

Cultivating Wellbeing
A mixed methods exploration of the impact of a nature-based
intervention for mental wellbeing, from the perspectives of service
users, staff and social prescribers

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ABSTRACT

Aims:

This study aims to evaluate the effectiveness of a nature-based intervention (NBI), Together We Grow (TWG), in enhancing psychological wellbeing and quality of life among participants. It seeks to understand the experience of participation through both measurable outcomes and personal accounts.

Introduction:

This study aims to explore the perceptions of participants, social prescribers, and staff regarding the barriers and opportunities associated with Nature-Based Interventions (NBIs). Using a mixed-methods design that combines quantitative outcomes with qualitative insights, the study investigates the impact of NBIs on individuals receiving primary or secondary mental health care services.

Methodology:

A convergent mixed methods design was adopted. Quantitative data were collected using pre- and post-intervention surveys, which included validated measures of psychological wellbeing (PHQ-9, GAD-7, SWEMWBS, and UCLA Loneliness Scale) and quality of life (WHOQOL-BREF). Qualitative data were gathered through semi-structured interviews with participants and staff. 12 service user participants were recruited, of whom 9 completed both pre- and post-test measures and a semi-structured interview. Quantitative data were analysed using paired t-tests and descriptive statistics, while reflexive thematic analysis (RTA) was employed for qualitative data.

Results:

Quantitative findings indicated statistically significant improvements in overall anxiety,

loneliness, and wellbeing scores following at least 12 weeks of participation at TWG.

Qualitative analysis revealed key themes including “Reclaiming Health”, “Finding Calm”, “Temporal Integration”, Building Self Agency and “Belonging”. Participants described NBIs as accessible, restorative, and meaningful, particularly in the context of stress and isolation.

Discussion:

Findings suggest that NBIs can positively influence wellbeing by offering psychosocial benefits. The mixed methods approach highlighted how measurable changes in wellbeing are enriched by understanding personal narratives and contextual factors. Implications include the need for broader integration of NBIs in health and social care.

Glossary of Key Terms

Eco-psychology

A field of psychology concerned with the interdependence between humans and the natural environment, emphasizing how disconnection from nature can contribute to psychological distress, and how reconnection supports well-being (Roszak, 1995).

Eco-therapy

A therapeutic approach that applies ecological and nature-based principles to psychological treatment, incorporating structured or unstructured contact with nature to promote mental health recovery (Jordan & Hinds, 2016).

Nature-based intervention (NBI)

An umbrella term for structured programmes or practices that utilise natural environments, green spaces, or interactions with animals and plants as intentional interventions to improve health outcomes (Bragg & Atkins, 2016).

Social and Therapeutic Horticulture (STH)

The purposeful use of gardening, plant cultivation, and horticultural activities to achieve specific therapeutic or rehabilitative outcomes in mental, physical, and social health (Sempik et al., 2003).

Mental illness

A clinically diagnosable disorder of thought, mood, perception, or behaviour that causes significant distress or impairment in personal, social, educational, or occupational functioning (World Health Organization [WHO], 2018).

Common mental illness (CMI)

Mental health conditions of high prevalence in the population, typically including depression, anxiety disorders, stress-related disorders, and mild to moderate affective disorders, most of which are treated in primary care (National Institute for Health and Care Excellence [NICE], 2011).

Severe mental illness (SMI)

A category encompassing enduring and disabling psychiatric disorders such as schizophrenia, schizoaffective disorder, bipolar affective disorder, and severe, recurrent major depressive disorder. These conditions often require long-term specialist management and are associated with significant functional impairment (NHS England, 2014).

CHAPTER ONE

Chapter Outline

This study aims to investigate the potential benefits of a horticultural, nature-based intervention (NBI) for people experiencing mental illness (MI) and receiving treatment at a primary or secondary level of health care. This chapter will explore the evidence base for NBIs, in particular those based on social and therapeutic horticulture principles (STH), outlining their theoretical and policy background, and then presenting a narrative synthesis of the literature. The final part of the chapter provides a rationale for the study, hypotheses and research questions.

Background to Study

Mental Health in the UK

Mental ill-health is the most significant single cause of disability in the UK, accounting for 22.8% of disease burden and costing the UK economy £118 billion annually, around 5% of UK GDP (McDaid & Park, 2022). According to the most recent Adult Psychiatric Morbidity Survey (APMS, 2014), 39% of adults aged 16-74 in England were accessing mental health treatment in 2014, up from 24% in 2007. NHS Digital collects data on people in contact with NHS-funded secondary mental health, learning disability and autism services. The 2023/24 bulletin estimates that 6.6% of people in England were known to be in contact with these services (NHS Digital, 2024), compared to 6.3% in 2022/23 and 5.8% in 2021/22. At the same time, recent reports highlight significant shortages in trained staff and resources, long waiting lists, and a lack of inpatient psychiatric beds; this confluence of factors results in a cycle of frequent discharges and readmissions for some individuals, often referred to as “revolving door” service users (Gillard et al., 2022; BMA, 2024).

The growing demand for mental health services in the UK provokes questions about the effectiveness of existing treatments, and suggests a need for new, more effective therapies or complementary interventions. There is now significant evidence that increased exposure to nature or restorative environments can positively impact mental wellbeing (Coventry et al., 2021; Bratman et al., 2019; Pritchard et al., 2020; Barton et al., 2016), and NBIs have been evidenced as cost-effective, sustainable and low-carbon alternatives to traditional treatments (Pretty & Barton, 2020; Whitburn et al., 2020; Liu et al., 2022). Considering current resource and staffing shortages, these studies suggest integration of NBIs as a core component of mental health care might provide a scalable and sustainable complement to existing treatment approaches.

Historical context

As far back as Hippocrates and the ancient Greeks, exposure to open spaces, parks, and gardens has been valued for its beneficial effects on mental and physical health (Jackson, 1999). Over time, the “medical” approach to healing developed, and natural resources such as sulphur and arsenic were extracted and used as medicines. Compounds such as morphine were formulated from natural sources. However, a belief in the benefits of nature exposure for patients persisted, with Florence Nightingale’s “Environmental Theory” espousing the value of cleanliness, fresh air, and natural light in the sickroom, including the use of plants to replace carbon dioxide with oxygen (Nightingale, 1860). In the nineteenth century, the “West Cure” was popular in the US, prescribed primarily for men with neurasthenia (then a common diagnosis of nervous exhaustion). Participants, including Theodore Roosevelt, Walt Whitman and Thomas Eakins, were sent “out West” to engage in activities such as cattle wrangling and roping horses, the idea being to remove them from the perceived stresses of urban life and immerse them in a natural and physically demanding environment (Franco, Shanahan & Fuller, 2017).

Up until the nineteenth century, the treatment of insanity or “lunacy” in England was notoriously harsh, and the London Bethlem Royal Hospital became synonymous with the inhumane treatment of its patients (Scull, 1994). Reflecting a cultural shift in approaches towards mental ill health, the 1808 “County Asylum Act” permitted counties to build asylums providing more humane care for pauper “lunatics”, removing them from workhouses and prisons. This was followed by the “Lunatics Act” of 1845, which enshrined the importance of quality, effective treatment in law. Patients were encouraged to enjoy landscaped surroundings and were often given the freedom to work outside. Sarah Rutherford, in her exploration of the Victorian treatment of mental ill-health, notes that asylums between 1845 and 1915 developed landscaped gardens and were envisioned as purpose-built therapeutic estates (Rutherford, 2005). After the 1845 Act, there was one such “therapeutic estate” in every English county, with London having twenty such asylums.

After World War One, the War Office estimated 80,000 veterans were suffering from “war neuroses” or “shell-shock” due to their combat experiences (Earlam, 1998). Nature-based therapeutic activities in centres such as Craiglockhart Hospital in Scotland were prescribed for veterans and civilians suffering the adverse effects of conflict (Leese, 2002; Summerfield, 2001). Recent years have seen a renaissance in therapeutic nature exposure for veterans with Post Traumatic Stress Disorder (PTSD) (Wheeler et al., 2020). Rather than being entirely innovative, therefore, NBIs can be seen as a modern expression of longstanding beliefs about the essential and reciprocal relationship between humans and the natural environment, as well as its benefits for our mental health.

Nature-Based Interventions in mental health: Definitions and Scope

Ecotherapy

Ecotherapy originated within ecopsychology, a discipline that emerged in the 1990s in response to growing concerns about environmental degradation and human disconnection from the natural world (Roszak, 1992). Ecopsychology proposes that psychological wellbeing is inherently connected to the health of the planet, as humans are part of an interdependent ecological system (Louv, 2005; Plotkin, 2008; Buzzell & Chalquist, 2009).

