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Inviting Nature into The Room: A Conversation with Clinical Psychology

by

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Abstract

The evidence-base documents the wide array of benefits that being in nature has for human health and wellbeing. This thesis aimed to explore the role that nature could play in the field of clinical psychology. Firstly, through furthering an academic understanding of how and why nature is beneficial for psychological wellbeing, and secondly through exploring clinical psychologists' current practice of working with nature. This thesis firstly presents a chapter outlining the creation of this project and its importance and relevance for the field of clinical psychology, in the context of current NHS and health narratives in the UK. The thesis continued with a systematic review of 10 articles aiming to understand if nature connectedness influenced the relationship between nature exposure and psychological wellbeing. The results offer a complex and nuanced picture, whereby nature connectedness does appear to play a role in this relationship, however various factors limit the ability to draw robust conclusions. This has implications for how clinical psychologists can incorporate elements of nature into their work and whether to prioritise patient's emotional and cognitive relationship with nature. To further understand clinical psychologist's current experiences, the empirical study interviewed 16 clinical psychologists, focusing on participants perceived benefits and barriers of working with nature, and why this is important to their overall practice. A thematic analysis was conducted which generated four themes. The themes summarised the ways that psychologists defined nature and how they have creatively and curiously incorporated this into their work. Moreover, nature was defined as enabling connection both intra and interpersonally. Psychologists explored the construct of risk and safety, and how nature fits into this continuum. The final theme explored issues of power and permission. This thesis has offered an exploratory yet persuasive argument for why and how clinical psychologists can innovate and improve practices within the profession through exploring ways of working with or in nature.

Keywords: clinical psychology, nature, nature exposure, nature connection, psychological wellbeing, thematic analysis.

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Research Thesis: Declaration of Authorship

Print name: Lara Madeleine Felder

Title of thesis: Inviting Nature into The Room: A Conversation with Clinical Psychology

I declare that this thesis and the work presented in it are my own and has been generated by me as the result of my own original research.

I confirm that:

1. This work was done wholly or mainly while in candidature for a research degree at this University;
2. Where any part of this thesis has previously been submitted for a degree or any other qualification at this University or any other institution, this has been clearly stated;
3. Where I have consulted the published work of others, this is always clearly attributed;
4. Where I have quoted from the work of others, the source is always given. With the exception of such quotations, this thesis is entirely my own work;
5. I have acknowledged all main sources of help;
6. Where the thesis is based on work done by myself jointly with others, I have made clear exactly what was done by others and what I have contributed myself;
7. None of this work has been published before submission

Signature: Date: 9th January 2026

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Definitions and Abbreviations

ART ..... Attention Restoration Theory

BPS..... British Psychological Society

CAMHS..... Child and Adolescent Mental Health Service

CASP..... Critical Appraisal Skills Programme

CN ..... Connection to Nature

CNS ..... Connectedness to Nature Scale

CP..... Clinical Psychologist

EBP..... Evidence-based Practice

GP ..... General Practitioner

GSP ..... Green Social Prescribing

HCPC..... Health and Care Professions Council

NBI ..... Nature-based Intervention

NC ..... Nature Connectedness

NE ..... Nature Exposure

NHS..... National Health Service

PPI..... Public and Patient Involvement

PRISMA ..... Preferred Reporting Items for Systematic Review and Meta-Analyses

PW ..... Psychological Wellbeing

RCT..... Randomised Controlled Trial

RTA ..... Reflexive Thematic Analysis

SRT..... Stress Reduction Theory

SWiM ..... Synthesis Without Meta-Analysis

UK ..... United Kingdom

WEIRD..... Westernised, Educated, Industrialised, Rich, Democratic

Inviting Nature into The Room: A Conversation with Clinical Psychology

The Potential for Working with Nature: From Policy to Practice

"[As] Psychologists we have heard but little about gardens, about foliage, about forests and farmland… Perhaps this resource for enhancing health, happiness, and wholeness has been neglected long enough" (Kaplan & Kaplan, 1989, p.189, in Passmore & Howell, 2014).

The first aim of this chapter was to offer insight into the creation of the project, self-reflexivity, and philosophical stance underpinning the research. The second aim was to situate the thesis within current policy and practice to demonstrate the value of this work. The third aim was to reflect upon next steps.

Self-reflexivity & Research Philosophy

The idea for the thesis arose from the author's personal interest, and noticing a gap between the evidence-base demonstrating the benefits of working with or in nature, and practice in the field of clinical psychology, and a curiosity about why this gap existed. There appears to be a growing interest across the clinical psychology profession in nature-based approaches (e.g., Rowsell, 2025) with guidance published by the British Psychological Society (BPS) during Covid-19 on how clinical psychologists could continue to work by adopting outdoor practices, such as walking therapy (BPS, 2021). This interest appears frequently in the climate action sector (e.g., the Association of Clinical Psychologists UK has a climate action network), demonstrating compassion and care on behalf of clinical psychologists for the natural world and its intersection with human wellbeing. In 2021 the Mental Health Foundation used the theme of nature for mental health week, arguing that nature is a significant untapped resource to support society's mental health (Rowland, 2021). While the above demonstrates an active interest of the clinical psychology profession in the UK in working in or alongside nature, it is still an emerging interest and the evidence demonstrating its benefits does not appear to be widely disseminated across the profession. For example, Hunt et al (2022) explored delivering nature-based training into a Child and Adolescent Mental Health Service (CAMHS) and staff reported they found it helpful, particularly for patients who struggled to engage in a formal setting. However, there does not appear to be any replication of this research since its publication, and these findings do not appear to be reflected in any national service guideline or policy. It therefore felt relevant and timely to explore clinical psychologists' experiences of this growing topic of interest.

This research was guided by critical realism, which is a paradigm that often appears in social justice studies (Pilgrim, 2014). Critical realism acknowledges how underlying and unobservable structures, such as power and policy, situated within society's broader context, influence peoples lived realities and therefore what we can observe (Pilgrim, 2014). This felt apt for the present research which focused on participant experiences whilst acknowledging the landscape of public healthcare and current society narratives around wellbeing and nature within the UK (Willis, 2023).

This felt important within the context of a changing NHS (e.g., abolishment of NHS England and the economic implications of this) (Triggle & Catt, 2025) and the climate crisis narrative featuring in daily news articles (e.g., Poynting, 2025). Furthermore, critical realism enabled the present research to acknowledge the complex web of factors that contribute to clinical psychologist experiences in the NHS, including interactions between patients, practitioners, and policy. An example that the author considered is how policies and therefore practice may favour cost-effective and evidence-based approaches, which influences healthcare practice; this is an invisible yet powerful force that shapes UK healthcare and therefore participant experiences.

The author's education is derived from European worldviews which often view humans as having power and control over nature (Gauthier et al., 2025). However, the author aimed to learn about how indigenous worldviews take an ontological stance that humans exist alongside the natural world and have a reciprocal and relational role to it (Gauthier et al., 2025). For example, the author read about practices such as Shinrin-Yoku; Japanese forest-bathing (Hansen et al., 2017). Moreover, the author reflected on their memories of childhood in the outdoors, and how their relationship to nature was fostered and evolved over their life. This was discussed with the research team, which led to conversations about the intersection of nature with spirituality and science, and how people may conceptualise nature from either perspective. These discussions challenged and balanced the author's perception of nature, further supporting them to notice and reflect on any potential bias. Consequently, this supported a less biased approach toward the project, from conception through to data analysis. An important outcome that emerged from this self-reflexivity was for the knowledge generated in this thesis to not lead to the creation of an intellectualised, protocol-based intervention using nature as a resource. Rather, the aim was to hold in mind the complexity of the human-nature relationship and consider how working with nature could be approached ethically and sustainably.

Qualitative research involves high levels of interpersonal interaction (Clark & Sousa, 2018). The author kept a reflective diary throughout the process to document the evolution of their thoughts and reflect on the experience of interviewing fellow psychologists (appendix A). This was not an attempt to obtain objectivity, rather to notice the excitement for the topic and rapport built with participants, and document how this may have impacted the interpretation of the data (Angen, 2000). This allowed the author to acknowledge how they engaged with the data. For example, each interview triggered varying emotions; through noticing this the author could consciously acknowledge the influence this had on the research process. Moreover, the author observed a sense of solidarity with participants over shared experiences.

Situating the Research

Global and Government Level

Across the globe, several governments appear to be implementing policies which acknowledge the human-nature connection; both how this relationship can benefit pro environmental behaviours in the context of sustainability, and how nature can benefit human wellbeing (Richardson et al., 2022). In the UK, various factors contribute to how change is introduced or encouraged in the national healthcare system (NHS), including government policy, the economy of the country, public and professional views (Pereira, 2025). Through a collection of plans and policies outlined below, it is apparent that the UK has a growing interest for nature-based approaches, notably in the context of promoting a sustainable future whilst acknowledging economic conditions.

Several plans, including the 25-Year Environment Plan (HM Government, 2018), the updated Green Finance Strategy (HM Government, 2023), and the NHS Green Plan guidance encouraging all trusts to develop green plans (NHS England, 2025), each identify in their own way the value of nature. For example, they acknowledge the importance of green spaces for connection to community, environmental sustainability, public health, and the economic health of the country. Moreover, the national wellbeing framework mentions the natural environment and situates this as having influence on both national and individual wellbeing (Hicks et al., 2013).

There are several initiatives which demonstrate the UK government's growing consideration of nature and its impact on health. Firstly, 'Green Social Prescribing' (GSP) refers to nature-based interventions within healthcare that involve green (e.g., walking outdoors, gardening project) or blue activities (e.g., open-water swimming) (NHS England, 2021). Secondly, Forest Schools demonstrate the feasibility and success of incorporating nature into the education system and its impact on children's health (Garden & Downes, 2021). Thirdly, UK national parks further illustrate the value we ascribe to natural spaces through prioritising and investing in the preservation of a natural space that holds historical and cultural heritage (Butler, 2018). Moreover, these parks are used as educational resources, for recreational activity, and to ensure the whole population has access to a green space (Butler, 2018). Together, these initiatives demonstrate how nature is being valued and understood within UK policy and practice. The one challenge that remains is a thorough understanding of the underlying mechanisms which explain how these initiatives impact on health. This is a wider challenge within the evidence-base for nature-based work, as there is a lack of robust, long-term, transdisciplinary investigation (Dick et al., 2020).

NHS Level

This research focuses specifically on the role of UK clinical psychologists therefore it is relevant to understand NHS policies and guidelines for working with nature. Notably, the NHS Long-Term Plan

said it aimed to change the way it operates and focus on prevention (NHS, 2019). Nature-based approaches map onto this; indeed, increasing contact with nature could support a lifestyle change that promotes both mental and physical health and could therefore prevent the development of mental health difficulties (Owens & Bunce, 2022). The new long-term plan was published in July 2025 and sought out both public and staff voices to shape this new plan (NHS, 2025). One shift that stands out is their ambition to shift from sickness to prevention, which involves promoting healthier choices, such as through increased exercise. However, there is no direct reference to the benefits of nature in the new plan, which feels to be a missed opportunity for the NHS to promote the benefits of nature exposure and connection.

While the Long Term Plan does not directly address nature, the NHS does highlight the importance of environmental sustainability in healthcare and acknowledges the importance of healthy environments in healthcare settings. This can be observed through their Greener NHS campaign and 'Net Zero' report (NHS England, 2020). Integrating nature-based approaches into healthcare could increase the healing abilities of NHS environments, given the health benefits associated with nature exposure (Garside et al., 2020). Furthermore, nature-based approaches can increase individuals' care for the environment and possibly increase pro-environmental behaviours (see review, DeVille et al., 2021), which would in turn reinforce the NHS commitment to a healthcare system that is sustainable for the environment. This could therefore have the benefit of creating a more holistic and circular system of care, whereby people and nature both benefit from one another.

The Green Social Prescribing Programme (NHS England, 2021) emphasised the importance of nature's role on health outcomes. The programme was delivered in seven locations and demonstrated improved mental health outcomes for patients who received green prescriptions. This possibly demonstrates the most robust evidence of national policy valuing the relationship between nature and human wellbeing. However, this practice is not equally represented across the country due to a lack of infrastructure and resources depending on location. There is therefore the risk to perpetuate inequitable care, which further reinforces the need for high quality national guidance (DHSC, 2023). In summary, the aforementioned policies indicate some form of commitment, or at the very least a curiosity, to working with or in nature.

Governing Bodies

Regarding the governance of clinical psychologists in the UK, there are two institutions offering support and guidance: the BPS, and the Health and Care Professions Council (HCPC). The BPS acknowledges the importance of environmental psychology and the role that clinical psychologists could play in shaping policy and practice in this topic, however, it does not have a particular framework for nature-based approaches (BPS, n.d.). The HCPC sets the standard for healthcare professionals in the UK through a consideration of the evidence base, to ensure the highest quality of

care for patients (HCPC, 2023). Whilst the HCPC does not comment on nature-based interventions, their standards of practice for clinical psychologists encourage a consideration of a patient's environment and culture (HCPC, 2023). This ethos has the potential to align well with nature-informed practice. Both the BPS and HCPC would be critical players in devising how to safely implement working with nature into clinical practice and care.

Next Steps

The following explores a handful of topics that the reader is invited to consider when reading this thesis and reflect on to determine which implications may be relevant to their practice. Firstly, working with or in nature intersects with matters of equity, diversity, and inclusivity. There are some existing frameworks that offer ideas on how nature could be integrated into patient interventions, such as the Green Care model (Garside et al., 2020; Haubenhofer et al., 2010). This offers ideas on the range and variety of activities that could be matched to an individual's needs, accounting for accessibility and safety in nature, and a patient's unique characteristics and needs. Therefore, readers are encouraged to reflect on how this work could be applied and adapted to their respective settings.

Another consideration is to question the current evidence-base critically and perhaps approach nature-based interventions under the framework of practice-based evidence (Swisher, 2010). Evidence-based research and consequently practice (EBP) can be at risk of bias, in part due to WEIRD (westernised, educated, industrialised, rich, and democratic) samples, funding and publication biases (Muthukrishna et al., 2020) and therefore not always applicable to a patient. Moreover, it can take upward of a decade for research to be implemented into patient care, meaning research may become outdated before it has reached patient care guidelines (Green, 2008). On the other hand, practice-based approaches enable practitioners to seek feedback from patients and can be monitored by measuring patient engagement, enjoyment, or improvement in clinical symptoms, and therefore more rapidly implemented and adjusted. That said, ignoring the evidence-base entirely is potentially dangerous (Lilienfeld et al., 2013). With regards to the evidence-base, more government-funded research employing community-based methodologies that involve patient and public consultation could lead to the development of an evidence base that addresses specific population needs. Research into the economic and social returns of green care would also be beneficial to catch the public eye and encourage the government to invest in nature-based work.

Finally, the public narrative in this space can be influential. Mayer and colleagues (2009) comment that narratives across society and the media use fear to enact change, however Mayer suggests that through taking the approach of highlighting the benefits of being in nature, people may become curious which would further its buy-in. Buy-in would be critical to then prompt funding and

research interest, which in turn would improve the evidence-base and quality of interventions. Therefore, curious conversations are encouraged within staff teams.

Conclusion

This chapter aimed to outline the conception of this thesis and demonstrate why clinical psychologists should consider working with or in nature throughout their careers. The dissemination plan includes submitting the systematic review to the British Journal of Psychology (see appendix B) given it values interdisciplinary work, and for the empirical project to be submitted to Applied Psychology: Health and Wellbeing, one of the two journals of the international association of applied psychology (see appendix C). The papers will be slightly amended to fit formatting requirements. The empirical project will also be presented at a Postgraduate Research Conference. The author aims to continue exploring this research interest throughout their career as a clinical psychologist.

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The Role of Connection to Nature on the Relationship between Nature Exposure and Psychological Wellbeing in Adults: A Systematic Review

Abstract

This paper aimed to systematically review studies looking at the relationship between nature exposure and psychological wellbeing in non-clinical adults and whether nature connection influenced this relationship. The evidence-base is unclear and inconclusive about how and why nature exposure may lead to improved psychological wellbeing. Some research has begun to explore the role that nature connectedness plays, however, there presently is no systematic review summarising this literature. A systematic search of databases (PsycInfo, Medline, Web of Science, and ProQuest) was conducted. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines. The methodological quality of the studies was reviewed using the Critical Appraisal Skills Programme checklist. A narrative synthesis of the 10 included studies is provided, which included a mix of cross-sectional and experimental papers. Overall, there is some evidence to suggest that nature connection mediates and moderates the relationship between nature exposure and psychological wellbeing, however, not all studies reached this conclusion. There was significant heterogeneity in the conceptualisation of the key concepts and measures used which requires discussion and have limited the ability to draw robust conclusions.

Introduction

This review explored the relationship between nature exposure (NE) and psychological wellbeing (PW); specifically, whether connection to nature influenced this relationship. The physiological and psychological benefits of nature exposure are widely documented (Bratman et al., 2021; Capaldi et al., 2014; Pritchard et al., 2019). The evidence-base also demonstrates the positive impact of nature connectedness (NC), defined as the subjective experiential relationship that a person has with nature (Liu et al., 2022), or the "psychological joining of nature and the self" (Lengieza & Swim, 2021, p2), on human wellbeing (Redondo et al., 2022). Research has explored the relationships between nature exposure, nature connection, and psychological wellbeing, investigating all directions of relationship between these three variables. For example, Liu and colleagues (2002) looked at nature exposure mediating nature connection and wellbeing, whereas Yan and colleagues (2024) looked at nature connection mediating the relationship between nature exposure and wellbeing. Both studies found positive mediations, suggesting that the directionality of pathways between these three variables is unclear. This may be due to the notable heterogeneity across research methods and methodology, such as type of nature exposure, facet of wellbeing measured, and the measure used to evaluate nature connection.

Nature Exposure and Psychological Wellbeing

Both nature exposure and psychological wellbeing are terms that are difficult to define and therefore contentious to research. Both terms are multifaceted constructs with no single tool used to capture or measure both, rather differing tools are used in research depending on the theoretical framework guiding the research. Nature broadly refers to all living beings, a "force that is responsible for physical life" (Cambridge Dictionary, n.d.), including humans, animals, and plants. Psychological wellbeing is frequently operationalised into hedonic (i.e., life satisfaction) and eudaimonic wellbeing (i.e., sense of purpose, personal growth) (Weiss et al., 2016). However, at times, measures of mental health are used to capture psychological wellbeing in research (Fleury-Bahi et al., 2012). Consequently, research may report conflicting findings based on the differing conceptualisations used for these terms, and different ways of measuring both constructs. This could help explain why there is not an over-arching theory explaining the relationship between nature exposure and psychological wellbeing.

There are several theories that hypothesize why humans enjoy and benefit from being immersed in nature. One is the biophilia hypothesis (Wilson, 1984) which proposes that humans have an innate need to be in nature which relates to our evolutionary history whereby the human species existed in natural environments; being in nature therefore fulfils an innate need which in turn increases feelings of wellbeing. Another theory is the Attention Restoration Theory (ART) (Kaplan, 1995), which suggests that viewing a natural environment allows cognitive attentional processes to rest and recharge, meaning our capacity for attention increases following nature exposure. A third is the Stress Reduction Theory (SRT) which propose that nature calms the human physiology, such as lowering heart rate, therefore reducing stress (Ulrich et al., 1991). In line with the aforementioned theories, numerous studies have demonstrated that exposure to nature reduces stress (Passmore et al., 2022), improves meaning in life (Pensini et al., 2016), reduces mental fatigue (Yan et al., 2024), promotes positive emotion (Passmore & Holder, 2017), and improves psychological wellbeing – measured in different ways – in both adults (see systematic review, Gascon et al., 2015) and children (see systematic review, Liu & Green, 2023). In summary, there are theories that outline how nature has a positive effect on both human cognitive processes and physiology, and perhaps an impact on an innate need of connection to nature. While the biophilia hypothesis offers a broader explanation, ART and SRT propose that nature exposure impacts wellbeing through the mechanism of cognitive restoration and physical restoration respectively. Nonetheless, the specific cognitive and physical mechanisms are still being researched to identify the specific pathways that lead to change. Pertinent to this synthesis is a framework inspired by the biophilia hypothesis, the Pathways to Nature Connectedness framework (Lumber et al., 2017). This framework is premised on the idea that developing a relationship with nature can improve wellbeing, and this relationship is the key mechanism of change (Lumber et al., 2017). This framework is still in its infancy with limited but growing empirical support (Passmore et al., 2025), and has a bigger focus on spirituality, as opposed to other theories that are more focused on cognitive and physical processes.

Nature Connectedness

Nature connection has been described as a sense of kinship with nature (Passmore et al., 2025), where humans experience a sense of oneness with the natural world which engenders feelings of wellbeing (Burns, 1998). Some research has demonstrated positive correlations between nature connection and measures of wellbeing (Nisbet et al., 2011) and a meta-analysis concluded

that people with a stronger nature connection also report greater life satisfaction and positive affect (Capaldi et al., 2014). There are, however, various ways that nature connection can be measured, and various factors that could influence the relationship between nature connection and wellbeing, including age, gender, and location/access to nature (Barragan-Jason et al., 2023). Results must therefore be interpreted with caution.

It is helpful to differentiate nature exposure and nature connection, how these two concepts are related in research, and importantly, whether both are required to see an improvement in psychological wellbeing. Research has aimed to explore this relationship, mostly demonstrating that both concepts influence the other. For example, nature exposure has been found to increase nature connection (Zelenski & Nisbet, 2014), as well as nature connection being found to enhance the benefits of nature exposure and prompt nature-seeking behaviours (Mayer & Frantz, 2004). Nature connection has been conceptualised as both an individual trait and a state, whereby someone's emotional response to nature could change (McMahan et al., 2018). Various factors have been suggested as influencing nature connection, such as childhood exposure to nature, which could influence an adult's nature connectedness and their comfort with seeking out nature (McMahan et al., 2018). In terms of nature exposure, various factors including type, length and location of the exposure, may influence the outcome under study. Therefore, while the evidence base generally proposes that both nature exposure and nature connection positively influence each other and human wellbeing, the details are more intricate.

Understanding the relationship between nature exposure and nature connection could further our theoretical understanding of nature connection and the role it plays in the NE-PW relationship. In addition, this would support the development nature-based interventions (NBI), which are increasingly popular in healthcare (see systematic review, Taylor et al., 2022). NBIs include various forms of gardening therapy, outdoor exercise, forest bathing, or simply walking outdoors – they all include nature exposure, though authors question if participants gain increased and longer-lasting benefit from NBIs if they report greater nature connectedness (Thompson & Barton, 2011).

