

Review

Contact with nature and youth well-being: Insights from natural and urban contexts

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Nature connectedness, which refers to the subjective sense of one's relationship with the natural world, is a multidimensional construct encompassing emotional, cognitive, and experiential ties, closely linked to personal and collective well-being. Strengthening this connection, especially among children and young people, requires active involvement in the places where they live and act. This article reviews evidence on two main areas: (1) immersive and regenerative experiences in natural contexts, and (2) nature contact in urban contexts. Across both domains, participatory methods, such as Youth Participatory Action Research and Photovoice, emerge as a transversal approach that transforms individual experiences into shared responsibilities, fostering ecological citizenship, community belonging, and sustainable, locally rooted relationships with nature.

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Keywords

Nature connectedness, Youth well-being, Participatory methods, Natural environments, Urban green spaces, Community engagement.

Introduction

In the current context of ecological crisis, urban density, and pervasive digital life, reconnecting with nature is becoming essential, especially for the younger generation whose developmental trajectories are strongly influenced by their environment and experiences of belonging [1]. Connecting with nature, a multidimensional concept

involving emotional, cognitive, and experiential connections with the natural world [2], is increasingly recognized for its impact on mental health, emotional regulation, social cohesion, and pro-environmental behaviors in adolescents and young adults [3,4]. Recent perspectives frame this connection as a fundamental psychological need in the general population along with autonomy and relationships [5,6]. Its accomplishment promotes psychological well-being and social motivation, while its frustration can lead to emotional disengagement [7].

These dynamics are particularly relevant in youth development. Adolescence is frequently associated with a reduction in feelings of connectedness to nature, as young people tend to engage less with natural environments during this stage of development [8]. In early adolescence, nature-based experiences can foster emotional regulation and a sense of wonder; in later stages, such as young adulthood, they often become a ground for value-based commitment and civic engagement [9]. For children and young people, nature connectedness promotes ecological action, civic engagement, and inclusive belonging [10,11].

To strengthen this connection, however, more than just passive observation is required, i.e. active participation. This has also been emphasized by recent work adopting a human ecological perspective, which highlights the importance of everyday engagement with nature, particularly through collective and place-based experiences [12].

In this sense, participatory action research (PAR) is a promising approach as it is a collaborative and democratic research methodology that actively involves young people and community members in the exploration of their relationship with nature, fostering both critical awareness and transformative action in their local environments [13]. By engaging youth and communities in environmental co-creation, observation and action, PAR transforms the natural environment from a passive backdrop into a relational and meaningful space [14]. PAR is especially relevant in youth development, where opportunities to shape one's environment contribute to a growing sense of agency, belonging, and ecological responsibility [15].

Current Opinion in Psychology 2026, **67**:102199

This review comes from a themed issue on Community and Nature (2025)

Edited by Michela Lenzi and Brian D. Christens

For complete overview about the section, refer [Community and Nature \(2025\)](#)

Available online 24 October 2025

<https://doi.org/10.1016/j.copsyc.2025.102199>

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In communities with less capacity or motivation to participate, it is important to use age-appropriate and culturally sensitive participatory methods and to activate community facilitators, ensuring that interventions are aligned with local needs, youth interests, and ongoing policy processes [12]. This participatory process helps to integrate the affective, cognitive, and civic dimensions of connecting with nature and strengthen personal and collective action. This is also confirmed by findings from community psychology, which show that young people who participate significantly in nature-based projects develop sustainable behaviors, stronger identity bonds, and a lasting sense of responsibility [16]. Recent work highlights how access to green spaces and the organization of nature-based activities by public institutions can promote pro-environmental behaviors and, at the same time, encourage community participation [17]. Participatory methods thus act as a bridge between individual experience and shared responsibility, grounding well-being in youth-centered, ecological, and community contexts.

For this reason, this paper reviews evidence from two main contexts in which young people connect with nature, immersive and regenerative experiences in natural settings, and nature-based engagement in urban environments. In both, participatory methods such as Youth Participatory Action Research emerge as transversal approaches that link individual well-being to community engagement and ecological citizenship. This perspective responds to specific developmental needs and contextual opportunities, underscoring the inherently complex and multidimensional character of nature connectedness and contributing to a more integrated understanding of how different settings and participatory practices shape youth well-being, engagement, and community participation.

Contact with nature in natural environments: immersive and regenerative experiences

Numerous studies have shown that direct contact with natural environments offers significant benefits for the psychological and social well-being of young people. Immersion in nature has been associated not only with reductions in stress, but also with improvements in mood, enhanced attentional capacity, and the promotion of a deeper sense of connection with the surrounding world. Such experiences go beyond mere exposure, activating multisensory engagement and fostering restorative processes that support mental balance and emotional resilience [18].