Ecotherapy translates these theoretical ideas into practice through structured, nature-based activities designed to enhance mental well-being (Hinds & Jordan, 2016). Although the terms are sometimes used interchangeably, ecotherapy is best understood as a subset of NBIs rather than a synonym. NBIs encompass a broader spectrum of interventions that purposefully engage people with nature to achieve a variety of outcomes: therapeutic, physical, social, or educational, whereas ecotherapy specifically situates this engagement within a psychotherapeutic or relational framework (Jordan & Hinds, 2016; Buzzell & Chalquist, 2009; Mind, 2023). Within this literature, “nature” may refer to many types of environments—from gardens and urban parks to forests, wetlands, or coastal areas. Some approaches even incorporate indoor or small-scale greening, such as caring for houseplants or community plots (Mind, 2023).

The term “therapy” itself is contested. Revell et al. (2014) distinguish between therapeutic exposure to nature (e.g., community gardening or nature walks) and formal psychotherapy conducted in natural settings, where the environment functions as a “third space” mediating therapeutic interaction (Berger & McLeod, 2006; Hinds & Jordan, 2016). Buzzell (in Hinds & Jordan, 2016) further differentiates between Level 1 eco-therapies, which use nature as a supportive backdrop for human healing, and Level 2 eco-therapies, which promote reciprocal, eco-centric relationships and environmental responsibility.

Nature-Based Interventions (NBIs)

NBIs have gained prominence in public health and applied psychology as structured, intentional programmes designed to enhance wellbeing and recovery through engagement with nature (Shanahan et al., 2019; Coventry et al., 2021). Unlike unstructured exposure to green space, NBIs are delivered with a therapeutic, social or health-related rationale, defined outcomes, and trained facilitation (Bragg & Atkins, 2016). NBIs include several subcategories. For example:

Horticultural activities, which involve gardening and plant cultivation for health or social outcomes, form a large proportion of NBIs and encompass both Social and Therapeutic Horticulture (STH) and Horticultural Therapy (HT) (Sempik et al., 2003).

Forest bathing and woodland therapy, originating from Japanese and Scandinavian practices, use mindful immersion in forest environments to reduce stress and restore attention (Hansen et al., 2017).

Animal-assisted interventions, such as equine or care-farm programmes, enhance emotional regulation and social functioning (Hoagwood et al., 2017).

Wilderness and adventure therapy programmes promote resilience and self-efficacy, particularly among young people (Ferneer et al., 2017).

While green exercise, defined as physical activity undertaken in natural settings (Pretty et al., 2007), can support mental and physical wellbeing, it is not inherently therapeutic unless structured with explicit psychological or social aims. NBIs, therefore overlap with, but are conceptually distinct from, green exercise initiatives.

In summary, NBIs form a broad category of interventions that use contact with nature to support various forms of wellbeing, while ecotherapy represents the explicitly therapeutic branch of this wider field. The rationale underpinning NBIs reflects the ecotherapy paradigm, which views wellbeing as embedded within an essential human–nature

relationship, suggesting reconnection with natural environments can enhance psychological restoration, self-regulation, resulting eventually in enhanced connection with nature and environmental stewardship (Jordan & Hinds, 2016; Roszak, 1995; Soryte et al., 2023; Knowlton & Balmford, 2017).

Social and Therapeutic Horticulture (STH)

Within the broader field of gardening for health, approaches range from informal community gardening and wellbeing initiatives to structured STH and formal Horticultural Therapy (HT) programmes (Thrive, 2019). This range reflects differences in therapeutic structure, practitioner training, and the degree of clinical involvement rather than a hierarchy of efficacy. Social and Therapeutic Horticulture (STH) represents one of the most established forms of NBI. It is defined as the purposeful use of horticultural activity to achieve clinically relevant improvements in mental, physical, and social health (Sempik et al., 2003).

Systematic reviews demonstrate that social and therapeutic horticulture (STH) can reduce symptoms of depression and anxiety, enhance social inclusion, improve occupational functioning, and increase subjective wellbeing (Kamioka et al., 2014; Wolsko & Hoyt, 2012). Meta-analyses further indicate significant positive effects on mood and psychological wellbeing, while systematic reviews report improvements in self-esteem and quality of life; however, limitations remain regarding sample size and methodological rigour (Wood et al., 2025; Genter et al., 2015; Xu et al., 2023). Qualitative studies identify mechanisms such as restoration through natural settings, nurturing living organisms, social connectedness, and a sense of mastery or identity through skill acquisition (Gonzalez et al., 2011; Smidl et al., 2017; Cipriani et al., 2018; Pieters et al., 2019).

Clinically, STH is relevant across a spectrum of mental health presentations. For individuals with common presentations such as anxiety or depression, participation may support recovery and social re-engagement. For those with severe and enduring mental

illness, structured, staff-supported horticultural activity can provide stabilising routines and vocational rehabilitation opportunities. Despite the growing evidence base, realist and systematic reviews emphasise the need for greater theoretical clarity, consistent terminology, and high-quality, longitudinal trials (Leck et al., 2015; Bragg & Atkins, 2016; Kamioka et al., 2014; Genter et al., 2015; Annerstedt & Währborg, 2011).

The UK Mental Health service framework and Green Social Prescribing (GSP)

In the UK, mental health services are divided into two main levels: primary care and secondary care. Primary care is the first point of contact for individuals seeking mental health support, involving general practitioners (GPs), practice nurses, and Talking Therapy for Anxiety and Depression (TTAD, formerly known as IAPT). The primary care level focuses on the initial assessment, diagnosis, and management of common mental illness (CMI). Secondary care involves more specialised and intensive mental health services for people with serious mental illness (SMI). Secondary care includes both inpatient services for acute episodes and outpatient and community-based services for ongoing treatment and support.

Another term central to this thesis is social prescribing (SP), designed to be a pathway for service users to be linked to holistic, person-centred health and wellbeing projects. This approach enables GPs, nurses, and social prescribers to refer patients to non-clinical services that support their wider social, emotional, and practical needs. Inherent in the model is the recognition that many factors influencing mental health lie beyond traditional medical care, for example, loneliness, social isolation, housing difficulties, and financial stress. Through social prescribing, individuals can be connected to community-based activities and support, with the overall aim of improving wellbeing, reducing health inequalities, and alleviating pressure on the healthcare system by addressing the social determinants of health. Green Social Prescribing (GSP) aims specifically for professionals to link people with activities

based in nature to improve their mental or physical health (GSP Toolkit, National Academy for Social Prescribing, [NASP] 2022).

Application of GSP in mental health services

In mental health services, NBIs and STH have been applied across primary and secondary care. In the community, interventions provide structured engagement with nature to support recovery and wellbeing, whilst for inpatients, horticultural and mindfulness-based NBIs have been implemented to enhance therapeutic relationships, encourage ownership of recovery and reduce anxiety and social isolation as well as staff burnout (Roberts & Fisher, 2024; Joubert et al., 2024). NBIs in inpatient settings are often treated as a physical activity (PA), known to contribute to both mental and physical recovery (Coffey et al., 2019; Lekka et al., 2021). However, access to PA is frequently limited by staffing shortages, restrictive institutional policies, and lack of patient involvement in planning, with consequences including boredom, anxiety, and increased risk of aggression or self-harm (Foye et al., 2020). These findings highlight suggest that NBIs may be most effective if embedded within services and care plans, accessible, and patient-centred.

For service users in the community, policy-level initiatives have sought to formalise NBIs through Green Social Prescribing (GSP), with GPs and social prescribers encouraged to issue “green prescriptions” linking patients to nature-based activities (van den Berg, 2017). Interventions appear most effective when delivered over 8–12 weeks, with weekly sessions of 20–90 minutes in natural settings (Coventry et al., 2021; Owens & Bunce, 2022). The NHS Long Term Plan (2019) and the Advancing Mental Health Equalities Strategy (AMHES, 2020) supported this approach, and government investment (£4m in 2020; £5.77m cross-government programme in 2021) established pilot sites for GSP, offering activities such as gardening, conservation, and outdoor exercise (Department of Health and Social Care [DHSC], 2023; NASP, 2022; Darcy et al., 2025).

In addition to formalised GSP, evidence from NASP indicates that many people appear to engage with NBIs and social and therapeutic horticulture (STH) through self-referral or community pathways (NASP, 2023). Thrive, a leading UK charity in the field, similarly notes that individuals frequently discover and join local programmes independently, often through community networks or word of mouth (Thrive, 2024). As policy recognition of NBIs grows, it is likely that the balance between self-initiated participation and formal prescription will continue to evolve.

