

Therapeutic Horticulture Evidence Summaries

What the research suggests across populations and settings

Evidence reviewed through August 2026

Therapeutic horticulture (TH) is being increasingly integrated across healthcare, recreation, education, community and human-service settings. As interest grows, so does the need to understand **what the research actually tells us about its potential benefits—and where the evidence is still developing.**

Research involving plants, gardening and horticultural experiences spans many populations and outcomes. Studies have explored mental and emotional wellbeing, social connection, engagement, physical function, cognition, quality of life and other areas of health and participation.

The overall picture is encouraging regarding the range of positive outcomes reported in research on therapeutic horticulture and broader nature-based practices across diverse populations, as well as the increasing recognition of TH as an important field of research. At the same time, therapeutic horticulture research is a diverse and evolving field. Programs differ considerably in who participates, what activities are used, how programs are facilitated, how long they last and what outcomes are measured.

These evidence summaries are designed to make that research easier to understand and use.

They provide a plain-language overview of research related to:

1. [Mental Health & Psychological Wellbeing](#)
2. [People Living With Dementia](#)
3. [Older Adults](#)
4. [Children & Youth](#)
5. [Physical Disability](#) & Rehabilitation
6. [Neurodevelopmental Disabilities](#)
7. [Cancer & Cancer Survivorship](#)

Each summary highlights what has been studied, the findings that appear most consistently across the literature, important limitations, and key areas for further exploration.

About the evidence in this resource

These summaries draw primarily from research identified through the **GrowTH Therapeutic Horticulture Research & Readings Database**, together with selected recent studies and reviews identified while developing this resource.

They are intended as an **evidence-informed overview**, not a formal systematic review of every study ever published in each area.

Where possible, greater weight has been given to systematic reviews, meta-analyses, randomized or controlled studies and more recent research. Qualitative and smaller exploratory studies are also included where they provide important insight into participant experiences or areas where controlled research remains limited.

A note about terminology

One challenge in interpreting this research is that studies do not always use the same terminology.

The literature may describe interventions as:

- Therapeutic horticulture
- Horticultural therapy
- Social and therapeutic horticulture
- Therapeutic gardening
- Horticultural activities
- Gardening programs
- Therapeutic or sensory gardens
- Garden-based interventions
- Broader nature-based interventions

These approaches can overlap, but **they are not necessarily equivalent**.

A structured therapeutic horticulture program facilitated around participant goals is different from recreational gardening, just as access to a therapeutic garden is different from actively participating in a horticultural intervention.

Where broader gardening or nature-based research is included in these summaries, we have tried to make that distinction clear rather than treating all contact with plants or gardens as evidence for therapeutic horticulture.

Throughout this resource, we use therapeutic horticulture as the broader term, while retaining the terminology used by researchers when describing specific studies and interventions.

What does the currently available research suggest overall?

Taken as a whole, the research provides **encouraging evidence that gardening and horticulture-based interventions can contribute to health and wellbeing across a range of populations.**

A 2024 umbrella review brought together 40 previous reviews of gardening and horticultural therapy and found an overall positive association with mental wellbeing, quality of life and health status (1). The same review's meta-analysis also found a significant positive overall effect on wellbeing. Importantly, however, the authors found considerable variation across studies and rated much of the existing review evidence as low or critically low quality, cautioning against drawing simple clinical conclusions from the combined findings.

A newer 2025 systematic review and meta-analysis examined controlled gardening and horticultural interventions involving adults living with chronic health conditions, including but not limited to physical dysfunction, pain, obesity, anxiety, depression, and cognitive dysfunction (2). The overall results also leaned in a positive direction, particularly for mental health, but effects on physical and general health were smaller and less certain. When studies at higher risk of bias were removed, the mental-health effect became stronger, while physical and general-health findings remained unclear.

Taken together, these findings support a **promising but appropriately cautious view of the evidence:** horticulture-based approaches may contribute to a range of outcomes related to both physical and mental health, as well as participation in daily life, but the strength of currently available evidence differs by population, outcome and intervention.

Areas of potential benefit

Across the research reviewed for this resource, several areas appear repeatedly.

Mental and emotional wellbeing

Mental health is one of the most frequently studied areas.

Research has focused on examining outcomes related to depression, anxiety, psychological distress, stress, mood and general emotional wellbeing. Reviews combining studies across different populations generally report positive findings, and population-specific research provides additional evidence in areas such as mental health services, older adulthood, dementia and cancer survivorship.

The evidence does not mean that horticultural programming will reduce depression or anxiety for every participant. It does suggest that thoughtfully designed horticulture-based interventions may provide a useful **complementary approach to supporting psychological wellbeing.**

Social connection, engagement and participation

In addition to the benefits of nature-based interventions when participating as an individual, group-based activities can create a shared focus for interaction, cooperation and meaningful activity.

Across several populations, studies report outcomes related to social connection, reduced loneliness, social participation, engagement and interpersonal relationships. These findings appear in research involving older adults, people living with dementia, people with intellectual disabilities, children and youth, people with mental health conditions, and people with or who have survived cancer.

Broader reviews have similarly identified social relationships and social connection among the quality-of-life and wellbeing outcomes associated with gardening and horticultural interventions.

For therapeutic horticulture practitioners, this may be particularly relevant when programs are intended to create opportunities for **participation, belonging, shared experience or meaningful social roles**.

Meaningful activity, confidence and sense of accomplishment

Therapeutic horticulture incorporates a range of gardening-based activities that can provide individuals with opportunities to engage in meaningful, purposeful tasks. Specifically, gardening provides visible processes and outcomes: a seed germinates, a plant grows, a task is completed, or something that has been cared for evolves over time.

This potential for meaningful engagement has been reflected in research examining the outcomes associated with gardening and therapeutic horticulture across different populations. Across several populations, studies have examined outcomes such as self-efficacy, self-esteem, confidence, adaptive functioning and meaningful participation. Some studies also describe experiences of responsibility, purpose, accomplishment and connection with familiar interests.

These outcomes are not unique to horticulture, nor are they automatically produced simply by completing a gardening task. They point instead to the potential value of **purposeful activities that offer choice, responsibility, skill development and opportunities for success**.

Physical and functional outcomes

Horticultural experiences can involve fine- and gross-motor movement, reaching, grasping, standing, walking, lifting, coordination, balance and sustained physical activity.

Research in older adults, rehabilitation, cancer survivorship and some disability populations suggests potential benefits in areas such as physical activity, endurance, hand function, dexterity, flexibility and functional performance.

The evidence is less consistent when physical-health outcomes are considered across populations as a whole. A 2025 meta-analysis found that overall physical-health effects

were relatively small and uncertain, reinforcing the importance of considering the **specific participant, activity, intensity and intended goal** rather than assuming gardening is inherently a physical rehabilitation intervention (2).

Cognitive and sensory engagement

Horticultural activities can involve sequencing, decision-making, attention, memory, problem-solving and multisensory engagement.

Some studies—particularly with older adults, people living with dementia, children and rehabilitation populations—report positive cognitive findings. Other studies find little or no measurable cognitive change.

For this reason, cognitive benefits should generally be described as **promising and population-specific rather than established across therapeutic horticulture interventions as a whole**.

Sensory engagement may be valuable even when measurable cognitive improvement is not the goal. Plant materials can offer varied opportunities for touch, scent, colour, movement and other forms of interaction that can be adapted around participant abilities and preferences.

Quality of life and broader wellbeing

Quality of life is another recurring outcome across the literature.

Research has examined dimensions such as perceived health, social relationships, emotional wellbeing, life satisfaction, independence and general quality of life. A 2024 umbrella review found that most included reviews examining quality of life reported positive findings associated with gardening or horticultural therapy, although definitions and measures varied considerably (1).