Current Review

The present review builds on previous reviews that have explored the relationship between nature connection and various facets of wellbeing. Pritchard (2020) reviewed the relationship between nature connection and eudaimonic wellbeing (Pritchard et al., 2020), concluding that

people with higher levels of nature connection tend to report greater eudaimonic wellbeing. Similarly, Capaldi et al. (2014) reviewed the relationship between nature connection and hedonic wellbeing, which they conceptualised as happiness, and proposed that nature connection correlated with hedonic wellbeing. Both reviews offer a summary of how nature connection is associated with different facets of wellbeing, however, do not delve into what mechanisms may be involved that support the relationship between nature connection and wellbeing. Moreover, it is unclear how nature exposure may have been involved in the studies included in the reviews. Pritchard (2020) acknowledged that nature connection may act as a mediating factor between nature exposure and wellbeing, however, reference no review that could help support this hypothesis. Capaldi et al. (2014) also questioned the relationship and proposed that people with higher levels of nature connection may seek out more nature exposure, which could then influence wellbeing. Therefore, these studies indicate that a review of the research looking at all three facets (NE, PW, NC) would be helpful to advance our understanding of their relationships.

Another recent review summarised whether nature connectedness mediated the relationship between nature exposure and physiological measures of wellbeing, including cognitive function, blood pressure, and cortisol levels (Gál & Dömötör, 2023). The authors concluded that there was evidence to support mediation, however, note there was tremendous methodological heterogeneity in their included papers, making it difficult to draw conclusions. Nevertheless, this study further encouraged the present review, noting there was interest on the role that nature connection played in the NE-PW relationship.

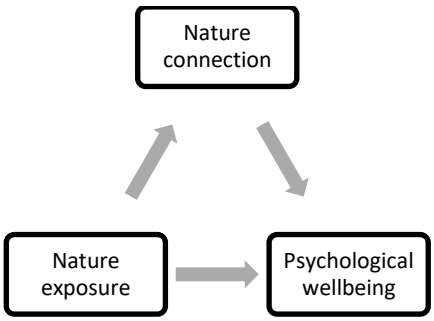
Another insightful review was completed by Lengieza and Swim (2021) which explored the antecedents to nature connection, which highlighted how individual factors in participants (e.g., age), situational context and internal psychological processes (e.g., personality constructs) all influence one's predisposition to developing connectedness to the natural world; this highlighted the complexity of this topic. Of note, the authors highlighted the bias in the field of research looking at how nature exposure increases connectedness, with virtually no research exploring the conditions in which nature exposure would diminish nature connection. They offer a balanced narrative and list the significant variety of ways in which nature exposure is defined and quantified in research across this field.

Together, these reviews demonstrate the nuanced relationship between nature, connectedness, and wellbeing, however no review has yet aimed to answer whether nature

connection acts as a mediator in the NE-PW relationship. There appears to be a gap in empirical support for the mechanisms of change postulated in the theories presented, and a lack of consistency and synthesis of the studies suggesting nature connection may influence the relationship between nature exposure and psychological wellbeing. The present review therefore aimed to evaluate the current quantitative research evaluating the role that nature connection played on the relationship between nature exposure and psychological wellbeing. Figure 1 demonstrated the pathway that this review focused on. The aim of this review was to summarise the evidence explaining this relationship, with a view to offering clinical implications regarding healthcare interventions and identifying gaps for further theory and research to address.

Figure 1.

Visual Summary of the Review



Materials and Methods

The review was pre-registered with Prospero (ID CRD42024601922) and was conducted in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021). This review focused on quantitative studies, excluding all qualitative research, given the focus on mediation or moderation statistical analyses. The initial aim was to explore this relationship in 'healthy controls' and therefore excluding clinical participant populations.

Study Eligibility Criteria

Purposefully broad definitions were used to conceptualise the key constructs (nature connection, nature exposure, psychological wellbeing) and to inform the eligibility criteria. The aim was for the searches to generate enough studies, whilst still enabling the review to draw precise implications and conclusions. No specific measures were requested for nature exposure or nature

connection, given there is no standardised nature exposure measure or intervention, nor is there a universal measure for nature connection. Psychological wellbeing was used as a broad term to capture and represent the various ways this construct is measured in research, and studies were included if they claimed their measure was capturing participant psychological wellbeing; being prescriptive here would have significantly diminished the amount of research available for the review, as established during initial literature searches.

Inclusion Criteria:

- Non-clinical adults aged over 18 years.
- Any geographic location.
- Quantitative study design including a moderation or mediation analysis.
- Nature exposure intervention or retrospective measure of nature exposure/contact.
- Measure of psychological wellbeing.
- Articles written in the English language.

Exclusion Criteria:

- Participants with mental health diagnoses or physical health conditions.
- Animal-assisted therapy interventions.

Search Strategy

The search strategy was based on the PICO framework (Chandler et al., 2024) (Table 1), developed with the support of a librarian and reviewed by the research team (see Table 2 for search terms which were combined using the Boolean operator 'AND'). Keywords were derived through an iterative process, from the literature and multiple trial searches. The following electronic databases were searched in December 2024: PsycInfo, Medline, Web of Science, and ProQuest. All searches were recorded in Rayyan (Rayyan, 2025) and duplicates removed. Titles and abstracts were initially screened for relevance by the main reviewer, with a second reviewer assessing a random 10% of searches (κ =1). Following this, a full-text screen of shortlisted studies was performed by the main reviewer to ascertain suitability for inclusion. A second reviewer screened 20% of the shortlisted studies (κ =1). Inter-rater reliability was perfect for both screenings (Cohen, 1968). The main researcher also screened the reference list of included articles to identify additional studies that the database search did not yield. The procedure is summarized in the PRISMA diagram (see Figure 2).

Table 1.

PICO Framework

PICO	
P – Population	Non-clinical adults aged over 18 years, any geographic location
I – Intervention	Nature exposure measure – including intervention or questionnaire measuring nature exposure
C – Comparison	Mediation or moderation analysis of the impact of nature connectedness
O – Outcome	A measure of psychological wellbeing

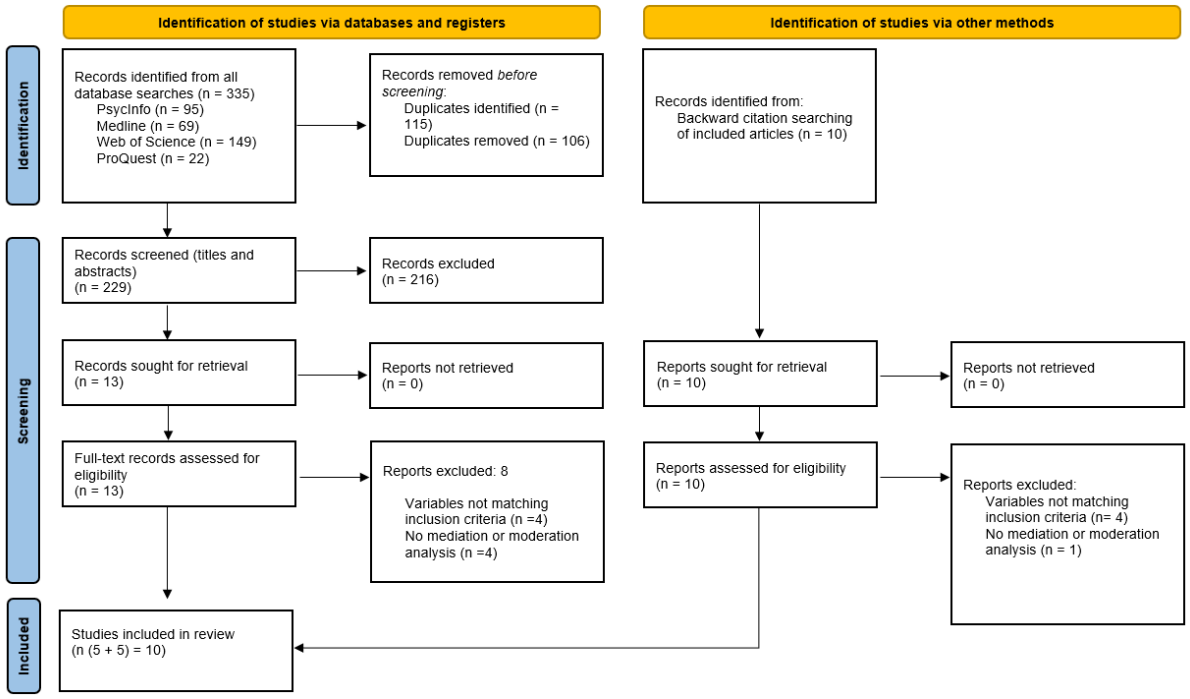
Table 2.

Search Terms

Domains	Search Terms
Nature exposure	natur* OR “outdoor*” OR greenspace* OR “green space” OR bluespace OR “blue space”
Wellbeing	Well-being OR wellbeing OR “psychological health” or “mental health”
Connection to nature	spirit* OR mystic* OR “nature connect*” or “connect* to nature”
Analysis	quant* OR mediation OR moderation

Figure 2.

PRISMA Flow Diagram



Data Extraction

The main reviewer extracted key data from the articles which are displayed in Table 3.

Evaluation of Evidence

For quality appraisal, the Critical Appraisal Skills Programme (CASP) (CASP, 2024a; CASP, 2024b) checklist was used to ensure a systematic approach was followed to assess the research (Randles & Finnegan, 2023). The CASP checklist offers a robust framework to assess research and report it transparently. Each section allows the assessor to select ‘yes’, ‘no’, or ‘can’t tell’. The criteria ‘can’t tell’ was used when there was insufficient information in the article to make an informed judgement. The main reviewer completed the quality assessment of all papers, 20% of which was verified by a second reviewer; this was then compared and discussed at length, culminating in no disagreements. Two versions of CASP were used given the diversity of papers, a cross-sectional one (CASP, 2024a) (see appendix D) and randomised control trials version (CASP, 2024b) (see appendix E). This allowed for an accurate quality appraisal whilst still following a similar framework.

Method of Synthesis

The included articles had significant heterogeneity across methodological procedures and measures used, precluding a meaningful meta-analysis (Boland et al., 2017). Ferguson (2014) disputes the idea that meta-analyses are the highest form of objectivity when answering a review question, rather he argues that researchers will fight for their ideological beliefs and find critiques of both meta-analyses or narrative syntheses in the pursuit of defending their research, or what they believe to be true. This review was not aimed to resolve an academic dispute, rather to summarise a relatively novel area of research and the author acknowledges their ideology and subjectivity in this topic. Therefore, a narrative review of the evidence was chosen to present the findings, with guidance taken from the Synthesis Without Meta-Analysis (SWiM) guidelines (Campbell et al., 2020).

Results

The review included 10 papers and full details of the screening process can be seen in Figure 2. Table 3 below illustrates the key information extracted from the included papers.

Table 3.

Study Characteristics

Authors (Year, Country)	Design; intervention	Participant Characteristics	Relevant Statistical Test and Results of Analysis	Relevant Findings
Fleury-Bahi et al. (2023); Spain, Netherlands, Turkey, Portugal, Germany, France, Hungary	Cross-sectional; survey	N = 1343 Gender: 56.4%F, 43.3%M Age: 38.60 (17-73)	Multi-level regression models. CN contributes significantly to wellbeing, $\Delta R^2_m = .035$, $p < .001$. CN has a significant regression coefficient, $b = 0.134$; $p \leq .001$. The interaction term between CN and PAN is significant, $b = -0.084$, $p = .013$.	NC significantly moderates the relationship between NE and wellbeing. For participants with higher CN scores, the association between PAN and WB is significantly weaker.
Li et al. (2024); China	Cross-sectional and semi-longitudinal; survey	N = 618 (N = 292 for longitudinal analysis) Gender: 76.21%F, 23.79%M Age: 19	Cross-sectional and semi-longitudinal mediation models. Cross-sectional: The indirect effect of INS ($B = 0.45$, $p < .001$, 95% CI [0.23, 0.79]) and CNS ($B = 0.64$, $p = .006$, 95% CI [0.26, 1.12]) were statistically significant. INS mediated 18.36% and CNS mediated 25.95.% of the total effect. Longitudinal: Significant mediating effect by INS $B = 0.23$, $p = .02$, 95% CI [0.03, 0.59]. Marginally significant mediating	Cross-sectional: NC partially mediated the relationship between tree visibility and wellbeing. The direct pathway between tree visibility and wellbeing was the strongest effect. When stratified by gender, the significant mediation only remained for females.

			effect by CNS, *B* = 0.12, *p* = .09, 95% CI [-0.02, 0.42].	Longitudinal: NC mediated the relationship between tree visibility and wellbeing with the INS measure and marginally mediated the relationship with the CNS measure.
Mayer et al. (2009); USA	Experimental; two conditions (nature vs urban) (study 1 and 3) or three conditions (nature vs virtual nature vs virtual urban) (study 2)	N = 76 Gender: 51F, 22M, 3 unidentified	Mediational analysis. When condition (urban, nature) and CNS scores were both used to predict positive affect, the relationship between condition and positive affect was significantly weakened, *b* = 0.32, *t* = 4.49, *p* < .001.	CNS mediated the relationship between condition (nature, urban) and positive affect.
		N = 92 Gender: 61F, 28M, 3 unidentified	Mediational analysis. When condition and CNS scores were both used to predict positive affect, the relationship between condition and positive affect was significantly weakened, *b* = 0.38, *t* = 3.51, *p* < .001.	CNS scores mediated the effect of condition on positive affect. These effects were not accounted for by other measures (i.e., awareness, attentional capacity).
		N = 64 Gender: 33 F, 29M, 2 unidentified	Mediational analysis. When condition and state CNS scores were both used to predict positive affect, the relationship between condition and positive affect was significantly weakened, *b* = 0.44, *t* = 2.69, *p* < .05.	CNS mediated the relationship between NE and positive affect. This effect was weaker than study 1 and 2. Contrast between conditions was subtler in study 3 (real vs virtual nature). All studies

				suggest CN has a mediating effect.
Pasca et al. (2022); Spain, Mexico, Italy, France, Portugal	Experimental; three conditions (natural, quasi-natural, non-natural)	N = 454 Gender: 78.4%F, 21.6%M Age: 20.92	Mediational analysis. Significant indirect effect of naturalness on wellbeing through CNS (point estimate = 0.47, BC 95%CI [0.08, 1.03]. Regression coefficients: Naturalness to CNS = .15, $p < .01$, and CNS to wellbeing = .11, $p < .05$.	CN mediated the relationship between type of environment and wellbeing outcomes.
Passmore & Howell (2014); Canada	Experimental; two conditions (nature vs control)	N = 84 Gender: 73F, 11M Age: 20.96 (18 – 45)	Regression analyses. Experimental condition ($b = - .28$, $p < .001$) and CNS ($b = .79$, $p = .01$) were significant predictors of elevation, but their interaction was not ($b = - .37$, $p = .20$). Experimental condition ($b = - .22$, $p = .04$) and CNS ($b = .78$, $p = .02$) were significant predictors of post-intervention net positive affect, but their interaction was not ($b = - .49$, $p = .13$).	CN did not moderate the relationship between condition and wellbeing outcomes. Nature condition was beneficial to all participants regardless of trait levels of NC.

Passmore & Holder (2017); Canada	Experimental; three conditions (nature vs human-built vs control)	N = 364 Gender: 67.6%F, 32.4%M Age: 20.09 (17 – 52)	Moderation analyses. No significant moderation of the relationship between condition (nature vs human-built) and net positive affect (*b* = .062, *t* = .49, *p* = .62) or elevating experiences (*b* = -.067, *t* = -.46, *p* = .65).	CN did not moderate the relationship between condition and the wellbeing outcome measures, positive affect and elevating experiences.
Passmore et al. (2022); China	Experimental; three conditions (nature vs human-built vs control)	N = 173 Gender: 36.4%F, 63.6%M Age: 18.78 (16 – 24)	Moderation analyses. No significant moderation of the relationship between condition (nature intervention, human-built) and: Net affect, (*b* = .005, *t* = .27, *p* = .79); Satisfaction with life, (*b* = .09, *t* = .43, *p* = .67); Meaning in life, (*b* = .17, *t* = .96, *p* = .34); Anxiety, (*b* = .03, *t* = .24, *p* = .81); Depression, (*b* = .06, *t* = .37, *p* = .71); and stress, (*b* = .2, *t* = 1.66, *p* = .1).	CN did not moderate relationship between condition and outcome variables.
Pensini et al. (2016); Germany (only extracting study 2)	Cross-sectional; survey	N = 141 Gender: 49M, 91F Age: 22.43 (19-40)	Mediation analysis. CNS significantly mediated the relationship between current NE and three wellbeing indicators: WEMBS, (*b* = .12, BC 95%CI [0.08, 0.38]), MLQ Presence, (*b* = .05, BC 95%CI [0.05, 0.16]), Self-Acceptance, (*b* = .04, BC 95%CI [0.02, 0.12]). INS did not significantly mediate the relationship between NE and wellbeing.	CNS significantly mediated the relationship between NE and three of the wellbeing outcomes.

Webber et al. (2015); UK	Mixed method; survey	N = 171 Gender: 67.8%F, 32.2%M Age: 50 (24-78)	Mediational analyses. CNS mediated the relationship between time on allotment and eudaimonic wellbeing, (*B* = .13, *t* = 1.91, *p* = 0.06). CNS did not mediate the relationship between time on allotment and quality of life, as mediation conditions were not met; allotment time did not predict quality of life (*B* = .01, *t* = .08).	CNS fully mediated the relationship between time spent on the allotment garden and eudaimonic wellbeing. CNS did not mediate the relationship between time spent on the allotment and quality of life.
Yan et al. (2024); China	Cross-sectional; survey	N = 171 Gender: 57.9%F, 42.1%M Age: 21-53	Mediational analysis. NC was a sensitive mediator between nature contact and attentional fatigue; visit duration (*B* = -.03), visit duration of green spaces, (*B* = -.03), frequency of pocket park visits (*B* = -.03). NC did not show a marked mediating effect between nature contact and mental stress.	NC mediated some of the relationship between nature exposure and attentional fatigue.

Note. Abbreviations as follows: Connectedness to Nature Scale (CNS), Connection to Nature (CN), Inclusion of Nature in Self scale (INS), Sample size (N), Meaning in Life (MLQ), Nature Exposure (NE), Nature Connectedness (NC), Perceived Amount of Nature (PAN), Warwick-Edinburgh Mental Wellbeing Scale (WEMBS), Wellbeing (WB).

Quality Appraisal

Overall, study quality varied. The CASP does not offer qualitative descriptors, rather both versions of the CASP ask 11 questions and studies either meet the criteria, don't, or do not offer the information to respond to the question (i.e., *Y= yes, N= no, CT= can't tell*). No study met all criteria. Overall, there were five cross-sectional and five experimental studies (see tables 4 and 5 for summary).

The cross-sectional studies were all appraised as meeting seven of the questions (i.e., where the response was 'yes'). All studies albeit two, where it was unclear (i.e., 'can't tell'), met the criteria for another two questions. There were two questions that raised questions; question 6, where no study offered power calculations for their sample size, and question 10, where no study met this criterion. Question 10 queried if results could be applied to the local population and the response was no for each study.

The experimental studies all reported on five items, and all albeit two studies reported on another two items, where the two studies did not offer this information. The studies reported most poorly on item 4. Four studies reported that participants were blind participants, and one study did not clarify this information (4a); one study reported on whether investigators were blind with four studies not reporting on this (4b); and one study reported that researchers were not blind, with the other four not reporting this (4c). All studies were appraised as 'yes' for item 9 which asked about harms and costs, and it was deemed that no harm was identified in the studies and therefore no unintended consequences reported. Question 11 was deemed not applicable, asking if the intervention offered greater value to patients in the researcher's care than existing interventions. Overall, all studies offered valuable insights and conclusions that could inform future interventions.

Table 4.

Quality Appraisal for Cross-Sectional Studies

Author	1	2	3	4	5	6	7	8	9	10	11
Fleury-Bahi et al., 2023	Y	Y	CT	Y	Y	CT	Y	Y	Y	N	Y
Li et al., 2024	Y	Y	Y	Y	Y	CT	Y	Y	Y	N	Y
Pensini et al., 2016	Y	Y	Y	Y	Y	CT	Y	Y	Y	N	Y
Webber et al., 2015	Y	Y	Y	Y	Y	CT	Y	Y	Y	N	Y
Yan et al., 2024	Y	Y	Y	Y	Y	CT	CT	Y	Y	N	Y

Note. (1) = clear aims; (2) = appropriate methodology; (3) = participant recruitment (i.e., checking for selection bias); (4) = appropriate measures; (5) = appropriate data collection; (6) = suitable participants / power; (7) = clear results; (8) = rigorous data analysis; (9) = clear statement of findings; (10) = replicable results; (11) = valuable research.

Table 5.

Quality Appraisal for Experimental Studies

Author	1	2	3	4a	4b	4c	5	6	7	8	9	10	11
Mayer et al., 2009	Y	Y	Y	Y	N	N	Y	Y	Y	CT	Y	N	N/A
Pasca et al., 2022	Y	Y	CT	CT	CT	CT	Y	Y	Y	Y	Y	N	N/A
Passmore et al., 2014	Y	Y	Y	Y	CT	CT	Y	Y	Y	Y	Y	N	N/A
Passmore et al., 2017	Y	Y	Y	Y	CT	CT	Y	Y	Y	Y	Y	N	N/A
Passmore et al., 2022	Y	Y	Y	Y	CT	CT	Y	Y	Y	Y	Y	N	N/A

Note. (1) = clear research question; (2) = randomisation of participants; (3) = all participant accounted for; (4) = a) blind participants, b) blind investigators, c) blind researchers; (5) = baseline characteristics; (6) = equal treatment and care between conditions; (7) = intervention effects reported; (8) = precision estimate reported; (9) = harms and costs analysis; (10) = replicable results; (11) = valuable research.

Study Characteristics

The 10 studies included in this review all aimed to answer the review question: does nature connection mediate or moderate the relationship between nature exposure and psychological wellbeing. However, some studies had multiple aims, with several research questions and stages of analysis. There were five cross-sectional and five experimental studies, with a variety of materials used to measure the concepts under study, as demonstrated in Table 3 highlighting the heterogeneity in methodology.

Sample Characteristics

The studies took place in several countries (Germany, Spain, Italy, France, Portugal, the Netherlands, Turkey, Hungary, China, The USA, Mexico, Canada, Australia and the UK), with two studies recruiting participants from multiple countries (Fleury-Bahi et al., 2023; Pasca et al., 2022). All studies had a mix of genders and adults of varying ages. Participants were recruited from the general population (Fleury-Bahi et al., 2023), allotment gardeners (Webber et al., 2015), and an academic research community including postgraduate students (Yan et al., 2024). All other studies comprised of student participants, the majority being psychology undergraduates. Five studies explored whether participant demographics interacted with the results. Pensini et al. (2016), Li et al. (2024), and Mayer et al. (2009) found that female participants scored higher than males on the CNS. Pasca et al. (2022) and Fleury-Bahi et al. (2023) both reported that age and CNS were significantly positively related, meaning older participants reported greater NC. The other five papers did not investigate sample characteristic interactions (Passmore & Holder, 2017; Passmore & Howell, 2014; Passmore et al., 2022; Webber et al., 2015; Yan et al., 2024).