In conclusion, the broader integration of GSP into statutory health systems appears uneven. Research highlights that although benefits of nature exposure for mental health are well-evidenced, NHS commissioning of NBIs and STH is constrained by barriers such as limited awareness, limited information available to practitioners, financial pressures, and questions of evidence robustness (Wood et al., 2024). NICE (2019) supports meaningful activity for both inpatient and community care, but in the absence of clear national guidance embedding NBIs and STH within mental health services, inappropriate referrals or prescriptions have been made for individuals with very complex needs without sufficient clinical oversight (NASP, 2023; DEFRA, 2023).

Can Green Social Prescribing Interventions Effectively Support Mental Health?

As noted above, over the past decade, UK health policy has increasingly recognised the role of nature in supporting physical and mental health. The 2011 White Paper (DEFRA, 2011) committed to strengthening human–nature connections, tackling inequalities in access to green space, and creating more opportunities for public engagement. Government thinking has been based on research suggesting NBIs can enhance wellbeing, reduce stress, and potentially prevent mental illness, while also addressing wider health inequalities (White et al., 2019; van den Berg, 2017; Bowler et al., 2010; Bratman et al., 2019; Bragg & Atkins, 2016; Darcy et al., 2024/2025). Benefits to physical and mental health include reductions in

depression and anxiety, and increased positive affect, alongside social benefits such as a sense of purpose, connection, and empowerment (Baxter et al., 2022; Joseph et al., 2023; Yuan et al., 2021; Hartig et al., 2014; Coldwell & Evans, 2018).

Critique of GSP initiatives

As mentioned previously there is evidence that only a proportion of individuals access NBIs through formal GSP pathways, with uptake highly variable across regions and populations (Polley & Pilkington, 2020; Dayson, 2022). Moreover, critiques highlight fragmented provision, inconsistent evaluation, and limited scalability (Bragg & Atkins, 2016; Bickerdike et al., 2017; Husk et al., 2019, 2020; Carnes et al., 2017; Pescheny et al., 2022; Kiely et al., 2022). Practical barriers in the form of unequal access to green space, transport difficulties, staffing shortages, and referral hesitancy further constrain delivery (Fixsen & Barrett, 2022; Surrey Heartlands ICS, 2023).

Broader concerns focus on the risk that SP risks medicalising social problems, shifting responsibility onto individuals, and potentially exacerbating inequalities (Brown & Aylett, 2025; Rafiei et al., 2024). Poole and Huxley (2024, p. 30) note: “Social prescribing is poorly defined, and there is little evidence for its effectiveness. It cannot address the social determinants of mental health... Social prescribing gives a false impression of addressing social factors, and as such is counterproductive.”

Theoretical models for NBIs

The body-brain connection

The body–brain connection is not a single, unified theory but rather a conceptual framework supported by multiple interdisciplinary models of the bidirectional relationship between physiological and psychological processes. Several theories underpin the perspective that mental states, emotions, and social experiences both influence and are influenced by bodily systems such as the nervous, endocrine, and immune systems, including Polyvagal

Theory (Porges, 1995, 2007); Embodied Cognition Theory (Lakoff & Johnson, 1999; Barsalou, 2008), which proposes that cognitive processes are grounded in sensory and motor experiences; and Interoception Theory (Craig, 2002; Critchley et al., 2004), which highlights the role of internal bodily awareness in emotional and self-regulatory processes. Collectively, these frameworks emphasise that the brain and body function as an integrated system, a view that aligns with holistic and biopsychosocial approaches to health and wellbeing.

Ohrnberger et al. (2017) argue that effective mental health interventions must therefore also address physical health. Long-term mental ill health is frequently associated with conditions such as hypertension, obesity, cardiovascular disease, and diabetes – all of which can contribute to social isolation, loneliness, and further psychological distress (DHSC, 2011). A recent review by Helen Seers (2022) for Natural England highlights growing empirical evidence that NBIs yield notable physical health benefits, including reduced blood pressure and heart rate, weight loss, and pain reduction, which are likely linked to decreased muscle tension and lower cortisol levels. These physical outcomes are often observed alongside reductions in anxiety, depression, and stress (Pretty & Barton, 2020; Barton et al., 2017; Buck, 2016; Seers, 2022).

In addition to the benefits of nature exposure, researchers and health professionals have investigated the potential impact that directly engaging in gardening or horticultural tasks might have on mental and physical wellbeing. Unruh and colleagues (2004) note that horticulture can assist terminal cancer patients by mirroring the life-cycle process, whereby birth, maturation, and death can be initiated, supported, and to some extent controlled (or at least appreciated in a deeper context) by participants.

The authors suggest that involvement and observation of these processes can make NBIs uniquely beneficial for those facing physical, mental, emotional or spiritual life crises. Horticulture encompasses a range of activities, including sowing, planting, composting,

thinning, pruning, checking for pests and diseases, and protecting vulnerable plants from predators. These activities are deeply embedded in our language; we speak of “green shoots” (of recovery), “reaping what we sow”, “making hay while the sun shines”, and the “seeds of success”. The life cycle processes of nature offer rich metaphors to reflect human processes of healing and renewal; trees shedding leaves in autumn followed by regrowth in spring, and butterflies’ metamorphoses from egg to larva to pupa to fully grown adult.

Biophilia Hypothesis

Wilson’s (1984) biophilia hypothesis suggests that humans possess an innate affinity with the natural world, shaped by evolutionary dependence on healthy ecosystems for survival. He argues that psychological distress often reflects a failure to connect with this broader ecology, exacerbated in modern societies by artificial lighting, reduced outdoor activity, and detachment from seasonal rhythms. Empirical support is provided by van den Born et al. (2024), whose review of 12 studies across four continents revealed consistently high levels of biophilic traits, suggesting cross-cultural validity as proposed by Wilson. Grinde and Patil’s (2009) review of 50 empirical studies suggests exposure to, or even representations of, nature supports wellbeing, whereas its absence creates “discord.” The authors conclude biophilia traits can be strengthened or weakened by experience, suggesting biophilia is dynamic rather than static. This insight reframes NBIs not simply as tapping into a fixed, innate tendency but as interventions that can cultivate and encourage biophilic responses through repeated engagement, resulting in enhanced well-being.

Similarly, Richard Louv’s (2005) concept of “nature deficit disorder” (NDD) highlights the potential for socio-cultural suppression of biophilia, suggesting that if there is a universal biophilic trait, it may be either encouraged or suppressed by environmental experience and socialisation. Louv introduces the idea of “biophobia”, where some individuals, particularly young people, can develop an aversion to nature, with implications

for creativity, attention, and mental health. However, Louv's concept of NDD lacks diagnostic rigour and has been described by some as a rhetorical device rather than a scientific construct (Dickinson, 2013).

A recent meta-analysis of 49 studies (n= 3,201) by Gaekwad and colleagues (2022) provides some empirical support for the biophilia hypothesis, demonstrating that exposure to natural environments produces medium-to-large improvements in positive affect and reductions in negative affect, compared with urban settings. However, the meta-analysis also highlights several important gaps in the current evidence base for the biophilia hypothesis. The studies identified varied widely in how "nature" is defined and in the measures used to assess outcomes, limiting comparison across research. Many experiments relied on short-term, laboratory-based exposures with small, homogeneous samples, while few examined long-term or real-world effects. The underlying mechanisms linking nature exposure to emotional wellbeing remain theoretically under-specified, and moderators such as baseline stress or demographic factors are rarely tested. The authors therefore identify a need for greater theoretical clarity, consistent definitions of "nature," standardized mood and physiological measures, and robust longitudinal designs to deepen understanding of how and for whom biophilic experiences bring psychological benefits (Gaekwad et al., 2022).

Attention Restoration Theory (ART)

Kaplan and Kaplan's (1989, 1995) Attention Restoration Theory (ART) identifies cognitive mechanisms underlying nature's restorative effects. It proposes that modern life depletes "directed attention", the capacity to focus on tasks despite distractions, leading to fatigue, irritability, and reduced cognitive performance. Natural environments restore this attentional capacity through four key components: being away (psychological distance from daily demands), extent (perceived coherence and scope of the environment), soft fascination

(gentle, effortless attention), and compatibility (fit between environment and individual needs). Together, these support cognitive recovery and self-regulation.

