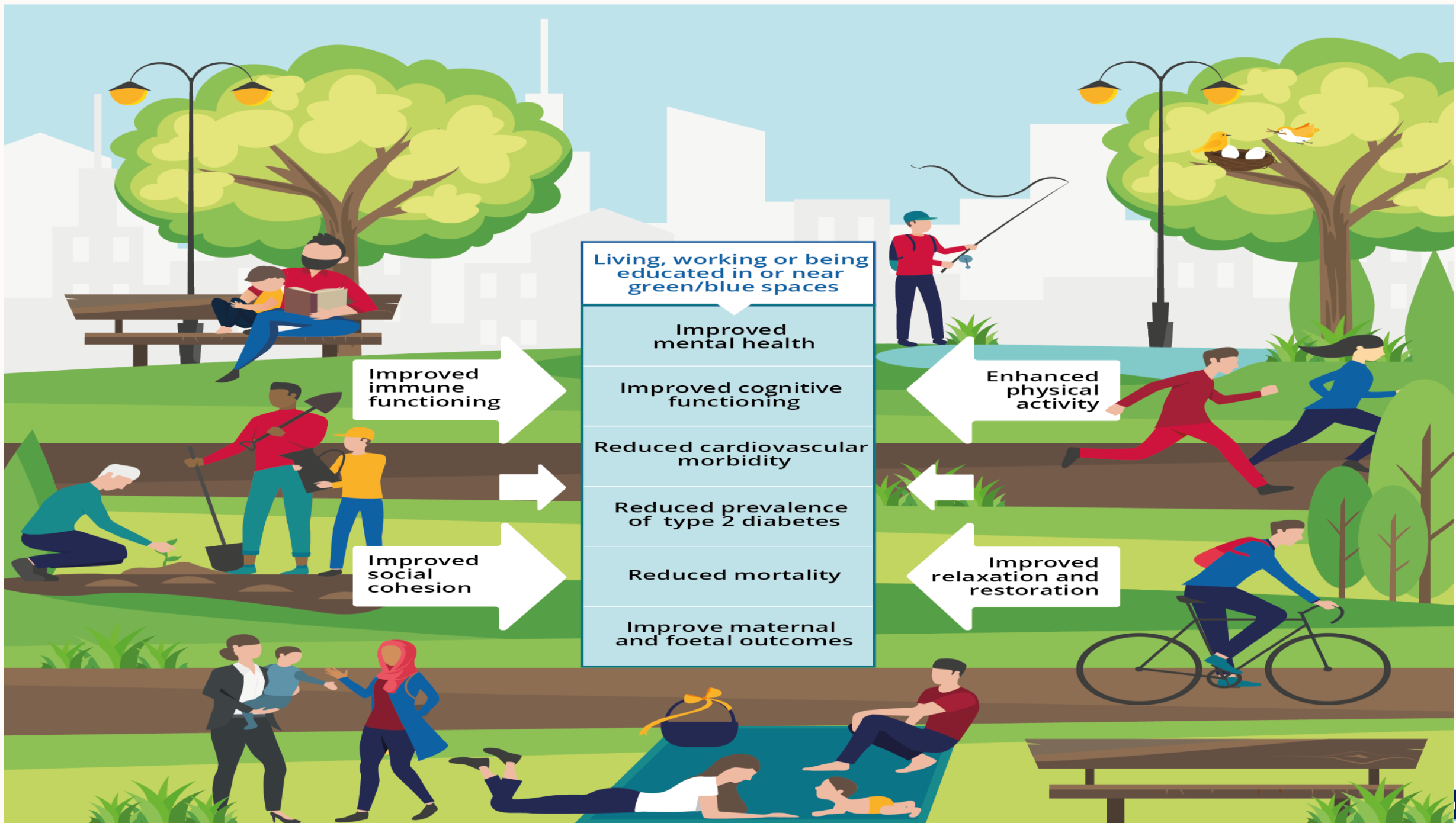


Exploring the Role of Nature in Childhood Development and Mental Health



Rationale

- Nature exposure plays a crucial role in cognitive , social, emotional, and physical development during childhood.
- As urbanization advances and screen time increases, children's connection with natural environments has diminished significantly. This coincides with rising mental health concerns among youth globally, presenting an urgent area for academic and clinical investigation.