Structured interventions, such as adventure therapy and forest immersion programmes, have been shown to be effective in both reducing psychological symptoms and promoting well-being, especially in clinical settings such as young people with cancer [19], substance use disorders [20] and families coping with trauma [21]. These interventions often combine physical activity,

cooperative tasks, and reflective practices, creating a setting where nature functions as both a therapeutic agent and a social facilitator.

Beyond the clinical setting, these approaches have been extended to schools [22] and university students [23], showing positive effects on improving emotional regulation [24], self-esteem, autonomy [25] and interpersonal skills [26]. The experience of awe and wonder in natural environments has been identified as a key factor in reducing stress and increasing life satisfaction [23]. This emotional response, triggered by vast, complex, or beautiful natural settings, has been linked to increased prosociality, environmental stewardship, and meaning-making in young people. For adolescents navigating developmental transitions, awe can serve as a catalyst for personal growth and civic motivation.

A recent study [27] explored the effectiveness of forest bathing, guided immersion in forest environments, in improving the psychological well-being of adolescents. Through a convergent mixed-methods design, the results showed a positive impact on multiple levels. The project was conducted according to the Youth Participatory Action Research (YPAR) approach, a collaborative and democratic research methodology that engages young people as co-researchers in all phases of the process, from identifying issues to designing, implementing, and disseminating findings, with the aim of fostering critical awareness, agency, and social change. This approach actively involved young people in the research process as co-researchers, valuing their subjective experience. The participatory approach played a key role in promoting empowerment, critical awareness and resilience, providing a safe space for emotional expression and reflection on the relationship with the environment.

Another study [28] used the Photovoice method to explore the experiences of adolescent students in nature-based physical activities (NBPA), highlighting how contact with natural environments, even outside school hours, promotes physical and mental well-being, strengthens peer relationships and collective motivation to promote access to similar experiences. Here too, the participatory methodology was a tool for stimulating a sense of agency and youth leadership.

Importantly, these immersive and regenerative experiences show that the benefits of contact with nature are maximized when young people are not only recipients but also active agents in shaping the activities and reflecting on their meaning. In this way, nature becomes more than a restorative backdrop, it becomes a relational, participatory space that integrates individual growth, social connection, and ecological responsibility.

Overall, these findings highlight that direct engagement with natural environments is a powerful pathway to

enhancing young people's overall well-being, promoting emotional balance, physical vitality, and meaningful connections with others through shared experiences in nature.

Contact with nature in urban contexts: regeneration, citizenship and connection with the territory

At the same time, several studies have highlighted the value of contact with nature, even in urban contexts that are often neglected or degraded, as an opportunity to activate processes of active citizenship, belonging, and social and environmental regeneration. Growing urbanization and the intensive use of digital technologies contribute to the so-called "extinction of experience" [29], referring to the progressive loss of direct contact with nature, especially among adolescents. This disconnection is accompanied by a reduction in the sense of community and civic participation [30].

To counter this phenomenon, a growing body of research has explored the role of urban green spaces as places of engagement and transformation. For example, a study conducted in the United Kingdom [31] used a Living Lab approach to involve high school students in the care of a large urban park. Through the use of the Nature Data Probe Toolkit, a participatory set of digital and observational resources designed to strengthen young people's environmental literacy and civic engagement, participants enhanced their ecological awareness, sharpened their observation skills, and built a stronger sense of connection with the natural environment, alongside an active role in managing green spaces.

Similarly, in China, an urban greening project co-designed with youth transformed underused urban areas into green public spaces, increasing their sense of local attachment and environmental responsibility [32]. The Art, Community and Environment (ACE) programme in Finland engaged youth in collective creative processes focused on the natural urban landscape, reinforcing ecological and cultural identity through art [33]. In this context, nature became both a subject of artistic inquiry and a medium for civic expression.

Other studies have shown how participatory practices can foster a deeper connection to place and encourage collective stewardship of the environment. For example, in urban contexts, place-based storytelling, a participatory narrative approach that invites individuals or groups to share and co-create stories rooted in specific, meaningful locations, has been shown to strengthen community identity and inspire collaborative care of local public spaces [34]. In addition, community governance initiatives in protected urban areas have been found to enhance young people's sense of belonging and environmental identity, as well as their motivation to protect and manage local natural resources [35]. Active

involvement in decisions about meaningful places fosters a sense of collective agency and social cohesion.

In addition to these participatory practices, various nature-based interventions in urban areas have demonstrated positive impacts on well-being, especially when youth are involved in designing and implementing them. For example, adventure play in natural urban settings has been proposed as a protective factor against childhood anxiety, enhancing coping skills and self-confidence through exposure to manageable risks [36].