A study by Lee et al. (2018) provides some empirical support for the idea that nature-based micro-breaks can facilitate cognitive resource recovery providing mood and performance benefits, in line with ART's assumptions. The authors applied ART in a micro-break/work context and applied view coherence (how the orderly elements of the view assisted sense making) and regulatory effort as mediators. Further experimental and quasi-experimental studies do suggest that brief exposure to natural settings can enhance working memory, task performance, and mood recovery compared to urban or built environments (Berman et al., 2008; Ohly et al., 2016; Stevenson et al., 2018). Eye-tracking and neuroimaging research has further linked natural scenes to reduced prefrontal activation, consistent with attentional restoration (Martínez-Soto et al., 2019).

In their comprehensive systematic review, Ohly et al. (2016) evaluated over 180 studies and found moderate support for ART's predictions: nature exposure was generally associated with improved attention, working memory, and cognitive performance. However, the review also highlighted substantial methodological limitations. Many studies were small, cross-sectional, or lacked active control conditions, making it difficult to determine causality. Measures of "attention restoration" and exposure to nature were often inconsistent, with many using laboratory simulations of nature rather than real-world settings. Ohly and colleagues concluded that ART remains a useful framework, but there is a need for more rigorous, theory-driven, ecologically valid longitudinal research to clarify when, how, and for whom exposure to natural environments supports cognitive restoration.

Joye & Dewitte (2018) also argue that while ART has shaped understanding of nature's cognitive benefits, it lacks theoretical clarity and empirical consistency. Its key concepts—directed attention, fatigue, soft fascination and restoration—are vaguely defined

and inconsistently measured. The authors also challenge the idea that all natural settings are restorative, noting that contextual, emotional, and individual factors play major roles. ART's limited integration with cognitive neuroscience and emotion research has led to an overly narrow focus on attention, despite modern views recognising multiple interacting attentional systems (Kaplan & Berman, 2010) and these authors advocate for a more biologically grounded framework explaining the emotional, physiological, and psychological mechanisms of restoration.

Further critiques highlight methodological issues such as reliance on self-report data and inconsistent cognitive findings (Hartig et al., 1997; Bowler et al., 2010). The simplistic natural–urban divide is also questioned, since urban parks can be restorative and natural settings may evoke discomfort depending on personal and cultural meanings (Herzog & Rector, 2009; Ratcliffe & Korpela, 2016). Additionally, ART overlooks active, social, and embodied engagement with nature (Franco et al., 2017; Marselle et al., 2021), even though restoration often occurs through shared activities that foster belonging and social connection (Marselle, 2013; Grahn et al., 2021).

Stress Reduction Theory (SRT)

Ulrich's (1983) Stress Reduction Theory (SRT) offers a complementary explanation for the psychological benefits of nature, emphasising affective and physiological processes rather than cognitive mechanisms. SRT proposes that natural settings elicit an automatic “rest and digest” response, activating the parasympathetic nervous system and downregulating the hypothalamic–pituitary–adrenal (HPA) axis. This produces measurable decreases in heart rate, blood pressure, and cortisol, leading to rapid stress recovery (Ulrich et al., 1991; Smith & Vale, 2006). Subsequent research has confirmed that exposure to natural scenes, whether real or virtual, can lower physiological arousal within minutes (Brown et al., 2013; Frumkin et al., 2017).

More recent work situates SRT alongside the biophilia hypothesis. Greymayne and colleagues (2023) conducted a meta-analysis of 47 experimental studies with a combined sample of 2,430 participants, comparing exposure to “natural” versus “urban” environments and measuring physiological stress responses (e.g., heart rate, blood pressure, cortisol) to each. The authors conclude that exposure to natural environments produced a small to medium effect size for reducing physiological stress compared to urban settings and interpret these results as broadly supportive of both the biophilia hypothesis and SRT. As discussed above, social, cultural, and technological factors can attenuate and disrupt biophilic tendencies, suggesting NBIs can function as corrective experiences that reignite latent biophilic responses through structured, meaningful contact with the natural world. Thus, SRT and biophilia together provide a biopsychological rationale for NBIs, situating them as mechanisms for restoring the emotional affinity with nature needed for increased physiological calm.

Despite its strengths, SRT has limitations. The boundaries between SRT and ART can be blurred and both theories neglect social dynamics; both attentional and stress responses can be socially mediated through shared walks or group activities. SRT’s focus on individual physiology overlooks contextual moderators such as belonging, safety, and shared identity that influence stress responses and may determine whether an environment feels genuinely restorative (Haslam et al., 2009; Joye & van den Berg, 2011; Marselle, 2013; Grahm et al., 2021).

SRT has been further criticised for deterministic assumptions of universal positive, or biophilic, responses to nature, ignoring individual and cultural variability (Joye & van den Berg, 2008). A green space perceived as tranquil by some may evoke fear in others, depending on prior experience or social context. Much of the supporting evidence also relies

on short-term laboratory or virtual exposure studies, which limit ecological validity (Mostajeran et al., 2023; Xu et al., 2024).

Calm and Connection Theory

Grahn et al.'s (2021) Calm and Connection Theory introduces a neuroendocrine dimension, proposing that exposure to safe, familiar natural environments stimulates the oxytocinergic system, reducing cortisol and enhancing trust, social bonding, and emotional stability (Neumann, 2002; Olff et al., 2013). This helps explain why group-based NBIs may be particularly effective, as they combine the biochemical effects of nature with the social benefits of shared experience.

While promising, evidence directly linking nature exposure to oxytocin release remains limited, and not all individuals experience nature as safe or calming. There is also a risk of reductionism if complex biopsychosocial processes are reduced solely to neurochemical pathways. Nonetheless, the theory aligns with the Social Cure framework, which highlights how shared social identities foster health through belonging, purpose, and social support (Jetten et al., 2012). At the same time, it highlights the potential for social curse dynamics: if social groups are conflictual or exclusionary, nature-based settings may amplify stress rather than alleviate it.

Place Attachment

Place Attachment theory builds on Bowlby's attachment theory (1969), proposing that individuals form emotional bonds with places that provide security and continuity (Brown & Perkins, 1992; Scannell & Gifford, 2010). These attachments are shaped by identity, culture, and lived experience, and have been shown to mediate wellbeing, resilience, and environmental stewardship (Lewicka, 2011; Joschko et al., 2023). Scannell and Gifford (2010) conceptualise place attachment through a tripartite model connecting person, place, and process dimensions. This framework highlights that attachment depends on *who* is

connected (individual or collective identity), *what* aspects of the place are valued (physical or social features), and *how* attachment operates through emotional, cognitive, and behavioural processes. In therapeutic contexts, encouraging individuals to identify a personal “nature-place” can foster psychological security (Palsdottir, 2014), with preferences often reflecting evolutionary landscape theories such as Prospect-Refuge Theory (Appleton, 1996) and Savanna hypothesis (Orians 1980, 1986).

Critiques of place attachment highlight several limitations. First, research often privileges positive attachments, neglecting negative or ambivalent experiences of place such as loss, displacement, or environmental injustice (Lewicka, 2011; Alirhayim, 2023). For migrants, displacement can weaken self-esteem and hinder new attachments, while social tensions may further alienate individuals from their surroundings. In such cases, NBIs centred on “place bonding” may inadvertently highlight exclusion rather than inclusion, a “social curse” effect (Kellezi & Reicher, 2012). The social curse effect refers to situations where belonging to a social group or identifying strongly with it has negative psychological or health consequences; for example, when group membership brings stigma, discrimination, exclusion, or reinforces harmful norms. The social curse is the “dark side” of the social cure idea, which usually emphasizes the benefits of social identity for wellbeing (Haslam et al., 2018).

As a further critique of the place attachment literature, some argue that the “person” dimension is overemphasised, neglecting how structural inequalities and spatial dynamics shape the accessibility and meaning of place (Lewicka, 2011). Referring to Scannell and Gifford’s (2010) tripartite framework, Lewicka (2011) suggests that research here tends to overemphasize the “personal” dimension (e.g., how individuals feel attached), while neglecting the structural inequalities and spatial dynamics that condition whether certain groups can form positive attachments at all. This is where the “social curse” again emerges;

attachment and identity can actually magnify disadvantage when broader inequalities (e.g., housing precarity, racism, marginalisation) are at play.

Thus, while place attachment provides valuable insight into how nature supports identity and belonging, it must be applied mindfully, with attention to its potential for both positive and negative outcomes, especially in diverse or marginalised populations (Eckersley, 2017).

Integrating Theories with Social Cure/Curse Perspectives

Together, these models—Biophilia, ART, SRT, Place Attachment, and Calm and Connection—demonstrate that nature has the potential to benefit wellbeing through multiple pathways: evolutionary predispositions, cognitive restoration, physiological stress recovery, emotional place-bonding, and oxytocin-mediated social connection. Yet each theory has limitations, often universalising, decontextualising, or overly individualising experiences.