1. **Exploring** the Role of Nature in Childhood Development and Mental Health
2. **Summarize** Evidence linking Nature To Child Mental & Cognitive Health
3. **Define** Different Obstacles for Nature Exposure and on Child Development and Mental Health
4. **Suggest** Practical Recommendations and Future integrating Nature as a Therapeutic Agent



- **Nature Exposure:** Direct (outdoor play) or indirect (views, plants, sounds)
- **Green Space:** Vegetated areas—parks, schoolyards, community gardens
- **Nature-Based Intervention:** Structured therapeutic/educational use of nature (Forest School, **Horticultural** Therapy)

Defining Nature Exposure and Intervention Frameworks

To effectively analyze the impact of nature on development and mental health, it's essential to establish a clear conceptual framework. **The effectiveness of nature's influence is largely mediated by three key intervention types:**

Access

Simply the **physical availability and proximity of natural spaces**, whether it's a neighborhood park, a school garden, or accessible wilderness areas. **Proximity facilitates spontaneous interaction.**

Exposure

The **direct sensory experience of nature**, involving sights, sounds, smells, and tactile interactions. This can range from **passive viewing to active participation in outdoor activities.**

Engagement

Active, meaningful interaction with natural environments, often involving purpose-driven activities like gardening, nature exploration, or ecological restoration projects. **This fosters deeper connection and learning.**

Crucially, the **quality** (biodiversity, naturalness, safety) and **quantity** (duration, frequency, intensity) of nature exposure are critical determinants of the outcomes observed. Research consistently indicates that richer, more frequent, and more direct interactions with nature yield more significant positive effects on cognitive, emotional, and physical health.

Cities Connecting Children to Nature

EARLY CHILDHOOD NATURE CONNECTION

Young children benefit from regular time outdoors

Early Childhood, ages 0 - 5:

Research shows that connecting young children to nature during the early years of life has many long-term benefits.



Cognitive Benefits of Nature for Children

- Nature fosters various cognitive skills, including **attention, concentration, creativity, and problem-solving abilities.**
 - **Nature-based learning environments** offer unique opportunities for **exploration, experimentation, and sensory engagement**, leading to improved academic outcomes and a greater love for learning.



Cognitive Benefits of Nature for Children

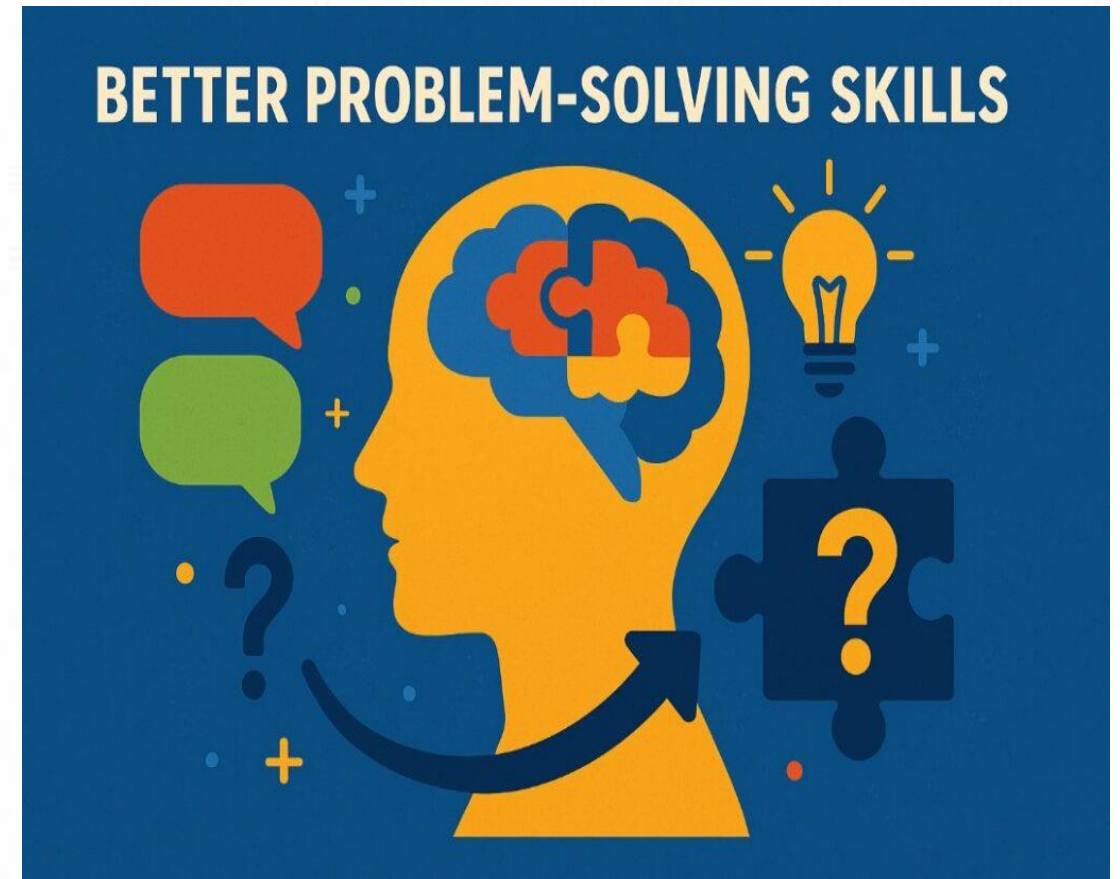
Playing outdoors allows children to develop **self-confidence, independence and self-esteem**



