



Nature's Healing Touch: Exploring the Therapeutic Benefits of Ecotherapy and Ecopsychology in Cancer Supportive Care

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ABSTRACT: Cancer care demands holistic strategies to address the intricate challenges faced by individuals during their journey. This narrative review explores the emerging field of ecotherapy and ecopsychology, encompassing nature-based interventions to enhance psychosocial well-being in the context of cancer. Ecotherapy, defined as the connection between nature and human well-being, offers a diverse range of modalities, including nature-based interventions, animal-assisted therapies, and virtual reality. Drawing from Vedic traditions, it highlights the human-cosmos analogy, emphasizing the interconnectedness between individuals and the nature. Theoretical frameworks such as the Biophilia Hypothesis, Attention Restoration Theory, Systems Theory, Place Attachment Theory and Stress Recovery Theory underpin ecotherapeutic practices. This review outlines the multifaceted benefits of ecotherapy, spanning stress reduction, emotional well-being, medical recovery, resilience building, social connectedness, and empowerment. Future directions underscore the need for individualized approaches, healthcare professional training, and collaborative efforts to unlock the full potential of ecotherapy in promoting psychosocial well-being throughout the cancer care continuum.

KEYWORDS: Animal-assisted therapy, Biophilia Hypothesis, Cancer care, Ecotherapy, Ecopsychology

INTRODUCTION

According to Multinational Association of Supportive Care in Cancer (MASCC), cancer supportive care represents a holistic approach aimed at enhancing the overall well-being of individuals navigating the complexities of cancer and its treatments. The focus is on averting and addressing the negative impacts of both cancer and its treatment. This encompasses the handling of physical and psychological symptoms and associated side effects throughout the entire spectrum of the cancer experience, spanning from diagnosis and treatment to post-treatment support. Supportive care strives to enhance rehabilitation, prevent secondary cancers, support survivors and provide quality end-of-life care for both patients and their families ¹.

Practitioners across various medical systems, spanning Ayurvedic and traditional Chinese medicine to numerous Western paediatric viewpoints, have consistently emphasized the pivotal role of nature in promoting well-being ². The human-cosmos analogy is a recurrent motif in Vedic culture, underscoring the intimate connection between humans and their environment. This concept finds mention in various ancient texts, including the Gayatri Mantra, Yogakundalini Upanishad, Garuda Purana, Charaka Samhita of Ayurveda, and Yajurveda. The Yajurveda articulates this idea with the statement, "Yatha pinde tatha brahmande, yatha brahmande tatha pinde," which translates to "As is the individual, so is the universe; as is the universe, so is the individual." This profound insight emphasizes the intrinsic interdependence and reflection between the microcosm of the individual and the macrocosm of the universe in Vedic philosophy ³.

Ecotherapy, a branch of applied ecopsychology, serves as a comprehensive term encompassing various techniques and practices. It facilitates reciprocal healing between the human mind and the natural world, the very environment from which the human mind has evolved ⁴. This exploration acknowledges the therapeutic potential inherent in nature and seeks to understand how ecotherapy and ecopsychology can provide innovative and meaningful contributions to the realm of cancer supportive care.

The primary purpose of this narrative review is to comprehensively investigate the therapeutic benefits of ecotherapy and ecopsychology for individuals affected by cancer. By synthesizing existing literature, the research aims to shed light on how intentional engagement with nature and the principles of ecopsychology can positively impact the psychological well-being of



cancer patients. The review endeavours to explore diverse ecotherapeutic techniques, ranging from nature walks and healing gardens to virtual reality and animal-assisted interventions, all within the specific context of cancer care.

This narrative review seeks to serve as a platform for not only summarizing current knowledge but also identifying gaps in understanding, offering insights for clinicians, researchers and healthcare providers. By critically examining the empirical evidence supporting ecotherapy in oncology, the research aims to contribute to the broader discourse on innovative and holistic approaches to cancer care. Furthermore, it sets out to underscore the significance of integrating ecotherapy and ecopsychology into the supportive care framework, acknowledging the potential for these interventions to enhance the resilience and overall well-being of individuals facing the challenges of cancer. In essence, the narrative review endeavours to provide a comprehensive and insightful exploration of the synergistic relationship between nature and cancer supportive care.