The Social Cure framework enriches these models by emphasising that wellbeing is not only an individual process but also a socially embedded phenomenon, shaped by group memberships, collective identities, and shared meaning-making (Haslam et al, 2018; Haslam, et al., 2022). Group-based NBIs may function in part as “social cures” by enhancing belonging, social support, and collective efficacy (Haslam, et al., 2020). Conversely, the social curse perspective highlights that interventions may also reproduce inequalities, exclusion, or conflict, thereby undermining wellbeing. For instance, green gentrification within urban squares may provide restorative spaces for some while displacing others, or certain environments may feel unsafe for women, migrants, or minoritized groups (Wu et al., 2022; Xu, et al., 2023; Haslam et al., 2024). Thus, NBIs should not be conceptualised as simple “dose-response” interventions but as complex biopsychosocial processes that operate across biological, cognitive, emotional, and social domains, moderated by culture, context, and group dynamics.

Summary

Within the literature on NBIs and STH, there is extensive discussion about the mechanisms that underpin their effectiveness. ART (Kaplan & Kaplan, 1989) and SRT (Ulrich, 1983) highlight the cognitive, affective, and physiological benefits of exposure to natural environments. However, NBIs typically combine multiple components beyond nature contact alone. Physical activity is well established as beneficial for mental and physical health (Biddle & Asare, 2011), while social interaction draws on principles of social support theory, promoting wellbeing through connectedness and shared experience (Cohen & Wills, 1985). Engagement in meaningful or purposeful activity can also be understood through self-determination Theory, which emphasises autonomy, competence, and relatedness (Deci & Ryan, 2000). Collectively, these perspectives suggest that STH projects operate through an interplay of mechanisms, with different elements becoming more salient depending on individual needs, preferences, and contexts.

Theoretical frameworks such as Biophilia, Place Attachment, Calm and Connection, and the Social Cure further illustrate how nature and group processes may combine to support wellbeing (Jetten et al., 2012; Haslam et al., 2018). Group-based NBIs can act as “social cures,” fostering belonging, social support, and collective efficacy, yet the Social Curse perspective cautions that such interventions may also reproduce exclusion or inequity (Jetten et al., 2017; Haslam et al., 2018). Overall, NBIs function as complex biopsychosocial processes rather than simple dose–response interventions, their outcomes shaped by individual, cultural, and contextual factors. This highlights a persistent tension: although nature holds strong theoretical potential to enhance mental health, current Green Social Prescribing (GSP) pathways may not yet provide an equitable or sufficiently integrated mechanism to fully realise this potential.

Literature Review

The growing body of evidence outlined above indicates that exposure to natural environments can support a range of mental health outcomes, particularly for individuals experiencing anxiety, depression, or chronic stress (Coventry et al., 2021). NBIs, structured activities in natural settings, are increasingly being implemented within UK healthcare systems, often through Green Social Prescribing (GSP), as complementary approaches to traditional mental health care. Despite evidence for potential benefits, referral rates to NBIs based on social and therapeutic horticultural principles remain low, and participation presents unique challenges.

While policy and financial commitments have facilitated the rollout of NBIs, several key questions remain unanswered. First, although social prescribers and general practitioners play a central role in the referral process, little is known about how confident or well-informed clinicians feel when recommending NBIs (Fixsen & Barrett, 2022; van den Berg, 2017). Second, there is limited understanding of how NBIs are perceived by service users in secondary care, including whether they are accessible or require adaptation for individuals with complex diagnoses or trauma histories (Fixsen & Barrett, 2022).

This literature review, therefore, focuses on NBIs as a broad category of structured, therapeutic engagements with nature, within which STH represents one established modality. The review addresses the following research questions:

1. How do clinicians perceive and experience referring patients to NBIs, and what factors influence their confidence and decision-making?
2. How do service users, in primary and secondary care, perceive and engage with NBIs, and what barriers or facilitators affect participation?
3. To what extent do NBIs require adaptation to meet the needs of individuals with complex mental health conditions or trauma histories?

By centring on NBIs rather than general nature exposure, this review aims to clarify both clinical and service-user perspectives on structured, therapeutic nature engagement and to identify gaps in the current evidence base.

Search Strategy

The review focused specifically on studies involving primary and secondary mental health service users, rather than theoretical literature. Search terms were developed iteratively to capture both intervention and population elements. Intervention terms are detailed in Table 1 below. I searched for literature investigating how NBIs impact individuals accessing mental health treatment at the primary or secondary care level. Searches were conducted across relevant health and social science databases to ensure broad disciplinary coverage and search terms were developed iteratively, informed by existing reviews, and consultation with my supervisor, to capture relevant empirical studies. Being mindful of the gaps identified above, I aimed to include both primary and secondary care service users, as well as the referral context for social prescribers and general practitioners (GPs). Medline, APA PsychINFO, and CINAHL were used to conduct a systematic search of titles and abstracts on the University of Essex library database. The search strategy is set out below in Table 1.

Table 1

Search Strategy

Key Word	Search Term
Nature	“contact with nature” OR “nature exposure” OR “exposure to nature” OR “natur*experience” OR “access to nature” OR “green space” OR “greenspace” OR forests OR “forest bathing” OR “forest environment” OR “wilderness” OR “green exercise” OR “gardening” OR “horticultur* intervention” OR “nature based intervention” OR “natur* therapy” OR “gardening” OR “ecotherapy”
Mental Health	“mental health” OR “mental illness” OR “mental disorder” OR “psychiatric illness” OR anxiety OR depress* OR mood OR “well*being”

Adults accessing mental health services	“patients” OR “service user” OR “inpatients” OR “psychiatric inpatient” OR “adult” OR “primary*care” OR “secondary*care” OR “social *prescribe*” OR “link*worker”
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The search was amended appropriately for the Web of Science and Scopus databases. Google Scholar, ResearchGate and grey literature at the University of Essex Library were also searched. The search was limited to English-language studies in Humans. All records were reviewed based on title and abstract using the PICO tool. The review aimed to identify peer-reviewed studies of adults accessing primary or secondary mental health care (Population) who attended an NBI (Intervention). Included studies assessed psychological wellbeing (Outcomes), were not required to include a control group (Comparator) and could comprise any study type.

Screening and Selection

Screening and selection of studies were undertaken by myself, with uncertainties discussed with my supervisors. All search results, presented were imported into a reference manager, and duplicate records were removed. Screening of titles, abstracts, and full texts was undertaken by myself, using predefined inclusion and exclusion criteria set out in Table 2 below.

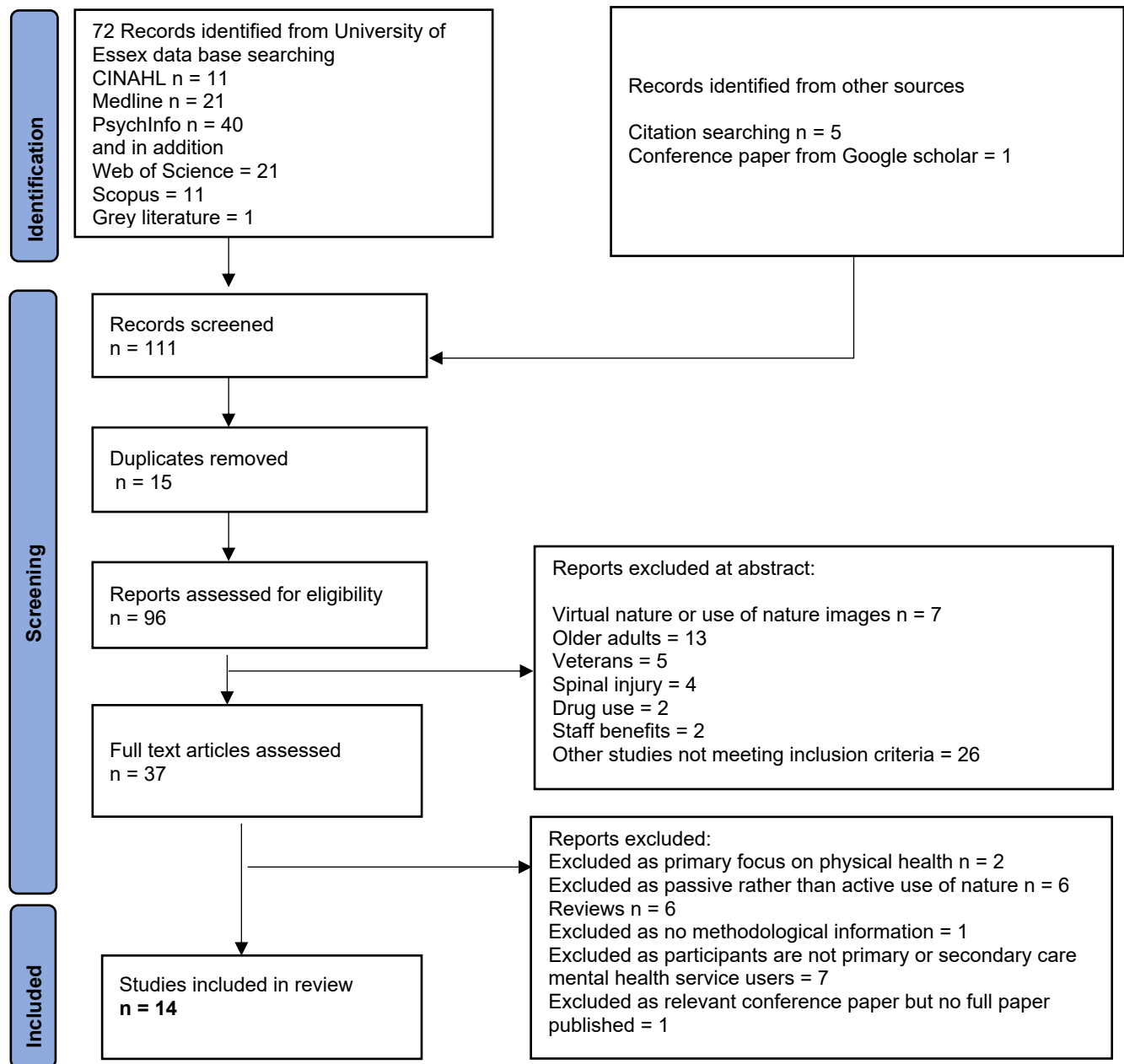
Table 2*Inclusion and Exclusion Criteria*