Cognitive Benefits of Nature for Children

Enhanced Cognitive Function

Regular exposure to natural environments significantly **improves concentration, working memory capacity, and creative thinking in thinking in children**. These cognitive enhancements persist even after returning to indoor environments.



Cognitive Benefits of Nature for Children

Academic Performance

Nature exposure can positively impact academic performance during childhood by **enhancing focus, engagement and well-being, improving attention spans, reducing stress, and promoting a more positive learning environment.**

Schools surrounded by green spaces report better standardized test scores, with improvements particularly in subjects requiring **sustained attention.**

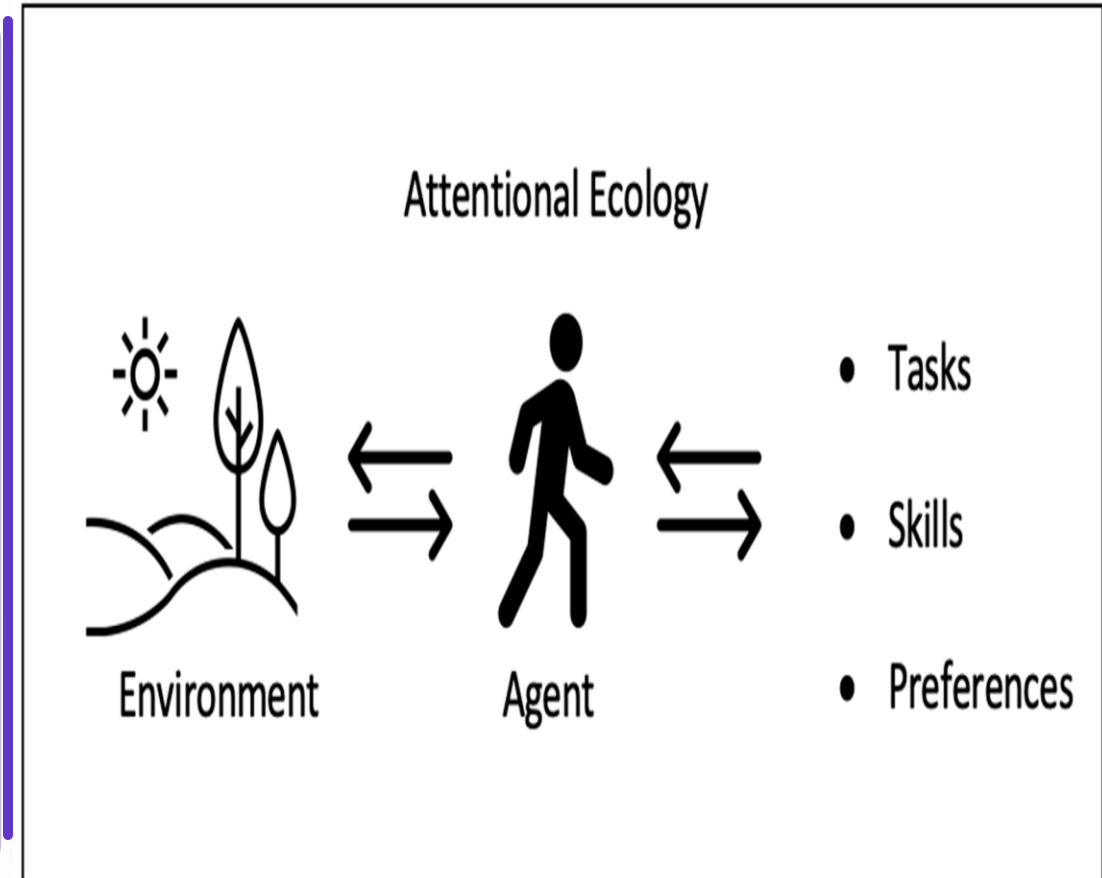


Cognitive Benefits of Nature for Children

Attention Restoration

Nature exposure **facilitates recovery from attentional fatigue through a process termed "attention restoration,"** allowing for **improved cognitive flexibility and executive functioning.**