Quality of life is broad by nature, and improvements may arise through several overlapping pathways rather than one specific therapeutic mechanism.

Why might horticulture support so many different outcomes?

One reason horticulture is difficult to study—and potentially valuable in practice—is that it is **multidimensional**.

A single horticultural experience may involve:

- Contact with plants and nature
- Physical movement
- Sensory stimulation
- Learning and problem-solving
- Choice and decision-making
- Responsibility and care

- Creativity
- Social interaction
- Familiar memories or personal interests
- Routine and anticipation
- Opportunities for accomplishment

Researchers have proposed several physical, psychological, social and nature-related pathways that may contribute to the benefits associated with gardening and horticultural activities. At present, however, research does not allow us to isolate one universal mechanism or determine that the same elements will matter equally for every participant.

This is one reason **intentional, participant-centred practice matters**.

The question is not simply whether gardening is beneficial.

It is:

What experience are we creating, for whom, for what purpose, and how can plants and horticulture contribute meaningfully to that experience?

Using the evidence responsibly

The research in this field can help practitioners understand and communicate what is currently known about therapeutic horticulture and where it may be relevant.

It should not be used to promise outcomes, and every practitioner is responsible for staying informed about current available literature.

Rather than saying:

"Therapeutic horticulture has been proven to improve mental health."

A more responsible statement would be:

"Research suggests that therapeutic horticulture and horticulture-based programs may support mental wellbeing, with studies reporting benefits in areas such as mood, depression, anxiety and stress."

Similarly, evidence from one population or program should not automatically be applied to another.

Useful language includes:

- **Research suggests...**
- **Studies have reported...**
- **Evidence indicates potential benefits for...**
- **The findings are promising...**
- **Some studies have found...**

Be cautious with:

- **Proven**
- **Guaranteed**
- **Will improve**
- **Treats**
- **Cures**

Evidence is one part of thoughtful therapeutic horticulture practice. It works alongside professional practice knowledge, participant perspectives and experience, appropriate training, careful program planning and ongoing contextual evaluation.

The population summaries that follow are intended to help you understand **where the evidence is strongest, where it is still emerging and how to communicate it with appropriate confidence and care.**

Mental Health & Psychological Wellbeing

Evidence at a glance

Research examining therapeutic horticulture (TH), social and therapeutic horticulture (STH), and structured gardening interventions suggests that these approaches **may support mental health and psychological wellbeing**, with some of the most consistent findings relating to depression, anxiety, psychological distress and general wellbeing. Recent reviews and controlled studies also report potential benefits for quality of life and, in some clinical populations, social functioning and rehabilitation outcomes.

The evidence base is encouraging but varied. Studies use different definitions of horticultural interventions, include populations ranging from generally healthy adults to people receiving psychiatric care, and differ considerably in program design, duration and outcome measures. Findings should therefore be interpreted as evidence of **potential benefit rather than a guarantee of specific outcomes**.

What the research suggests

Depression and anxiety

This is one of the strongest areas of evidence regarding the effects of TH on various mental health conditions. A 2025 systematic review and meta-analysis focused specifically on STH delivered by trained practitioners to adults with, or at risk for, depression and anxiety (3). Across studies with comparison groups, STH was associated with significant reductions in both depression and anxiety, although the authors noted substantial heterogeneity and risk of bias.

Mental wellbeing and psychological distress

Broader reviews of horticultural therapy and gardening interventions generally report positive effects on mental wellbeing. A meta-analysis of 18 randomized controlled trials found a moderate positive overall effect of horticultural therapy on mental health (4), while a 2024 umbrella review found an overall positive effect of gardening and HT on wellbeing (1).

Clinical mental health settings

Research also includes people receiving treatment for diagnosed psychiatric conditions. A 2024 randomized trial involving 211 adult psychiatric inpatients found lower anxiety after four weeks of horticultural therapy plus usual care compared to usual care alone (5). A systematic review of research involving people with schizophrenia reported improvements across symptoms, rehabilitation outcomes, quality of life and social functioning, although study quality and intervention characteristics varied (6).

What to keep in mind

The literature does not consistently distinguish between **formal therapeutic horticulture, social and therapeutic horticulture, therapeutic gardening and broader gardening interventions**, which are not necessarily equivalent. Studies also vary widely in population, facilitator training, program duration, setting and measures used.

Several systematic reviews identify small samples, inconsistent reporting, heterogeneity and risk of bias as important limitations. More rigorous randomized studies with clearly described interventions are still needed, particularly to determine which approaches work best, for whom and under what conditions. However, the available literature still provides promising evidence of potential benefits associated with therapeutic horticulture and related approaches.

The evidence is best used to support TH as a **promising complementary approach** within mental health and wellbeing programming rather than to suggest that it will produce a particular clinical outcome for every participant.

Key studies to explore

Wood, Barton & Wicks (2025) — Systematic review and meta-analysis

Examined 17 STH studies involving adults with, or at risk for, depression or anxiety. Meta-analysis found significant effects favouring STH for both depression and anxiety, while also identifying substantial heterogeneity and risk of bias.

[Explore the study](#)

Panțiru et al. (2024) — Umbrella review and meta-analysis

Synthesized 40 reviews examining gardening and horticultural therapy and found an overall positive association with wellbeing, mental health and quality of life. The authors caution that high heterogeneity limits direct clinical conclusions.

[Explore the study](#)

Tu (2022) — Meta-analysis of randomized controlled trials

Combined 18 RCTs and found a moderate positive effect of horticultural therapy on mental health. The review also called for stronger allocation and blinding procedures in future trials.

[Explore the study](#)

Joubert et al. (2024) — Randomized controlled trial

Among 211 adult psychiatric inpatients, four weeks of horticultural therapy alongside usual care resulted in significantly lower anxiety than usual care alone.

[Explore the study](#)

Lu et al. (2021) — Systematic review and meta-analysis

Reviewed 23 studies involving 2,024 people with schizophrenia and reported beneficial effects across symptoms, rehabilitation outcomes, quality of life and social functioning.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Research suggests that therapeutic horticulture and structured horticulture-based programs may support mental wellbeing and reduce symptoms of depression, anxiety and psychological distress. Evidence is promising across both community and clinical settings, although outcomes vary and stronger, more consistent research is still needed.

People Living With Dementia

Evidence at a glance

Research examining therapeutic horticulture, horticultural activities and therapeutic gardens for people living with dementia suggests **promising benefits for engagement, agitation and behavioural symptoms, mood and emotional wellbeing, and social participation**. Some studies also report improvements in cognition and quality of life, although findings in these areas are less consistent.

The strongest evidence appears to favour **active, participatory horticultural experiences** rather than passive exposure alone. For instance, a quantitative systematic review of 14 randomized controlled trials and quasi-experimental studies involving 411 people with dementia supports the effectiveness of participatory horticultural therapy for cognition, agitation, positive emotion and engagement (7).

Overall, the currently available literature spans many settings, including residential care, adult day programs and community settings; interventions include structured horticultural programs, gardening activities, therapeutic gardens and other forms of nature engagement. This breadth is encouraging, but it also means that the interventions described as "horticultural therapy" or related terms are not always comparable.

What the research suggests

Engagement and meaningful participation

Engagement is one of the most consistently supported outcomes. A meta-analysis found that people with dementia participating in horticultural interventions spent significantly more time engaged in activity and less time inactive (8). Other comparative and community-based research suggests horticultural activities can promote active participation, social interaction and opportunities for meaningful involvement (9).

