not as effective as real-world interactions with nature in improving mood, the ongoing development and exploration of these technologies holds immense potential for promoting health and well-being, especially among older adults who may have difficulty accessing the natural environment.

As technology advances, these simulations have the potential to become increasingly lifelike, transporting seniors to breath-taking landscapes and immersing them in the soothing sights and sounds of nature (Van Houwelingen-Snippe et al., 2021). Green forests, tranquil lakes and vibrant wildlife could soon be accessible with just a headset, offering a break from the confines of indoor environments. While marvelling at the wonders of virtual nature, seniors can enjoy the calming effects of lush greenery and the gentle rustling of leaves.

The idea that virtual reality technology can transport people into a natural world where trees sway and rivers rush is a wondrous achievement that underscores the human desire to connect with nature and find solace and tranquillity in the great outdoors. By using virtual natural environments, people can experience the therapeutic effects of nature even when access to the physical world is limited. Overall, these findings highlight the unique opportunity that virtual representations of nature offer to improve the well-being of older people.

Conclusion: Engaging with nature in later life

Amidst the inexorable growth of urbanisation, the importance of nature-based activities for older adults is becoming increasingly clear. In recent years, there has been a surge of interest in such activities as they offer immense potential to promote health and well-being in older people. This book looks at various nature-based activities and new trends and illustrates their many benefits for seniors.

An emerging trend that is gaining popularity among health care providers is the inclusion of nature-based activities in health and wellness programmes. Recognising the healing effects of nature on physical and mental health offers healthcare providers and nature-based activities providers the opportunity to enter into a symbiotic relationship that allows for more comprehensive and effective interventions.

Another emerging trend is the use of technology to promote engagement and learning in nature-based activities for older adults. With the advancement of virtual reality and other immersive technologies, they can experience nature in all its glory, with more interactivity and immersion. This trend is especially important for older people who have limited mobility or live in areas with little access to natural environments.

Nature's green embrace has long been valued for its many benefits for older people. Yet access to natural environments remains difficult, especially for seniors living in urban areas or care facilities. These challenges can be overcome by cultivating nature-based activities that can thrive both indoors and amidst busy urban landscapes. To meet the needs of the ageing population and promote intergenerational harmony, it is important to design urban spaces and facilities with green oases that cater to the ageing soul.

Another challenge is the need for trained professionals to carry out nature-based activities. As many older people require special support or adaptations to participate in outdoor activities, it is important that providers have the expertise and skills to meet their needs. One possible solution is to develop training programmes and certification processes for these providers to ensure that the natural pleasures of the outdoors are accessible to all.

Unlocking the full potential of outdoor activities for older adults requires a deeper understanding that combines scientific research and poetic contemplation. It is crucial to identify the specific elements in nature-based activities that have an impact. In this way, tailored interventions can be developed to meet the needs of people in their prime. In order to investigate the lasting impact of nature-based activities, more longitudinal studies are needed that examine the lasting effects of these activities on the health and well-being of older people.

In parallel to this research, practise also needs to focus on partnership and collaboration. Harmonious alliances between nature-based activity providers, health services and other stakeholders can help integrate such activities into health and wellness programmes. This will ensure that high-quality, evidence-based interventions are implemented and that the impact of nature on the health and well-being of older people is improved.

Nature offers an opportunity to enhance the vitality of ageing people and enrich their lives with vibrant health. By adapting to new trends, overcoming challenges and continuing to advance research, we can advance the development of effective nature-based programmes for older adults. This book has emphasized the many benefits that nature-based activities bring to seniors, from improving physical fitness and cognitive performance to enriching social relationships. By continuing to invest in this area, we can contribute to the well-being of our older people while deepening their deep connection to the natural world.