Inclusion:	Exclusion:
• Studies with populations aged 18 - 65 • Studies involving horticultural or gardening nature-based interventions • Studies including primary or secondary care mental health service users • Studies including empirical data	• Studies of persons outside the age range of 18 - 65 • “Blue” or water-based studies • Studies using non-clinical samples • Dementia, spinal cord or other neurological conditions. • Physical health conditions • Passive nature engagement • Review and theoretical papers

Quality Appraisal

A PRISMA flow diagram is a visual tool used in systematic reviews and meta-analyses to clearly outline the process of study selection. Figure 1 below tracks the number of records identified in the database searches and other sources, detailing how many were screened, excluded, and the number of full-text articles screened for eligibility, as well as the number of studies ultimately included in the narrative synthesis. By providing a transparent overview of each stage in the review process, the PRISMA diagram helps readers understand study selection and ensures the review is conducted transparently and rigorously.

Figure 1



PRISMA Flow diagram of search strategy

Approach to Synthesis

A narrative synthesis approach was adopted due to the heterogeneity of the literature identified, which encompassed a range of disciplines, study designs, and outcome measures. The fourteen studies included in the review, presented in tables 3 and 4, were critically appraised using the Mixed Methods Appraisal Tool (MMAT), designed to evaluate the methodological quality of empirical studies across qualitative, quantitative, and mixed-methods research (Pluye et al., 2009; Hong et al., 2018). Each study was assessed against the relevant MMAT criteria to ensure methodological rigour. To enhance reflexivity, the appraisal process and results were discussed with my supervisor; however, as this process was not blinded, there remains a potential for interpretive bias.

Applying the MMAT facilitated consistent and transparent evaluation across differing study designs. The tool has been validated as appropriate for use within narrative synthesis reviews (Pluye & Hong, 2014; Hong et al., 2017, 2018a) as its structured framework supports systematic comparison while maintaining the flexibility required to integrate diverse forms of evidence. Proponents argue that the MMAT strengthens the credibility and transparency of reviews by ensuring that studies meet minimum quality standards, thereby enhancing the rigour of narrative syntheses (Hong et al., 2017, 2018a).

Strengths and Limitations of approach to synthesis

The strengths of this approach include its capacity to accommodate methodological diversity and to synthesise evidence across disparate fields. Limitations include the subjective nature of narrative synthesis, potential bias introduced through non-blinded appraisal, and the lack of duplicate independent screening, which may affect reproducibility.

Key Features of the MMAT

The MMAT is considered comprehensive and able to appraise studies employing the following methodologies: qualitative, quantitative, randomised controlled trials (RCTs), non-

randomised quantitative studies, descriptive quantitative studies, and mixed methods studies. The MMAT employs a two-part structure for appraisal, beginning with screening questions and followed by an assessment of the methodological quality of the study (Appendix A). All studies included below met the initial screening question criteria of the MMAT. In Tables 5 and 6, I have evaluated the paper's quality using the relevant MMAT questions related to its methodology.

Critique of the MMAT tool

It is also important to note the relevant critique of the MMAT tool for critical appraisal. The current version of the MMAT eliminates the previous summative numerical score and recommends a more detailed presentation for each criterion (Hong et al., 2018), but this can limit researchers' ability easily to compare studies. Others have suggested that there is insufficient guidance on the weighting of methodological flaws, leading to subjective inconsistencies among researchers, and that the criteria can be too vague, particularly for the appraisal of mixed methods studies (Pluye et al., 2009; Pace et al., 2012).

Quality and design of included studies

The literature search identified a broad and diverse range of studies, and a narrative synthesis (Popay et al., 2006) was employed, as a meta-analysis was deemed infeasible due to heterogeneity in study designs, outcomes, and contexts. Narrative synthesis is a method used to systematically analyse and summarise findings from diverse research studies utilising different methodologies. Narrative synthesis enables researchers to draw meaning from complexity, incorporating the various physical or psychological outcomes or measures employed.

Process of Narrative Synthesis

Following Popay and colleagues' framework for narrative synthesis, I used the MMAT format to synthesise qualitative, quantitative and mixed methods evidence. Popay et

al. (2006) propose that a conceptual framework should be developed to guide the synthesis and explore how different mechanisms link variables. I was interested in the links between physical and psychological health and how participants perceived that an NBI could benefit them holistically. I was also interested in the meaning of horticulture to them, what it evoked in terms of their personal histories or their values, and how engaging in an NBI contributed to their recovery and healing.

Based on this conceptual framework, I developed initial theories by summarising and organising findings across studies, as presented in Tables 5 and 6 below. Then, I created visual descriptions of data types and findings (Figures 2 and 3), where my ideas about the links and connections between studies were grouped into themes, clusters, and illustrated patterns in the data. These tools and relationships would be used when analysing the data collected in my own survey, questionnaire and semi-structured interview. Popay's framework emphasises transparency (clearly documenting the synthesis process, including decision-making steps), reproducibility (ensuring others can replicate the synthesis), and rigour, using systematic methods for organising and analysing data.

Strengths and Limitations of the Approach

This approach enabled the review to capture the diversity of NBIs delivered to clinical populations and to synthesise findings across different methodologies. The use of MMAT strengthened transparency and allowed comparison across study designs. Supervisory oversight further supported consistency and reflexivity. However, limitations remain: reliance on narrative synthesis increases interpretive subjectivity; the lack of independent duplicate screening and blinded appraisal may introduce bias; and the heterogeneity of included studies limited the extent of direct comparison or meta-analysis. Despite these constraints, the approach was well suited to examining the emerging evidence base for NBIs in mental health contexts, where intervention formats and study designs are highly variable.