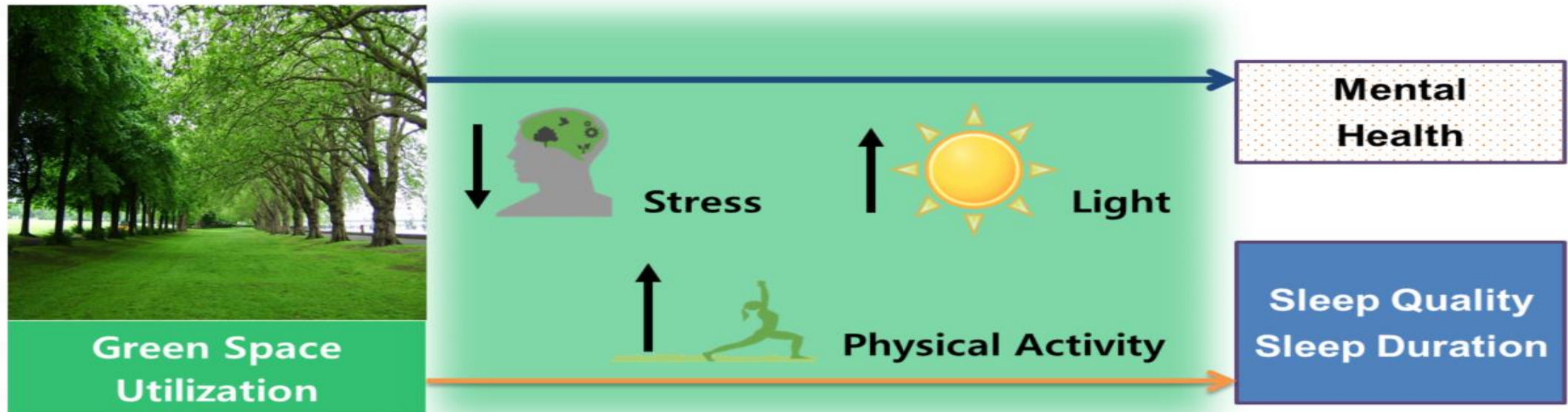
Attention restoration theory (ART) asserts that people can concentrate better after spending time in nature, or even looking at scenes of nature.



Emotional and Mental Health Impacts

In general, most green space types yielded positive effects on both **short-term and long-term mental health outcomes**

Mental health is the ability of people to **think, express their emotions, interact with each other, make a living and enjoy life**



Contextual Factors

- Gender
- Race
- Socio-economic status

Emotional and Mental Health Impacts

- Nature experiences through living near green spaces, such as parks and natural areas significantly **promote the emotional well-being of children**
- **Early childhood nature exposure (ages 2-5)** is associated with significantly lower rates of emotional problems in later developmental stages, and suggesting a **protective effect**, particularly reduced **anxiety and depression symptoms**.
- Research indicates that **even 60 minutes** of daily exposure to nature can reduce the risk of mental health issues by **50%** in children.



Emotional and Mental Health Impacts

Stress Reduction

Exposure to nature can lead to a decrease in stress by as much as **28%**.

Contact with natural environments **decreases cortisol levels, heart rate, and self-reported stress in children**, even with minimal exposure durations.



Emotional and Mental Health Impacts

ADHD Symptom Mitigation

Children with access to green spaces demonstrate **reduced symptom severity in attention deficit hyperactivity disorder**, particularly after engaging in "green exercise."

20% increase in green space around a child's residence was associated with a more than **10%** lower probability of the child using ADHD medication.



Emotional and Mental Health Impacts

Anxiety and Depression

Regular nature contact correlates with decreased prevalence of anxiety and depressive symptoms in school-aged children.

A **10%** increase in the proportion of green space was linked to a lower risk of depression



Social Development and Environmental Awareness

- Social and environmental awareness in children are intertwined aspects of their development, **fostering a sense of responsibility towards both their community and the natural world.**
- Early childhood is a crucial period for cultivating these interconnected concepts.