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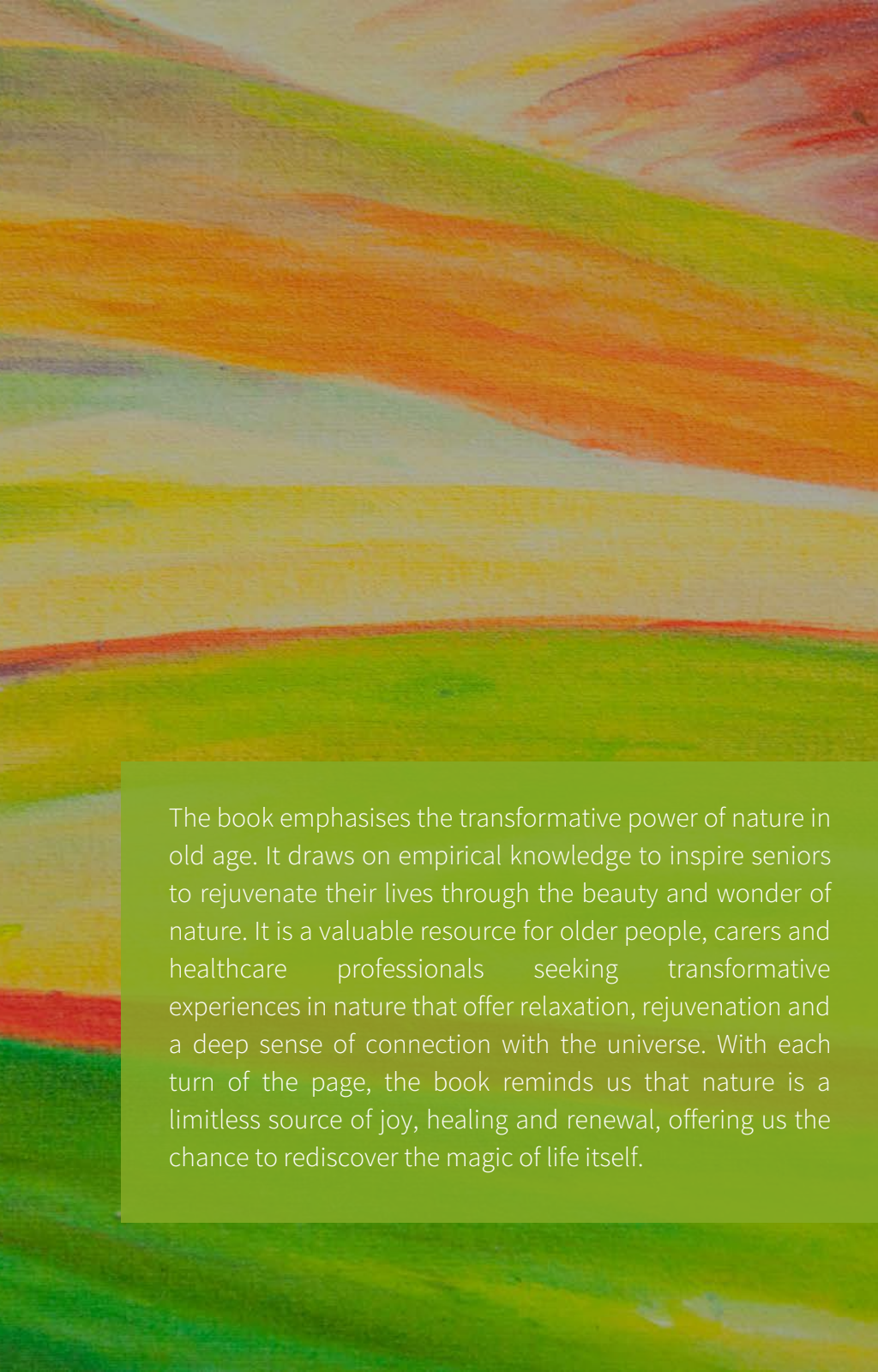

The book emphasises the transformative power of nature in old age. It draws on empirical knowledge to inspire seniors to rejuvenate their lives through the beauty and wonder of nature. It is a valuable resource for older people, carers and healthcare professionals seeking transformative experiences in nature that offer relaxation, rejuvenation and a deep sense of connection with the universe. With each turn of the page, the book reminds us that nature is a limitless source of joy, healing and renewal, offering us the chance to rediscover the magic of life itself.