THEORETICAL CONSTRUCTS

Ecotherapy can be understood through various theoretical constructs that provide a foundation for its principles and practices. Here are some key theoretical frameworks through which ecotherapy is often interpreted:

Human- Cosmos Analogy from Vedic Tradition: The profound interconnectedness between the individual (pinda) and the universe (brahmanda) in Vedic traditions, as articulated through various scriptures.

1. **Yajurveda:** The verse "Yatha pinde tatha brahmande, yatha brahmande tatha pinde" underscores the inseparable relationship between the individual and the universe. It highlights the reflection and interdependence between the microcosm of the individual and the macrocosm of the universe.
2. **Yoga-kundalini Upanishad in the Krishna Yajurveda:** "Pindabrahmāṇḍayor eikyaṁ liṅgasūtrātmanor api. Swāpāvyākṛtayor eikyaṁ swaprakāśa cidātmanoḥ (1.81)" verse further elucidates the unity of the microcosm and macrocosm, emphasizing the close connection between manifest and unmanifest forms. It states that internal nature and external nature, as well as internal energy and external cosmic energy, are united.
3. **Garuda Purana:** "Etatte sarvamākhyātaṁ snānādiṣu phalaṁ mayā Brahmāṇḍe ye guṇāḥ santi śārīre te vyavasthitāḥ || 2.32.105 ||" emphasizes that the qualities present in the universe are arranged in the human body. This aligns with the holistic view that the individual encapsulates the essence of the entire cosmos.
4. **Gurugita:** Brahmāṇḍapiṇḍe sadṛṣe brahmaprakṛtisambhavāt Samaṣṭivyāṣṭisambandhādekasambandhagumfite || 98 || Rṣhidevāśca pitaro nityaṁ prakṛtipūruṣau Tiṣṭhanti piṇḍe brahmāṇḍe grahanakṣatrāśayaḥ || 99 || reinforces the idea that the nature of the Absolute Truth, akin to the universe's body, establishes a hidden connection between the whole and the one. It acknowledges the perpetual presence of sages, demigods, and forefathers in the universal body.
5. **Ayurvedic Texts:** The Ayurvedic perspective, as presented in the Charaka Samhita, 'Yāvanto hi loke mūrtimanto bhāvaviśeṣāḥ Tāvantaḥ puruṣe, yāvantaḥ puruṣe tāvanto loke. Puruṣo'yaṁ loka-sammitaḥ' affirms the mutual presence of the universe in the human and vice versa. The human is regarded as a reflection of the broader cosmos³.

In essence, these Vedic insights underscore a deep-seated belief in the unity of all existence. The human being is not seen in isolation but as an integral part of the vast cosmic order. This interconnected worldview from Vedic traditions resonates with the holistic principles often emphasized in ecotherapy. The understanding that the well-being of the individual is intricately linked to the health of the natural world aligns with the foundational concepts of ecotherapy.

Biophilia Hypothesis: 'Biophilia' was coined twice independently by Erich Fromm and E.O. Wilson, representing a psychological affinity for all that is alive and adaptive traits fostering a cognitive connection with the living world. The 'Biophilia Hypothesis,' compiled by Wilson and Stephen R. Kellert, posits a profound human reliance on nature for aesthetic, intellectual, cognitive and spiritual meaning. Biophilic design, rooted in this hypothesis, asserts an inherent human connection to nature, aiming to replicate natural settings to enhance well-being. Originating from Florence Nightingale's principles, biophilic design, endorsed by architect and co-founder of Maggie's Centres- Charles Jencks, prioritizes non-clinical, human-centred therapeutic environments. This approach significantly influences supportive care, vital for cancer patients facing psychological distress, fatigue, anxiety, or depression. Recognizing the impact of the physical environment on healthcare, this design philosophy extends beyond advanced medical technology, focusing on addressing the psychological, emotional and social needs of patients and their families⁵.



Solis Health, founded by Mrs. Bhairavi M Shibulal in Bangalore, is guided by the principles of biophilic design, incorporating elements from nature and open architect design to provide holistic care for both cancer patients and their caregivers, a tranquil inclusive healing space.