Agitation and behavioural symptoms

Multiple reviews suggest horticultural interventions may help reduce agitation and some behavioural and psychological symptoms associated with dementia. Lu et al.'s meta-analysis found significantly lower agitation following horticultural interventions, while Zhao et al. also found a significant effect of participatory horticultural therapy on agitation ((7, 8). A review of therapeutic gardens similarly identified agitation and behaviour among the areas in which positive changes were most frequently reported (10).

Mood, emotional wellbeing and social connection

Research has reported improvements in positive emotion, mood and psychological wellbeing, alongside opportunities for social interaction and connection. In community settings, a systematic review of eight studies involving 178 people living with dementia found positive impacts on engagement, social interaction, and mental and physical wellbeing (9). A recent controlled pilot study also reported improved mood and fewer

behavioural and psychological symptoms following a structured outdoor horticultural program (11).

Cognition and quality of life

Findings related to cognition are more mixed. One study found significant improvements in overall cognitive scores following participatory horticultural therapy, and smaller intervention studies have also reported cognitive gains (7). However, the included systematic review of community-dwelling people with dementia found no conclusive evidence of improvement in cognitive function (9). A 2023 pilot study found cognitive and self-reported quality-of-life benefits among participants with mild-to-moderate dementia, suggesting that the severity of dementia may influence outcomes (12).

Access to gardens and therapeutic outdoor spaces

Available evidence also includes therapeutic and sensory gardens. A systematic review of 16 quantitative studies found that 14 reported improvement in at least one measured area, with frequently reported effects involving engagement, agitation, depression or mood, stress and medication use (10). Garden access should not be treated as equivalent to facilitated therapeutic horticulture, but the findings suggest that supportive outdoor environments may contribute to wellbeing and participation for people living with dementia.

What to keep in mind

The evidence base is **heterogeneous**. Studies use a variety of different terms, including horticultural therapy, gardening therapy, horticultural activities, therapeutic gardens, sensory gardens and broader nature-based interventions. Programs also differ considerably in their activities, level of facilitation, duration, setting and intended outcomes. A 2021 review of garden-based interventions for people with dementia and mild cognitive impairment noted the growing domain of research related to therapeutic gardening and gardens, but also highlighted inconsistent definitions and a lack of standardized reporting (10).

Many studies are small or quasi-experimental, and several reviews identify the need for larger, higher-quality controlled studies. Dementia type and severity also vary across studies, and an approach that is engaging and appropriate for someone with mild dementia may need significant adaptation for someone living with more advanced dementia.

Claims about **cognitive improvement should be made particularly carefully**. Although some quantitative studies and meta-analyses report positive cognitive findings, these results are not consistent across the literature. The evidence is currently stronger for outcomes such as engagement, agitation, mood and meaningful participation than for slowing or reversing cognitive decline.

Key studies to explore

Zhao, Liu & Wang (2022) — Quantitative systematic review and meta-analysis

Reviewed 14 studies, including four randomized controlled trials and ten quasi-experimental studies, involving 411 people with dementia. Participatory horticultural therapy showed significant effects on cognitive function, agitation, positive emotion and engagement; ornamental horticultural activities did not demonstrate significant effects on agitation or positive emotion.

[Explore the study](#)

Lu et al. (2020) — Systematic review and meta-analysis

Reviewed 23 studies and included eight in meta-analysis. Horticultural interventions were associated with significantly reduced agitation, increased time spent engaged in activities and reduced inactivity. The authors also noted inconsistent definitions of horticultural therapy and limitations in the quality of the available research.

[Explore the study](#)

Murroni et al. (2021) — Systematic review of therapeutic gardens

Reviewed 16 quantitative studies examining therapeutic gardens and gardening interventions for people with dementia. Fourteen reported significant improvement in at least one area, with findings most frequently relating to engagement, agitation, depression or mood, stress and medication use. The review also highlighted the limited evidence available to determine which garden design features are most beneficial.

[Explore the study](#)

Scott et al. (2022) — Systematic review of community-based horticultural activities

Synthesized eight studies involving 178 community-dwelling people with dementia. Horticulture-based activities were associated with positive impacts on engagement, social interaction and mental and physical wellbeing, but the review found no conclusive evidence of improved cognitive function.

[Explore the study](#)

Yang et al. (2022) — Pilot randomized controlled trial

Examined a 10-week horticultural therapy program for nursing-home residents living with dementia and apathy. The intervention significantly reduced apathy and improved cognitive scores immediately after the program compared with usual care, although improvements in quality of life and functional capacity were not demonstrated.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Research suggests that participatory therapeutic horticulture and horticulture-based programs may support engagement, reduce agitation and behavioural symptoms, and contribute to mood, social connection and meaningful participation for people living with dementia. Evidence for cognitive and quality-of-life outcomes is promising but less consistent, and outcomes are likely to depend on the individual, the stage of dementia, the setting and how the program is designed and facilitated.

Older Adults

This summary focuses primarily on older adults without dementia. Research specific to people living with dementia is summarized separately.

Evidence at a glance

Research examining therapeutic horticulture (TH), horticultural activities and structured gardening programs with older adults suggests **potential benefits across psychosocial wellbeing, social connection, quality of life and physical functioning**. More recent evidence also points to possible improvements in self-efficacy, self-esteem, stress and some aspects of cognitive function.

A 2024 systematic review and meta-analysis that focused specifically on older adults (at least 60 years old) **without dementia** identified 27 studies with therapeutic horticulture or gardening interventions, involving 1,629 participants across 11 countries. The strongest benefits were demonstrated for self-efficacy, self-esteem, agility and aerobic endurance. The authors rated the overall certainty of evidence as **very low**, largely because many studies used quasi-experimental designs or had potential measurement bias; however, they state that the review can still serve as an important resource for both clinical and community settings (13).

Taken together, the evidence supports horticulture-based interventions as a **promising approach for supporting healthy ageing and wellbeing**, while also showing that outcomes vary considerably across populations, settings and program designs.

What the research suggests

Psychological wellbeing and mood

Reviews have reported improvements across outcomes including mood, depression, anxiety, emotional functioning and general psychological wellbeing. A 2023 review including individuals 65 years and older living in long-term care facilities examined the effects of horticultural therapy and gardening (14). The authors found that benefits were most evident in psychological outcomes, including feelings of happiness, psychological wellbeing, and psychological and emotional comfort. A 2022 systematic review and meta-analysis of 15 studies involving 1,046 older adults found positive effects on mood as well as quality of life and physical functioning (15).

Self-efficacy, self-esteem and sense of competence

The previously mentioned 2024 review of older adults without dementia found improvements in both self-efficacy and self-esteem (13). These outcomes may be particularly relevant to horticultural programs that provide opportunities for choice, skill development, responsibility and visible accomplishment. However, because the certainty of the evidence was rated very low, these findings should be described as promising rather than definitive.

Social connection and loneliness

Several studies suggest that horticultural programming may support social relationships and reduce loneliness. In a randomized trial involving 59 community-dwelling older adults, a six-month HT program produced a significant improvement in social connectedness (16).

In nursing-home settings, an eight-week horticultural activity program involving 150 older adults was associated with significant reductions in both depression and loneliness compared with routine care (17).

Physical function and active participation

Horticultural activities can involve reaching, standing, walking, carrying, grasping and other forms of movement, and some evidence suggests benefits for physical functioning. The previously mentioned 2022 meta-analysis reported improvements in overall physical function (15), while the 2024 review found particularly promising results for aerobic endurance (13). Keep in mind that when considering a therapeutic horticulture intervention for older adults, the type, intensity and accessibility of the activity matter and individual benefits will vary.

Quality of life, stress and cognition

Quality of life appears frequently as an important outcome in literature focused on older-adult populations, with several reviews and individual studies reporting positive findings. In a study of 86 community-dwelling older adults, eight weeks of horticultural activities were associated with improved quality of life, reduced perceived stress and improved working memory compared with controls; the social-relationships component of quality of life showed the largest improvement (18).