Interventions

There were a variety of nature exposure interventions within the experimental studies, with three focusing on physical exposure to nature using the Noticing Nature Intervention, targeting the cognitive and emotional engagement with nature (Passmore & Howell, 2014; Passmore & Holder, 2017; Passmore et al., 2022). This intervention required participants to spend two weeks immersing themselves in a nature activity (Passmore & Howell, 2014), as well as taking photos when a scene evoked emotion (Passmore & Holder, 2017) or providing descriptions of the emotions evoked (Passmore et al., 2022). Another study used technology to simulate nature using photographs which were then categorised into different quantity and quality of natural environments (Pasca et al.,

2022). The final study employed both actual and digital exposure to nature, and manipulated engagement by encouraging mindfulness of nature (Mayer et al., 2009).

Measures

Nature Exposure

The experimental studies used different approaches to conceptualise and consequently measure nature exposure. One study used time length of the outdoor walk and classification of the environment as either nature or urban (Mayer et al., 2009); one used subjective categorisation of quantity and quality of nature based on categorisation of naturalness (Pasca et al., 2022); and Passmore's three studies (2014, 2017, 2022) used subjective ratings from participants to measure nature exposure (e.g., participants reported definitions and descriptors of nature exposure).

Four of the cross-sectional studies used idiographic measures whereby they asked participants questions about their nature exposure, such as nature visit frequency and duration (Webber et al., 2015; Yan et al., 2024), nature visibility (Li et al., 2024), nature accessibility and perceived amount of nature near participant homes (Fleury-Bahi et al., 2023). One study used the NEES (Pensini et al., 2016) which was constructed for the purposes of the study and asked about nature exposure frequency and duration, and access to different natural environments. Fleury-Bahi et al. (2023) also used satellite imagery to quantify the natural green and blue space.

Psychological Wellbeing

There were 18 different measures used to assess psychological wellbeing (see Table 6 below) reflecting the breadth of how this construct is defined. 14 of these measures were used once in separate studies, and four measures were used across several studies (EES, MLQ, PANAS, SMS). The PANAS was used in all five experimental studies. Most studies used one to two measures, though ranged up to six measures.

The measures of psychological wellbeing can be categorised into the following underlying constructs: hedonic wellbeing (SWLS, PANAS, WHO-5, WEMBS), eudaimonic wellbeing (Ryff's scales, MLQ, SMS, QEWB, SCM, MHC-SF, WHOQOL), stress or mental health constructs (DASS, PSS, AFS), identity-related constructs (SSAS, MPS), and spiritual-related experiences (EES, EWB).

Each study justified its choice of measure however there did not appear to be a unifying theory or approach throughout all studies.

Table 6.

Summary of the Measures Used in Each Study

	Measures	Fleury-Bahi et al., 2023	Li et al., 2024	Mayer et al., 2009	Pasca et al., 2022	Passmore & Howell, 2014	Passmore & Holder, 2017	Passmore et al., 2022	Pensini et al., 2016	Webber et al., 2015	Yan et al., 2024
NE	Idiographic Measures*	X	X							X	X
	NEES								X		
	Satellite Imagery	X									
PW	AFS										X
	DASS							X			
	EES					X	X	X			
	EWB						X				
	MHC-SF	X									
	MLQ							X	X		
	MPS							X			
	PANAS			X	X	X	X	X			
	PSS										X
	QEWB									X	
	Ryff's Scales								X		
	SCM					X					
	SMS					X	X				
	SSAS			X							
	SWLS							X			
	WEMBS								X		
	WHO-5		X								
	WHOQOL-BREF									X	
NC	AIS							X			
	CNS	X	X	X	X	X	X		X	X	
	INS		X		X				X		
	NCI										X

Note. Abbreviations as follows in order of appearance: Natural Environments Exposure Scales (NEES), Attentional Fatigue Scale (AFS), Depression, Anxiety and Stress Scale (DASS), Elevating Experience Scale (EES), Engagement with beauty Scale (EWB), Mental Health Continuum Short Form (MHC-SF), Meaning in Life (MLQ), Metapersonal Self Scale (MPS), Positive and Negative Affect Schedule (PANAS), Perceived Stress Scale (PSS), Questionnaire for Eudemonic Wellbeing (QEWB), Self-concordant motivation (SCM), Sense of meaning scale (SMS), Situational Self-Awareness Scale (SSAS), Satisfaction with Life Scale (SWLS), Warwick-Edinburgh Mental Wellbeing Scale (WEMBS), World Health Organization-Five (WHO-5), World Health Organisation Quality of Life (WHOQOL-BREF), Allo-Inclusive Identity Scale (AIS), Connectedness to Nature Scale (CNS), Inclusion of Nature in Self scale (INS), Nature Connection Index (NCI). **Idiographic measures:* these studies designed

questionnaires specifically for their research, for example, asking participants to self-report how much time they spend in nature.

Nature Connectedness

There were four measures of NC used, two of which were only used once in separate studies (the AIS and NCI). The CNS was used across eight studies, and the INS used across three studies. Seven studies used one measure of NC, and three studies used the two same measures (CNS and INS). See table 6 for the details of which study included which measure.

All these measures assess the relationship between humans and nature, however, have different theoretical approaches and possibly tap into different constructs (Tam, 2013). The AIS and INS focus on participants' identity and whether nature forms part of this (Leary et al., 2008; Schultz, 2001), whereas the CNS and NCI focuses on emotional and cognitive connection to nature (Mayer & Frantz, 2004; Cheng et al., 2012).

Analytic Procedure

Four of the mediation studies were cross-sectional and two were experimental. One of the moderation studies was cross-sectional and the other three were experimental.

Of the six mediation studies, all used regression-based analyses, though with different approaches. Three studies followed Baron and Kenny's (1986) procedure (Mayer et al., 2009; Webber et al., 2015; Yan et al., 2024), one used Hayes (2013) regression-based approach (Pasca et al., 2022), one used Preachers and Hayes (2008) approach (Pensini et al., 2016), and one used structural equation modelling (Li et al., 2024).

Of the four moderation studies, all used regressed-based methods, with one using a multi-level regression analysis (Fleury-Bahi et al., 2023), one not detailing the precise approach (Passmore & Howell, 2014), and two employing the Hayes PROCESS macro (Passmore & Holder, 2017; Passmore et al., 2022).

Key Findings

All five of the cross-sectional studies supported NC as a moderator (Fleury-Bahi et al., 2023) and mediator (Li et al., 2024; Pensini et al., 2016; Webber et al., 2015; Yan et al., 2024) of the relationship between nature exposure and psychological wellbeing. However, Webber et al (2015) only found a mediation effect of NC on one of their PW measures and not the other (quality of life) as the latter did not meet the conditions for mediation.

Two of the experimental studies supported NC as a mediator of the relationship between nature exposure and psychological wellbeing (Mayer et al., 2009; Pasca et al., 2022). Three of the experimental studies did not support NC as a moderator on the relationship between NE and PW (Passmore & Howell, 2014; Passmore & Holder, 2017; Passmore et al., 2022). These three studies used the Noticing Nature Intervention.

Looking at results by analysis, the six studies using mediation found that NC mediated the relationship between nature exposure and psychological wellbeing (Li et al., 2024; Mayer et al., 2009; Pasca et al., 2022; Pensini et al., 2016; Webber et al., 2015; Yan et al., 2024). Only one of the four studies using a moderation analysis found a moderating effect of NC on the relationship between nature exposure and psychological wellbeing (Fleury-Bahi et al., 2023).

Discussion

Summary of Findings

The synthesis considered ten studies reporting on the relationship between nature exposure and psychological wellbeing, and whether a measure of nature connection mediated or moderated this relationship. There were an equal number of cross-sectional and experimental studies, with a large variety of measures employed, different analytic methodologies, and varying participant pools. The results offer an interesting and complex picture making it difficult to draw a single conclusion on whether nature connection influences the relationship between nature exposure and psychological wellbeing. While seven studies report that there is an influence of nature connection on this relationship, three papers, curiously by the same author, conclude otherwise. There are various factors, such as the different measures and conceptualisations of the key constructs, that require discussion as they will have limited the ability to draw robust conclusions. Effect sizes were not included for this reason of heterogeneity across studies and therefore looking at this statistic could lead to false conclusions.

Six studies proposed that NC does mediate, to varying extents, the relationship between nature exposure and psychological wellbeing. One of the four moderation studies proposed that NC moderates the relationship between nature exposure and psychological wellbeing. Taken together, this tells us that NC does play a role in this relationship, however, this review can only offer cautious conclusions as to how, why, and for whom NC plays a significant role. It does tentatively suggest that

nature exposure leads to improved psychological wellbeing through the mechanism of nature connection, rather than this improvement depending on how connected to nature participants are. One study however did find a moderating effect, which indicated that people with higher levels of nature connection would require less nature exposure to see an improvement in their psychological wellbeing, whereas people with lesser levels of nature connection would require increased nature exposure to view the same benefits on their wellbeing. The three other moderation studies did not support this conclusion.

Passmore's three studies (2014, 2017, 2022) demonstrate quality improvement across each paper, however the papers utilise different measures, such as the CNS in their 2014 and 2017 paper, and the AIS in 2022. This makes comparison between studies challenging. The papers all use the Noticing Nature Intervention, which involved participants spending two weeks actively engaging with nature. Whilst being experimental, all nature exposure was through self-directed and self-reported activity. It is possible that participants experienced significant heterogeneity in what they perceived to be nature exposure. Whilst these papers do not find a mediating or moderating effect of nature connection on the relationship under study, the papers conclude that anyone could benefit from engaging with nature which ultimately has positive effects on the wellbeing measures. One limitation was that Passmore et al.'s (2022) paper involved the translating of measures by an author and without verification, therefore it is unclear what the quality of the translation of key concepts was; it is unclear if this will have influenced results.

There were several methodological barriers to consider when interpreting the results from the included papers. Firstly, as demonstrated in table 6, there was heterogeneity in how the three concepts under study were conceptualised and measured. A prime example is Webber et al's (2015) study finding different results between their two measures of wellbeing – subjective versus eudaimonic measures of wellbeing. Whilst this study conceptualised both of these as coming under the umbrella of psychological wellbeing, there is debate amongst researchers about how psychological wellbeing is defined (Ryan & Deci, 2001), which could help to explain Webber's result. This reflects the inconsistent definitions of nature and wellbeing in the evidence-base, which in itself is a reflection of the many theoretical understandings of both concepts. In terms of nature connection, there are several measures that have developed to measure this, and a few were used in the included papers – however more exist (Tam, 2013). Critically, conceptualizing a measure that captures an individual's psychological and emotional connection to nature is a challenge in itself. This variety across papers will have inevitably limited the ability to draw cohesive conclusions. Another methodological consideration were the different study designs. The cross-sectional studies can

comment on correlations between variables however cannot infer causality, therefore the direction of relationship is difficult to interpret. Four cross-sectional studies supported NC as a mediator of the relationship between nature exposure and psychological wellbeing (Li et al., 2024; Pensini et al., 2016; Webber et al., 2015; Yan et al., 2024). There is debate about whether a mediation can be concluded from cross-sectional research, as cross-sectional research is completed at a single time-point, when true mediation typically requires temporal precedence (Kazdin, 2007). Therefore, the results from these studies must be interpreted considering this limitation. The third factor influencing the ability to synthesise and compare the studies was the variety of length and type of nature exposure, and how this was measured. The studies were therefore challenging to objectively compare, hence the narrative synthesis approach highlighting the complexity of the relationship between the three variables.

Theoretical Implications

Existing theories which explain the relationship between nature exposure, nature connection, and human psychological wellbeing, are complex. Key theories include the Attention Restoration Theory (Kaplan, 1995), the Stress Reduction Theory (Ulrich et al., 1991), and the Biophilia Hypothesis. More recent frameworks include the Nature Connectedness Pathways (Lumber et al., 2017), which is more spiritual focused as opposed to the key theories nodding toward evolutionary psychology. This review offers some support for this framework, whereby seven of the 10 included studies propose that connection to nature does play a role in the nature-wellbeing relationship.

The results of this review propose that nature connection may help to explain and/or influence the relationship between nature exposure and wellbeing, suggesting that ART and SRT may only capture the biological and cognitive elements of the relationship, and do not make any reference to the mechanism of nature connection. The biophilia hypothesis may better capture this complex relationship as it refers to an innate need of humans to be immersed in nature. Overall, an understanding of all theories contributes to a better understanding of the nature-human relationship, each offering a perspective. There may not yet exist a theory that explains all dimensions of this relationship. This may not be possible, as it would involve capturing nature exposure and nature connection as standardised constructs, which would require researchers to ascribe to the same theory and conceptualisation. However, there may be scope for a more comprehensive theory encompassing the emotional and spiritual aspect of nature exposure, while still acknowledging the biological and cognitive benefits. The biopsychosocial-spiritual model could begin to offer a more holistic understanding of how nature exposure influences a person's wellbeing

(Saad et al., 2017), which extends the biopsychosocial model by adding a spiritual dimension, however the definition and conceptualisation of this added dimension is incredibly complex and debated. Saad et al. (2017) argue that a better understanding of this spiritual element, which could include nature connectedness, would improve healthcare through a more holistic understanding of human wellbeing.

Strengths and Limitations of the Included Studies

Most of the studies were conducted in Westernised communities, with WEIRD samples; most participants were undergraduate students, and only one study was completed in the UK. Whilst this demonstrates a growing interest of the role that nature and nature connectedness play on human wellbeing, which is positive, it is important to consider the cultures that are not researched, or where the research is not published. For example, the communities that revere nature and the indigenous communities that view nature connectedness as a health measure. Any theoretical and clinical implications that come from further research would strongly benefit from greater variety in the populations and cultures studied.

Another question raised by the papers was around the accessibility and visibility of greenspace and the implications this could have for public health. Most papers offered critical discussions around the clinical implications of their research, which is a strength. For example, Pasca (2022) argued that there was no difference in nature connection between participants in natural and quasi-natural conditions, inferring that accessing a park in a busy city could be as beneficial as being in a forest. Similarly, Mayer (2009) found that, whilst real nature produced stronger outcomes, exposure to virtual nature still demonstrated benefits in wellbeing outcomes, suggesting that for people unable to access nature, viewing a nature documentary would still be beneficial.

The papers had several methodological limitations, and half were cross-sectional therefore cannot truly infer mediation (Kazdin, 2007). The quality assessments may not hold up next to well-funded and highly controlled RCTs. Moreover, the presentation of results was unclear at times, with various effect size measures used and no consistency in how statistics were presented, making some of the studies hard to follow. Two papers that were originally included, were then excluded during a second read where an author noticed that both papers definition of an adult was 16+ (Martin et al., 2020; Liu et al., 2022). These papers met criteria otherwise and had meaningful outcomes. Further reviews would benefit from considering how to incorporate the research in this field more widely, such as looking at children and adults. This further highlights the heterogeneity in the research in this field and adds to the difficulty of synthesising the research and how to rationalise PICO criteria.

There were a few factors that were not accounted for however could have influenced results. Firstly, no study looked at personality, but it could play a role in how people engage with nature exposure and their connection to nature, such as openness to experiences, agreeableness, and conscientiousness (Lengieza & Swim, 2021). Secondly, the quality of a natural environment can be debatable, and what may feel natural to one community could be different to another (e.g., green space versus mountains versus a desert) (Pasca et al., 2021). Most of this research focused on green spaces, neglecting a large proportion of what could be seen as natural.

Inspection of the measures revealed that the PANAS was used in all five experimental studies, which is a widely used and efficient measure with strongly reliability and validity (Crawford & Henry, 2004). However, there was huge variability in the measures for nature connection, which may each tap into different constructs. This was demonstrated in Li and colleagues' (2024) paper, where they used the CNS and INS measure which provided slightly different results. This therefore questions other studies that have found significant or non-significant results, and whether this would have been different had the authors selected a different measure. A paper by Tam (2013) reported strong convergence amongst various NC scales, and proposed that measures tapped into a shared underlying construct, however they did not include two of the measures included in this review (the NCI and AIS).

Clinical Implications

Overall, due to the methodological differences, study quality (e.g., whether researchers were blind in experimental studies), heterogeneity in measures and participant demographics, it is difficult to offer definitive clinical conclusions. The literature supports nature connection playing an important role in the relationship between nature exposure and psychological wellbeing, however, inferring clinical applications is more complex. It is important to acknowledge the context of each study, particularly Webber's (2015) research suggesting that nature exposure could reduce other measures of wellbeing, such as social wellbeing.

The review raises two questions; firstly, if nature connection does mediate and/or moderate the relationship between nature exposure and psychological wellbeing, then should healthcare interventions prioritise developing people's nature connection when only using nature exposure as an intervention. This would mean that merely being exposed to nature may not be particularly beneficial for wellbeing, whereas supporting the development of a connection with the natural world could have greater outcomes. This raises questions about how nature connection could be fostered, and who would hold the responsibility (e.g., government or healthcare, or both). Looking at guidance

for clinical psychologists, there appears to be increasing attention and prioritisation of public health and illness prevention (e.g., The HCPC updated their standards of proficiency in 2023 for clinical psychologists to promote health and prevent ill health), therefore exploring the role that nature exposure and nature connection could play in people's wellbeing feels important. Secondly, if nature connection does not play a role in this relationship, then public health initiatives should prioritise access to nature and encouraging time in nature, regardless of people's cognitions or affect toward nature. All studies conclude that access, exposure, and engagement with nature, whatever this may look like, is beneficial to a certain extent across various wellbeing outcomes.

Further Research

Further research could explore the following suggestions in this topic. Firstly, large-scale RCTs would support drawing more robust clinical implications around public healthcare and urban planning. However, to achieve an RCT, research must first offer clear definitions and conceptualisations of what is meant by nature exposure, nature connection, and psychological wellbeing. Moreover, the development of a standardised measure of nature connection which may be inspired by what already exists, could help future synthesis of this relationship. Secondly, research focusing on how to operationalise nature and measure this could be beneficial (i.e., including light, sound, colours, and weather). However, a highly controlled RCT is at odds with nature, which inherently is not a controlled environment, nor would this be realistic of the natural world. Thirdly, both qualitative research and using patient and public involvement to design the research from start to finish would be helpful to better understand how participants make sense of these results.

Strengths and Limitations of the Review

A limitation of this review was that heterogeneity precluded a meaningful meta-analysis, which would have supported drawing more precise and robust conclusions (Higgins et al., 2024). There was heterogeneity across study design, population, intervention, outcome measures and analysis approach. Therefore, future studies could synthesise research that is more homogeneous across one of these dimensions, leading to smaller and more specific reviews that could involve a meta-analysis. Alternatively, the development of standardised measures, such as for quantifying nature exposure or measuring nature connection, would support the ability to draw comparisons across research outcomes. This would, however, require clear definitions and underpinning theories. The field may not be in the position to achieve this presently. More generally, undertaking additional

research investigating nature exposure and psychological wellbeing would then enable more studies to be synthesised by group such as design or methodology.

The overarching strength of this review was its novelty in synthesising complex pieces of research and aiming to further the evidence-base in this topic area. Notably, this review has furthered the understanding of the academic community of how nature connection may explain and/or influence the relationship between nature exposure and psychological wellbeing.

Substantial thought was given to the inclusion and exclusion criteria, given the limited research in this topic and this review being the first to answer the question under study. The criteria were aimed to be flexible for the searches to generate enough studies, however still precise to draw helpful implications and conclusions. For example, animal-assisted therapy interventions were excluded, which could be conceptualised as nature exposure, however a separate review would likely offer more conclusive outcomes and recommendations. Moreover, the research in this area appears more focused on the animal-human connection (Beggs et al., 2021; Halm, 2008).

The conceptualisation of psychological wellbeing was purposefully broad, with the aim to be flexible and capture the diversity of definitions and ways this construct is measured in research. This then enabled the review to demonstrate the several ways that psychological wellbeing is measured which then adds a challenge to synthesising research in this topic area.

The search terms were then generated and informed by the literature and in consultation with two librarians. The percentage of dual screening during the initial (10%) and full screen (20%) was informed by best practice guidelines (Covidence, 2024; Higgins, 2008), and to generate enough papers for the second reviewer to quality assess.

The quality of the studies included in this review were challenging to assess. The CASP was user-friendly and enabled an in-depth quality assessment which aligned with a narrative synthesis. The CASP was limited in that it does not offer scoring or ratings therefore the studies cannot be compared objectively. Prompt 10 queried if results could be applied to the local population; the local population for the researcher is debatable and could be all UK residents, making this a tricky question to assess. Regarding the experimental studies, these did not report all aspects of their procedure transparently, which the CASP picked up on. This could be because this area has limited high-quality experimental studies to inform the development of research protocols. Prompt 11 for the experimental studies was also deemed not applicable, asking if the intervention under study offered greater value to patients in the researcher's care than existing interventions; the current offers in the NHS for improving patient mental health are typically medication or talking therapies

(Department of Health & Social Care, 2023). The response to this question is subjective and arguably challenging to compare the various nature-based interventions with treatment as usual, given the included papers did not have a 'treatment as usual' condition representing NHS treatment.

Lastly, both a strength and limitation were the choice of population for participants included in this review. Investigating healthy controls enabled a synthesis of research that was not confounded by a highly heterogeneous sample which included various physical and mental health conditions, though still being heterogenous in other ways (e.g., age and nationality). Further reviews could assess the role that nature connection plays between nature exposure and psychological wellbeing in specific clinical samples in order to draw more precise conclusions for those populations.

Conclusion

This review was the first aimed to clarify the evidence around the role that nature connection plays on the relationship between nature exposure and psychological wellbeing. This review demonstrated that the evidence is complex due to methodological and conceptual heterogeneity, however, the synthesis would suggest that nature connection does play a role in this relationship. The difficulty in synthesising this area of research reflects the richness of nature connection and the complex role it may play in the relationship between nature exposure and psychological wellbeing. There are clear directions for further research and the clinical implications propose that the literature could inform public health initiatives. One concern is the lack of an overarching theoretical framework supporting this field of research, which is mentioned in most studies and wider narratives on this topic (Lengieza & Swim, 2021). Conversely, perhaps this is a topic that sits at the intersect between science and spirituality. Research may need to continue without the guidance of a framework, agreed construct, or unifying theory for now, accepting that a synthesised response may not be feasible that fits the paradigm that dominates healthcare in the UK. Overall, this review has strengthened the theoretical and empirical evidence base proposing that nature connection could be an important psychological mechanism that influences how nature exposure impacts psychological wellbeing.

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Clinical Psychologists' Experiences of The Benefits and Barriers of Working with or in Nature

Abstract

Working with, alongside, or in nature is a topical and timely area of study. Extensive research has demonstrated the beneficial outcomes that spending time in nature has on human health and wellbeing. Clinical psychologists are well placed to explore how to incorporate elements of nature into their clinical work given the impact that nature has on mental health and the mind-body connection. The current study interviewed 16 trainee and qualified clinical psychologists on their experiences of working with nature. A thematic analysis of the results captured four themes: a position of curiosity, connection versus disconnection, safety versus risk, and reflections on power. This research has generated an understanding of how UK clinical psychologists draw on the evidence base and use practice-based evidence to weave nature into their work, with patients and teams, across NHS and private settings. This study generated implications about the paradigm that guides clinical psychology, our understanding of wellness, the mind-body relationship, and human-nature relationship. Moreover, this study explored how the aforementioned constructs are conceptualised and inform psychological treatment, and how psychologists grapple with their values and interests in the absence of guidance, policy, or opportunity.