Attention Restoration Theory (ART): Attention Restoration Theory (ART) developed by Rachel and Stephen Kaplan posits that exposure to nature replenishes directed attention, essential for tasks requiring focus ⁶. ART has been extensively employed to evaluate the psychological advantages of green spaces, with a particular focus on alleviating anxiety, mitigating stress, enhancing happiness and replenishing attention ⁷. In cancer care, ecotherapy interventions guided by ART principles contribute to a reduction in fatigue, the bothersomeness of fatigue and pain, accompanied by increased levels of treatment satisfaction ^{8,9}.

Systems Theory: Systems theory views individuals as interconnected with the broader ecological system ¹⁰. This theoretical framework recognizes that the well-being of individuals is intricately linked to the health of the natural world. Interventions aim not only to support individual mental health but also to foster ecological awareness and sustainable practices ¹¹.

Place Attachment Theory: This psychological construct involves the emotional bond individuals form with specific places. Ecotherapy leverages place attachment by creating meaningful connections between individuals and natural environments, fostering a sense of belonging and emotional well-being ^{12,13}.

Stress Recovery Theory (SRT): Stress Recovery Theory (SRT) developed by Ulrich and colleagues posits that exposure to nature elicits a biophilic response, facilitating attention restoration, physiological recovery and positive emotional responses. Applied in healthcare, SRT underscores the stress-reducing benefits of nature, guiding interventions to enhance overall well-being ^{14,15} of patients, caregivers and the staff.

THERAPEUTIC APPROACHES IN ECOTHERAPY FOR CANCER PATIENTS

Ecotherapy, grounded in the belief that nature can serve as a healing force for psychological well-being, offers a range of therapeutic approaches tailored to the unique needs of individuals affected by cancer. These interventions not only complement traditional cancer care but also provide a holistic framework that recognizes the interconnectedness of nature and human health.

A. Nature-Based Interventions:

Horticultural therapy (HT): Within the realm of nature therapies, horticultural therapy (HT), known for its ease of implementation, has gained significant popularity for treating and rehabilitating patients, as well as promoting positive health outcomes for elderly individuals ¹⁶. Horticultural therapy involves utilizing plants and gardening within professionally guided therapy programmes ¹⁷. Engaging in horticultural activities not only boosts psychological well-being by fostering positive emotions but also induces physiological relaxation by diminishing sympathetic nervous system activity ¹⁸.

Forest Therapy and Forest Bathing: Forest bathing involves leveraging the healing properties of forests to enhance health and prevent diseases through strolls in the forest, experiencing it through all five senses. Despite the interchangeable use of the terms 'forest therapy' and 'forest bath,' they represent distinct applications. Forest therapy is conducted under the guidance of a professionally trained individual, whereas in forest bathing, the forest itself serves as the therapeutic agent. This practice yields positive impacts on the cardiovascular, nervous, endocrine, and immune systems, as well as mental health ¹⁹.

In a study by Q.Li et al, the forest bathing excursion notably elevated the counts of NK, perforin, granzysin, and granzymes A/B-expressing cells. Collectively, these results suggest that a forest bathing trip enhances NK activity. This effect is, to some extent, facilitated by the heightened number of NK cells and the induction of intracellular anti-cancer proteins ²⁰.

Healing Gardens and Therapeutic Landscapes: The expression 'healing garden' is frequently associated with the green areas within hospitals or other healthcare facilities designed to enhance health outcomes. These spaces serve as tranquil havens, fostering healing for patients, families, and staff by offering a place for relaxation and rejuvenation ²¹. Healing gardens tailored for cancer populations don't adhere to a one-size-fits-all approach. Reflecting the diversity in types and stages of cancer, each of these healing gardens possesses a unique combination of nature and health services intricately integrated into their hardscape, softscape, and aesthetic ambiance ²². Therapeutic landscapes or gardens are created to address the distinct requirements of particular patient populations,



often actively and purposefully involving them. Healing gardens are recognized for boosting symptom relief, reducing stress, improving overall well-being, and fostering a sense of hopefulness ²¹.