Based on the findings from the studies mentioned above, cognitive outcomes overall are less well established compared to psychosocial outcomes. Individual studies have reported improvements in areas such as working memory or cognition, but the evidence is not yet strong enough to conclude that horticultural programming reliably improves cognitive function in older adults.

What to keep in mind

The older-adult literature includes people living independently in the community, nursing-home residents, hospitalized older adults and people who may be living with specific health conditions. Interventions also vary considerably—from practitioner-led horticultural therapy to structured gardening activities.

The 2024 review concluded that HT may provide both psychosocial and physical benefits to older adults without dementia, while rating the certainty of the available evidence as very low (13). Larger, well-designed controlled studies with clearly described interventions and consistent outcome measures are still needed to determine the best practices for TH intervention and confirm the associated benefits in older adults.

Key studies to explore

Giang et al. (2024) — Systematic review and meta-analysis

Reviewed 27 studies involving 1,629 older adults without dementia from 11 countries. Findings suggested benefits for psychosocial and physical outcomes, particularly self-efficacy, self-esteem and aerobic endurance, but the overall certainty of evidence was rated very low.

[Explore the study](#)

Wang et al. (2022) — Systematic review and meta-analysis

Synthesized 15 studies involving 1,046 older adults and found positive effects on physical functioning, quality of life and mood. The authors also reported possible physiological benefits, while noting uncertainty about the optimal type and duration of intervention.

[Explore the study](#)

Ng et al. (2018) — Randomized controlled trial

Studied a six-month horticultural therapy program with 59 community-dwelling older adults. The intervention group showed improved social connectedness and a reduction in the inflammatory marker IL-6, providing an example of research examining both psychosocial and physiological outcomes.

[Explore the study](#)

Chu et al. (2019) — Controlled horticultural activity study

Among 150 nursing-home residents, an eight-week horticultural activity program was associated with significant reductions in depression and loneliness compared with routine care.

[Explore the study](#)

Chan, Chu & Chen (2022) — Community-based intervention study

Examined eight weeks of horticultural activities with 86 community-dwelling older adults. Participants showed improvements in quality of life and working memory and reductions in perceived stress, with the largest quality-of-life improvement occurring in social relationships.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Research suggests that therapeutic horticulture and structured horticulture-based programs may support psychological wellbeing, social connection, quality of life and physical functioning among older adults. Findings related to self-efficacy, self-esteem, stress and some cognitive outcomes are also promising, although study quality and program design vary and stronger research is still needed.

Children & Youth

This summary focuses on children and youth broadly.

Evidence at a glance

Research involving children and youth includes **formal horticultural therapy programs, structured horticultural activities, school gardens and broader garden-based education**. Across these approaches, findings suggest potential benefits for emotional wellbeing, stress regulation, social skills, engagement, self-efficacy and learning. School-gardening research also reports benefits related to nutrition, physical activity and healthy behaviours.

Although promising, the evidence base is more limited and less consistent compared to available literature for many adult populations. Many of the larger reviews examine **school gardening rather than therapeutic horticulture specifically**, while TH-focused studies with children are often smaller and conducted with particular groups or in particular educational contexts. This distinction matters: a school garden designed primarily for education or nutrition is not automatically a therapeutic horticulture intervention.

A 2023 realist synthesis identified 24 school-gardening interventions with positive health and wellbeing outcomes such as increased fruit and vegetable intake, dietary fiber and vitamins A and C, improved body mass index, and improved wellbeing of children (19). The same study highlighted the following as key mechanisms: experiential learning, integration of nutrition-based and gardening-based education within the curriculum, family and adult engagement, cultural context and reinforcement of activities during implementation.

What the research suggests

Emotional wellbeing, stress and emotion regulation

Several TH-specific studies suggest that horticultural activities may help children develop emotional skills and manage stress.

In a small randomized pilot study involving 20 elementary-school children experiencing adjustment difficulties, nine weekly sessions of flower arranging, planting and flower pressing were associated with reductions in several types of reported stress (20). School-life stress decreased significantly, and salivary cortisol fell immediately following the horticultural activities. Because the sample was very small, the findings are best considered as preliminary.

More recently, a controlled 2024 study involving 42 children in Grades 3 and 4 who qualified for educational-welfare support examined a horticultural therapy program combined with cognitive-behavioural emotion-regulation training (21). Children

participating in the program showed significant improvements in emotional intelligence, emotion regulation and resilience compared with their pre-program scores.

A 2026 randomized controlled trial did not show the same stress-related improvements (22). Sixty children aged 11–12 participated in either a six-week horticultural activity program or a control condition. Children in the horticultural group showed sustained improvements in social skills and reductions in problematic internet use through six-month follow-up, but **perceived stress did not differ significantly between groups over time**. This study is not directly comparable to the previous one, but highlights the need for more controlled studies and a systematic review of the available evidence relating to TH and stress in children.

Social skills, relationships and social-emotional learning

Gardening can create opportunities for cooperation, shared responsibility, problem-solving and interaction, and social outcomes appear frequently in the studies focusing on child and youth.

A 2021 scoping review specifically examined school gardens and social-emotional learning, with eight studies meeting the inclusion criteria (23). The included qualitative studies suggested that school gardening may support experiences related to social-emotional learning, but the quantitative studies produced relatively few statistically significant findings. The authors therefore concluded that the potential is promising but that stronger research is needed before firm conclusions can be drawn.

Individual horticultural studies provide additional encouraging evidence. For instance, the 2026 randomized trial described above found significantly stronger social skills among children participating in horticultural programming at post-test and at both three- and six-month follow-up (22).

A larger horticultural activity study involving 336 kindergarten children aged 5–7 reported improvements in emotional intelligence and prosocial behaviours following a 24-session program involving planting, plant care, harvesting, crafts and cooking (24). The program also targeted scientific inquiry and learning.

Learning, curiosity and engagement

Children's horticultural programs frequently combine wellbeing goals with experiential learning. Activities such as sowing, observing growth, caring for living things, harvesting and investigating plant processes can create opportunities for observation, sequencing, problem-solving and sustained engagement.

The 2016 study with kindergarten children by Park and colleagues reported improvements in scientific investigation abilities and attitudes alongside emotional and prosocial outcomes (24).

Broader school-gardening research also suggests that gardens may be particularly valuable for children who are less engaged by traditional classroom learning. One 2016 systematic review found that qualitative studies frequently described school gardens as

places where children could learn experientially, develop confidence and participate differently from how they did in the classroom. However, the review states that more quantitative evidence is needed to support the qualitative data suggesting the wide range of benefits from school gardens (25).

Nutrition, physical health and healthy behaviours

A substantial portion of the literature focused on child and youth gardening comes from public health and education rather than therapeutic horticulture programs.

A 2022 systematic review of 35 school garden-based studies involving more than 25,000 students found generally positive effects on nutrition knowledge, attitudes and acceptance of fruits and vegetables, with some improvements in dietary behaviour (26). Effects varied according to program design, duration, parent involvement and other social and environmental factors.

The aforementioned 2023 realist synthesis similarly found positive outcomes relating to diet, physical health and wellbeing across school-gardening interventions (19). Together, these findings demonstrate that there are a variety of positive impacts related to nutrition and health-related behaviours that may be sustained from gardening interventions in school settings.

What to keep in mind

The available studies focused on child and youth cover a **very wide range of interventions**. School vegetable gardens, therapeutic horticulture, horticultural activity programs, nutrition education, indoor plant activities and garden-based learning may all appear within the same broad evidence base, but they differ substantially in purpose and facilitation.