Recent research has also addressed the psychological consequences of the ecological crisis on younger generations. Studies highlight growing levels of eco-anxiety, ecological grief, and eco-guilt, particularly among adolescents, which can be mitigated through meaningful environmental engagement [37,38]. Urban green spaces, when co-managed or co-designed by youth, can function not only as spaces of restoration but also as symbolic sites of ecological repair, enhancing youths' sense of efficacy and purpose [39].

Taken together, the evidence suggests that urban green spaces, when approached as participatory and co-managed environments, can foster not only community regeneration, youth empowerment, and shared ecological responsibility, but also contribute significantly to young people's psychological and social well-being in the places where they live.

Conclusion

This work has highlighted the multidimensional benefits of nature contact for youth, not only in terms of individual psychological well-being but also as a relational and collective resource that strengthens social ties, community belonging, and shared ecological responsibility, explicitly across both natural and urban contexts in relation to social engagement, civic participation, and ecological agency [40].

Importantly, immersive experiences in natural environments, and daily situated experiences in urban green spaces should be seen as complementary rather than alternative pathways to fostering nature connectedness during adolescence. While the former provide intense opportunities for emotional restoration, wonder, and identity formation, the latter offer repeated, accessible, and socially embedded encounters that integrate nature into everyday life.

Meta-analytic evidence supports the positive association between nature connectedness and eudaimonic well-being, particularly when young people engage with nature in ways that foster identity, purpose, and social connection [41]. These effects are stronger

when participatory methods are embedded in the intervention, promoting youth agency and civic identity [42].

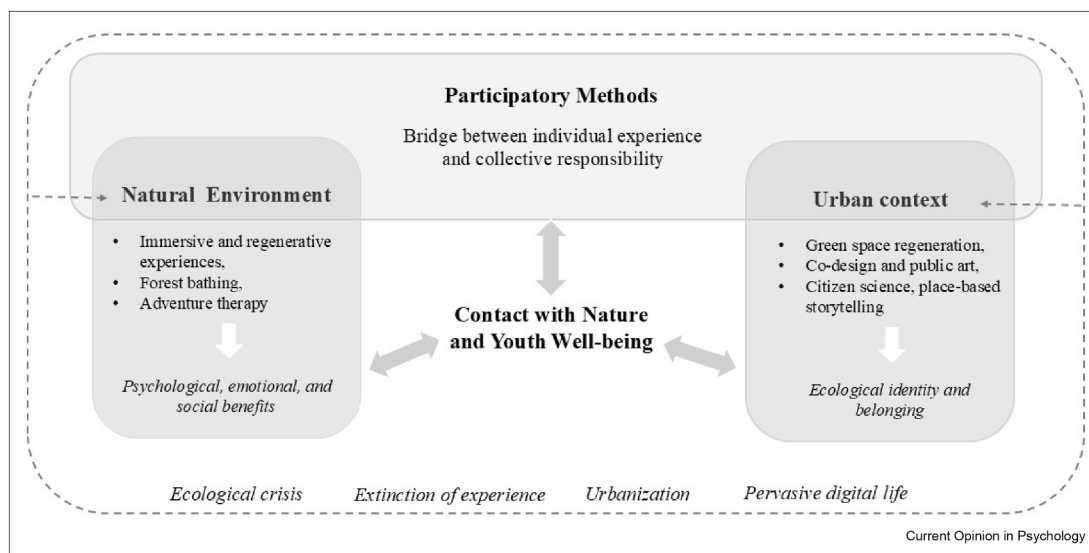
The existing literature clearly shows that immersive experiences in natural environments contribute to reduced stress, enhanced emotional regulation, and greater life satisfaction among young people. These benefits become even more salient when nature-based interventions are designed and implemented through participatory approaches, such as Youth Participatory Action Research (YPAR) and Photovoice. In these cases, young people are not merely recipients of care or education, but active agents in shaping their relationship with the natural world and their social environments. Participation itself becomes both a process and an outcome, acting as a key mechanism that transforms individual benefits into collective gains, fostering empowerment, critical awareness, and emotional expression.

While much of the current research on nature and well-being focuses on natural settings, this review has also emphasized the potential of urban green spaces as transformative sites for youth engagement. In urban contexts, where adolescents are increasingly disconnected from nature due to digital saturation and environmental degradation, co-designed greening initiatives, art-based interventions, and participatory governance of public spaces provide meaningful opportunities for young people to reconnect with their neighborhoods and to develop a sense of ecological and civic responsibility [43].

These interventions go beyond environmental education: they create spaces for belonging, creativity, and community reimagination. In particular, place-based storytelling and participatory urban design appear to strengthen local identity and foster sustained engagement with both nature and community. In urban settings, these processes not only reconnect youth with green spaces but also stimulate community regeneration, reinforce local identity, and create opportunities for intergenerational and intercultural exchange. Such participatory transformations position urban nature as a shared social resource, where well-being emerges as both an individual and a collective achievement.