Eco-Art Therapy (EaT): Eco-Art Therapy (EaT) integrates therapeutic processes, where practitioners encourage clients to creatively interact with natural materials or environments. This approach combines eco-psychological theory with art therapy, aiming to enhance sensation, facilitate personal reflection, and integrate nature into the therapeutic process. EaT follows a strengths-based approach, emphasizing self-expression through various themes symbolizing transitional stages such as birth, growth, death, acceptance and hope. The creative process, integrating body, mind and nature, becomes a means of coping, self-discovery, and personal empowerment ²³ for individuals navigating the complexities of cancer treatment and survivorship.

B. Animal-Assisted Interventions:

Incorporating Animals in Cancer Supportive Care: Animal-assisted interventions (AAIs) have recently gained attention as a complementary treatment. They involve patients interacting with animals to alleviate psychological distress, address cancer-related symptoms such as pain, and enhance overall quality of life. AAIs encompass various activities and are essentially synonymous with terms like pet therapy, animal-facilitated therapy, equine-assisted therapy, and canine-assisted interactions. This approach can be categorized into two main types: animal-assisted activities (AAAs) and animal-assisted therapies (AATs), both of which are pertinent for individuals dealing with cancer. AAAs are typically brief, casual interactions with animals, contributing to a general improvement in quality of life. AATs, on the other hand, involve structured animal interactions deliberately designed to achieve specific clinical outcomes ²⁴. AAT has the potential to enhance human physical, psychological, emotional and spiritual well-being, and it may contribute to alleviating symptoms such as pain, fatigue and psychological distress ²⁵. The incorporation of animals into cancer care settings contributes to a more holistic approach, recognizing the multifaceted needs of individuals undergoing treatment and providing an additional layer of psychosocial support.

C. Virtual Reality (VR):

In oncological care, Virtual Reality (VR) serves as a distractive tool, effectively regulating patients' emotional responses during stressful treatments by redirecting their focus to more pleasant stimuli. The incorporation of multisensory elements induces a sense of presence in a virtual environment, creating a subjective experience of being in a different place than physical reality. Aligned with Frederickson's broaden-and-build theory (2001), promoting positive emotions through VR could enhance patients' resilience in facing the challenges of cancer. Specifically, the use of VR during chemotherapy has demonstrated efficacy in reducing anxiety and alleviating emotional tension, presenting multiple advantages in fostering emotional regulation ²⁶. Patients facing obstacles to experiencing real nature, whether due to treatment demands, post-treatment effects, or reduced mobility from advanced cancer, find virtual reality to be a beneficial alternative ²⁷.

In summary, these ecotherapeutic approaches for cancer patients are tailored to harness the healing potential of nature, offering diverse interventions that go beyond traditional healthcare settings. From guided nature walks to immersive wilderness experiences, ecotherapy provides a range of tools to support the psychosocial well-being of individuals navigating the complexities of cancer.

APPLICATION OF ECOTHERAPY IN CANCER CARE SETTINGS

A. Integration into Hospital Settings: Ecotherapy can be seamlessly integrated into hospital settings to enhance the overall well-being of cancer patients. Incorporating a healing or meditation garden ^{28,29}, Horticulture Therapy, Gardening, rooftop green spaces, or indoor plant installations ³⁰ into hospital design aims to integrate the life-affirming advantages of connecting with nature seamlessly into the continuum of care ²⁸. Healing gardens, provide accessible natural environments within the clinical setting. These spaces serve as therapeutic retreats, offering patients and their families opportunities for respite, relaxation, and reflection. Integrating ecotherapy into hospital design aligns with a patient-centred care approach, recognizing the importance of addressing physical, emotional, social and spiritual aspects of the cancer journey ³¹.

B. Community-Based Ecotherapy Programs for Cancer Survivors: Community-based ecotherapy programs extend the benefits of nature-based interventions beyond the confines of medical facilities. These programs, often organized by community organizations or healthcare institutions, create supportive spaces where cancer survivors can engage in ecotherapeutic activities. Guided nature walks, community gardening projects, wilderness therapy, social horticulture therapy which involves cultivating as a community in



village hall, library or any available space or outdoor mindfulness sessions offer ongoing support, fostering a sense of community and connection³² among survivors. Community-based ecotherapy initiatives empower individuals to continue their healing journey beyond medical treatment and promote a shared understanding of the healing potential found in nature.