Social Development and Environmental Awareness

Cooperative Interaction

Outdoor activities in natural settings **foster cooperation, communication, and conflict resolution skills** through unstructured play and **shared discovery experiences**.

It allows children to develop essential skills for organising their **thoughts, understanding the world, recreating experiences and sharing ideas**



Social Development and Environmental Awareness



Environmental Consciousness

Early engagement with nature **builds environmental stewardship and ecological**, establishing **foundational attitudes toward conservation** that persist into adulthood.

Early childhood environmental education can help address potential barriers to nature engagement later in life, such as **fear of nature or lack of access.**

Social Development and Environmental Awareness



Horticultural Therapy

Horticultural therapy (HT) is a process that uses gardening and plant-based activities to achieve specific therapeutic goals.

Group gardening and plant cultivation activities demonstrate significant improvements in emotional welfare and social cohesion among diverse childhood populations.





Disparities in Access to Nature

20%

Access Disparity

Children in the lowest income quintile have approximately **20%** less access to parks and natural areas compared to those in the the highest income bracket.

74%

Urban Limitation

74% of children in dense urban environments lack regular access to natural green spaces within safe walking distance of their homes.

3x

Health Impact

Children with limited nature access demonstrate nearly **three times the prevalence** of certain mental health challenges compared to peers with abundant access.

Environmental justice concerns highlight the unequal distribution of natural resources across resources across socioeconomic and geographic boundaries, necessitating targeted policy targeted policy interventions.

Integrating Nature into Education and Parenting



Curricular Integration

Educational policies increasingly call for for systematic **embedding of nature nature experiences within standard academic curricula, recognizing their cognitive and and developmental benefits.**



Outdoor Learning Environments

Purpose-designed outdoor learning spaces spaces facilitate both **structured educational activities and self-directed exploration, supporting multiple developmental domains simultaneously.**



Parental Facilitation

Evidence-based parenting strategies now now emphasize **daily nature contact contact** as a fundamental component of component of optimal child development, development, comparable to nutrition and and physical activity.

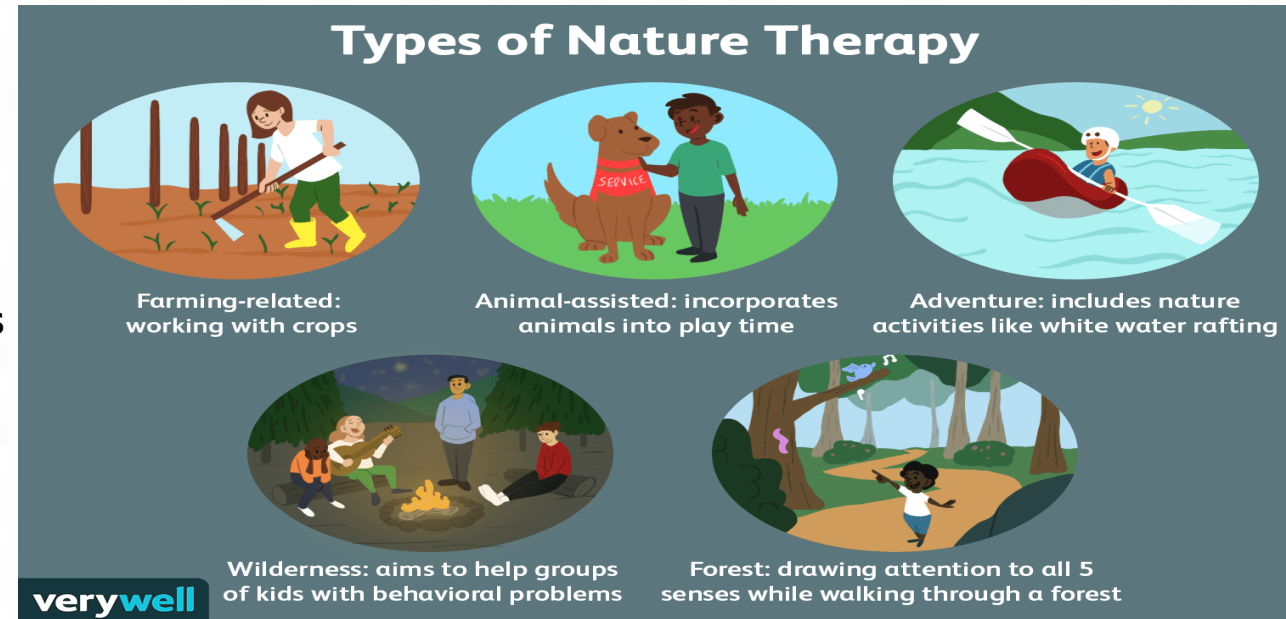
Nature as a Therapeutic Agent

Forest Therapy Protocols

Structured forest immersion programs demonstrate measurable improvements in mood regulation, mindfulness capacity, and physiological markers of stress in children with various psychological challenges.