Table 3

Summary and description of quantitative studies identified in literature search

Psychiatric in-patients coded in yellow				
Author, Date and Country	Reference	Population, Sample and attrition	Type of Nature based intervention	Methods
1) Bay-Richter et al. (2012) Sweden	Garden rehabilitation stabilises INF-gamma and IL-2 levels but does no relieve depressive-symptoms	In-patients randomised to 8-week garden rehabilitation or TAU N=18 (9 participants in experimental and control group)	No information given about specific type of horticulture intervention.	RCT Pre-test, at 4 and 8 weeks patients had blood samples taken and inflammatory factors in blood plasma measured using ELISA. Psychopathology measured with Comprehensive Psychopathological Rating Scale (MADRS)
2) Gonzalez et al. (2011) Norway	A prospective study of group cohesiveness in therapeutic horticulture for clinical depression	Outpatients with DSM-4 major depression, dysthymia or depressive phase of bipolar 2 disorder and BDI > 15. N = 46, 5 dropped out	12-week NBI involved group based gardening activities twice a week, with each session lasting 3 hours. Activities designed to be simple and enjoyable allowing participants to engage with nature and take breaks when needed.	Quantitative non-randomised Twelve-week intervention twice a week for 3 hour session. Pre and post-test measures: BDI, State-Trait Anxiety Inventory Scale, Positive and Negative Affect Scale PANAS-PA, Perceived Stress Scale PSS, Therapeutic Factors Inventory Cohesiveness ScaleT FI-CS.
3) Joubert et al., (2024) France	Impact of horticultural therapy on patients admitted to psychiatric wards, a randomised, controlled and open trial	Psychiatric in-patients Control n=105 Experimental n =106.	No details given on activities or location of the horticultural intervention. Length, duration and type of session is unstated.	RCT Aims to assess the impact of horticultural therapy on anxiety in adult psychiatric inpatients over four weeks compared to TAU. HADS-A scale used
4) Kam & Siu (2010) Hong Kong	Evaluation of Horticultural Activity Programme for Persons with Psychiatric Illness	24 Psychiatric out-patients randomised to control and experimental groups 2 participants dropped out	Intervention conducted at the New Life Farm, sheltered workshop specialising in psychiatric rehabilitation. 10 horticultural sessions over two weeks, each session lasting one hour. Planting, weeding, harvesting Objectives, to encourage social support and promote “work behaviour” or work readiness.	RCT 10 participants completed experimental group, 12 participants completed sheltered workshop training. Participants assessed before and after 10 sessions using Chinese DASS21 and the Personal Wellbeing Index (PWI-C) and the Work Behaviour Assessment. Semi structured interviews as follow up
5) Kim & Park (2018) South Korea	Horticultural therapy program for middle-aged women’s depression, anxiety and self-identity	Female out-patients Control n = 18 Experimental n = 18	12 one-hour sessions. Participants attended x 2 per week Planting, crafting (pressed flowers, flower arranging, terrarium, dish garden, lunch box with edible flowers, hydroponics.	RCT The Menopause Symptom Index, self-rating depression scale, state-Trait Anxiety Inventory and Dignan Ego-identity scale used pre and post-test of 12-week test period.

Author, Date and Country	Reference	Population, Sample and attrition	Type of Nature based intervention	Methods
6) Oh et al, (2017) South Korea	Assessment of the psychopathological effects of a horticultural therapy program in patients with schizophrenia.	N = 28 outpatients with schizophrenia were assigned to either a control group (TAU) or an NBI	10-week NBI designed around various plant cultivating activities. The NBI involved sessions once a week from April 2017 to June 2017.	Quantitative non-randomised. Pre- and post-test design of experimental and control groups. A psychiatrist evaluated the psychopathological symptoms of schizophrenic patients in both groups using the Korean version of the Positive and Negative Syndrome Scale (PANSS) and Brief Psychiatric Rating Scale (BPRS).
7) Stigsdottir et al. (2018) Denmark	Efficacy of nature-based therapy for individuals with stress-related illnesses;	Out-patients, privately treated, signed off work and with ICD-10 diagnosis N = 84	NNBT (Nacadia Nature Based Therapy) 10 weeks programme, x3 per week for 3 hours. Consists of therapeutic conversations, awareness exercises, nature-based activities (gardening chosen from a range by the participant), reflection & relaxation, homework. <i>Interaction with other participants was not encouraged</i>	RCT Patients randomised to STreSS (Specialised Treatment for Severe Bodily Distress Syndromes)– CBT programme delivered by psychologists for those unable to work due to stress or to NNBT for a ten-week period.

Table 4

Summary and description of qualitative and mixed-methods studies identified in literature search

Psychiatric in-patients coded in yellow				
Number, Country and Author	Title	Population, Sample and Attrition	Type of NBI	Methods
8) Carlson et al., (2020) USA	Nature-based Group Therapy Reflections: A Grounded Theory Study	Psychiatric inpatients N=75	An NBI in a psychiatric inpatient unit. Activities included flower arranging, seed planting, garden care and propagation. Inside sessions during February and March. Sessions were an hour long and began inside with introduction and check in.	Grounded Theory Patients average stay on inpatient unit was 5 – 7 days, during this time they were invited to take part in a nature-based group therapy session followed by survey and written reflections.
9) Cipriani et al., (2018) USA	Uncovering the Value and Meaning of a Horticulture Therapy Program for Clients at a Long term Adult Inpatient Psychiatric Facility	Inpatient psychiatric patients N= 10 2 OTs 8 service users	NBI known as the Greenhouse Program at a long-term adult inpatient psychiatric facility. Activities included planting watering and sales.	Qualitative study investigated the value and meaning of the Program and its impact on recovery goals. Modified version of the empirical, phenomenological, psychological (EPP) method focussing on the experience and meaning of a phenomenon of each participant, using a multi-step process.
10) Fieldhouse et al., (2014) UK	Vocational rehabilitation in mental health services: Evaluating the work of a social and therapeutic horticulture interest company	Staff (N= 13) and trainees (N = 6) of the CIC	Trainees at a horticultural CIC were asked to participate in a series of workshops about the training programmes efficacy.	Qualitative Three Action Inquiry workshops aimed to combine trainee, staff and management viewpoints about what worked using freefall writing, story circles and a learning history
11) Pieters et al., (2019) USA	Gardening on a psychiatric inpatient unit: Cultivating recovery	Psychiatric inpatients 31 invited to join, 2 declined, 1 chose not to be interviewed, 2 did not complete gardening activity N = 25	45-minute sessions. Started in dayroom with introduction about gardening preferences, moved outside to outdoor deck of inpatient unit, returning indoors for reflection on activities and to provide feedback. Sensory engagement encouraged. Herbs, succulents and flowers.	Qualitative study to assess impact of 45 min weekly gardening activity In-person interview recorded after the activity

Number, Country and Author	Title	Population, Sample and Attrition	Type of NBI	Methods
12) Smidl et al., (2017) USA	Outcomes of a Therapeutic Gardening Program in a Mental Health Recovery Center	Community Mental Health Center patients N = 20	Based on the Mental Health Recovery Model. Project staff and participants met with nursery consultant. Participants decided what they wanted to grow. Raised beds built in spring x2 afternoons per week. Weekly data collection. Harvest July – Autumn. Participants made salsa, salad, potpourri and dried herbs. Follow up survey completed.	Mixed methods One-to-one initial interviews 2 standardised quantitative measures Volitional Questionnaire (VQ) and Visual Analog Mood Scale (VAMS).
13) Trkulja et al. (2021) Serbia	Development of Evidence-Based rehabilitation practice in Botanical Garden for People with mental health Disorders	Day Hospital patients N=27 No information about attrition or drop out.	Based on Kaplan and Kaplan ART (1989, 1995) In a Botanical Garden but activities unclear. Experimental group n = 15, control = 12 (art sessions and relaxation) Horticultural activities unclear, One-hour sessions over 5 weeks, 3 sessions per week. Participants attended 12.	Mixed Methods Clinical Global Impression (CGI) scale and on-site observation
14) Wastberg et al. (2021) Sweden	Experiences of meaning in garden therapy in outpatient psychiatric care in Sweden A Narrative Study	Outpatients with Common Mental Disorder (CMD), unable to work. N = 8	Based on CHIME model: (Connectedness, Hope and Optimism, Identity, meaning in life, empowerment) and Hammell (2004) “Doing, Being, Becoming”. Sessions began with reflection in small groups then moved to gardening, seeding, planting, creative activities. Clients also met with a psychologist once per week for reflection.	Narrative Individual interviews were conducted at 5 – 9 weeks (n = 8) into programme and again at 12 weeks (n = 6). Data analysed using narrative methodology.

Overview of included literature

The literature review comprised six studies of psychiatric in-patients, with the rest described as “out-patients” or community patients. Participant numbers ranged from 8 to 211, altogether $n = 631$. Studies 3 and 7 were RCTs with larger participation numbers; the only other extensive study used grounded theory (8). A further wide variation between the included studies is the “dosage”, ranging from ten weeks to nine months. With longer timeframes, the duration of sessions and rate of attendance became increasingly unclear. Papers 2, 3, 7, 12 and 14 were unclear on these aspects, with others being vague about what the interventions entailed (8, 3, and 12). There was considerable variation in the type of work undertaken; some studies appeared to be primarily indoor and focused on crafts made possible by flowers and plants, such as creating terrariums or flower arranging (11 and 13). Only one study (7) did not encourage group cohesiveness and social interaction as part of the recovery process. Instead, researchers encouraged participants to avoid each other and focus on the structured therapy provided in the garden. This was noted as a disincentive to continue by participants, and other studies emphasised the contribution that social bonding could make to the efficacy of horticultural therapy.

Table 5

Assessment of each quantitative paper for quality, using the MMAT tool.