C. Incorporating Ecotherapy into Palliative Care: In the realm of palliative care, where the focus is on improving the quality of life for individuals facing life-limiting illnesses, ecotherapy provides avenues for meaningful experiences. Nature exposure and activities tailored to individual preferences become integral components of palliative care plans. Whether through creating sensory-rich outdoor spaces, healing gardens, facilitating virtual nature experiences for home-bound patients, or incorporating animal-assisted therapy, ecotherapy contributes to the holistic care approach in palliative settings^{33,34}. By embracing the principles of biophilic design, palliative care providers can enhance patients' spiritual and emotional well-being, promoting comfort and a sense of peace in the final stages of life. Integrating ecotherapy into palliative care emphasizes the importance of holistic support that extends beyond traditional medical interventions³⁵.

BENEFITS OF ECOTHERAPY IN CANCER SUPPORT

Nature Exposure and Stress Hormones: Ecotherapy's impact on stress reduction is rooted in the concept that exposure to natural environments can modulate stress hormones. Time spent in nature has been associated with a decrease in cortisol levels, the hormone linked to stress. The calming and restorative qualities of natural settings create a counterbalance to the demands and anxieties associated with cancer treatment. This physiological response contributes to an immediate sense of relief and relaxation, laying the foundation for improved emotional well-being^{36,37}.

Positive Effects on Emotional Well-being: Nature exposure has been correlated with a reduction in symptoms of anxiety, loneliness and depression among cancer patients³⁶. The beauty and tranquillity of natural settings provide a therapeutic backdrop for emotional processing, fostering a positive mindset, improving self-esteem and overall mood and offering respite³⁸ from the emotional toll of cancer-related stressors.

Medical Recovery and Pain Perception: Nature in medical settings promotes rapid recovery, as evidenced by patients in rooms with flowers and plants needing fewer post-operative medications. They exhibit more positive physiological responses, increased positive emotions, and greater satisfaction with their hospital rooms. Indoor ornamental plants are linked to overall improved health outcomes for post-surgery patients. Exposure to nature scenes, including images, influences pain perception. Patients exposed to nature images were more likely to shift from stronger to weaker pain medication during recovery².

Physiological Benefits: Nature-Based Interventions (NBIs) yield positive effects on cancer-related quality of life, physical activity, immune system markers (like natural killer cells and T cells), cortisol levels, anxiety, and blood pressure. Cancer survivors share common risk factors for cardiovascular disease, including age, poor diet, psychosocial stress, inflammation, and sedentary lifestyles. NBIs positively influence these factors, particularly mitigating inflammation, a critical concern for cancer survivors³⁹.

Enhanced Resilience: The benefits of ecotherapy extend beyond immediate relief, equipping individuals with sustainable strategies to cope with the ongoing challenges of cancer survivorship. Engaging in nature-based activities plays a crucial role in fostering resilience and facilitating recovery post-treatment for cancer survivors. These activities offer a feeling of connection, comfort, and rejuvenation^{2,40}.

Sense of Social Connectedness: Exposure to nature heightens social cohesion, defined by Forrest and Kerns as a sense of community, shared values, positive relationships, acceptance, and belonging. Studies also indicate that nature exposure improves social connections and contacts. Moreover, increased nature exposure is associated with a decrease in loneliness and less frequent feelings of insufficient social support. This, in turn, positively impacts self-reported health, reduces health complaints, and enhances mental well-being⁴¹.

Connection with the Self: In Berger's (2020) observations, the term 'touching nature' implies that direct engagement with the natural environment can strengthen an individual's connection with their inherent self. In essence, this direct contact can link clients to a sense of inner strength and authenticity, facilitating the development and expression of crucial personal qualities. As individuals delve into the creative process involving nature, an internal connection emerges, fostering heightened awareness and presence. This,



in turn, has the potential to cultivate radical acceptance and, eventually, empathy towards oneself and others. Ultimately, guiding clients in recognizing their physical state through this process can promote adaptive coping skills and heightened resilience²³.

Empowerment and Sense of Control: Participating in nature-based activities involving mindfulness-based activities like guided imagery, breathing, etc provides cancer patients with a sense of empowerment and control over aspects of their lives. This empowerment contributes to a positive mindset and a more proactive approach to managing their health⁴².