This is particularly important when translating research into TH practice. Positive findings from a school gardening program should not automatically be attributed to therapeutic horticulture, just as findings from a highly structured therapeutic program cannot necessarily be generalized to an informal gardening club.

Many child-specific TH studies also involve relatively small samples, short interventions or particular groups, and outcomes may rely on self-report, teacher ratings or other measures that are sensitive to context. Developmental stage matters as well: an approach designed for kindergarten children cannot be assumed to have the same effects for adolescents.

Overall, the evidence is best understood as **supporting the potential of thoughtfully designed horticultural experiences to contribute to children's wellbeing, social participation and development**, while recognizing that the strength of evidence differs by outcome and type of program.

Key studies to explore

Holloway et al. (2023) — Realist synthesis of school gardening

Examined 24 school-gardening interventions to understand how and under what circumstances gardening may influence children's health and wellbeing. Positive outcomes included aspects of nutrition, physical health and wellbeing, with experiential learning, curriculum integration, adult engagement and cultural context among the mechanisms associated with successful programs.

[Explore the study](#)

Lohr et al. (2021) — Scoping review of social and emotional learning

Reviewed eight studies examining school gardens and youth social-emotional learning. Qualitative evidence suggested potential benefits for social-emotional experiences, while quantitative findings were limited, highlighting the need for stronger outcome research.

[Explore the study](#)

Lee et al. (2018) — Randomized pilot study

Twenty elementary-school children experiencing adjustment difficulties participated in either horticulture-related activities or preferred indoor activities. The horticultural group showed reductions in several stress measures, including a significant reduction in school-life stress, and immediate reductions in salivary cortisol following horticultural activities.

[Explore the study](#)

Woo & Park (2024) — Controlled horticultural therapy study

A horticultural therapy program incorporating cognitive-behavioural emotion-regulation strategies was delivered to 42 Grade 3–4 children eligible for educational-welfare support. Participants in the intervention group showed significant improvements in emotional intelligence, emotion regulation and resilience.

[Explore the study](#)

Kacar & Ayaz-Alkaya (2026) — Randomized controlled trial

Sixty children aged 11–12 were randomized to a six-week horticultural activity program or control group. The horticultural group showed significantly improved social skills and reduced problematic internet use through six-month follow-up. Perceived stress did not improve significantly relative to the control group, illustrating that horticultural interventions may affect some outcomes but not others.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Research suggests that therapeutic horticulture and structured horticulture-based programs may support emotional wellbeing, social skills, engagement and developmental learning among children and youth. Some studies also report benefits related to stress, emotion regulation and resilience. The wider school-gardening literature identifies additional health, learning and nutrition benefits, although these programs are not necessarily equivalent to therapeutic horticulture and the quality and consistency of evidence vary across outcomes.

Physical Disability & Rehabilitation

This summary focuses on physical disability and rehabilitation, including stroke, acquired brain injury and other physical health conditions. Research specific to neurodevelopmental and intellectual disabilities is summarized separately.

Evidence at a glance

Research examining therapeutic horticulture, gardening and broader nature-based rehabilitation suggests that these approaches **may support physical function, participation, psychological wellbeing, and quality of life for some people participating in rehabilitation or living with physical health conditions**. The evidence is encouraging, but it is also highly varied: studies include occupational therapy integrated with horticultural approaches, gardening, nature-based rehabilitation, therapeutic gardens and other structured nature-based interventions, delivered across hospital, outpatient and community settings.

A 2024 systematic review and meta-analysis of randomized controlled trials involving people with physical health conditions found significant benefits from nature-based interventions for several condition-specific outcomes, including diastolic blood pressure and heart rate in participants with cardiovascular conditions, fatigue in people with central nervous system conditions and body-fat percentage in people with endocrine conditions (27). Other outcomes tended to favour nature-based interventions but were not consistently statistically significant. The authors noted moderate-to-high risk of bias and considerable variation across interventions and populations.

Within rehabilitation specifically, some of the clearest examples of TH and other nature-based intervention impacts come from research focusing on populations who have sustained a stroke or other acquired brain injury. Literature elaborated on in the following sections suggests that horticultural and other nature-based approaches may provide opportunities to practise motor and sensory-motor skills, support cognition and daily functioning, increase motivation and participation, and contribute to psychological wellbeing. However, the evidence base remains relatively small and does not yet establish the best practices for integrating therapeutic horticulture alongside traditional rehabilitation approaches.

What the research suggests

Physical function and rehabilitation goals

Horticultural activities often involve many important physical movements, such as reaching, grasping, fine-motor coordination, standing, walking, lifting, sequencing and other purposeful physical tasks (28,29). When these activities are selected and adapted around rehabilitation goals, they may provide a meaningful context for practising and improving functional skills.

One controlled study involving 40 people with hemiplegia following stroke compared occupational therapy alone with occupational therapy plus a structured horticultural occupational therapy program (30). Participants receiving horticultural occupational therapy showed greater improvements in hand function, functional independence and depression, with gains also reported in self-care, communication and social cognition. Although the study is relatively small and from 2010, it provides a detailed example of horticultural activities being integrated intentionally into rehabilitation rather than used simply as recreation.

Broader nature-based evidence also supports the possibility of physical benefits. The previously mentioned 2024 systematic review of people with physical health conditions found significant effects for selected cardiovascular, central nervous system and endocrine outcomes, while results for other physical outcomes were mixed (27).

Acquired brain injury and stroke rehabilitation

Nature-based rehabilitation has been studied particularly in people recovering from stroke and other acquired brain injuries.

A 2020 scoping review identified seven studies involving adults with acquired brain injury (31). Findings suggested possible improvements in motor and sensory-motor function, cognition and quality of life, while effects on anxiety and depression were unclear. The authors cautioned that differences in intervention design, outcome measures and study methodology made direct comparisons between included studies difficult.

However, the literature has expanded since then. A 2025 systematic scoping review identified 38 studies examining nature interaction across acute care, inpatient and outpatient rehabilitation and life after rehabilitation for people with acquired brain injury (32). Gardening and gardens were among the intentional forms of nature interaction used in hospital settings. The review concluded that nature appears relevant throughout recovery but emphasized the need for stronger evidence about **how, when and for whom nature should be incorporated into rehabilitation**.

Motivation, participation and psychological wellbeing

Rehabilitation often requires sustained effort over time, and meaningful activities may help people remain engaged in that process.

The 2010 study on the effects of horticultural occupational therapy in patients with post-stroke hemiplegia reported that the program helped motivate participants to engage in rehabilitation alongside improvements in physical and functional measures (30).

Qualitative research with occupational therapists and physiotherapists using nature-based approaches in neurorehabilitation also suggests that practitioners perceive natural settings as offering different possibilities for activity, participation and wellbeing compared to traditional rehabilitation spaces (33). Specifically, the authors concluded that therapists perceived that nature-based rehabilitation may contribute to a more stimulating and playful rehabilitation process compared to when the same methods are applied in an indoor setting. This study does not provide clinical measures of the effectiveness of

nature-based rehabilitation, but does provide an experiential basis for some of the potential benefits.

Physical activity and maintenance of function

Gardening can also provide opportunities for moderate-intensity, purposeful physical activity outside formal rehabilitation sessions.

During interruptions to outpatient cardiac rehabilitation during the COVID-19 pandemic, a study of 41 adults aged 65 and older found that participants who regularly gardened did not experience the same deterioration in exercise heart rate and perceived exertion seen among non-gardeners (34). Because participants were not randomized to gardening, the study cannot establish that gardening caused the difference, but it suggests that gardening may offer a meaningful way to help maintain activity and function for some people with cardiovascular conditions.