Introduction

"*The wellness of any organism is based on both the health of its ecology and the wellbeing of the relationship between the two*" – G. W. Burns (1998)

Using nature to promote human health is not a new idea (Berget et al., 2010). The human-nature connection and the healing benefits that this relationship offers to both mind and body, has been researched and documented for decades, and incorporated into changing conceptualisations of health for centuries (Burns, 1998). From historical practices to present-day anecdotes, finding solace in the natural environment is a collective experience (Gauthier et al., 2025). The scientific revolution brought about medicalised and empirical approaches to healthcare which included a distancing from nature-based healing approaches (Lindemann, 2010). However, there appears to be a shift in recent research re-exploring the human-nature relationship, its impact on wellbeing and the environment (Ives et al., 2017).

This emerging research requires an inter-disciplinary collaboration given the complex and dynamic relationship between humans and the environment (McMichael, 2008). Thus far, research has demonstrated a wide array of positive outcomes that nature-informed healthcare has on human wellbeing, however most studies carry a moderate risk of bias due to varying and non-standardised methodologies (Coventry et al., 2021; Gritzka et al., 2020; Shanahan et al., 2019; Struthers et al., 2024; Wilkie & Davinson, 2021). This research led to the development of practical implications, such as nature-based interventions (NBIs) (Marx & More, 2022). These include a variety of informal approaches that incorporate nature into practice, such as therapy outdoors (Cooley et al., 2020), or formalised approaches, such as Green Care (Garside et al., 2020). Hinde and colleagues (2021) have argued that such approaches are cost-effective for the healthcare system (Hinde et al., 2021). Research has also prompted public health initiatives. For example, social prescribing was developed as a community intervention in 2019 whereby General Practitioners (GP) could prescribe a daily walk as part of patients' care plans (Pretty & Barton, 2020).

Clinical psychologists are required to promote health and demonstrate an understanding of the role that environmental factors play on wellbeing (HCPC, 2023). Therefore, considering connection to nature or access to natural spaces could inform holistic formulations. Additionally, clinical psychologists can advocate for the importance of preventative healthcare, which could reduce demands on NHS services, improve population wellbeing and offer long-term economic benefits (Pretty & Barton, 2020). Current evidence exploring the role of clinical psychologists in this topic is limited, with research mostly exploring climate advocacy and the impact of climate change on

patient health (Walker & Lloyd, 2025). It is therefore relevant and timely to explore clinical psychologists' role in this topic.

Theoretical Framework

Several theories explain why exposure to nature is beneficial. Firstly, the Biophilia Hypothesis, with links to evolutionary psychology, suggests that humans have an innate desire to connect with, and be in, nature, which can offer survival benefits (Wilson, 1984). Secondly, the Stress Reduction Theory (Ulrich et al., 1991) outlines that being in nature has a calming effect on human physiology which therefore reduces physiological indicators of stress. Ulrich (1984) demonstrated that hospital patients with natural views from their beds recovered faster than those with urban views; a result that has been replicated in other environments (Verderber & Reuman, 1987). Thirdly, the Attention Restoration Theory (Kaplan & Kaplan, 1989) outlines that nature-based visual stimuli reduces attentional fatigue, therefore supporting cognitive functioning and improving wellbeing. These three theories appear frequently in the literature.

Other theories exist. The Calm and Connection Theory proposes that nature exposure supports emotion regulation and connection to self and others (Grahn et al., 2021). Evolutionary medicine proposes a more systemic view whereby disease could result from a mismatch between humans and their ecologies, such as obesity rising in the context of a highly industrialised society (Natterson-Horowitz et al., 2023). These slightly different theories all contribute to the understanding of how nature influences human wellbeing and have informed current frameworks, practices, and even inspired building designs to emulate nature (Joye & De Block, 2011). An example of a framework is Lumber's (2017) Pathways to Nature Connectedness, which was inspired by the Biophilia Hypothesis. This framework aims to promote connectedness between humans and nature, through providing guidance on how to create interventions to enhance this relationship (Lumber et al., 2017). This links to another key element. Though not a theory, nature connectedness is described as a psychological construct representing the relationship a person has with nature (Richardson et al., 2020). Other practices have developed from the idea of nature connectedness, including Ecotherapy which argues that human disconnection from nature is a source of distress and therefore aims to reconnect humans with their natural world (Doherty, 2016).

Some of these theories focus on engagement or immersion in nature, whereas others are underpinned by connection to nature (Pritchard et al., 2020). Whilst offering plausible explanations as to the effect of nature on wellbeing, there is a lack of robust research specifically supporting the hypotheses made (Joye & De Block, 2011). Additionally, these theories lack a consideration of

intersectionality that would be required to inform practice in the UK today. Moreover, they do not all consider how spirituality may help the understanding of the human-nature relationship, which does not readily lend itself to empirical investigation.

Additional theories include those held by indigenous communities which view nature as akin to humans with its own rights, as opposed to Eurocentric perspectives that can view nature as a resource to be used (Gauthier et al., 2025). Gauthier and colleagues (2025) offer a detailed history and compelling critique on how Eurocentric science and psychological approaches focus primarily on the individual and neglect the value that ethnic majority cultures give to nature when conceptualising their wellbeing. For example, indigenous approaches to living often stem from reverence and respect for nature. There are several implications of Eurocentric approaches dominating the evidence base and healthcare practice. Namely, certain populations may not resonate with these approaches and therefore feel excluded or misunderstood by the healthcare system (Ajayi, 2021). It is therefore invaluable to consider diverse understandings of the human-nature relationship.

Current Evidence and Context

The Benefits of Engaging with Nature

There are several systematic reviews that outline the role of nature in improving wellbeing. Pritchard and colleagues (2020) undertook a meta-analysis to explore the relationship between nature connection and eudaimonic wellbeing. They concluded that individuals who are more strongly connected to nature also display greater wellbeing. Coventry and colleagues (2021) concluded that nature-based interventions are effective for improving mental health outcomes in adults. In 2022, Taylor concluded that NBIs have positive psychological and physiological outcomes for populations with long-term conditions. Finally, Troughton and colleagues (2024) reviewed the potential of nature as a therapeutic tool for enhancing engagement in mental health services and concluded that nature could be integrated as a complementary approach to enhance engagement. Notably, they propose further research explore culturally appropriate interventions. In summary, this is evidently a topical area with interest from the research community, practitioners and patients. However, there is limited insight into practitioner experiences of delivering nature work and how they are integrating the aforementioned evidence into their work in the absence of best practice guidelines. There also appears to be a gap in exploring the impact of nature work on practitioners themselves.

Applications to Practice

A substantial amount of the literature looking at human wellbeing and nature takes an ecological lens whereby humans and nature can both enhance or benefit from the other (Dick et al., 2020). For example, supporting people to engage in outdoor activities can improve human wellbeing while also fostering more sustainable environmental behaviour (Dick et al., 2020). This research, whilst focusing specifically on how nature could intersect with the clinical psychology profession, does acknowledge that any outcomes will need to be considerate of the natural environment and developed in a way that is sustainable and not damaging to nature.

The Wildlife Trust demonstrated that delivering community-based health services which are integrated with the natural environment would be cost-efficient to the NHS (Sendall et al., 2023). This is because of the psychological and physical health benefits primarily, and also the development of community which targets loneliness and isolation (Sendall et al., 2023). Clinical Psychologists could be significant in supporting such initiatives, or signposting patients to places like the Wildlife Trust. However, nature-based approaches mostly rely on third sector initiatives, which results in inequitable access (Hinde et al., 2021). A national public health initiative spearheaded by the NHS could address this. Whilst social prescribing and green care are examples of national initiatives, there is generally a lack of guidance and consistency (Hinde et al., 2021).

Cooley and colleagues (2020) proposed a framework following a meta-synthesis of the ways that psychological practitioners deliver outdoor therapy. The framework highlights whether nature is an active or passive component to the therapy, the quality of the natural space, and the influence of both client and practitioner characteristics (i.e., comfort levels of being outdoors, attitudes toward conventional therapy). This is a compelling framework offering practical guidance and argues that outdoor work will enrich the therapy. Whilst the review included UK-based studies, no participants in these UK studies were clinical psychologists.

A significant implication of psychologists promoting nature-based interventions revolves around access and inclusion. Once patients are given access to nature and supported to enjoy it safely and inclusively or perhaps supported to develop values around their relationship to nature, they could continue to do so for the rest of their lives. The long-term implications and benefits could be significant for individuals, the environment, and society (Richardson et al., 2020).

The Evidence-Practice Gap

Limited research has explored UK healthcare professionals' understanding of the role of nature in their respective professions. Lane and Reed (2023) interviewed counsellors and play therapists working with children outdoors, finding that outdoor therapy is increasing in popularity, however the authors noted the need for additional research to explore why and for whom this is helpful, and if it is effective for patients. Similarly, Hunt and colleagues (2022) interviewed Child and Adolescent Mental Health Services (CAMHS) professionals who had recently undergone training to incorporate nature-based activities into their healthcare delivery and found several benefits, though outlined considerations for such activities to be sustainably integrated into practice in the long-term, such as using co-creation to implement activities that are appropriate to the specific patient population. Neither study involved clinical psychologists. Tambyah and colleagues (2022) interviewed mental health clinicians including psychologists in Australia on their views of nature-based interventions within community mental health teams. They found that clinicians believed this could support patients, though acknowledged barriers such as service-level resistance. Collectively, these studies demonstrate that healthcare professionals perceive several benefits of incorporating nature into clinical interventions. They also mention similar limitations, notably the challenge of needing system buy-in for the clinical implications to be implemented. No study appears to have explored UK clinical psychologist views on working with nature.

Clinical psychologists are arguably well placed to advocate for the implementation of nature-based approaches in healthcare. Indeed, clinical psychologists are expected to develop various competencies including formulation skills (BPS, 2024), which they could use to consider how nature could be woven into a patients' care. Clinical psychologists are trained to make theory-practice links and adapt the evidence-base to inform their practice when guidelines may not exist (BPS, 2024). Clinical psychologists could also support with teaching, training and practice across services. It is therefore valuable to explore how clinical psychologists could bridge the gap between the aforementioned research with limited guidelines and policy.

The Current Study

Recent years have seen the emergence of psychologists entering spaces such as climate advocacy, echoing a demand for the profession to be socially responsive (Goghari, 2022), and highlighting the unique position of the workforce to facilitate connection and communication between people and nature (Li et al., 2022). With an increasing national interest in nature-based

interventions, it is valuable to consider how clinical psychologists fit into the paradigm of working with nature given their profession typically approaches wellbeing with a holistic philosophy. More importantly, as the workforce of psychologists has become an increasingly diverse community (Goghari, 2022), practitioners bring with them a greater variety of lived experience, knowledge, and skills, across different social, cultural, and political backgrounds. It would seem logical to harness this wealth of diversity on conceptualisations of nature and wellbeing, which in turn could improve the accessibility and inclusivity of care for patients that may share these views, beliefs, or values. This study therefore aimed to understand clinical psychologists' experiences of working with nature with the view to generate clinical implications to promote creativity, innovation, and generativity for the profession.

Aim and Research Questions

The present research aimed to explore UK clinical psychologists' experiences of the benefits and barriers of working with or in nature, and why this is important to their practice. Moreover, the study aimed to inform future developments within the profession. The language around nature was kept broad to allow participants the freedom to share their definitions. The following research questions guided the study:

1. What are clinical psychologists' experiences of working with and/or in nature and why might it be important to their practice?
2. What are clinical psychologists' experiences of the benefits of working with and/or in nature?
3. What are clinical psychologists' experiences of the barriers of working with and/or in nature and how do they negotiate with these?

Methodology

Design

In line with a critical realist philosophical stance, the research adopted a qualitative methodology using reflexive thematic analysis (Braun & Clarke, 2024b). The approach was exploratory in nature with the aim to explore participants' subjective experiences. A semi-structured interview approach was adopted for data collection, allowing for organic yet focused conversation (Rabionet, 2011). Interviews were conducted remotely through Teams. One participant went for a walk during their interview, and others sat in outdoor spaces or next to a window; this was actively encouraged during recruitment. There was an option for in-person outdoor interviews to promote

immersion into the topic area, in line with wider literature that has found this method to generate richer perspectives particularly with regards to working outdoors (Heijnen et al., 2022; Lynch & Mannion, 2016). However, no participant was able to engage in this. Remote interviews allowed for participants across the UK to participate, and research has suggested that participants can offer the same level of authenticity online versus in person (Bargh et al., 2002).

The project aimed to incorporate public and patient involvement (PPI). The target participant pool were clinical psychologists (trainee and qualified) therefore the research team (comprising one trainee and three qualified clinical psychologists) were the targets. Whilst there were several lengthy consultations during the development of this project, as well as conversations with colleagues and peers, these were informal. Therefore, one qualified clinical psychologist was formally interviewed as per PPI guidance (Jennings et al., 2018). They offered feedback on the study design, recruitment poster and interview schedule. Their feedback was discussed by the research team and incorporated into the project.

Ethical approval was received from the University of Southampton (ERGO 89835.A1) and all ethical standards ensuring consent and anonymity were respected (see appendices F and G). Particular consideration was given toward participants possibly being fellow colleagues, with past or future working relationships.

Researcher reflexivity

Qualitative research involves high levels of interpersonal interaction (Clark & Sousa, 2018). The author kept a reflective diary throughout the process to document the evolution of their thoughts and reflect on the experience of interviewing fellow psychologists (appendix A). This was not an attempt to obtain objectivity, rather to notice the excitement for the topic and rapport built with participants, and document how this may have impacted the interpretation of the data (Angen, 2000). This allowed the author to acknowledge how they engaged with the data. For example, each interview triggered varying emotions; through noticing this the author could consciously acknowledge the influence this had on the research process.

The author's education is derived from European worldviews which often view humans as having power and control over nature (Gauthier et al., 2025). However, the author aimed to learn about how indigenous worldviews take an ontological stance that humans exist alongside the natural world and have a reciprocal and relational role to it (Gauthier et al., 2025). For example, the author read about practices such as Shinrin-Yoku; Japanese forest-bathing (Hansen et al., 2017). Moreover, the author reflected on their memories of childhood in the outdoors, and how their relationship to

nature was fostered and evolved over their life. This was discussed with the research team, which challenged and balanced the author's perception of nature, further supporting them to notice and reflect on any potential bias. Consequently, this supported a less biased approach toward the project, from conception through to data analysis. An important outcome that emerged from this self-reflexivity was for the knowledge generated in this thesis to not lead to the creation of an intellectualised, protocol-based intervention using nature as a resource. Rather, the aim was to hold in mind the complexity of the human-nature relationship and consider how working with nature could be approached ethically and sustainably.

Participants

Participants were either trainee or qualified clinical psychologists studying or practicing in the UK. Training CPs were required to be currently enrolled in a UK Doctor of Clinical Psychology programme (DClinPsy), and qualified practitioners had to provide their active HCPC registration, however, could have previously trained abroad. All participants underwent ID verification checks at the start of the interview. Following Braun and Clarke's (2019) guidance, the aim was to interview enough participants to achieve information power and a variety of participants across different settings. A total of 16 participants were recruited, nine trainees and seven qualified psychologists.

Care was taken around recruiting trainee clinical psychologists given the main author's position as a trainee at the time of the research. The research was not directly circulated with the author's training cohort therefore reducing any expectation for peers to participate in the research. Where participants were known to the author, confidentiality and maintaining anonymity was carefully discussed with those participants at the start of interviews. The author also used their research team as a supervisory space to reflect on the process and ensure no ethical concerns arose.

No personal demographic information (i.e., age, gender) was sought as it was not relevant for the analysis plan and offered participants more anonymity within a small participant pool; however, most participants shared this information during the interview, including self-disclosure of neurodivergence and long-term health conditions. Participants worked across the NHS, third sector, and private practice. Third sector and private organisations included animal-assisted and outdoor work; though details have been retained for reasons of anonymity. NHS settings included adult acute inpatient, adult forensic, CAMHS community and specialist settings, child and adult learning disability, neuro rehabilitation, palliative care, and various physical health settings including child and adult inpatient and outpatient teams.

Materials

A survey was created using Qualtrics comprising the participant information sheet, consent form, an eligibility screening questionnaire, the Connectedness to Nature Scale (Mayer & Frantz, 2004), and a calendar to indicate interview availability (see appendices H, I, and J).

The CNS (Mayer & Frantz, 2004) was used to provide context on the participant sample from a position of curiosity about how connected the participants were to nature and whether the sample is representative of the wider clinical psychology workforce. Whilst a variety of scales exist to measure concepts related to nature connectedness (Tam, 2013), the CNS was selected as it measures emotions toward, and cognitive beliefs about, nature, and has been shown to predict wellbeing and environmental behaviour (Mayer et al., 2009).

The interview schedule was created and refined following conversations with the research team and piloted on one qualified and one trainee clinical psychologist. Feedback from both led to amendments of the final interview schedule (see appendix K).

Procedure

Participants were recruited using purposive and snowball sampling, to capture participants that had self-reported experience of working with or in nature in their clinical career so far. Recruitment took place primarily through social media (i.e., LinkedIn) and the research team circulating the research poster with their networks (Appendix L). Interested participants completed the online survey and then an interview was arranged via email.

All interviews took place between October 2024 and January 2025 and were recorded via Teams. Interviews lasted for approximately one hour. Participants were emailed a debrief form (see appendix M) and sent a £25 voucher as a token of appreciation. The main researcher kept a reflective diary after each interview. Each interview was anonymised at point of transcription.

Data Analysis

Interviews were analysed using Reflexive Thematic Analysis (RTA), following Braun and Clark's (2006) guidance. This is the most widely cited qualitative research analysis method which encourages a flexible and organic approach to analysing interviews that goes beyond description and allows the researcher to identify and interpret patterns and meaning in the data (Braun & Clarke, 2017). To familiarise themselves with the data, the main researcher transcribed all interviews, read the printed transcripts several times, slowly coding them using paper-based methods (i.e.,

highlighting, sticky notes). This process generated small units of meaning which were then grouped into patterns and initial themes. This process was iterative; codes and themes were reviewed multiple times and discussed as a research team, resulting in a final set of themes and subthemes. Braun and Clarke (2024a) advise the researchers to reflect on their values and purpose of their research throughout the process, and to actively acknowledge their subjectivity; the main researcher accessed supervision to reflect on this.

Results

Participant CNS scores suggested that on average, the sample were strongly connected to nature, however large range indicated variance between individuals. The CNS ranges from 14 to 70.

Table 7.

CNS Mean Score and Range

Sample	CNS mean score
All participants	53.25 (range: 34 – 69)

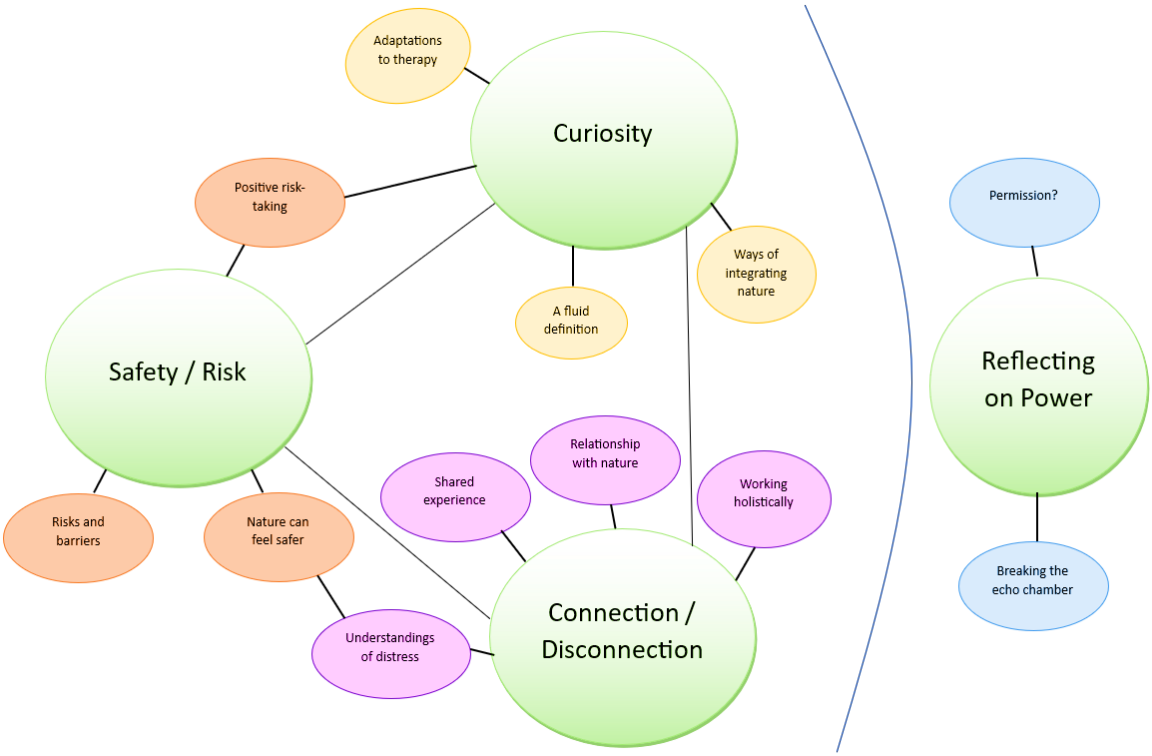
Evidencing the Themes

Four over-arching themes were identified (see Appendix N for coding manual). The first theme; 'a position of curiosity' explores what working with or in nature could look like, how psychologists could integrate nature into their work, why it is important and where, when, and with whom this could be beneficial. The second theme; 'connection versus disconnection', explores how nature enables connectedness on intrapersonal and interpersonal levels. The third theme; 'safety versus risk' explores two facets of the same construct and explores how psychologists view taking these risks. The fourth theme; 'reflections on power' explores the notions of authority, autonomy, and responsibility within the profession. This fourth theme connected all themes, illustrated in the thematic map below (see figure 3) as a lens through which all themes could be interpreted through or alongside. As participants reflected on both benefits and barriers, and why this work is valuable to them, they tended to link their reflections to the thoughts captured in the power theme. This appeared to be because of the power structures that influenced and regulated their ability to work with nature, which consequently impacted on their ability to be curious, take risks, and work holistically (captured in the other three themes).

The results section is concluded with Table 8, which lists a selection of ideas of how participants discussed working with or in nature.

Figure 3.

Thematic Map of the Themes and Sub-Themes



Theme 1: A Position of Curiosity

Subtheme 1: A Fluid Definition

Participants offered various definitions and conceptualisations for working with/in nature:

"*I see it as working in and with nature as like an overarching umbrella. And then I think within that there's, like subcategories, because I think there's something about working with the outside world (…) and then I think there's something about working with elements of nature, so plants and animals. And then I think there are more copyrighted type terms like the idea of animal assisted interventions*" (P5)

Participants highlighted the influence that language had on how working with nature is received: "*I think about concrete things that have meaning to that person, and that means lots of language has to be super flexible*" (P16). Additionally, language influenced the accessibility of these ideas: "*I use the term nature-based practice, I see that as a much broader term, and I also see it as a bit more accessible when working with multiple disciplines*" (P15).