The benefits of ecotherapy in cancer support extend beyond the physical realm, reaching into the emotional and psychological dimensions of the individual. By providing stress reduction, improving mood, enhancing coping skills, and fostering resilience, ecotherapy emerges as a valuable and integrative component of the supportive care framework for individuals affected by cancer.

CONSIDERATIONS AND FUTURE DIRECTIONS FOR RESEARCH AND PRACTICE IN ECOTHERAPY AND ECOPSYCHOLOGY IN ONCOLOGY

When analysing research, it is crucial to acknowledge limitations in the practice of ecotherapy, especially considering the diverse stages, types and phases of cancer journeys. Understanding individual sensitivities to natural elements, allergies, strength levels for outdoor activities, and preferences for specific landscapes becomes essential. As ecotherapy gains recognition, healthcare providers need comprehensive training to confidently incorporate nature-based interventions into cancer care, addressing confidentiality and ethical considerations.

Professional development programs should equip healthcare professionals with knowledge about ecotherapy's therapeutic benefits, intervention techniques and strategies tailored to individual patient needs and preferences. The multi-disciplinary coordination in ecotherapy, incorporating various therapeutic modalities like mindfulness, meditation, yoga exercises, aromatherapy, therapeutic diet and elements from eco art therapy, necessitates effective teamwork.

Looking towards the future, rigorous research methodologies and standardized measures should strengthen the evidence base, exploring long-term effects and the feasibility of implementing ecotherapeutic interventions in diverse cancer populations and healthcare settings. Additionally, research should encompass the integration of various modalities within ecotherapy, highlighting the importance of multi-disciplinary coordination in the healthcare team. Recognizing ecotherapy's value opens avenues for collaboration between healthcare professionals, researchers and nature-based therapy practitioners. This collaboration optimizes the delivery and impact of interventions throughout the cancer care continuum.

In conclusion, ecotherapy and ecopsychology, incorporating a range of therapeutic modalities, offer promising avenues for enhancing the psychosocial well-being of individuals affected by cancer, promoting a comprehensive and holistic approach to cancer supportive care.

CONCLUSION

In conclusion, the profound Vedic perspective, encapsulated in the timeless aphorism "Yatha pinde tatha brahmande, yatha brahmande tatha pinde," establishes an enduring link between the microcosm of the individual and the macrocosm of the universe. This ancient wisdom underscores the intrinsic interdependence and reflection between humans and their environment, an insight that resonates through the fabric of Vedic philosophy.

Ecotherapy, as explored in this comprehensive narrative review, emerges as a transformative bridge between the human mind and the natural world. Rooted in diverse theoretical constructs such as the Biophilia Hypothesis, Attention Restoration Theory, Systems Theory, Place Attachment Theory, and Stress Recovery Theory, ecotherapy offers a rich tapestry of interventions that harness the healing potential of nature.

The therapeutic approaches discussed, ranging from nature-based interventions like horticultural therapy and forest bathing to animal-assisted interventions and virtual reality, exemplify the versatility of ecotherapy in catering to the unique needs of individuals navigating the complexities of cancer. These interventions extend beyond traditional healthcare settings, seamlessly integrating into hospitals, community-based programs, and palliative care, thereby enriching the continuum of cancer care.

The benefits of ecotherapy, as elucidated in this review, are profound and multifaceted. From reducing stress hormones and enhancing emotional well-being to contributing to medical recovery and fostering resilience, ecotherapy serves as a holistic and integrative component of cancer supportive care. The interconnectedness it cultivates extends to social bonds, self-connection, empowerment, and a sense of control, ultimately empowering individuals facing cancer challenges.



Looking ahead, the integration of ecotherapy into mainstream oncological care necessitates addressing considerations related to individual sensitivities, professional training, and ethical practices. Future research endeavours should employ rigorous methodologies to further solidify the evidence base, exploring the long-term effects and feasibility of ecotherapeutic interventions across diverse cancer populations.

As we embark on this journey to intertwine the ancient wisdom of Vedic philosophy with the innovative approaches of ecotherapy, it is imperative to recognize the collaborative potential among healthcare professionals, researchers, and nature-based therapy practitioners. By embracing this synergy, we can usher in a new era of cancer supportive care, one that honours the profound connection between humans and nature, fostering resilience, healing, and overall well-being.

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