Rehabilitation environments and access to nature

The physical environment can also influence how nature is incorporated into rehabilitation.

A 2024 scoping review of nature-based design in stroke rehabilitation identified 28 studies examining gardens, outdoor spaces, indoor plants and horticultural materials, views and access to nature, and other forms of nature-based design (35). The authors found considerable variation and important gaps in the evidence, but concluded that garden settings and horticultural or garden therapy activities may offer useful opportunities within stroke rehabilitation environments.

When considering how therapeutic horticulture can be implemented in a physical rehabilitation setting, accessibility is an especially critical consideration. A 2011 study examining a rooftop garden used for physical therapy found high patient satisfaction but also identified accessibility and maintenance problems that reduced the garden's usefulness (36). This reinforces an important principle for TH practice: a garden is not inherently therapeutic or accessible simply because it exists. The environment, tasks and materials need to be designed around the abilities and goals of the people using them.

What to keep in mind

The evidence in this area is **particularly heterogeneous**. There is a broad spectrum of physical impairment and disabilities, including people recovering from stroke or acquired brain injury, people with cardiovascular or musculoskeletal conditions and people living with longer-term physical impairments. Their rehabilitation goals, risks and appropriate horticultural activities may be very different.

The interventions included in available literature are similarly broad. Some studies examine formal horticultural therapy integrated with occupational or physical rehabilitation, while others investigate gardening, nature exposure, therapeutic landscapes or broader nature-based interventions. Evidence supporting one of these approaches should not automatically be presented as evidence for all of them.

The broader physical-health evidence is promising, but the 2024 meta-analysis found moderate-to-high risk of bias and inconsistent effects across several outcomes (27). Similarly, the acquired-brain-injury reviews emphasize substantial differences between studies and a continuing need for rigorous research (32). This is not an indication that therapeutic horticulture and nature-based interventions are not an important tool for physical rehabilitation; rather, it calls attention to the need for more robust research with programming that includes comparable parameters (such as frequency, duration, and type of activity).

Key studies to explore

Struthers et al. (2024) — Systematic review and meta-analysis

Reviewed 26 randomized controlled studies of nature-based interventions for people with physical health conditions, with 15 studies contributing to meta-analysis. Significant effects were identified for selected cardiovascular, central nervous system and endocrine outcomes, while heterogeneity and risk of bias limited broader conclusions.

[Explore the study](#)

Norwood, Aplin & Gustafsson (2025) — Systematic scoping review

Reviewed 38 studies examining nature-based interventions and nature interaction across the rehabilitation journey of people with acquired brain injury. The review identified gardening and garden use among intentional approaches and highlighted both the perceived value of nature and substantial gaps in evidence about how it should best be incorporated into rehabilitation.

[Explore the study](#)

Kim et al. (2010) — Controlled horticultural occupational therapy study

Forty people with hemiplegia after stroke received either occupational therapy alone or occupational therapy combined with a structured horticultural program. The horticultural group showed significant improvements in hand function, depression and functional independence, including self-care, communication and social cognition.

[Explore the study](#)

Vibholm, Christensen & Pallesen (2020) — Scoping review

Reviewed seven studies of nature-based rehabilitation for adults with acquired brain injury. Findings suggested potential improvements in motor and sensory-motor function, cognition and quality of life, while psychological outcomes were less clear and study heterogeneity limited conclusions.

[Explore the study](#)

Ogura et al. (2022) — Observational cardiac rehabilitation study

Among older adults whose outpatient cardiac rehabilitation was interrupted during the COVID-19 pandemic, those who gardened maintained exercise responses better than non-gardeners. The non-randomized design means causation cannot be established, but the study provides an example of gardening as potentially meaningful physical activity during rehabilitation.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Research suggests that therapeutic horticulture, gardening and other nature-based approaches may complement more traditional physical rehabilitation approaches by supporting meaningful physical activity, participation, functional practice, psychological wellbeing and quality of life. Evidence is particularly promising in areas such as stroke and acquired brain injury rehabilitation, but interventions and populations vary substantially and stronger condition-specific research is still needed.

Neurodevelopmental Disabilities

This summary brings together research involving a variety of neurodevelopmental conditions, including autistic people and people with intellectual or developmental disabilities. These are distinct populations with different strengths, needs and experiences, and findings from one group should not automatically be generalized to another.

A note on language

Different people prefer different approaches to language. This summary uses both person-first and identity-first language. Additionally, "disabilities" is often used rather than "condition" to encompass the functional impairment that results when the various aspects of a condition interact with the societal environment.

Evidence at a glance

Research examining therapeutic horticulture (TH), horticultural activities and broader nature-based interventions for people with neurodevelopmental and intellectual disabilities is **promising but still developing**. Studies with specific TH interventions suggest potential benefits related to social participation, emotional and behavioural functioning, vocational skills, self-efficacy, adaptive functioning and physical or fine-motor skills. Research involving autistic children also points to possible benefits for social, sensory and behavioural functioning, although much of the stronger review-level evidence examines nature-based interventions broadly rather than therapeutic horticulture specifically.

Therapeutic horticulture and related interventions are currently understudied in this population compared to others such as older adults, dementia or mental and physical health. Many TH studies involving people with neurodevelopmental disabilities include small sample sizes, pre-post designs, or site-specific programs in schools, disability services, sheltered workplaces and community settings. Nevertheless, a growing group of studies demonstrates how horticultural approaches can be intentionally designed around outcomes such as social interaction, emotional development, functional skills and vocational participation.

What the research suggests

Social participation and interpersonal skills for people with intellectual disabilities

Social outcomes are among the most frequently reported benefits.

A controlled study involving 24 elementary-school children with intellectual disabilities examined a six-month horticultural therapy program designed to support attention and sociality (37). Children participating in the program had significantly higher sociality scores than the control group, including areas related to self-assertion, self-control and cooperation. However, attention did not improve significantly between groups.

Research with adults with intellectual disabilities also reports promising social and interpersonal outcomes. An eight-session vocational horticultural therapy program involving 28 adults found significant improvements in social skills alongside emotional behaviour and hand function (38). A separate 12-session program involving 14 adults with intellectual disabilities working in a sheltered workshop reported improvements in several measures related to adaptive behaviour, work performance and interpersonal functioning (39). Neither of these studies involving adults included a control group, so the findings should be considered preliminary.

Autistic children and youth

The broader nature-based intervention literature provides encouraging evidence for autistic children. A 2023 systematic review and meta-analysis included 24 studies on nature-based interventions involving 717 participants, and found positive short-term associations with social communication, hyperactivity, irritability and aspects of sensory functioning, including inattention/distractibility, sensory seeking and sensory sensitivity (40). However, only a small portion of the included interventions involved horticultural or nature-based therapy; most were recreational approaches such as equine-assisted activities and golfing. The findings therefore support the potential value of nature-based interventions but should not be presented as evidence for TH alone.

Research focused directly on horticulture is less common. In an open pilot study involving eight autistic youth and young adults, participants cared for local crop varieties within a healing garden (41). Researchers reported improvements across rehabilitative objectives, particularly social skills, interpersonal relationships, independence and adaptive behaviour. Because the study was small and uncontrolled, it provides useful preliminary information rather than definitive evidence.

A one-year horticultural therapy program involving 44 autistic children aged 10–15 in Kerala also reported improvements in emotional intelligence following participation in indoor and outdoor plant-based activities (42). Again, the study adds to the emerging evidence but does not provide the same level of certainty as a large controlled trial.

Emotional wellbeing and self-efficacy for people with intellectual disabilities

Horticultural programs may provide opportunities for success, responsibility, choice and visible accomplishment, all of which can be relevant to emotional wellbeing and self-efficacy.