Participants commented on the cultural conceptualisations of nature and how nature can be used as an analogy to understand life. For example, informing our understanding of life, death, and change. Participant were mindful that presenting this to patients could be overwhelming, instead opting for simpler language when introducing ways of working with nature: "*I say outdoors quite a bit because I feel like nature often feels like this really big concept that you must be in this really beautiful place and be grounded by Mother Nature*" (P2).

Participants negotiated with themselves what would quantify as nature within their setting: "*let's be outdoors (…) and go and sit on the bench in the car park (…) because that's the best thing that we can offer right now for you in terms of a wellness space at the hospital*" (P3). Similarly, participants were mindful that their conceptualisation of nature could lead to different benefits or barriers:

"*I think there are less barriers to 'little n' nature than there are 'big N' nature, so I think there are less barriers to walking appointments than there are to accessing a specific type of farm therapy where there are horses*" (P5)

Whilst participants had their own definitions of nature, they were mindful of patient and public narratives around nature, noting that current narratives appear to separate humans from nature because "*separation is seen as a sign of superiority*" (P9).

Subtheme 2: Ways of Integrating Nature

Participants reflected that nature maps well onto current practice: "*I think people who spend time in nature often understand like the CFT [compassion-focused therapy] model quite readily, it seems to fit quite nicely*" (P16).

Participants referenced nature as a framework, and explored the ideas, tools, and strategies that they have used inspired by nature:

"*As a clinical psychologist, we have lots of different models and ways of working under our belt. I think this is another way of being able to work, another model or framework that we can pull on and put into play when we are working with a population or client that would benefit from it*" (P5)

Participants also described nature as replacing the therapy room and argued this should be accessible in all settings: "*hospital beds have wheels for a reason (…) if people weren't mobilising yet, we could at least push the bed outside*" (P7).

Participants reflected that integrating nature into their work is not only beneficial for patients: "*the benefits are endless (…) for service users, for staff, and ultimately the benefits for the planet and humanity*" P15

A few participants mentioned how they often receive negative feedback from patients about the state of NHS buildings: "*all the kids say this is so horrible, it's all just so white*" (P13), and how everyone would have appreciated nature-inspired architecture, such as "*photographs*" (P10) or "*artwork on walls*" (P14).

Subtheme 3: Adaptations to Therapy

Working with nature supported participants to question and adapt their working practices, and inspired new ideas about working with issues of equality, diversity, and inclusivity: "*The answer to people's problem isn't in talking about them, they're about making the world a fairer place for everyone, and nature is a good starting point*" (P8).

Participants shared how working with nature could lead to a more inclusive experience. For example, "*in a room-based setting, the only space that clients can have is silence*" (P8), whereas nature "*offers a base level calming presence for some (…) or like a base or safe place, you know, they might want to stand under a tree or not look at you or run their hands through the grass, that's very sensory*" (P8).

Participants highlighted how nature can be helpful for working with neurodivergent patients: "*it's a bit more natural when you're outside, to not look directly at each other*" (P7). A practical example included doing: "*ADHD assessments and the child can't tolerate being inside. And so instead we take them to a park and we'll walk around the park and do the assessment there. There's something calming that's able to open people up*" (P5).

Participants reflected that working with nature should not be an adaptation but rather a basic consideration: "*it's starting with like the basics, like Maslow's Hierarch hierarchy of needs, I think having a window I could open and still have some confidentiality. Some fresh air. Some light coming into the room*" (P14).

Participants reflected on the intersection between nature and other characteristics. For example, socioeconomic status: "*I think more people who are in a higher socioeconomic status will*

have more access to these kinds of naturalistic provisions because a lot of them are private" (P5). And reflections on gender: "*I think that boys are just generally encouraged to do these things a bit more [go outdoors]*" (P4).

Participants further reflected on the intersection between physical health or ability, and additional considerations such as "*fatigue*" (P9) and risk:

"*if there is someone who has a physical disability, I'd be a lot more hesitant to take them into a public place (…) there was so much risk assessing that was associated with that and if something went wrong, so then you kind of deny them access for something that's not their fault, which I think is tricky*" (P4)

A few participants critiqued frameworks such as the social graces, and wondered whether nature could extend it: "*Does it need to fit into the framework? Could it extend the framework? Could it be something that reframes it*" (P6).

Participants were especially mindful of how the profession could expand ways of working in a respectful and appropriate way that "*isn't appropriating somebody else's culture*" (P3) but is challenging historical ways of working:

"*The anti-nature rationale, cis-het male thinking of like how psychology works and how we work as humans and the like, constant historical and still today, silencing of natural indigenous female healers and thinking around like how that has now led to the profession that we have and that is just not spoken about*" (P6)

Theme 2: Connection (versus Disconnection)

Subtheme 1: Having a Relationship with Nature

Participants explained that nature can become a third-party actor in the therapeutic rapport between practitioner and patient: "*nature is like a co-therapist*" (P15). Nature can also turn a therapeutic space into a more equal space: "*it offers a place to talk with people, work with people, where the therapist isn't the most powerful thing in the room, nature is*" (P8).

Participants explained that for both them and patients, it was important to treat nature with respect: "*I really worry about commodifying nature as a therapeutic tool*" (P15). Having a relationship with nature meant approaching it sustainably: "*it's where we're harmonious with what was here before us, and we leave as little imprint as possible*" (P8).

Participants described nature as reminding everyone of their humanity: "*we're not robots you know, we are biological beings*" (P16), and nature can create a space that enables human connection: "*the core of our training is to connect with people*" (P12).

Participants mentioned that "*we have collectively forgotten what it is to live in relationship with what's happening outside*" (P15), and participants explored how this has impacted our wellbeing: "*We have over analysed what it means to be a human, to be alive, we've manualised it in such a way, that sometimes putting people in the most basic environments, maybe they might figure that out on their own*" (P12).

Finally, some participants spoke about their own relationship to nature as spiritual: "*That sense of awe and connection (…) there is something I find existentially quite beautiful around like, I am in everything, like there is no separation between, like existentially what I am and the world around me*" (P9).

Subtheme 2: Nature Enables a Shared Experience

Nature was described as enabling connection and facilitating shared experiences:

"*we're kind of like marvelling at what's around us and connecting through that. It breaks down those barriers of like, oh, it's not you the professional, and me, the help seeker, but actually we're just both people in this space*" (P9)

Participants described nature as changing the therapy etiquette: "*I think it helps you to start the conversation and to just share in the world*" (P11). Similarly, nature was described as facilitating conversation: "*nature offers a space where we just naturally start to be able to have those conversations*" (P14).

Participants reflected on the possibility of connection between professionals: "*imagine getting the MDT to be not sat in front of a screen. You know to be in a green space. You know the main benefit I predict would just be about connection*" (P14) and people "*getting along better when they've been outside*" (P13).

Subtheme 3: Working Holistically

All participants considered how working with nature can connect the mind with the body, and how the body seems to relax when in contact with nature: "*the nervous system effects, I think people naturally sort of calm down, their heart rate lowers when they're outside*" (P7). Participants

also differentiated between the primary gains of being outdoors but also the secondary gains, such as "*increased muscle tone and mobility*" (P16).

In addition, participants acknowledged the value of neuroscience and somatic experiences creating alternative and more inclusive practices for populations that do not favour talking therapies, enabling them to still access support:

"*I work with autism and trauma, and really complex young people, and I feel like I don't really need to even talk to them to be able to work with them, so I'm very much working with bodies (…) so these kinds of outdoor approaches are useful*" (P8)

Participants described that observing nature could support patients to connect with themselves. For example, learning about the fight-or-flight response:

"*I might say something like oh, I've noticed that your animal's got a little bit tense. Like, what can you notice in them that's become tense? Why might that have happened? And then it starts the conversation off in a little bit more of an easier way to then reflect back on themselves*" (P16)

Participants acknowledged that connecting to one's senses could be either containing or scary: "*if you've got sensory integration problems, sometimes nature is just really tricky, it's not necessarily predictable*" (P16).

Overall, participants felt that nature facilitated the skill of noticing the body: "*really connecting with your senses (…) just being connected with the world to like something that's bigger than us can feel containing, because it can take you out of your head*" (P11). Participants reflected that there needs to be a balance between mind and body: "*the mind is such a complex phenomenon, but I think the focus on the mind has ignored the body*" (P8).

Subtheme 4: Nature Shifts how we Understand Distress

Participants described working with nature as prompting reflection and challenging understandings of human nature: "*the therapy room setting (…) is steeped in history, and judgement, and medicine, and power (…) and I think we've tried to be a bit too clever and we've forgotten the simple things that make the difference*" (P8).

Nature was described as a safe place from which to explore distress in a trauma-informed way: "*it just feels inseparable from the way that I understand distress, understand coping*" (P3) and "*I just feel like this is such an important branch of psychology that fundamentally relates to human distress*" (P15).

Participants described nature as "*grounding*" (P11), "*regulating*" (P16), and "*helps to reset your circadian rhythm with the natural light*" (P7); all of which were felt to have therapeutic benefits.

Participants described how nature could be less threatening than a therapy room which therefore facilitates discussions around distress: "*by just going to do some mindfulness or relaxation techniques outside in the fresh air, that feels a lot less threatening than sitting down and me asking you questions*" (P2).

Lastly, participants reported that nature can facilitate understanding of life and death, in a symbolic and metaphorical way: "*because we're talking about life and death, I think just really physically situating yourself in your kind of wider environment, it's quite freeing and releasing*" (P3).

Theme 3: Safety (versus Risk)

Subtheme 1: Acknowledging the Risks and Barriers

Participants acknowledged the risks that they have navigated and the importance of clinical governance: "*it's important to have a robust risk assessment in place, particularly when working with people who might be really, really unwell*" (P15). Participants also considered the risk that can come with nature: "*nature can be unfair, unjust, unkind; but it doesn't do it on purpose, it just is*" (P8).

Participants mentioned several barriers that were difficult to navigate in a risk-free manner. For example, navigating matters of "*confidentiality*" (P8), "*lack of guidanc*e" (P13), and "*busy staff*" (P1). There were also challenges around "*funding*" (P6). Participants reflected that it was important to have an awareness of these barriers as they exist for a reason:

"*I'm thinking about how the NHS services obviously are absolutely stretched to their limit at the moment, and often you know, we're encouraged to try and do as much work in the shortest time as possible and, being outdoors potentially means, or working with nature potentially means that less can be achieved*" (P5)

Some of the risks and barriers explored how clinical psychologists are perceived by the wider workforce and what the repercussions could be of working with nature: "*am I going to get the blame?*" (P2), and "*another barrier would be an unspoken one, about the legitimacy of kind of focusing very, like clearly prescribing time in nature*" (P3). Participants worried about the risk of challenging "*an ingrained service culture*" (P15) and teams being "*overly cautious*" (P15).

Subtheme 2: Nature Can Feel Safer

Participants, after consideration of risks, shared that nature can sometimes feel safer: "*I actually work with really risky clients and we actually find it's a lot safer outside because they're not constrained by a small room or a small ward, so actually they're a lot safer in their behaviour*" (P8).

Participants highlighted the importance of their work being patient-led and, in some cases, this involved outdoor work: "*I would give him the choice of like, where would you like our session today, and he would always chose to walk around outside (…) for him it felt safer because he was more in control of the environment*" (P11).

Participants reflected on how risk-averse certain institutions are: "*I don't find it helpful to work through the lens of, what's the worst thing that you could imagine happening, let's predict it's going to happen and how you are going to manage that*" (P14). Participants further reflected that operating from this lens "*doesn't encourage a huge amount of creativity, I don't feel like it's a helpful lens of threat for psychological work to be happening*" (P14).

Participants also reflected that being outdoors felt normal: "*we need to be around things that are alive (…) we are designed to be out in nature and to enjoy it*" (P11). Participants also reflected on how tricky therapy can be and that: "*if you're doing psychological therapy anyway, why not be in a context where you're also going to get boosts from other things*" (P7).

Finally, participants reflected on the safety that working with nature offers them as practitioners: "*sitting outside in the garden having a conversation with somebody who was going to die felt beneficial, it felt facilitative for me to have that conversation*" (P3).

Subtheme 3: Positive Risk-Tasking as a Profession

Participants reflected on what it meant to be a clinical psychologist and viewed positive risk-taking as part of their roles. Participants critically reflected on their ways of working:

"*I find it difficult to understand why we as psychologists are so set on this kind of evidence-based practice that takes place in a clinic when actually for thousands of years humans have been very community based and very in touch with nature and we're seeing higher levels of loneliness and isolation and lack of community feeling now*" (P5)

Participants wondered if there was enough evidence to rationalise new ways of working and that perhaps "*you don't have to put everything into psychological theory*" (P9). Participants appeared to feel limited by what their role should be: "*as psychologists we inherently fear that we're not doing*

real science" (P12), and that this could inhibit exploring new ways of working; "*I feel a little institutionalised in that I've accepted there is no negotiation with the system*" (P14).

Participants also reflected on the benefit of working outside one's comfort zone:

"*We often have that perception that we need to be in the clinic room to do our job properly, and I think that couldn't be furthest from the truth. So I think we need to allow ourselves to be more comfortable with the unknown and that might be having a session in the forest*" (P2)

Participants shared concerns that if the profession doesn't take risks, then nothing will change: "*if we don't ever do something a bit different then we're just always going to stay the same and be quite stagnated*" (P11). At the same time, participants acknowledged that "*it's ok if it's not for everyone*" (P1) and "*not within our comfort zone as clinical psychologists*" (P1).

Finally, three participants shared that their approach to working with nature was "*to ask for forgiveness than for permission*" (P7, P11). Participants acknowledged the risk of pushing boundaries for the sake of innovation and continuous improvement:

"*It's a bit hilarious if you think about it like there were all these psychologists not being able to do their work because people don't engage online [during COVID-19] and nobody knew what to do. And then there was me (…) running the gardening group in a forensic setting*" (P6)

Theme 4: Reflections on Power

Subtheme 1: Who Gives you Permission?

All participants questioned matters of power. Participants felt that nature was an important option as it reduced the power between practitioner and patient: "*we're in a neutral environment in terms of power differenc*es" (P11). However, participants felt hindered by the wider system:

"*It feels like a whole system that feels impenetrable. Who's turning the cogs? (…) I feel like I'm someone who wants to be accessing this stuff and practising it, but then the people doing that I feel are different to the people that are driving policy and change*" (14)

Participants reflected on the topic of power for their patients. They expressed discomfort knowing that some patients needed to request permission to go outdoors: "*that client's access to nature has been massively changed by the people that are now in power of his access to nature*" (P16). Participants also expressed concern of the power differential between the patient and the system:

"*The whole institution sets it up for the patient to be much less powerful than the healthcare workers, decisions are made around them, they have no choice of what room they're in, they don't get to chose when the lights are on or off, what the soundscape is*" (P7)

Participants also reflected on whether patient voices are truly heard: "*I'm thinking of those people that are from different cultures where they have a really different relationship with nature (…) those people generally, statistically, are not in positions of leadership within the NHS, so their voices really aren't heard*" (P4).

Participants felt that they had a "*responsibility*" (P8) to use their education and research skills to address these issues but also to "*critique therapists as always having the answer*" (P8), and ensure the work is collaborative and patient-led: "*our patients would love this stuff, it's trying to convince each other that this is worthwhile, that's the issue*" (P12). On the other hand, participants equally recognised that this may not be "*interventions that would work for everybody*" (P16), and that this was fine as the aim was to hear patients' voices, which could include not working with nature.

Compared to the qualified participants, the trainee participants expressed feeling like they held less authority: "*am I allowed to do that like as a trainee? I feel like we've got to follow the rules and that seems like it's not in the rulebook*" (P11).

Some participants felt they had autonomy though acknowledged their "*supportive*" (P10) teams enabling nature-based work: "*I feel fortunate that I have the autonomy to decide kind of how I provide a psychology service on my ward with the support of the wider psychology team, but we're lucky where I work*" (P15).

Other participants did not have this experience: "*a lot of systemic change is needed (…) or some sort of permission giving for staff to know that it's ok to take people outside*" (P13).

Subtheme 2: Breaking the Echo Chamber

Participants reflected on what it meant to be a clinical psychologist, their working paradigm and vision for the profession: "*what does it mean to help someone?*" (P9).

Participants felt well placed to work with nature: "*Why psychologists? I think that's because we do have that massive connection between mind and body (…) I think we're one of the only ones in the MDT that really makes that connection between the two*" (P2).

And expressed a desire for innovation: "*I feel like sometimes as psychologists, we're in bit of an echo chamber […] you kind of need someone to go out the box and to, like, bring some kind of research and teaching into the box to share it*" (P11).

Participants expressed worry around being judged by other professions if they pushed for nature as an agenda:

"*That's almost quite a fluffy, touchy feely kind of adjunct to the like very intense, super medicalized, this is like emergency medicine type thing (…) I can just imagine if the psychologist was like, we want to go out walking, and I want you to like sit with me under the trees, I can imagine that being like a bit of a culture shock*" (P3)

Other participants felt it was important to support the wider workforce: "*I work with occupational therapists and nurses and doctors, and I think I see part of my role as supporting other professionals to bring more nature into their practice*" (P15).

Participants also reflected on how to create change. Psychologists described the importance of leaning into their leadership competencies, and the importance of "*learning from others*" (P14). Psychologists further reflected on their responsibility of "*advocating and campaigning*" (P1) and inspiring change: "*I believe in it so much and I feel therefore, I'm kind of practising what I preach and practising with integrity*" (P3). Most importantly: "*if we know that nature is beneficial for mental health and if our role is to kind of support people's mental health then I think it makes sense to try and make a mental health resource available*" (P1).

Participants expressed that to break this echo chamber, the profession needs more research, teaching, and sharing of practice. Participants found it: "*actually shocking thinking about it, that it isn't on there [DClin teaching]*" (P11). Participants also felt that the entire system needs a change:

"*It's not that I'm completely anti-science, I am here sat with you, I just feel like there are other ways of understanding and measuring impact and not all of them are written up and summarised by NICE guidance*" (P14)

Participants recognised that change "*takes so much energy and effort and time and money*" (P13), but the alternative is "*stagnation*" (P11). Psychologists must "*innovate*" (P15), strive for improvement and build "*momentum*" (P9): "*it just feels ridiculous that we're not using nature*" (P11).

Several participants noted that nature encourages "*fun*" (P5) for both them and patients. This playfulness challenges how psychologists view their roles: "*I don't know how to play anymore*

*because I'm a very serious clinical psychologist trainee, I need to be taken seriously, I don't know how to play anymor*e" (P12).

In summary, participants expressed several ideas on how to create change but questioned what the next step was: "*I'm not 100% sure where I stand yet in terms of do we need a revolution or is subtle enough good enough for the moment?*" (P6).

Table 8.

A Selection of Ideas for Working with or In Nature as a Clinical Psychologist

Working in Nature	Working with Nature
Outdoor therapy sessions (in a park, bringing patient hospital beds into a greenspace)	Inviting patients to share their experiences of nature (cultural, religious, or spiritual)
Encouraging outdoor staff activities (outdoor staff lunch break)	Bringing nature into the room (decorating clinical spaces with plants or images of nature)
Experiential activities (collecting an outdoor object that represents current feelings)	Using nature as an inspiration for ward environments (lighting, nature sounds)
Linking patients to community nature groups (gardening clubs)	Using nature to embody the therapy (a patient nurturing a plant over the course of a treatment) or topic (observing life cycles to understanding life and death)
Noticing nature on a commute to work	
Animal-assisted work (feeding ducks in a pond, walking a patient's dog)	Sensory exercises using all the senses: hearing, seeing, tasting, touching, smelling
Nature-based activities as adjuncts to treatment to support a therapeutic aim or teach a skill (learning responsibility, teamwork)	Using nature-inspired techniques and metaphors from third-wave approaches, e.g., leaves on the stream (Acceptance and Commitment Therapy)
Immersive videos that patients can watch emulating being outdoors	Delivering teaching and training about nature-work or requesting training

Discussion

Discussion of Findings

This research explored UK clinical psychologists' experiences of working with nature, its importance, perceived benefits and barriers, and how participants navigated perceived barriers. This research further aimed to explore clinical implications of psychologists working with nature. Thematic analysis identified that working with nature was perceived as invaluable and influential to participants' identity as a psychologist, their personal and professional values, and passion for their roles. There were numerous benefits and barriers discussed, as well as anecdotes for how the barriers were navigated and ideas for what clinical psychologists could do to incorporate nature into their work. There was a desire for change, a pattern of both excitement and exhaustion, curiosity and defeat. This ambivalence connects the themes around psychologists being curious and seeking or encouraging connection, whilst being mindful of the barriers, risks, and powers at play. Throughout, participants were thoughtful, critical, and acknowledged the importance of systems that have influenced their experiences. Finally, matters of equality, diversity, and inclusivity, were woven into all responses, highlighting the training that psychologists are receiving to ensure their care is patient-centered and respectful. The complexity and duality of certain themes throughout the interviews reflects the topic under the study, that nature is a multi-faceted construct that can be woven into a psychologist's practice in numerous ways, which is consistent with wider research (Cooley et al., 2020; Lane & Reed, 2022).

What are clinical psychologists' experiences of working with and/or in nature and why might it be important to their practice?

Participants explained their experiences of working with or in nature in a fluid and dynamic way, whereby their definitions of the work and the language they used to describe it shifted depending on the setting of their work. Participants used nature in a range of ways in their work. This links to Cooley's (2020) framework, where nature is described as actively or passively incorporated into therapy, and where it can be a low or high interaction, such as a bench outside a hospital or being in a forest. Another overlap with this framework is the practitioner and client characteristics, whereby participants highlighted that for some patients, nature is part of their lifestyle, values, or belief system, and therefore it feels integral to work with nature. The theme of curiosity captured the fluidity and holism that working with or in nature offers participants and why it is important to them.

Participants reflected on what it meant to be a clinical psychologist. There was a pattern of wanting to challenge the status quo and move away from the institutional anxiety that psychologists can feel. For example, worries around being judged by the medical profession, therefore not taking positive risks, which can lead to psychology being too medicalised. This sentiment of fear around risk-taking could be attributed to the culture of blame that can permeate healthcare settings; this could be prevented through management and leadership shifting this culture (Reddington, 2016).

There was a difference between trainee and qualified psychologist experiences, whereby trainees expressed feeling less able to work with nature, and to be creative with their work more generally, as they worried about needing permission or not having guidelines to follow. Trainees believed they would have more opportunities to work in line with their preferences once qualified. These narratives are echoed in wider literature around the challenges of being a trainee clinical psychologist (Jones & Thompson, 2017).