Clinical Integration

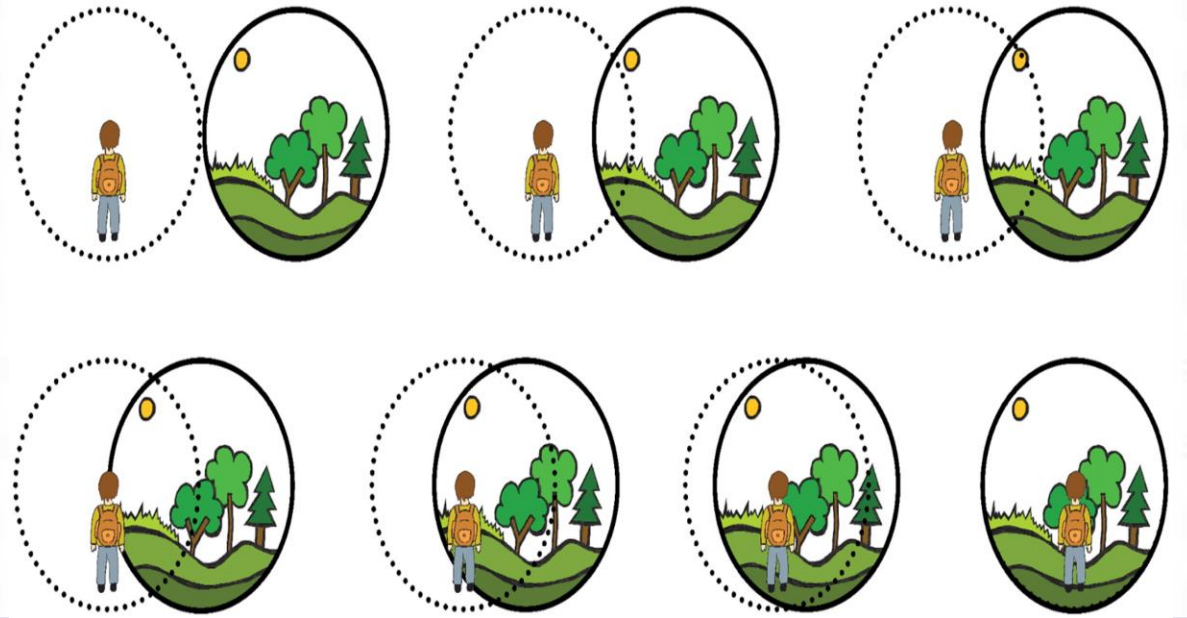
Nature-based interventions increasingly appear in formal therapeutic protocols for both prevention and treatment of common childhood mental disorders, including anxiety and depression.



Prescription Programs

Innovative initiatives like UCSF's SHINE program formally prescribe nature experiences for children from low-income families, tracking outcomes through rigorous clinical methodology.

Practical Recommendations for Families and Communities



Regular Unstructured Playtime

Schedule consistent opportunities for free play in natural settings, emphasizing exploration rather than structured activities. Even brief **exposures of 20-30 minutes** produce measurable benefits.

Community Green Space Development

Advocate for **accessible, well-maintained parks and natural areas** within communities, particularly in underserved neighborhoods where access disparities are most pronounced.

Nature Relatedness Cultivation

Foster **emotional connection** to natural environments **through activities that promote wonder, wonder, curiosity, and appreciation.**

Conclusion and Future Directions



Integrating Nature into Urban Planning

Prioritizing green infrastructure and accessible parks, within city designs. This **ensures equitable access to natural spaces for all children, particularly in densely populated areas and underserved communities** [United Nations Human Settlements Programme, 2025 recommendations].



Nature in Education and Healthcare

Embedding nature-based learning into school curricula and promoting eco-therapy and outdoor activities as recognized mental health supports. This involves **training educators and healthcare providers in nature-based practices** [World Health Organization, 2024 guidelines on child mental health].



Refining Mechanisms and Optimizing Interventions

Future research must focus on **the design design of optimized nature-based based interventions** tailored for diverse populations and specific developmental needs [Jiang , 2025].

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