In a vocational succulent-cultivation study, adults with intellectual disabilities showed significant improvements in measured emotional behaviour following eight weekly sessions (38). Qualitative research with adolescents with intellectual and developmental disabilities attending a horticultural therapy camp identified themes including community building, self-efficacy and engagement with nature (43). These findings are useful for understanding participant experience, although qualitative research does not establish that TH caused the observed changes.

Functional and vocational skills for people with intellectual disabilities

Available literature on horticultural-based interventions for people with intellectual disabilities contains a notable group of studies focused on **vocational participation**.

A 2020 study developed an eight-session horticultural therapy program around real succulent-production tasks for 28 adults with intellectual disabilities (38). Participants demonstrated significant improvements in grip strength, pinch force, hand dexterity, social skills and emotional behaviour following the program. The intervention was delivered on a working farm and deliberately used repeated horticultural tasks to develop practical vocational skills.

Similarly, a 2022 study designed a horticultural therapy program around the actual work demands of 14 adults employed in a sheltered workshop (39). Following 12 sessions, participants showed improvements in hand strength and dexterity, bag-assembly performance, adaptive vocational functioning and horticultural job competencies. The study illustrates how horticultural activities can be selected around specific functional goals rather than simply offered as general recreation.

What to keep in mind

This evidence category is **particularly diverse**. Autism, intellectual disability and other neurodevelopmental disabilities are not interchangeable, and there can also be substantial variation among individuals who share the same diagnosis. Age, communication style, sensory preferences, physical abilities, interests, support needs and personal goals should all influence specific program designs.

The research itself is also heterogeneous due to a variety of study designs, interventions, and targeted outcomes. It includes formal horticultural therapy, therapeutic gardens, vocational horticulture, camps and broader nature-based interventions. Findings from general nature exposure, equine-assisted activities or outdoor recreation should not be attributed directly to therapeutic horticulture.

In particular, the autism-specific TH literature remains relatively small. Even the strongest recent systematic review concerns **nature-based interventions overall**, with horticultural therapy representing only a small proportion of the included studies (40).

Many studies with horticultural-specific interventions that involve people with neurodevelopmental disabilities also use small samples and pre-post designs without comparison groups. Positive change following participation is encouraging, but it cannot establish that horticultural therapy alone caused the improvement.

It is also important not to approach TH with the assumption that neurodivergent traits must be “corrected.” Appropriate practice should be **person-centred and strengths-based**, supporting meaningful participation, autonomy, communication preferences, sensory needs and goals identified with the participant and their support team.

Key studies to explore

Fan et al. (2023) — Systematic review and meta-analysis

Reviewed 24 studies involving 717 autistic children and found positive short-term associations between nature-based interventions and aspects of social communication, behavioural functioning and sensory functioning. Most interventions were not horticultural, so the review provides important context for nature-based practice rather than direct evidence for TH specifically.

[Explore the study](#)

Kim et al. (2012) — Controlled horticultural therapy study

Twenty-four elementary-school children with intellectual disabilities participated in either a six-month horticultural therapy program or a control condition. Sociality improved significantly in the HT group, while attention did not differ significantly between groups.

[Explore the study](#)

Scartazza et al. (2020) — Open pilot study with autistic youth

Eight autistic youth and young adults participated in caring for local biodiversity within a healing garden. Researchers reported improvements in rehabilitative objectives, particularly social interaction, interpersonal relationships, independence and adaptive behaviour. The very small uncontrolled sample limits the strength of conclusions.

[Explore the study](#)

Joy, Lee & Park (2020) — Vocational horticultural therapy study

Twenty-eight adults with intellectual disabilities completed eight weekly sessions of succulent cultivation at a working farm. Significant pre-post improvements were reported in hand function, emotional behaviour and social skills. The study did not include a control group.

[Explore the study](#)

Son, Kim & Park (2022) — Vocational rehabilitation study

Fourteen adults with intellectual disabilities working in a sheltered workshop completed a 12-session HT program designed around their work demands. The study reported improvements in hand function, work performance, adaptive vocational functioning and selected interpersonal measures, while noting the limitations of its small uncontrolled design.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Emerging research suggests that therapeutic horticulture and structured horticulture-based programs may support social participation, emotional wellbeing, functional and vocational skills, and meaningful engagement for some people with

developmental disabilities, including autistic people and people with intellectual disabilities. Broader nature-based research also suggests potential benefits for sensory, social and behavioural functioning among autistic children. The evidence remains relatively small and heterogeneous, however, and programs should be individualized, strengths-based and responsive to each participant's goals, preferences and support needs.

Cancer & Cancer Survivorship

This summary includes research involving people at different stages of cancer, people receiving treatment or palliative care, and cancer survivors. These populations have different needs and goals, and findings from one stage of the cancer experience should not automatically be generalized to another.

Evidence at a glance

Research involving therapeutic horticulture (TH), social and therapeutic horticulture (STH), gardening, and broader nature-based interventions suggests **potential benefits for physical functioning, psychological wellbeing, social connection, coping and quality of life. Evidence varies by cancer population, intervention and stage of the cancer experience.** The evidence is encouraging, but research focused directly on TH interventions remains relatively small. Much of the larger evidence base examines gardening or nature-based interventions that should not be treated as equivalent to professionally facilitated therapeutic horticulture, but still provide insight into potential benefits of horticulture-related interventions more broadly.

A 2023 scoping review identified 12 studies involving 2,786 cancer survivors and reported improvements across outcomes including anxiety, depression, sleep, connectedness, stress, fatigue and pain (44). More recently, a 2026 systematic scoping review of community-based social-prescribing interventions for people recovering from cancer treatment identified **gardening as one of the most frequently studied approaches**, with seven gardening studies represented (45). These reviews are part of a growing area of research but do not establish that any one specific horticultural approach will produce the same outcomes across cancer types, treatment stages or individuals.

Current research on nature-based interventions focuses on cancer survivorship rather than people in active and/or advanced stages of cancer. Available evidence comes from **cancer survivorship gardening programs** designed to support physical activity, diet and function (45,46). Research during active or advanced illness is smaller, but TH and STH studies in oncology and palliative-care settings suggest that plant-based activities may also provide opportunities for emotional expression, distraction from illness, connection, creativity and meaningful engagement (47,48).

What the research suggests

Physical activity, function and survivorship

A literature review of nature-based therapy suggests that gardening and horticultural therapy may support physical activity and functional outcomes among cancer survivors (49). Among the included studies, interventions demonstrated increased physical activity and improvements in physical functioning and fatigue, while no changes were observed in overall quality of life or weight.

Future findings from the two-year *Harvest for Health* randomized controlled trial may provide further insight into some of the aforementioned health outcomes (50). Their 2022 article provides strong rationale for using an at-home vegetable gardening approach with mentorship from Master gardeners to improve lifestyle behaviours and health outcomes among cancer survivors, although the focus is on older individuals (50). This RCT is a follow-up of a feasibility study from 2015, where preliminary findings demonstrated fruit and vegetable servings, and weekly physical activity (51).

The largest trial to date randomized 381 cancer survivors aged 50 and older to a one-year gardening intervention or waitlist (46). The intervention did **not** significantly improve the study's primary composite measure combining diet, physical activity and physical function. However, participants assigned to gardening showed significant improvements in physical performance and perceived health, and vegetable and fruit intake increased within the intervention group. The trial also identified increased gut-microbiome diversity, while COVID-19 significantly affected some outcomes.

Earlier randomized feasibility studies with older adults and breast-cancer survivors also demonstrated high retention and satisfaction and reported promising changes in physical activity, physical performance, dietary intake and psychosocial outcomes (51–53). These findings suggest that **gardening can provide meaningful, sustained physical activity during survivorship**, but the evidence does not show uniform improvement across all health outcomes, and more robust studies are needed.