In summary, these interviews created a space for clinical psychologists to reflect on their work with nature. Overwhelmingly, participants felt that working with nature augmented their practice. Participants' emphasis on authenticity, integrity, innovation and a values-driven approach demonstrates the importance of this work to their personal and professional identities. Moreover, participants felt that as clinical psychologists they were well-placed to support the development and implementation of nature work, a sentiment echoed by mental health professionals in other studies (Tambyah et al., 2022).

What are clinical psychologists' experiences of the benefits of working with and/or in nature?

Participants outlined benefits of working with or in nature for themselves personally and professionally, for their patients, colleagues and teams, and secondary benefits for environmental and climate awareness. Their experiences recall the 'flexibility within fidelity' idea of cognitive behaviour therapy protocols and practices (Kendall & Frank, 2018), whereby psychologists have been able to flexibly adapt their care to best support patients, however, are still operating within their service remits and under policies and psychological principles. The self-determination theory (Adams et al., 2017) could help explain why participants benefit from this work, as it may fulfil their needs of autonomy, competence and relatedness, particularly as they overcome challenges which could reinforce their motivation to pursue this work (Utloa, 2020).

The primary benefit was summarised through the connection that nature offers. Reflecting on connection and disconnection is inherent to clinical psychology and the human experience. Within

the narrative of a global loneliness epidemic (Cacioppo & Cacioppo, 2018), fostering connectedness feels critical and research has suggested that nature contact can offer relief from social and emotional loneliness (Astell-Burt et al., 2024). Nature was also suggested as supporting patients to connect with themselves, by slowing down and noticing their thoughts and emotions. This could be explained by the Attention Restoration Theory, as nature replenishes attentional systems and could support general cognitive functioning (Atchley et al., 2012).

Participants proposed that working with nature encouraged a critical reflection of how therapy is conceptualised and what constitutes therapy. The theme of having a relationship with nature echoes a theme in Lane and Reed's (2023) research which reported that nature was a co-therapist in their study. This theme has been generated by several studies in different settings, suggesting that the relational and living aspect of working with nature warrants further investigation.

Participants highlighted the suitability of nature-based approaches for neurodivergent populations and patients who have experienced trauma, as nature can circumvent speaking and focus on feeling or experiencing through the senses. A systematic review argued that nature-based interventions are a great alternative to traditional therapy for autistic children, in part due to the experiential and sensory aspect of them (Fan et al., 2023). Regarding trauma approaches, various studies (e.g., Fisher, 2023; Stevens & Truong, 2024) have demonstrated that nature-informed therapeutic approaches can support trauma recovery. White and colleagues (2023) use the biopsychosocial model to formulate how nature-informed care can support diverse patients. They argue that nature can support biological, psychological, and social mechanisms in a more integrated manner, than perhaps standalone medication or a talking therapy.

What are clinical psychologists' experiences of the barriers of working with and/or in nature and how do they negotiate with these?

Participants acknowledged the multitude of risks and barriers that are present when working with nature. Practical and logistical considerations, matters of risk, confidentiality, and organisational attitudes have been previously outlined (Tambyah et al., 2022). These are all valid considerations when exploring new ways of working. Similar risks have also been identified in the British Psychological Society (BPS) guidance for working outdoors (Cooley & Robertson, 2020), such as consideration of both patient and practitioner health and if this impacts on access to the outdoors. Participants desired formal guidance and policy to inform nature-based work. It is unclear whether they were unaware of existing BPS guidance, perhaps due to dissemination barriers, or whether the

BPS guidance was overly focused on taking patients outdoors, as opposed to creatively working with nature. Participants also emphasised the importance of leadership and workplace culture and how this either facilitates or prevents nature-based work. Perhaps participants are seeking guidance from the NHS or their local trust or services, rather than from their professional body.

As a contrast to participants' exploration of risk was the sub-theme of nature, at times, being a safer space or an opportunity to learn about safety. Participants reported that there is space for playfulness, fun, and positive risk-taking in nature. This is a relatively novel finding, linking to wider literature reporting nature offering a space for relaxation (Tambyah et al., 2022), or nature inviting unstructured outdoor play for children (Lane & Reed, 2022). Various sub-themes speak to this sense of fun, exploration, and learning that can come with outdoor adventures and perhaps is enticing to adults who may have become disconnected from their outdoor world. Participants additionally mentioned that being outdoors comes with real risks that can offer perspective to patients and teams about what constitutes risk and could possibly teach patients how to be safe. Wider literature has explored this concept, arguing that risky outdoor play can be beneficial for child development and support learning (Harper, 2017). This points to a wider discussion around society's perception of risk, whereby Western society is seen as risk-averse, however it has been argued that learning comes from experience, trial-and-error, and this can involve sitting with uncertainty (Harper, 2017). Participants appeared to navigate matters of risk and safety through using their clinical expertise and monitoring participant feedback to inform their work as it progressed, echoing the principle of practice-based working (Barkham & Mellor-Clark, 2003).

Participants' experience of the barriers prompted reflection on power, notably the power dynamics between patient and practitioner, practitioner and system, and patient and system. There were concerns around the field stagnating if clinical psychologists did not work towards challenging power differences. They expressed a sense of responsibility toward improving practice, and ensuring it is equitable and adaptable to clinical need. One way to achieve this is through improving the cohesiveness of clinical psychology and policymakers. This was recently observed whereby a trainee clinical psychologist was offered a placement with a qualified psychologist who was a member of parliament, aiming to bring psychology knowledge into policymaking (Beretti, 2023). This may bridge power differences through improving communication between those in positions of power and decision-making and practitioners on-the-ground.

Participants raised ethical questions, such as whether it is acceptable that patients in inpatient or forensic settings have their access to nature heavily limited, or where they must rely on

available staff to bring them outdoors. Participants shared discomfort, shock, and humour about needing permission to work with or in nature, which they described is inherently natural. Of course, there is the balance of managing risk and safety in this clinical context, however, given the evidence-base documenting the value of exposure to nature during medical and psychiatric hospital admissions (Guidolin et al., 2024), it feels imperative to further question this from an ethical standpoint.

Interviews ended with participants exploring what they believed should happen next in clinical psychology, which is captured in the final sub-theme. Participants reflected on their professional identity and the paradigm of clinical psychology. Participants shared that they felt well-placed to create traction in this topic, through research, teaching, advocacy, and nature-informed clinical practice where appropriate. Participants highlighted the value of learning between professions and settings, particularly with occupational therapists. This echoes wider literature documenting occupational therapists enabling outdoor engagement for patients (Firby & Raine, 2023). Whilst participants acknowledged how large-scale national change has many barriers, most seemed content with the small ways they could continue to work with or in nature and the discrete ways they could encourage their colleagues to do the same.

Clinical Implications

Practical implications

This research echoes and extends previous findings, notably raising a question around the paradigm that guides clinical psychologists and whether this is a new orthodoxy for clinical psychology, informed by neuroscience, spirituality, and the mind-body connection. This discipline has seen significant shifts over the past half-century; in the UK, initial members of the BPS were medical practitioners (Pilgrim, 2010), which set a tone that is still present today. The profession has seen continuous development from leading figures questioning what a clinical psychologist is and how we understand human wellness and distress (Pilgrim, 2010). The undertone of the current research speaks to this, proposing that perhaps there is a way to operate that is curious with the aim of offering the highest quality of patient-centered, practice-based, care.

The results in this study suggest that participants found that nature enabled more equitable and adaptable practice, meeting both practitioner and patient needs and values. Consequently, such results propose that there is potential feasibility for the profession of clinical psychology to consider how to integrate nature into current practice, either mapping onto or extending current ways of

working. This was exemplified in Table 8. Of note is the fluid definition that participants used when describing working with nature, which gives permission for interested clinical psychologists to consider how they could apply working with nature in small and individualised ways, whether to benefit themselves or their patients. Whilst participants acknowledged service pressures and staff fatigue, they advocated to be curious about trialling new ways to practice.

Within participant experiences, there appeared to be a gap between what information is out there (i.e., BPS guidelines for working outdoors) and awareness of these resources. There also appeared to be a lack of community within the clinical psychology workforce, whereby participants felt alone in this passion and expressed wanting more sharing of ideas. This suggests that there is scope for the field to consider how it could increase dissemination through professional networks and support the formation of a community.

Research Implications

This research has raised a question about how wellbeing is conceptualised. In the UK, wellness is situated within the individual, which disconnects them from their context, community, and culture (Gauthier et al., 2025). Further research should consider exploring conceptualisations of wellbeing and nature through more collaborative research projects with a diversity of patients and practitioners, to produce culturally sensitive and context-appropriate action.

Similarly, participants mentioned a barrier around measuring working with nature. Finding a standardised measure for the effectiveness of nature work could be challenging for reasons such as the conceptualisation of nature and wellbeing. However, such a measure would likely be integral to implementing a nature-based intervention into guidance and policy. Further research could explore the development of such a tool.

Most participants cautioned that the aim is not for nature to become a commodity, and that transforming nature into a transactional tool could be harmful for the environment. Further research could explore ways of ‘using’ or relating to nature whilst considering wider political and economic systems.

Strengths and Limitations

Gauthier and colleagues (2025) study highlighted important limitations for research into nature which are applicable to this study. Firstly, this study was not grounded in community-based research and there was limited involvement of the public. Whilst there was involvement during the

development of the project, it would have been beneficial to receive additional PPI throughout all stages of the research. Jennings and colleagues (2018) advocate for an ongoing partnership between the research team and participants. Therefore, further research would benefit from more consistent use of PPI with the view to increasing the meaning and implications of the results.

Participants were encouraged, where possible, to sit outdoors during the interview. While the intent was to encourage immersion into the topic with the view to generate rich conversation (Evans & Jones, 2011), there was a risk of priming participants. While priming can be a helpful tool, it can lead to participants sharing more than they are comfortable with, which can be an ethical problem (Dawson et al., 2015). In line with literature (Allmark et al., 2009), this was managed through transparent discussion between researcher and participant and allowing participants to contact the researcher following the interview should they have any questions or concerns.

Secondly, it would have been valuable to explore whether similarities or differences exist between UK-trained clinical psychologists and those that trained elsewhere. Some participants were not British and some had immigrated to the UK for their education. Whilst a few commented on differences in their upbringings and lifestyle, this research could have expanded on this further, perhaps by seeking out additional demographics and offering commentary on this. Similarly, years of experience in the profession were not recorded; this encouraged equitability and enabled both trainees and qualified psychologists to participate, valuing all experiences and reflections. However, perhaps a deeper understanding of the different roles and levels of responsibility of participants could have further situated the context of their experiences, and whether these factors influenced their beliefs on the topic. Indeed, this was mentioned in a subtheme (‘who gives you permission’), where trainees expressed feeling they had less authority. One important limitation was that participant demographics of age, gender, and ethnicity were not recorded. This data typically enables research conclusions to be situated within a context, and to understand which groups are represented or underrepresented in research. While such demographics were discussed during interviews, these were not formally recorded during data collection. In line with EDI-informed best practice (NIHR, 2022), further research would benefit from gathering this information, in order to better understand the representation of clinical psychologists working with/in nature, whilst balancing the importance of maintaining anonymity in small sample groups.

According to the HCPC register, in April 2025 there were 30,383 registered practitioner psychologists, however this is not exclusively clinical psychologists, including educational and counselling psychologists (HCPC, 2025). Nevertheless, the current study interviewed 16 participants

and whilst it generated rich data, it is not reflective of the entirety of the CP workforce. It is possible that participants were attracted to this research given their interest. This is also reflected in participant CNS scores which indicated that participants were, on average, well connected to nature. Further research would benefit from interviewing a larger sample of clinical psychologists.

This study has several strengths, notably its novelty. The findings offer clarity on how clinical psychologists in the UK are navigating working with or in nature, which is increasingly topical and timely from public health and climate perspectives. The qualitative methodology enabled in-depth insight and captured diverse perspectives. It drew on lived experiences and went beyond a consideration of benefits and barriers, through exploring how barriers are navigated, and ascertained participants' hopes for the future. This research has excitingly raised a multitude of questions based on a complex topic, opening avenues for further research. Nature appears to beget curiosity, possibility, and offers an expansive way of working and thinking about mental health and wellbeing.

A final consideration is that this research has predominantly discussed nature as a positive, when nature can be a risky or dangerous place. Psychologists mostly referenced risks around patient safety and the unpredictable nature of being outdoors, however further consideration should be given to whether there could be harm in promoting nature-based work. Moreover, several participants used humour when commenting that it is easier to ask forgiveness than permission, however this encourages a culture where clinicians may hide aspects of their practice, which could lead to unregulated practice. Moreover, this would perpetuate psychologists working in silos and not sharing practice, which was mentioned as a barrier. This highlights the complexity of this topic and the thought that must go into implementing change.

Conclusion

This research has enabled clinical psychologists to discuss a complex and nuanced topic demonstrating conflicting reflections and mixed emotions about their experiences and desires for their roles within the current healthcare system. This study has demonstrated that working with or in nature offers numerous benefits to practitioners, patients, and wider systems, and whilst there are barriers, these may be overcome. In addition, this research has suggested that working with nature enables more equitable and adaptable practice to meet patient needs and values. Finally, questions have been raised about power and permission within the healthcare system and how decisions are made. Clinical psychologists are depicted as well-placed to address these systemic challenges and suggest ways to innovate. Perhaps it's time for the system to open some windows and let fresh air in.

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Appendix A Extracts from Author's Reflective Diary

July 2024: *Working at XXX Hospital has meant that I have access to XXX garden. This has had huge benefits to myself as a practitioner and for my patients. If the weather allows, I take all my patients outside. The calm and quiet is a significant contrast to the ward. It feels like a more intimate space whilst also being more natural than the hospital environment. It has allowed for natural ice-breakers, where myself and the patient notices birds, insects, or spiders. There is less power in the outdoor space – I don't feel like there is a patient and a professional, rather we feel like two people interacting with one another. For example, when I am startled by a spider, I think this humanises me. I think that I have built the best rapport across all placements with my current patients and I wonder if something about the outdoor space has contributed to this, and perhaps enabled me to feel more relaxed and confident as a trainee psychologist in this space.*

November 2024: *Feeling so excited about my research and the participants that I am meeting. I wish I could speak to people about it, as it's a great feeling finally being in a place where the research is coming to life. The conversations that I am having with participants are fascinating and I am networking too. Meeting trainees forms a connection that feels special, and meeting qualified psychologists is inspiring and showing me a path into qualified life that I have always envisioned, and now realise is possible. I feel inspired that qualified psychologists are working with nature and excited about this developing further. I am noticing that there is a lot more happening in the intersection between psychology and nature than I originally thought. The deeper I get into this topic, the more that I am coming across initiatives/research/people in this space. It makes me question though how much of a deep-dive I have had to do to uncover this, and how we could make this more accessible/known to psychologists who may not be seeking out this information as proactively.*

Appendix B Author Guidelines Systematic Review

BJP AUTHOR GUIDELINES

1. 1. SUBMISSION

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Figures

Although authors are encouraged to send the highest-quality figures possible, for peer-review purposes, a wide variety of formats, sizes, and resolutions are accepted.

Click here for the basic figure requirements for figures submitted with manuscripts for initial peer review, as well as the more detailed post-acceptance figure requirements.

Legends should be concise but comprehensive – the figure and its legend must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement.

Supporting Information

Supporting information is information that is not essential to the article, but provides greater depth and background. It is hosted online and appears without editing or typesetting. It may include tables, figures, videos, datasets, etc.

Click here for Wiley's FAQs on supporting information.

Note: if data, scripts, or other artefacts used to generate the analyses presented in the paper are available via a publicly available data repository, authors should include a reference to the location of the material within their paper.

8. General Style Points

For guidelines on editorial style, please consult the **APA Publication Manual** published by the American Psychological Association. The following points provide general advice on formatting and style.

- **Language:** Authors must avoid the use of sexist or any other discriminatory language. The BPS's Inclusive Language Guidance provides a set of recommendations to support the key principles of inclusivity in writing.
- **Abbreviations:** In general, terms should not be abbreviated unless they are used repeatedly and the abbreviation is helpful to the reader. Initially, use the word in full, followed by the abbreviation in parentheses. Thereafter use the abbreviation only.
- **Units of measurement:** Measurements should be given in SI or SI-derived units. Visit the Bureau International des Poids et Mesures (BIPM) website for more information about SI units.
- **Effect size:** In normal circumstances, effect size should be incorporated.
- **Numbers:** numbers under 10 are spelt out, except for: measurements with a unit (8mmol/l); age (6 weeks old), or lists with other numbers (11 dogs, 9 cats, 4 gerbils).

Wiley Author Resources

Manuscript Preparation Tips: Wiley has a range of resources for authors preparing manuscripts for submission available **here.** In particular, we encourage authors to consult Wiley's best practice tips on **Writing for Search Engine Optimization**.

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The **BPS Early Career Researcher Best Paper Award** is open to researchers and practitioners who completed their highest degree no more than five years ago. Please read full terms and criteria before applying. Those who wish to apply can opt-in to the question when submitting their manuscript for peer review.

10. 5. EDITORIAL POLICIES AND ETHICAL CONSIDERATIONS

11. Peer Review and Acceptance

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All listed authors should have contributed to the manuscript substantially and have agreed to the final submitted version. Authorship is defined by the criteria set out in the APA Publication Manual:

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16. Data Sharing and Data Accessibility Policy

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19. 6. AUTHOR LICENSING

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Appendix C Author Guidelines for Empirical Paper

Author Guidelines

Applied Psychology: Health and Well-Being is one of the two official journals of the International Association of Applied Psychology (IAAP), the oldest worldwide association of scholars and practitioners of the discipline of psychology (founded in 1920).

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For editorial inquiries, please contact the Editors-in-Chief, Yiqun Gan (**ygan@pku.edu.cn**) and Jennifer Inauen (**jennifer.inauen@psy.unibe.ch**).

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Original Papers	Reports of new research findings or conceptual analyses that make a significant contribution to knowledge.	Yes, unstructured 150-200 words	Data Availability Statement 6 Keywords The maximum length recommended is 30 pages. If your manuscript exceeds this limit (e.g., for systematic and meta-analytic reviews or manuscripts reporting multiple studies), please provide justification in your cover letter.
Reviews	Critical reviews of the literature, including systematic reviews and meta-analyses. These papers are usually commissioned but authors may submit abstracts to the Editors for consideration.	Yes, unstructured	If your manuscript exceeds the 30-page limit (e.g., for systematic and meta-analytic reviews or manuscripts reporting multiple studies), please provide justification in your cover letter.
Letter to the Editor	Usually by invitation but authors may submit Letters for the Editors' consideration.	No	

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Before you submit, you will need:

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- funding statement
- conflict of interest disclosure
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- permission to reproduce material from other sources
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Abstract: The title must be included again, on the same page and immediately before the abstract. An abstract of 150-200 words in English should precede the article.

Headings: There should be no more than three (clearly marked) levels of subheadings used in the text of the article.

Acknowledgements: These should be supplied, as briefly as possible, on a separate page.

Statistics: Results of statistical tests should be given in the following form: F(1,9) = 23.35, p

Keywords: All articles should contain keywords. No more than 6 keywords should be submitted.

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Chapter in edited book:Baker, F. M., & Lightfoot, O. B. (1993). Psychiatric care of ethnic elders. In A. C. Gaw (Ed.), Culture ethnicity, and mental illness (pp. 517-552). Washington, DC: American Psychiatric Press.

Journal article: Klimoski, R., & Palmer, S. (1993). The ADA and the hiring process in organizations. Consulting Psychology Journal: Practice and Research, 45(2), 10-36.

References in Articles
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Appendix D CASP Criteria for Cross-Sectional Studies

CASP Checklist:
For Descriptive/Cross-Sectional Studies

Reviewer Name:	
Paper Title:	
Author:	
Web Link:	
Appraisal Date:	

During critical appraisal, never make assumptions about what the researchers have done. If it is not possible to tell, use the "Can't tell" response box. If you can't tell, at best it means the researchers have not been explicit or transparent, but at worst it could mean the researchers have not undertaken a particular task or process. Once you've finished the critical appraisal, if there are a large number of "Can't tell" responses, consider whether the findings of the study are trustworthy and interpret the results with caution.

Section A: Are the results valid?
1. Did the study address a clearly focused issue? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: *A question can be 'focused' in terms of* • *the population studied* • *the risk factors studied* • *is it clear whether the study tried to detect a beneficial or harmful effect* • *the outcomes considered*
2. Did the authors use an appropriate method to answer their question? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *Is a descriptive/cross-sectional study an appropriate way of answering the question* • *did it address the study question*
3. Were the subjects recruited in an acceptable way? ☐Yes ☐ No ☐ Can't Tell
CONSIDER:

We are looking for selection bias which might compromise the generalisability of the findings: • *Was the sample representative of a defined population* • *Was everybody included who should have been included*
4. Were the measures accurately measured to reduce bias? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: *Look for measurement or classification bias:* • *did they use subjective or objective measurements* • *do the measurements truly reflect what you want them to (have they been validated)*
5. Were the data collected in a way that addressed the research issue? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if the setting for data collection was justified* • *if it is clear how data were collected (e.g., interview, questionnaire, chart review)* • *if the researcher has justified the methods chosen* • *if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted?)*
6. Did the study have enough participants to minimise the play of chance? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if the result is precise enough to make a decision* • *if there is a power calculation. This will estimate how many subjects are needed to produce a reliable estimate of the measure(s) of interest.*
7. How are the results presented and what is the main result? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if, for example, the results are presented as a proportion of people experiencing an outcome, such as risks, or as a measurement, such as mean or median differences, or as survival curves and hazards* • *how large this size of result is and how meaningful it is* • *how you would sum up the bottom-line result of the trial in one sentence*
8. Was the data analysis sufficiently rigorous? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if there is an in-depth description of the analysis process* • *if sufficient data are presented to support the findings*

9. Is there a clear statement of findings? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if the findings are explicit* • *if there is adequate discussion of the evidence both for and against the researchers' arguments* • *if the researchers have discussed the credibility of their findings* • *if the findings are discussed in relation to the original research questions*
10.Can the results be applied to the local population? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *the subjects covered in the study could be sufficiently different from your population to cause concern.* • *your local setting is likely to differ much from that of the study*
11.How valuable is the research? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *one descriptive/cross-sectional study rarely provides sufficiently robust evidence to recommend changes to clinical practice or within health policy decision making* • *if the researcher discusses the contribution the study makes to existing knowledge (e.g., do they consider the findings in relation to current practice or policy, or relevant research-based literature?)* • *if the researchers have discussed whether or how the findings can be transferred to other populations*

APPRAISAL SUMMARY: *List key points from your critical appraisal that need to be considered when assessing the validity of the results and their usefulness in decision-making.*

Positive/Methodologically sound	**Negative/Relatively poor methodology**	**Unknowns**

Appendix E CASP Criteria for Experimental Studies

CASP Checklist:
For Descriptive/Cross-Sectional Studies

Reviewer Name:	
Paper Title:	
Author:	
Web Link:	
Appraisal Date:	

During critical appraisal, never make assumptions about what the researchers have done. If it is not possible to tell, use the "Can't tell" response box. If you can't tell, at best it means the researchers have not been explicit or transparent, but at worst it could mean the researchers have not undertaken a particular task or process. Once you've finished the critical appraisal, if there are a large number of "Can't tell" responses, consider whether the findings of the study are trustworthy and interpret the results with caution.