As summarized in Figure 1, participatory methods represent a central bridge between individual experience and collective responsibility, fostering youth well-being through contact with nature. In natural settings, immersive practices such as forest bathing, adventure therapy, and other regenerative activities are linked to psychological, emotional, and social benefits. In urban contexts, situated experiences such as green space regeneration, co-design, public art, and citizen science promote the development of ecological identity and a sense of belonging. These approaches, however, unfold within a framework of contemporary pressures, ecological crisis, extinction of experience, urbanization, and the pervasiveness of digital life, that shape both their forms and their outcomes. They allow for the integration of young people lived experiences into the design of interventions and the production of knowledge, offering a counter-narrative to deficit-based or individualistic models of well-being. When participation is grounded in

Figure 1



Natural and urban contexts of youth contact with nature through participatory methods.

a social justice framework, it amplifies marginalized voices and supports processes of systemic change, at the personal, institutional, and community level. These findings suggest that youth nature connectedness should not be seen solely as a protective factor against distress or eco-anxiety, but as a driver of transformative engagement and sustainable futures [44].

At the same time, this synthesis invites a critical reflection on the risks and tensions associated with both nature and community connectedness. While nature may serve as a refuge, it can also evoke distress, particularly in the context of the climate crisis and the emotional burden of long-term environmental threats. However, the studies reviewed here suggest that participatory and collective forms of engagement with nature can help young people process these emotions, turning anxiety into agency and disconnection into commitment.

In conclusion, this work underscores the need to move beyond dualisms that separate nature from community, or individual well-being from collective action [45]. Nature-based interventions, particularly those grounded in participatory principles, can foster new forms of youth engagement that are simultaneously emotional, relational, and political.

Future research should further explore how these processes unfold across different life stages and cultural contexts, and how they can be scaled or adapted to support inclusive, community-driven responses to the ecological and social challenges of our time. Ultimately, reconnecting youth with nature, both in forests and in cities, offers a powerful pathway for strengthening community ties, fostering ecological citizenship, and promoting youth well-being in its individual, relational, and collective dimensions.

Author contributions

Martina Olcese: Conceptualization, writing – original draft preparation, writing – review and editing.

Francesco Madera: Conceptualization, writing – review and editing.

Paola Cardinali: Conceptualization, writing – review and editing.

Laura Migliorini: Conceptualization, writing – original draft preparation, writing – review and editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

No data was used for the research described in the article.

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* of special interest

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Further reading

13. The investigators conducted a narrative review of the interdisciplinary literature to examine how connection with nature and behaviors for learning can be deliberately and simultaneously supported in nature-based practice. Drawing on psychology, education, and outdoor learning research, the review identified six key design principles, such as emotional safety, space for reflection, and relationship building, that support both cognitive and emotional development. The findings underscore the importance of intentional pedagogical design in promoting calm, focused, and socially engaged learning in natural environment.
26. The researchers conducted a mixed-methods study involving 34 high school students to examine the effects of forest bathing on

adolescents' mental well-being. The results showed significant improvements in mood, emotional regulation, and stress reduction. Qualitative data revealed feelings of calm, connection, and increased awareness of nature, indicating that immersive experiences in natural environments can support mental health and deepen adolescents' relationship with the natural world.

27. The investigators implemented a five-week Photovoice unit with a physical education and health course consisting exclusively of 11th and 12th grade girls to explore nature-based physical activity (NBPA). The unit engaged students in outdoor activities, reflections and photographic storytelling, enhancing their connection with nature, themselves, their peers and their community. The results revealed that the NBPA promoted mindfulness, emotional well-being, and community involvement, particularly through activities such as yoga on the beach and cleaning up the local area. Using Instagram to share photos and captions has enabled peer interaction and youthful expression, demonstrating how participatory methods can build lasting connections between students, nature, and the communities in which they live.
29. The researchers implemented a Living Lab with 126 adolescent participants to assess the effects of a citizen science-based toolkit on connecting with nature. The results showed increased observational awareness and more specific language used to describe biodiversity, indicating that participatory methods can improve young people's engagement with green spaces and promote pro-environmental attitudes.
32. Researchers conducted a qualitative participatory action-research study involving 11 primary school teachers to explore how a nature-immersive, place-based approach could be used to teach skills of early reading, in particular phonemic awareness, through real-world materials. Participants designed literacy resources using natural environments and objects, integrating systematic phonetic instruction with outdoor experiences. The results highlighted an increase in perceived knowledge, pedagogical confidence, and eco-skills, suggesting that nature-based literacy approaches can improve both teaching effectiveness and ecological awareness in early education.