Psychological wellbeing, coping and meaning

Nature and horticulture may play an important psychological role during and after cancer treatment.

A systematic review and qualitative meta-synthesis of 11 studies examining cancer patients' experiences of nature found recurring themes involving connection with valued aspects of life, feelings of safety and normality, new perspectives, meaningful physical activity, relationships and aesthetic or sensory experiences (52). The review suggested that nature can provide a supportive context in which people navigate the many aspects of experiencing cancer.

Smaller horticulture-specific studies reinforce this possibility. A pilot ecotherapy intervention involving women affected by breast cancer found themes related to positivity, meaning-making, control and reflection on the experiences of living with and beyond cancer (53). A study involving women with cancer and chronic pain similarly suggests that therapeutic horticulture may support vitality and meaningful participation, although changes in pain itself were not demonstrated (54).

Social connection and meaningful participation

Gardening can create opportunities for shared activity and connection during survivorship, when changes in work, relationships and daily life may contribute to isolation.

A small community-gardening study paired adolescent and young adult cancer survivors with experienced gardeners. Participants successfully planned, planted and harvested

produce with their mentors, demonstrating the feasibility of the approach and identifying opportunities for social interaction alongside physical activity and dietary goals. The sample was small and the study was designed primarily to assess feasibility rather than effectiveness (55).

A broader 2026 social-prescribing review also identified social connectedness, emotional resilience and coping among outcomes reported across community-based interventions for cancer survivors (45). Gardening programs were notable for high engagement and, in some studies, continued gardening after the formal intervention ended.

Palliative care and advanced cancer

TH may have a unique role when the purpose of programming is **comfort, quality of life, connection and meaningful engagement rather than rehabilitation or health-behaviour change**.

In a qualitative study involving 15 people with advanced stages of cancer on a palliative-care ward, participants described horticultural therapy as impacting wellbeing, variation from clinical routine, creativity, and relationship-building (47). They also reported positive stimulation, distraction from the hospital routine and opportunities to connect with others. At the same time, declining health meant that many participants were unable to attend repeated sessions, highlighting the importance of flexible and accessible approaches during advanced illness.

A larger hospice service evaluation delivered indoor STH to 218 people with advanced or terminal illness (48). Distress scores decreased significantly immediately following sessions, while participants also reported improvements in wellbeing, quality of life and symptom management, including pain. Because this was a service evaluation rather than a randomized controlled trial, the findings are encouraging but cannot establish that STH alone caused the changes.

Another horticultural therapy study in palliative care found significant improvement in **existential distress** immediately after the intervention and in concerns related to healthcare four weeks later, but did not find significant change in the overall quality-of-life score or most other measured domains (56).

Pain and physical symptoms

Some studies have explored horticultural approaches for people experiencing cancer-related symptoms or treatment burdens, but this evidence remains limited.

A six-week therapeutic horticulture pilot with seven women with cancer and chronic pain found significant improvements in vitality, lower-body flexibility, agility and dynamic balance, but **not in pain perception (54)**. A 2024 small controlled study involving people undergoing radiation therapy also reported improved physiological and behavioural indicators of wellbeing following horticultural activity, though the sample and intervention were limited (57).

These findings suggest that TH may support aspects of wellbeing and function even when the underlying symptom itself does not change.

What to keep in mind

The cancer evidence base includes **very different populations and intervention goals**. Someone receiving radiation therapy, an older person several years into survivorship, a young adult rebuilding social connections after treatment and a person receiving end-of-life care may all benefit from therapeutic horticulture and related tools in different ways.

The interventions are equally varied. Research includes professionally facilitated therapeutic horticulture, STH, home vegetable gardening with Master Gardeners, community gardening, therapeutic gardens, ecotherapy and broader nature exposure. Positive findings from general gardening or nature-based programs should not automatically be described as evidence for therapeutic horticulture specifically.

Research in oncology and palliative settings is generally smaller and includes qualitative studies, pilot studies, single-group interventions and service evaluations. These are particularly useful for understanding **participant experience, feasibility and potential mechanisms**, but provide significantly less certainty about cause and effect compared to large-scale and randomized controlled trials.

Programs looking to integrate therapeutic horticulture or other nature-based tools should also account for treatment-related fatigue, pain, infection risk, mobility limitations, neuropathy, lymphedema considerations, cognitive changes and fluctuating health status. Appropriate activities, materials, intensity and facilitation will depend on the individual and should complement—not replace—oncology, rehabilitation, palliative or other clinical care.

Key studies to explore

Jamaluddin et al. (2026) — Systematic scoping review

Reviewed 32 community-based social-prescribing studies involving people recovering from cancer treatment. Seven involved gardening, making it one of the most frequently represented intervention types. Gardening studies reported promising findings related to diet, physical activity, physical function, psychosocial outcomes and sustained engagement, while the review highlighted limitations in study design, long-term outcomes, accessibility and sustainability.

[Explore the study](#)

Demark-Wahnefried et al. (2024) — Randomized clinical trial

Randomized 381 older cancer survivors to a one-year mentored home vegetable-gardening intervention or waitlist. The primary combined outcome of diet, physical activity and physical function did not differ significantly between groups, but gardening participants demonstrated improvements in physical performance and perceived health, alongside increased vegetable and fruit intake within the intervention group.

[Explore the study](#)

Timko Olson et al. (2023) — Scoping review

Reviewed 12 studies involving 2,786 cancer survivors and a range of nature-based interventions and exposures. Findings across the studies included improvements in anxiety, depression, sleep, connectedness, stress, fatigue and pain. Because the review covered nature-based interventions broadly, it provides important context but should not be interpreted as evidence for TH alone.

[Explore the study](#)

Pilgrem (2023) — STH palliative-care service evaluation

Evaluated indoor STH delivered to 218 hospice patients over two years. Distress scores fell significantly after sessions, and participants reported benefits related to wellbeing, quality of life and symptom management. The absence of a control group means the findings demonstrate promising real-world outcomes rather than definitive effectiveness.

[Explore the study](#)

Mori et al. (2021) — Therapeutic horticulture pilot study

Seven women with cancer and chronic pain completed a six-week therapeutic horticulture program. Significant improvements were reported in vitality, lower-body flexibility, agility and dynamic balance, while pain did not significantly change. Qualitative findings also helped describe how participants experienced the program.

[Explore the study](#)

Using the evidence

One reasonable way to summarize the evidence is:

Research suggests that therapeutic horticulture, structured gardening and other nature-based approaches may support physical function, psychological wellbeing, social connection, coping and meaningful participation for people affected by cancer. Gardening interventions have shown particularly promising results during survivorship, while smaller TH and STH studies suggest potential value during active treatment and palliative care. The evidence varies considerably by intervention, cancer population and outcome, and horticultural approaches are best understood as complementary supports rather than substitutes for appropriate cancer care.

Bringing the evidence into practice

The research summarized in this resource points to a growing and encouraging evidence base for therapeutic horticulture and horticulture-based programming across a wide range of populations and settings.

At the same time, applying evidence effectively depends on more than empirical findings. Research must be considered in context alongside the individual participants involved, the practitioner's knowledge and role, the setting, program goals, available resources and ongoing evaluation.

As the field continues to develop, stronger research will help us better understand which approaches are most effective, for whom and under what circumstances.

For now, these summaries can help practitioners communicate the currently available evidence with greater clarity and support more informed conversations and decisions about therapeutic horticulture practice.

[Explore the full GrowTH Therapeutic Horticulture Research & Readings Database](#) for additional studies and ongoing research.

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