Section A: Are the results valid?
12. Did the study address a clearly focused issue? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: *A question can be 'focused' in terms of* • *the population studied* • *the risk factors studied* • *is it clear whether the study tried to detect a beneficial or harmful effect* • *the outcomes considered*
13. Did the authors use an appropriate method to answer their question? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *Is a descriptive/cross-sectional study an appropriate way of answering the question* • *did it address the study question*
14. Were the subjects recruited in an acceptable way? ☐Yes ☐ No ☐ Can't Tell
CONSIDER:

We are looking for selection bias which might compromise the generalisability of the findings: • *Was the sample representative of a defined population* • *Was everybody included who should have been included*
15. Were the measures accurately measured to reduce bias? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: *Look for measurement or classification bias:* • *did they use subjective or objective measurements* • *do the measurements truly reflect what you want them to (have they been validated)*
16. Were the data collected in a way that addressed the research issue? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if the setting for data collection was justified* • *if it is clear how data were collected (e.g., interview, questionnaire, chart review)* • *if the researcher has justified the methods chosen* • *if the researcher has made the methods explicit (e.g. for interview method, is there an indication of how interviews were conducted?)*
17. Did the study have enough participants to minimise the play of chance? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if the result is precise enough to make a decision* • *if there is a power calculation. This will estimate how many subjects are needed to produce a reliable estimate of the measure(s) of interest.*
18.How are the results presented and what is the main result? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if, for example, the results are presented as a proportion of people experiencing an outcome, such as risks, or as a measurement, such as mean or median differences, or as survival curves and hazards* • *how large this size of result is and how meaningful it is* • *how you would sum up the bottom-line result of the trial in one sentence*
19.Was the data analysis sufficiently rigorous? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if there is an in-depth description of the analysis process* • *if sufficient data are presented to support the findings*

20.Is there a clear statement of findings? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *if the findings are explicit* • *if there is adequate discussion of the evidence both for and against the researchers' arguments* • *if the researchers have discussed the credibility of their findings* • *if the findings are discussed in relation to the original research questions*
21.Can the results be applied to the local population? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *the subjects covered in the study could be sufficiently different from your population to cause concern.* • *your local setting is likely to differ much from that of the study*
22.How valuable is the research? ☐Yes ☐ No ☐ Can't Tell
CONSIDER: • *one descriptive/cross-sectional study rarely provides sufficiently robust evidence to recommend changes to clinical practice or within health policy decision making* • *if the researcher discusses the contribution the study makes to existing knowledge (e.g., do they consider the findings in relation to current practice or policy, or relevant research-based literature?)* • *if the researchers have discussed whether or how the findings can be transferred to other populations*

APPRAISAL SUMMARY: *List key points from your critical appraisal that need to be considered when assessing the validity of the results and their usefulness in decision-making.*

Positive/Methodologically sound	**Negative/Relatively poor methodology**	**Unknowns**

Appendix F Empirical Ethics Application Form

ERGO II Ethics application form – Psychology Committee

1. **Applicant Details**

1.1 Applicant name	Lara Felder
1.2 Supervisor	Dr Lisa Cant
1.3 Other researchers / collaborators (if applicable): *Name, address, email*	Dr Alison Bennetts Dr Matt Slavin

2. **Study Details**

2.1 Title of study	Clinical psychologists' experiences of the benefits and barriers of working with nature
2.2 Type of project (e.g. undergraduate, Masters, Doctorate, staff)	Doctorate in Clinical Psychology

2.3 Briefly describe the rationale for carrying out this project and its specific aims and objectives.

"*The wellness of any organism is based on both the health of its ecology and the wellbeing of the relationship between the two*" – G. W. Burns (1998)

There is considerable evidence advocating for nature-based approaches and interventions within healthcare settings (Chaudhurry et al., 2020; Coventry et al., 2021; Leavell et al., 2019; Marx & More, 2022) for improving both psychological and physical wellbeing, whilst maintaining a cost-effective healthcare system (Hinde et al., 2021). The human connection to the natural environment has been studied and documented cross-culturally for decades, as well as its healing abilities for both mind and body (Burns, 1998). In Western healthcare systems we are increasingly seeing the incorporation of nature-based interventions into treatment (Marx & More, 2022). For example, the university of Exeter published a large report exploring how nature-based therapeutic intervention can support people with poor mental health (Garside et al., 2020). Their results demonstrated a wide array of outcomes, leading them to propose a model of green care which suggests how people can experience nature in daily life, through health promotion activities, and through a targeted therapeutic intervention.

Nature-based approaches include a variety of formalised approaches (e.g., Green Care, Ecotherapy, Wilderness Therapy) (Garside et al., 2020), as well as approaches inspired by nature, working in or alongside nature, or a practice that honours the connection between nature and human health, both physical and mental. Examples of nature-based interventions include exercising in nature, receiving therapy in nature, and gardening or forestry programs. Regardless of the type of nature-based intervention, their benefits are numerous across several health outcomes (Garside et al., 2020).

An area that has not yet been explored is how clinical psychology and psychologists fit into the concept of green care, particularly what their experiences are of drawing on nature in their

clinical practice. Several therapeutic modalities and techniques such as mindfulness refer to nature (e.g., 'leaves on the stream' activity), and certain settings offer psychologists the opportunity to deliver a therapy session with patients in an outdoor setting. Clinical psychologists are in the unique position to add to the narrative given their work across a variety of settings and working with the mind-body-environment connection, but also having an influence on practice, education, and policy. The current study therefore proposes to investigate the experiences of clinical psychologists working with and/or in nature, specifically what they perceive to be the benefits and barriers of integrating nature-based approaches into clinical psychology and what they would like to see happen in the field going forward.

This study aims to generate understanding of the experiences of clinical psychologists' drawing on the evidence base and practice-based evidence of working with nature, specifically their perceptions of the benefits and barriers, and how they navigate the perceived barriers. Moreover, the study aims to inform future developments within the profession.

2.4 Provide a brief outline of the basic study design. Outline what approach is being used and why.

The ontology and epistemology guiding this research will be critical realism. The present research acknowledges the landscape of clinical psychology in the UK within the current socio-political and cultural narratives that may influence the integration of nature-based interventions into the field, whilst still focusing on individual experiences. Given this and the exploratory nature of this research, the study will adopt a qualitative methodology.

In line with similar research (Lane & Reed, 2022; Tambyah et al., 2022), methods will include semi-structured interviews to generate richer data, as opposed to questionnaires. The aim would be to recruit participants through purposive sampling and snowball sampling, to capture participants that have experience working with or in nature within their clinical practice.

2.5 What are the key research question(s)? Specify hypotheses if applicable.

4. What are clinical psychologists' experiences of working with and/or in nature and why might it be important to their practice?
5. What are clinical psychologists' experiences of the benefits of working with and/or in nature?
6. What are clinical psychologists' experiences of the barriers of working with and/or in nature and how do they negotiate with these?

3. Sample and setting

3.1 Who are the proposed participants and where are they from (e.g. fellow students, club members)? List inclusion / exclusion criteria if applicable.

Participants will include both trainee and qualified clinical psychologists that have experience of working with and/or in nature.

Inclusion criteria: Trainees currently enrolled on a Doctorate in Clinical Psychology program in the UK and qualified clinical psychologists currently registered with the HCPC.

The research will aim to recruit 10-15 participants to generate theoretical saturation (Fugard & Potts, 2015).

3.2. How will the participants be identified and approached? Provide an indication of your sample size. If participants are under the responsibility of others (e.g., parents/carers, teachers) state if you have permission or how you will obtain permission from the third party).
Recruitment will primarily be through social media. Personal pages and group admins will be contacted to post on groups for trainee and qualified CPs. I can also contact the Holistic Faculty of the BPS and university clinical psychology doctorate program list holders, to circulate the advert to appropriate colleagues. I will follow policy when using email lists and not use spamming lists for advertising the research. I would then practice snowball sampling by encouraging participants' network to consider the research and distribute via known personal contacts.
3.3 Describe the relationship between researcher and sample. Describe any relationship e.g., teacher, friend, boss, clinician, etc.
It is possible that there could be participants that are colleagues of the researcher, either in the past or present. Similarly, a participant could be a fellow trainee that is an acquaintance.
3.4 How will you obtain the consent of participants? (*please upload a copy of the consent form if obtaining written consent***) NB A separate consent form is not needed for online surveys where consent can be indicated by ticking/checking a consent box (normally at the end of the PIS). Other online study designs may still require a consent form or alternative procedure (for example, recorded verbal consent for online interviews).**
The study advertisement will include a QR code and social media posts/emails will include a link to the Qualtrics survey. This will contain the participant information sheet, eligibility screening questions, consent form, connectedness to nature scale (Mayer & Frantz, 2004; to provide context on the participant and comment on the sample), and finish with possible dates for suitable interview times. Consent will be verbally confirmed at the start of the interview.
3.5 Is there any reason to believe participants may not be able to give full informed consent? If yes, what steps do you propose to take to safeguard their interests?
No.

4. Research procedures, interventions and measurements

4.1 Give a brief account of the procedure as experienced by the participant. Make it clear who does what, how many times and in what order. Make clear the role of all assistants and collaborators. Make clear the total demands made on participants, including time and travel. *Upload copies of questionnaires and interview schedules to ERGO.*
The researcher will circulate a study advertisement detailing the research across social media platforms, known personal networks, and university networks (e.g., fellow trainees). Interested and eligible participants who complete the Qualtrics survey will then agree an interview date with the researcher at a mutually convenient time. For participants resident in Hampshire, an

in-person outdoor interview will be offered. Details of this will be discussed should the participant be interested in this option, considering accessibility, health and safety, and the weather. The researcher will visit the suggested location prior to the interview to ascertain suitability. Where possible, the interviewer and interviewee will sit in an outdoor location that offers privacy to conduct the interview, such as a park. The area will need to have phone signal to ensure the researcher can check-in and check-out before and after the interview with a pre-agreed emergency contact. For participants wishing to undertake a virtual interview, they will be encouraged to sit somewhere in nature themselves whilst the researcher also sits in an outdoor space to perform the interview.

The interview will last for around one hour and be semi-structured. Consent will be confirmed verbally. The interview will be recorded via Teams for virtual interviews. For in-person interviews, the interview will be recorded via a microphone device. Participants who complete the study will then be emailed a debrief form to conclude their participation in the research and sent a voucher as a token of appreciation.

4.2 Will the procedure involve deception of any sort? If yes, what is your justification?

No.

4.3. Detail any possible (psychological or physical) discomfort, inconvenience, or distress that participants may experience, including after the study, and what precautions will be taken to minimise these risks.

The only possible psychological discomfort or distress would be if the interview discusses a topic that the participant brings up and then experiences as overwhelming, e.g., any negative experiences they have had in their career in clinical psychology. The researcher will advise at the start that should this happen, the interview can be paused. The debrief sheet will include potential signposting if required and participants will be able to contact the research team after the interview as well should they need further support.

4.4 Detail any possible (psychological or physical) discomfort, inconvenience, or distress that YOU as a researcher may experience, including after the study, and what precautions will be taken to minimise these risks. If the study involves lone working please state the risks and the procedures put in place to minimise these risks (<u>please refer to the lone working policy</u>).

The only psychological discomfort that the researcher may experience is if a topic is raised, or a response given by a participant, that feels personally triggering or upsetting. The researcher will be able to reflect on this experience with their supervisors in a follow-up meeting. This is, however, not anticipated.

Lone working is applicable in the event a participant agrees to an in-person outdoor interview. The location will likely be a park or outdoor area that is private enough to conduct an interview but not so remote that it is unsafe or lacks phone signal in the event of an emergency. Details of the timing and location of the interview will be shared with other members of the research team and a check-in/check-out procedure will be followed by an identified safe person.

The outdoor area will be scoped out by the researcher prior to conducting the interview to assess for any hazards.

4.5 Explain how you will care for any participants in 'special groups' e.g., those in a dependent relationship, are vulnerable or are lacking mental capacity), if applicable:
Not applicable.
4.6 Please give details of any payments or incentives being used to recruit participants, if applicable:
£25 voucher per participant for their completion of the questionnaire and interview in accordance with the University of Southampton's finance procedure (2019). For participants attending in-person, travel costs will be expensed. Costing was estimated in accordance with the University of Southampton's Finance procedure and guidance on payments to participants.

5. Access and storage of data

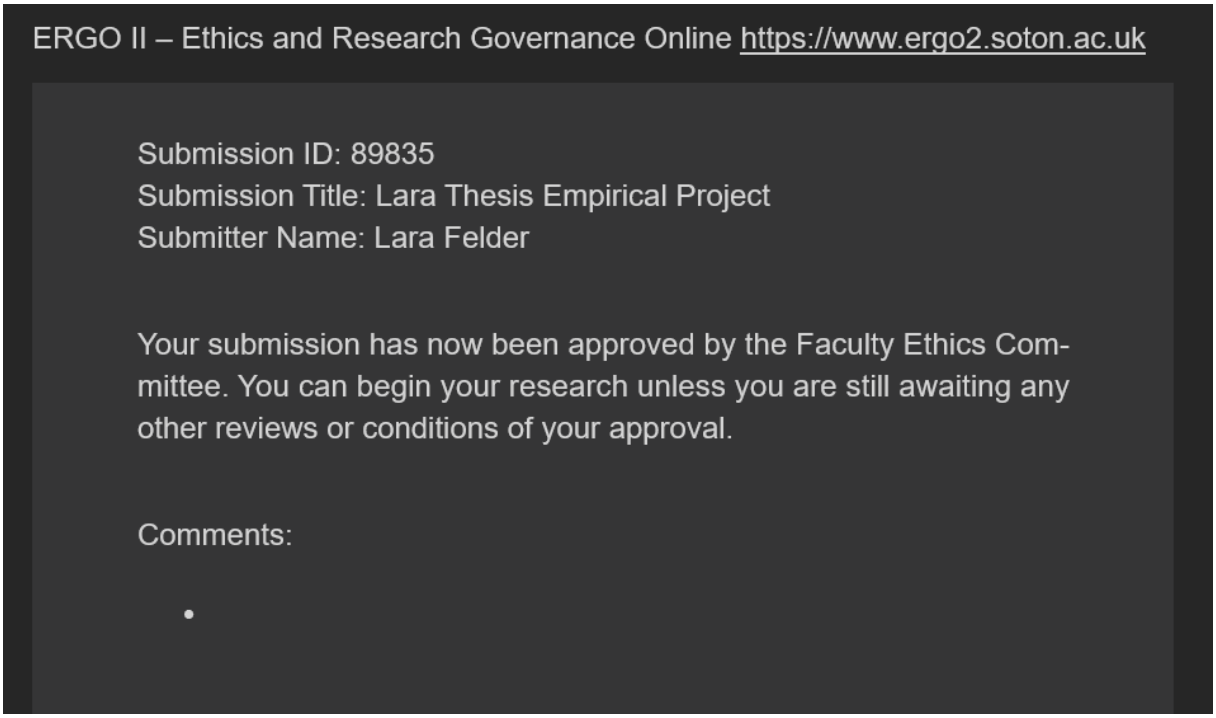
5.1 How will participant confidentiality be maintained? Confidentiality is defined as non-disclosure of research information except to another authorised person. Confidential information can be shared with those already party to it and may also be disclosed where the person providing the information provides explicit consent. Consider whether it is truly possible to maintain a participant's involvement in the study confidential, e.g. can people observe the participant taking part in the study? How will data be anonymised to ensure participants' confidentiality?
Interviews will be recorded via Teams or a microphone device. Transcripts produced by Teams will then be verified and corrected by the main researcher. The microphone recordings will be transcribed by the researcher or by the help of a voluntary research assistant should there be the need of this (e.g., if all interviews are completed in person via a microphone). A transcription service (e.g., Page Six) may be utilized if there are over a dozen interviews completed, to support the limited time that the main researcher has and help make the process more efficient. Recordings will be anonymized when they are transcribed. Participants will leave their initials and emails on their PIS and consent form, which will then all be assigned a unique number to thereon refer to data. This information will be stored securely on a password protected document and in line with GDPR regulations. Only members of the research team and responsible members of the University of Southampton may be given access to data for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. All of these people have a duty to keep information strictly confidential. For in-person outdoor interviews, there is the possibility that members of the public may observe participation, and this will be discussed with interested participants. Every effort will be made to ensure the location of the outdoor interview is private enough to allow for confidentiality. Should a passerby approach the participant, we can pause the interview for a couple minutes until they are out of earshot. Direct quotes from the interviews may be used in the write-up for the final research project but these will be anonymised. Participants may request for their responses to not be directly quoted; if this is the case, the researcher will make a note of which participants and transcript are

not to be directly quoted. An opt-out will be added to the consent form with regards to the use of direct quotes.
5.2 How will personal data and study results be stored securely during and after the study. Who will have access to these data?
All data will be stored on the researcher's password-protected University of Southampton computer and backed up on a secure server. All data will be anonymised following data collection. Data will be held for 10 years after the research project has finished and will then be securely destroyed, in accordance with the University of Southampton's Research Data Management Policy. The plan is for the coding manual to be deposited in the Soton repository at the end of the project, given the likely small dataset.
5.3 How will it be made clear to participants that they may withdraw consent to participate? Please note that anonymous data (e.g. anonymous questionnaires) cannot be withdrawn after they have been submitted. If there is a point up to which data can be withdrawn/destroyed e.g., up to interview data being transcribed please state this here.
This will be made clear on the consent form and participant information sheet. Data collected will be anonymised one week after collection when questionnaires and interviews are linked and once transcription begins, at which point participants will no longer be able to withdraw their data.

6. Additional Ethical considerations

6.1 Are there any additional ethical considerations or other information you feel may be relevant to this study?
Ethical approval will be sought from the University of Southampton, following review from members of the Psychology ethics sub-committee and University Research Governance. The research team will also consider their own position and any source of personal bias in the write-up. The main researcher is keeping a research diary to log thoughts and feelings generated as the project progresses. NHS approval is not required for this given I will not be recruiting through the NHS or directly targeting NHS clinical psychologists.

Appendix G Ethics approval



ERGO II – Ethics and Research Governance Online https://www.ergo2.soton.ac.uk

Submission ID: 89835
Submission Title: Lara Thesis Empirical Project
Submitter Name: Lara Felder

Your submission has now been approved by the Faculty Ethics Committee. You can begin your research unless you are still awaiting any other reviews or conditions of your approval.

Comments:

•

Appendix H PIS

Participant Information Sheet

V3, 11.10.2024, Ergo: 89835

Study Title: Clinical psychologists' experiences of the benefits and barriers of working with nature

Researchers: Lara Felder (trainee clinical psychologist), Dr Lisa Cant (supervisor), Dr Ali Bennetts (supervisor), Dr Matt Slavin (supervisor).

ERGO number: *89835*

Hello! I am a trainee clinical psychologist conducting this research as part of my thesis for my Doctorate in Clinical Psychology, at the University of Southampton. You are being invited to take part in the above research study. To help you decide whether you would like to take part, it is important that you understand why the research is being done and what it will involve. Please read the information below carefully and ask questions if anything is not clear or you would like more information before you decide to take part in this research. If you are happy to participate you will be asked to sign a consent form.

What is the research about?

There is a significant evidence-base outlining the vast physical and psychological benefits of nature-based approaches and interventions for people in various healthcare settings. There are also numerous theories explaining why being in nature can be healing and proposed models of how green care could become a more formalized treatment; whereby Green Care is the UK's conceptualization of an intervention taking place in natural surroundings. The healthcare system is slowly recognizing these benefits and various professionals have begun to adopt nature-inspired practices. The current study aims to explore this within the context of clinical psychology.

The present study aims to gather information about how the field of clinical psychology can use nature across training, practice, and policy to bridge the theory-practice gap on the benefits of nature for mental health and wellbeing. This study specifically aims to understand clinical psychologists' experiences of incorporating nature into their practice, and what they perceived to be the benefits and barriers of implementing nature-based approaches into clinical psychology, for both themselves, their patients, and the wider field.

Why have I been asked to participate?

You are a trainee clinical psychologist in the UK or are a qualified clinical psychologist currently registered with the HCPC. You also have experience of working with and/or in nature within your practice as a psychologist.

To be able to take part I must:

- Speak and read English to the level of being able to engage in an interview.
- Have access to technology to carry out a virtual interview or be able/willing to attend in person.
- Be registered in the UK on a Doctorate in Clinical Psychology course.
    - OR
- Be a qualified Clinical Psychologist registered with the HCPC (but could have trained anywhere in the world).
- Have experience of working with nature, or in nature, as part of your practice. This is self-defined experience and there are no specific requirements for what this experience looks like.

What will happen if I take part?

You will firstly answer demographic questions and respond to the Connectedness to Nature Scale (Mayer & Frants, 2004) to offer contextual information. You will then attend a remote interview with Lara which will take around an hour. Where possible, participants are encouraged to attend the virtual interview whilst themselves sitting outdoors in a fairly quiet and confidential location if this is possible and accessible to the participant. This is to encourage immersion into the topic of discussion.

If you live in Hampshire, there is the option to conduct the interview in person in an outdoor setting. There will be consideration of accessibility, health, and safety, should you be interested in this option and details can be further discussed. For example, this could involve sitting in a park on a bench for the duration of the interview and being considerate of timing to avoid a crowd, or agreeing to pause the interview should passerby walk close by meaning they could eavesdrop.

All interviews will be recorded and transcribed. For virtual interviews, these will be recorded via Teams. In person, interviews will be recorded with a microphone device. We record the interview to ensure there is an accurate record of the discussion.

Please note, you will be asked for a form of identification (e.g., workplace ID, driver's license) at the beginning of the interview as part of participant identity checks.

Are there any benefits in my taking part?

The main perk will be to discuss a topic you are interested in! You may benefit both personally and professionally from our discussion. You will also be contributing to current research on an emerging topic of significant importance. For participants who complete the study, a £25 voucher will be given as a token or appreciation for your time.

Are there any risks involved?

There are no direct risks to taking part in this study. If you find the topic overwhelming at any point you may withdraw from the study. You may also reach out to the research team following the interview if you are left feeling distressed.

You will be emailed a debrief form following the interview that will include the signposting below should you need further support if you experience psychological discomfort or distress:

Mind (mind.org.uk)

Call the InfoLine to find specialist support in your area: 0300 123 3393

Shout (www.giveusashout.org)

Text SHOUT to 85258 to chat by test to a trained volunteer for confidential support 24/7.

Samaritans (www.samaritans.org)

Call 116 123 for support 24/7.

What data will be collected?

When you complete the consent form you will be asked to leave your name and email address. This personal information is to support the recruitment process and to track receipt of your voucher, and will be stored separately and password protected in line with GDPR regulations. Once we have completed the interview, your details will be assigned a unique number to thereon refer to your data. This number will anonymise your personal information from the demographic information (trainee/qualified status and place of work), questionnaire, and transcript.

Will my participation be confidential?

Only members of the research team and responsible members of the University of Southampton may be given access to data about you for monitoring purposes and/or to carry out an audit of the study to ensure that the research is complying with applicable regulations. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to your data. All of these people have a duty to keep your information, as a research participant, strictly confidential.

Direct quotes from the interviews may be used in the write-up for the final research project but these will be anonymised. Participants may request for their responses to not be directly quoted.

What happens if I change my mind?

You have the right to change your mind and withdraw at any time without giving a reason and without your participant rights being affected. If you withdraw, we will destroy any data collected up to this point. Once your data has been anonymised, it will not be possible to withdraw your data. This will happen within one week of completing your questionnaire and interview.

Where can I get more information?

For more information about this study, please contact the researcher lf1n22@soton.ac.uk

What happens to results of the research?

The research is being submitted as part of a thesis for the completion of my doctorate in clinical psychology and it may be published in a peer-reviewed journal.

What happens if there is a problem?

If you remain unhappy or have a complaint about any aspect of this study, please contact the University of Southampton Research Integrity and Governance Manager (023 8059 5058, rgoinfo@soton.ac.uk).

Data Protection Privacy Notice

The University of Southampton conducts research to the highest standards of research integrity. As a publicly-funded organisation, the University has to ensure that it is in the public interest when we use personally-identifiable information about people who have agreed to take part in research.

This means that when you agree to take part in a research study, we will use information about you in the ways needed, and for the purposes specified, to conduct and complete the research project. Under data protection law, 'Personal data' means any information that relates to and is capable of identifying a living individual. The University's data protection policy governing the use of personal data by the University can be found on its website (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page).

This Participant Information Sheet tells you what data will be collected for this project and whether this includes any personal data. Please ask the research team if you have any questions or are unclear what data is being collected about you.

Our privacy notice for research participants provides more information on how the University of Southampton collects and uses your personal data when you take part in one of our research projects and can be found at http://www.southampton.ac.uk/assets/sharepoint/intranet/ls/Public/Research%20and%20Integrity%20Privacy%20Notice/Privacy%20Notice%20for%20Research%20Participants.pdf

Any personal data we collect in this study will be used only for the purposes of carrying out our research and will be handled according to the University's policies in line with data protection law. If any personal data is used from which you can be identified directly, it will not be disclosed to anyone else without your consent unless the University of Southampton is required by law to disclose it.

Data protection law requires us to have a valid legal reason ('lawful basis') to process and use your Personal data. The lawful basis for processing personal information in this research study is for the performance of a task carried out in the public interest. Personal data collected for research will not be used for any other purpose.

For the purposes of data protection law, the University of Southampton is the 'Data Controller' for this study, which means that we are responsible for looking after your information and using it properly. The University of Southampton will keep identifiable information about you for 0 years after the study has finished after which time any link between you and your information will be removed.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. Your data protection rights – such as to access, change, or transfer such information - may be limited, however, in order for the research output to be reliable and accurate. The University will not do anything with your personal data that you would not reasonably expect.

If you have any questions about how your personal data is used, or wish to exercise any of your rights, please consult the University's data protection webpage (https://www.southampton.ac.uk/legalservices/what-we-do/data-protection-and-foi.page) where you can make a request using our online form. If you need further assistance, please contact the University's Data Protection Officer (data.protection@soton.ac.uk).

Thank you.

Thank you for taking the time to read the information sheet and considering taking part in the research.

Appendix I Consent From

Consent Form (as appears on Qualtrics)

Below list will be tick boxes

- I confirm that I read the participant information sheet explaining the above study and I understand what is expected of me.
- I was given the opportunity to consider the information, ask questions about the study, and all my questions have been answered to my satisfaction.
- I agree to take part in this study and understand that data collected during this research project will be used for the purpose of this study.
- I understand that my participation is voluntary and that I am free to withdraw from this study at any time without giving a reason.
- I understand that if I withdraw from the study, it may not be possible to remove my data once my personal information is no longer linked to the study data. I understand that I can withdraw my data from the use in this study within a week following my participation in the interview.
- I understand that all personal information collected about me will be kept confidential unless required by law or relevant regulations (e.g., for the purpose of monitory the safety of this study).
- I understand that my anonymised data collected during this study will be shared with research partners collaborating on this research.
- I understand that my anonymised data collected during this study will be archived in a data repository so that it can be used for future research and learning.

Name:

Email address:

Appendix J Connection to Nature Scale

Connectedness to nature scale (Mayer & Frantz, 2004)

Please answer each of these questions in terms of *the way you generally feel*. There are no right or wrong answers. Using the following scale, in the space provided next to each question simply state as honestly and candidly as you can what you are presently experiencing.

1	2	3	4	5
Strongly disagree		Neutral		Strongly agree

____1. I often feel a sense of oneness with the natural world around me.
____2. I think of the natural world as a community to which I belong.
____3. I recognize and appreciate the intelligence of other living organisms.
____4. I often feel disconnected from nature.
____5. When I think of my life, I imagine myself to be part of a larger cyclical process of living.
____6. I often feel a kinship with animals and plants.
____7. I feel as though I belong to the Earth as equally as it belongs to me.
____8. I have a deep understanding of how my actions affect the natural world.
____9. I often feel part of the web of life.
____10. I feel that all inhabitants of Earth, human, and nonhuman, share a common 'life force'.
____11. Like a tree can be part of a forest, I feel embedded within the broader natural world.
____12. When I think of my place on Earth, I consider myself to be a top member of a hierarchy that exists in nature.
____13. I often feel like I am only a small part of the natural world around me, and that I am no more important than the grass on the ground or the birds in the trees.
____14. My personal welfare is independent of the welfare of the natural world.

Appendix K Interview Schedule

Study Title: Clinical psychologists' experiences of the benefits and barriers of working with nature.

Researcher: Lara Felder

ERGO number: 89835

Ask to see ID. Describe overview of interview - in three sections. Start transcription.

Any questions?

1. Overview of topic

- Please could you start by telling me what personally sparked your interest in working with or in nature?
  - Prompt: how long have you held this interest?
- Can you tell me about your professional experience of working with nature?
  - Prompt: when did you start doing outdoor work?
- What term do you prefer to use when describing nature in relation to clinical practice, and why?
- Do you draw on any training or research to inform your practice in this area?

2. Participant thoughts of benefits and barriers

- What do you perceive to be the benefits of working with and/or in nature in the context of our profession? Why do you view these as benefits?
  - Prompt: benefits for yourself as a practitioner and for your patients/clients.

- What do you perceive to be the barriers of working with and/or in nature in the context of our profession? Why are these barriers? How have you navigated these barriers?
- What has encouraged you to continue with your interest/practice?

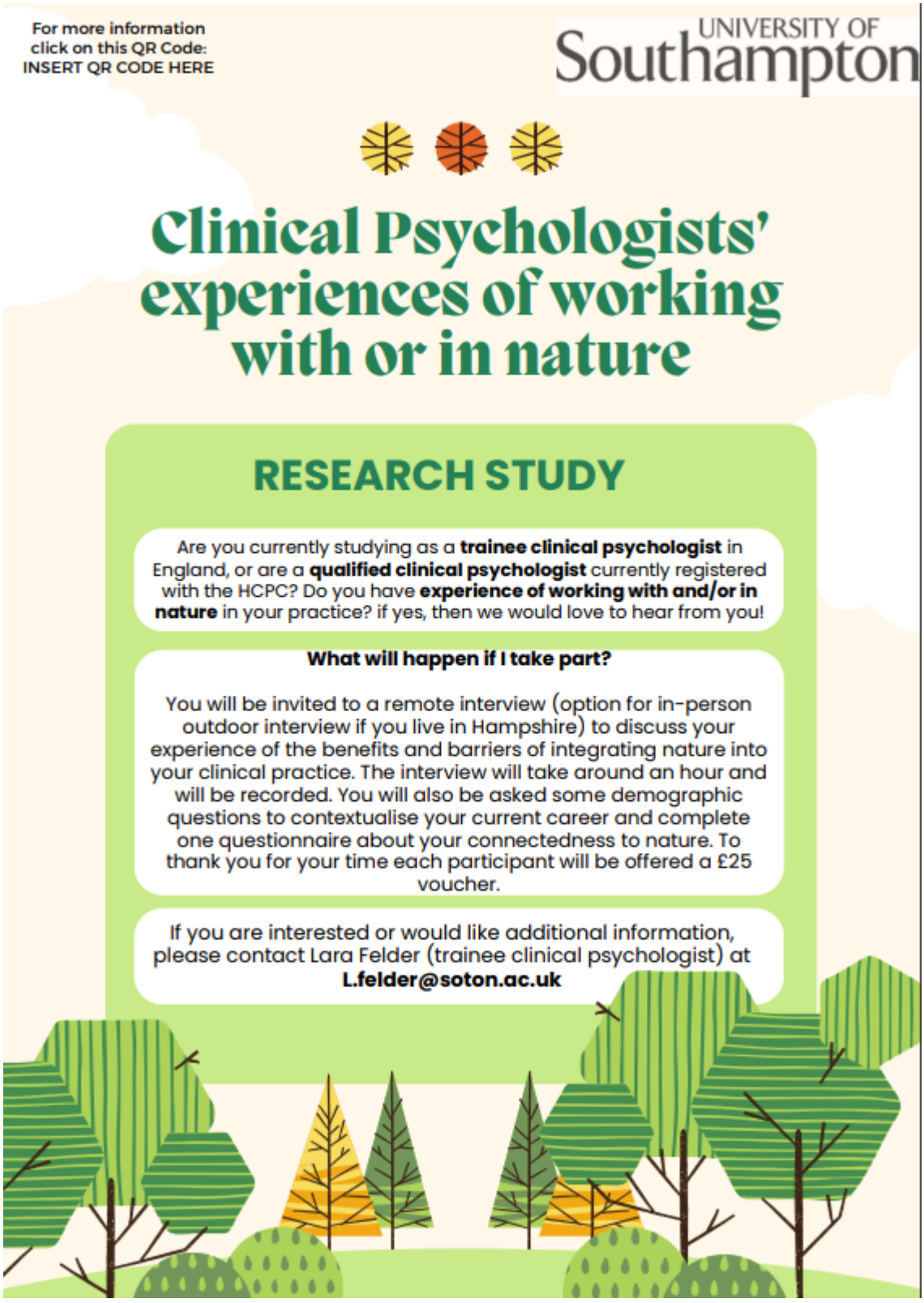
3. Next steps

- What developments would you like to see within the field of clinical psychology related to working with/in nature?
  - Prompts: across research, education, teaching & training, competencies, and policy (e.g., NICE).
- Consideration of equity, diversity, and inclusivity is important in clinical psychology. What has been your experience of working with nature specifically thinking about EDI?
  - Prompt: how do you think nature-based approaches would fit into this framework?

- Any other thoughts?

Voucher will be emailed to you. Debrief form too.

Appendix L Empirical Recruitment Poster



Appendix M Debrief statement

UNIVERSITY OF Southampton

Study Title: Clinical psychologists' experiences of the benefits and barriers of working with nature.

Researcher: Lara Felder

ERGO number: 89835

Debriefing Statement *(written)* (Version 3, 09/09/2024).

Thank you for your participation in this study, your contribution is greatly appreciated.

The aim of this research was to better understand clinical psychologists' experiences of working with nature and what they perceive to be the benefits and barriers of this. In addition, it was aimed to understand how psychologists navigate perceived barriers and how they would like the field of clinical psychology to progress. Your responses will help add to the literature on how clinical psychologists can integrate nature into clinical care, which then has potential to impact clinical practice, education, and policy.

Please be reminded that your data will be kept confidential, and it will be anonymised one week from your interview date, at which point you will no longer be able to withdraw your data from the study.

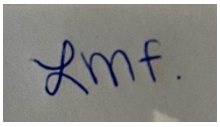
This data forms part of the completion of my thesis for my Doctorate in Clinical Psychology and may be published in a peer-reviewed article.

If you are interested in **further reading** in this topic area, I would recommend this book:

> Burns, G. W. (1998). *Nature-guided therapy: Brief Integrative Strategies for Health and Well-being*. Routledge.

If you would like to receive a copy of the final report of this study when it is completed, please feel free to contact the main researcher, Lara Felder.

Thank you for your participation in this research.

Researcher's Signature: 

Date: 09/09/2024

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)23 8059 3856, email fshs-rso@soton.ac.uk

Aftercare

If you are feeling distressed following the interview, you are encouraged to reach out to one of the support services below:

Mind (mind.org.uk)

Call the InfoLine to find specialist support in your area: 0300 123 3393

Shout (www.giveusashout.org)

Text SHOUT to 85258 to chat by test to a trained volunteer for confidential support 24/7.

Samaritans (www.samaritans.org)

Call 116 123 for support 24/7.

If the above signposting does not meet your needs and you feel that you need additional support, please contact the research team:

Lara Felder: L.Felder@soton.ac.uk

Dr Lisa Cant: L.A.Cant@soton.ac.uk

Dr Ali Bennetts: A.Bennetts@soton.ac.uk

Appendix N Coding Manual

Themes	Sub-themes	Codes
Holding a position of curiosity	A fluid definition of nature	• Using a flexible definition of nature is important • Our conceptualisation of nature influences our willingness to act • Working with animals • Mother Nature • Being in the wild • Copyrighted terms like farm therapy • Viewing nature as a living being (e.g., the mushrooms are my neighbour) • Nature work can be seen as silly, sift, or hippy-dippy • Public narratives are powerful and how they influence people • Witchcraft – history of female healers being oppressed • Native perspectives and views are different; viewing your country as a living being • Nature is alive – metaphor to religion or God • Nature is interconnected to everything • Nobody owns nature, we all have a responsibility to look after it • We need nature to survive as a species • Nature emulates life – helps us understand change • Nature connection is undeniable if you let it in
	Ways of integrating nature	• Using nature in an assessment • Person-centred activities • Nature as a metaphor • Nature as a safe place • Nature as an intervention • Nature as prevention • Nature-inspired resources • Being informed by the formulation • Nature as an adjunctive therapy • Offering nature as part of a bank of options • Making nature an invitation rather than a prescription • Nature-inspired architecture, bespoke paintings indoors, colours • Some of our work settings have increased our awareness of how important nature is and how much we value it • Clinic spaces and hospitals can feel artificial and unsuitable (e.g., no windows) • A chance to get away from an overwhelming hospital setting
	Adaptations to therapy	• Nature work can be amazing or overwhelming for neurodivergent populations • Nature offers a distraction – in a therapy room, the only space patients have is silence • Big N versus little n

		• We need more green spaces that are free and accessible • Different genders can have different experiences of being outdoors • Viewing nature as part of Maslow's hierarchy of needs • Exploration of how society views nature • There are different cultural values of nature • Being mindful of ability and disability intersecting with access to the outdoors • Socioeconomic status – most naturalistic provisions are private (e.g., equine therapy) • Deconstructing whiteness in the profession and how this intersects with outdoor work • Historical roots of psychology silencing indigenous female healers • The way forward needs to be collaborative and note a 'white nature project' • Nature extended an EDI framework rather than fitting into it • Critiques of EDI and social graces frameworks • Issue of class and access to outdoors (e.g., being trapped in sky scrappers on housing estates) • Acknowledging that nature can be unfair, unjust, and unkind • Need to account for physical health, temperature, fatigue, and transport
Connection versus disconnection	Having a relationship with nature	• Treating nature like a person • Not abusing nature • Not turning nature into a task or tool • Not glorifying the hardship that can come with nature (e.g., natural disasters) • Nature reminds us of our humanity • Animals are levelling – you learn respect, companionship, leadership • Using nature as a scaffold (e.g, to build relationships) • Relational medicine • Having a relationship with nature means having compassion for it and respecting it • Opposite of making nature gimmicky and intellectualizing it • Triad with nature
	Nature enables a shared experience	• Being children again – nature offers childlike joy • Being spontaneous and carefree • Viewing nature work as being creative • Nature connection is intuitive • Nature lets you put your guard down • Nature creates a shared experience between patient and therapist • Nature is a universal value • Nature breaks the ice • Nature as part of a systemic approach • Nature enabling engagement and connection • Nature facilitating hard conversations • Nature boots staff wellbeing and staff morale • There is a different social etiquette in nature

		• Difference in CPs own nature identity, affinity and CN
	Nature shifts how we understand and talk about distress	• Being outdoors is instinctive • Nature is symbolic • Nature makes me feel better • Nature slows things down • Nature to mediate trauma • Nature is grounding • Nature is regulating • Nature work can be trauma-informed • Working with the circadian rhythm • Human nature means being connected to nature • Avoid over-intellectualising our work • Nature-based approaches are more accessible – you don't even need to speak • Nature as a safe base (attachment) • Nature celebrates difference • We need to be around things that are alive – there's nothing alive in clinic rooms • Getting out of your head and into your body • Forensic settings highlight the disconnection with nature • Asking service-users what they need in their moment of crisis
	Working holistically	• The impact of nature on your nervous system • Experiencing – better quality of life • It can be fun • Primary and secondary gains in nature (e.g, accidental gains such as increased muscle tone and mobility) • Moving can support processing (e.g., in the context of neurodivergence and trauma) • Outdoor work is skill-based (transferable skills, learning to be helpful and useful) • Issue around the legitimacy of nature approaches since we're so used to talking therapies • We're moving away from talking therapies and toward the neuroscience on the mind-body approaches and somatic experiences • Patients who spend time in nature seem to understand CFT better • Observing nature and learning from it (e.g., seeing the FFF response in an animal) • The body has strong responses to the outdoors – visceral reaction • Nature imagery is powerful because our minds are powerful • We need to get out of our minds and into our bodies • Nature gives you energy • Nature impacts all your senses • Nature also has aesthetic enjoyment • Awe and beauty of being nature and just being

		• Connecting to nature could be scary – becoming in touch with how you feel and sitting in silence can be scary • Nature isn't about fixing, it's about listening to yourself and noticing • We have over-analysed what it means to be human • Our society tries so hard to avoid natural things, like ageing • Delivering experiential staff training on nature
Safety versus risk	Acknowledging the risks and barriers	• Nature can be threatening and scary • The weather can be a barrier • Doing a risk assessment is valuable and important, but it's people's response to having to do one that's a barrier (e.g., not wanting to bother or governance saying it would be too complicated) • We need protocols but they don't have to be too prescribed or controlled • Outdoor work is a different kind of risk (e.g. real challenge and real safety considerations; like being around a horse) • Nature can be less predictable and controllable • We need to be realistic – nature isn't for everyone • Worries about confidentiality • Fear of blame • Fear of consequences to staff • Fear that we will intellectualise nature • Funding barriers • Time is a barrier • Worried it's not medical enough • Hierarchy as a barrier • Lack of evidence base as a barrier • Lack of guidelines • Staff are too busy • Staff are afraid of judgement • Policy barriers • Service culture as a barrier • Feeling disconnected indoor
	Nature can feel safer	• Nature equalises power • Refugees connection to home – being in a clinic room could be terrifyingly foreign • Nature can be more predictable • Nature can feel safe, quiet, and private • Nature can be a blank slate • Nature invites psychological safety • It just makes sense/it's natural/logical to work outdoors • Nature is free • Our current models of working aren't inclusive so why not try something different • Turning to nature as a professional during times of adversity • It all comes down to perspective (what is riskier, indoors or outdoors?)

	Positive risk-tasking as a profession	• Governance can be a barrier (what's allowed and not) • Easier to ask for forgiveness than permission • Doing a risk assessment is valuable and important, but it's people's response to having to do one that's a barrier (e.g., not wanting to bother or governance saying it would be too complicated) • The more we do it, the more normalised it will be • There will always be practical considerations but we don't need to be nervous about it • We've become so risk-averse and afraid of consequences as a profession it's almost unnatural • What's within our comfort zone as CPs – it's ok if it's not for everyone • We need permission to do this safely • Change takes time and we cannot give up, we must avoid stagnation • Would actually be logistically helpful as nature work reduces pressure on clinic space • There are protocols (e.g., outdoor neuro rehab group) • Evidence-based practice doesn't work for difference because the research is WEIRD • Nature is more accessible than a medical clinic room • Practice-based research is critical (as opposed to waiting 10 years for evidence-based research to make it into guidelines) • There is a spectrum from EBP to PBE • The evidence-base is biased and flawed • We have the research showing that being stuck indoors on our phones is unhealthy • We don't need to standardise using nature • What is valid and acceptable is debatable • We have enough research to turn this into practice • It's the policy that makes staff feel restricted
Reflections on Power	Who gives you permission?	• Being a trainee versus qualified and how this intersects with working with nature • Power and privilege intersect with this work • Cultural humility and competence is relevant here • Staff feeling like they need a rationale to get buy-in • Patients might not know that this is an option • CPs have a responsibility to do research and use our education • Operational management in NHS hold too much power/barrier • Some locations have a willingness to work (green coordinator) • Discourse around how to convince the NHS that this is valuable work (needs a strong rationale) • We need more permission giving for staff to be outside • Picking our battles • Are we actually listening to patient feedback who are saying NHS buildings are often horrible • Being a CP is individual to some extent • Our work doesn't need to be revolutionary, we have agency to make small changes • How different voices are heard in the NHS

		• Who is in positions of leadership in the NHS • CPs have authority • We work within an MDT that has a say in the legitimacy of nature work • Taking a non-expert position is important here • It's ok if it's not for everyone, that's not what we're advocating • Change stars with leaders and ripples down • We need more critique on therapists' thinking they know best
	Breaking the echo chamber	• CPs are often stuck in an echo chamber and nature work breaks this • British culture doesn't value nature • Working outdoors is the bare minimum • Relevant for younger generations who are acutely aware of planet health • We adapt our practice anyway so why not expand it to nature work • Nature isn't viewed as a legitimate space • We need to redefine psychology • Nature work could be strange for children who would rather be on social media • One participant didn't think there are barriers, it's just 'not on trend' • Change requires time, energy, effort and money • How our profession is understood or misunderstood • There is a disconnect between people driving policy and change, and us • Our system is stuck we must question it and be innovative • What is our understanding of wellness and illness as a society and profession – this is what informs our interventions • NHS and NICE like things that are quantifiable and measurable • Links to patriarchy and societal norms – how norms are constructed in our society • We as a society have made nature feel unsafe and inaccessible • What are society's expectations of a CP and what we can do? • Learning from other cultures • Sharing learning across teams and trusts • Giving ourselves permission to work with the unknown • We need to practice with integrity • Psychologists are advocates, are influential, and it is a rewarding job • We are best-placed to lead the way forward here • We run a risk of being too medicalized as a profession • More teaching on Dclin • More research • Patient-led research and PPI is critical • CPs upskilling the MDT – building capacity to be creative • It's a collective responsibility • We need to shift attitudes which is harder than logistics and practicalities • Our language is important – it doesn't need to be called therapy, it could be community-based green care

		• Intersection with the climate crisis and mental health crisis and colonialism • Striving for continuous improvement and innovation • Do we need psychology-led services? • We need to keep building momentum • Holding hope and a vision for the future • The system can't make money from nature work