Key for colour coding and MMAT questions

OT – mental health recovery / skills/vocation perspective/ attempts to encourage “work-readiness”		Type of study	MMAT Appraisal questions
Nursing – alleviation of boredom, supporting patients to cope on the wards		Quantitative RCT	1. Is randomization appropriately performed? 2. Are the groups comparable at baseline? 3. Are there complete outcome data? 4. Are outcome assessors blinded to the intervention provided? 5. Did the participants adhere to the assigned intervention?
Psychiatry – searching for biological markers common to mental ill-health		Quantitative non-randomised	1. Are the participants representative of the target population? 2. Are measurements appropriate for the outcome and intervention? 3. Are there complete outcome data? 4. Are confounders accounted for in the design and analysis? 5. Was the intervention administered as intended?
Recovery in the community – preventive approach		Quantitative descriptive	1. Is the sampling strategy relevant to address the research question? 2. Is the sample representative of the target population? 3. Are the measurements appropriate? 4. Is the risk of nonresponse bias low? 5. Is the statistical analysis appropriate to answer the research question?

Study	Study Type	Main findings	Key strengths	Key limitations	Overall quality
1	RCT Bay-Richter et al. (2012) Sweden	Patients were randomized to either garden rehabilitation with treatment-as-usual (TAU) or TAU alone. No significant differences in inflammatory markers or psychiatric measures were reported at baseline. MADRS and ELISA-based cytokine measurements are appropriate for the study objectives. Repeated measures ANOVA and post-hoc tests are suitable for the data structure.	Incorporates both psychological assessments and biological markers, offering a multidimensional perspective. The use of randomization enhances internal validity. Addresses cytokines like INF-gamma and IL-2, contributing to the understanding of inflammation in depression.	Small sample size limits generalizability and statistical power. Lack of detail on participant adherence and dropout rates weakens conclusions. Potential for bias in outcome assessment. The 8-week intervention may not capture long-term effects of garden rehabilitation.	1. Unclear Randomisation process not clarified 2. Yes. Groups appear comparable at baseline.. 3. Yes. There is complete outcome data. 4. Unclear Lack of information about blinding 5. Unclear Lack of information about adherence and attrition. Comments: this is a moderate-quality paper but some of the MMAT criteria is either partially met or unclear

Study	Study Type	Main findings	Key strengths	Key limitations	Overall quality
2	Quantitative non-randomised Gonzalez et al., (2011) Norway	Study found significant improvements in depression. Depression, but not anxiety and stress benefits persisted to a 3 month follow up. The groups quickly established strong cohesiveness correlating positively, although not significantly with changes in mental health outcomes. 38% of participants reported increased social activity with 31% maintaining this at follow-up.	Single group within-subjects design. Study uses well-established tools and measures. Repeated measures ANOVA was used for statistical analysis of measurements across two timepoints.	The authors acknowledge the self-selection bias as participants were recruited through advertisements; study did not measure group cohesiveness at baseline; potential for non-response bias due to drop out rate, limited follow up duration.	1) Unclear Participants recruited through advertising and welfare register and so may not be fully representative. 2) Yes. The study uses well-established measurements 3) Yes. The study uses appropriate statistical methods. 4) Unclear no confounders considered 5) No. Intended as an RCT. Comments: Paper provides useful preliminary findings. Although the authors planned to complete an RCT no participants were willing to be in the control group.
3	RCT Joubert et al., (2024) France	This RCT investigates whether horticultural therapy can reduce anxiety in adult psychiatric inpatients as compared to standard care. Anxiety measured in experimental group and control group after 4 weeks. After four weeks participant anxiety was reduced in the experimental group.	Large sample from inpatient population n = 211. Robust statistical analyses were performed, including sensitivity analyses and adjustments for baseline imbalances. The HADS-A is a validated and widely used tool Groups were generally comparable, but differences in professional activity and living conditions were noted, which could introduce confounding.	Short duration of intervention. The open-label design and reliance on subjective outcomes could introduce bias. Impact of other therapeutic interventions in the control group may confound the results. The study was open-label, meaning participants and staff were aware of group assignments. Dropout rate approximately 9.5%, reasons for attrition were not fully detailed A computer-generated randomization process was used, but the study was open-label, leading to a lack of participant and staff blinding.	1) Yes. The study used a proper random allocation method. 2) Yes. Baseline characteristics are comparable 3) No. the study has a moderate drop-out rate, and it is unclear if intention to treat analysis was performed. 4) No. the trial was open -label and there was no mention of blinding outcome assessors. 5) Yes. There was good adherence Comments: The study meets many MMAT criteria but has limitations in blinding and potential confounding variables.
4	RCT with follow up semi structured interviews Kam & Siu (2010) Hong Kong	The study found a significant decrease in anxiety, depression and stress levels among participants in the experimental group. No significant improvements in “work behaviour” or quality of life Participants reported emotional benefits such as stress reduction and enjoyment, social benefits and increased self-confidence.	Participants were randomly assigned and no significant differences in demographic or base line measures between groups. Single blinded, and randomization is described. Complete outcomes reported.	Study set out to recruit participants with schizophrenia and psychosis, there were two participants with other illnesses so group was not homogenous, The study period was very short, although intensive. Only 22/24 participants completed. No follow up.	1) Yes. Participants were randomly allocated to groups 2) Yes. Groups were comparable at baseline 3) Yes. All measures are reported with pre and post intervention data. 4) Yes. The study is single-blinded and randomisation process is described. 5) No. Two participants dropped out. Comments: The small sample size and short duration affect the external validity and generalisability of result

Study	Study Type	Main findings	Key strengths	Key limitations	Overall quality
5	RCT Kim & Park (2018) South Korea	NBI reduced depression and anxiety scores and improved self-identity among participants in the experimental group as compared to the control group. Programme designed to promote self-expression, self-awareness and to foster a sense of community and interaction among participants.	Participants were satisfied with the programme noting improvements in stress, emotional stability and social interaction. Validated scales used for measurement and independent sample t-tests and paired t-tests used for analysis.	Very small sample size for RCT The study does not specify the non-response bias and provides insufficient detail as to blinding and randomisation.	1) No. No details of randomisation are provided. 2) Yes. The two groups appear comparable at baseline 3) Yes. The pre and post data appear to be complete. 4) Unclear The study does not mention blinding, which may introduce bias 5) Yes The study reports that participants adhered to programme with 100% attendance rate Comments: Study is of moderate quality.
6	Quantitative non-randomised Oh et al, (2017) South Korea	The NBI group significantly improved in terms of positive, negative, and general symptoms on the PANSS and clinical symptoms of schizophrenia as measures on BPRS after the 10-session horticultural therapy program. However, there was no change in the PANSS and BPRS scores in the control group.	Exceptionally clear horticultural programme outlined in Table 2. NBI appeared to support development of personal relationships, cooperation, responsibility, and communication. NBI provides positive re-appraisal and social support.	No limitations were acknowledged or discussed. Participants were voluntarily, rather than randomly assigned to group	1) No. Sample size is very specific and no detailed demographic data given. Voluntary assignment may limit generalisability 2) Yes. The study uses well established tool adapted for the Korean population. 3) Yes. The study uses paired t-tests to analyse differences before and after the programme, but no potential confounding variables are mentioned. 4) Yes. There is complete outcome data. 5) Yes the conclusions are supported by the results, although there is a small and specific sample. Comments: Good quality study but very specific in design and population.
7	RCT Stigsdottir et al. (2018) Denmark	Study found NBI promoted improvements in wellbeing, enhanced social interactions, sense of accomplishment and purpose, skills development in a safe and supportive non-judgemental and calming environment.	Validated tools (PGWBI and SMBQ) were used at multiple time points. A computer algorithm was used to randomize participants equally into NNBT and STreSS groups. Allocation was handled independently. The study indicates allocation by a research assistant but does not confirm specific concealment methods.	Recruitment bias (overrepresentation of women), clustering effects in NNBT, and small sample sizes affect generalizability. Participants were aware of the treatment type (NNBT vs. STreSS), potentially influencing perceived outcomes.	1) Yes. The study describes random allocation of participants to groups using an algorithm 2) Yes. The groups were comparable although predominantly female. 3) Unclear There is partial data and the LOCF method for missing data has been used. 4) Unclear The text does not explicitly state if outcome assessors were blinded, which is a potential limitation in minimizing bias. 5) Unclear Two participants did not want the assigned treatment and so did not adhere. Comments: Despite missing data this was a well conducted RCT in many respects with most limitations discussed.

Table 6

Assessment of each qualitative and mixed methods paper for quality, using the MMAT tool.

Key for colour coding and MMAT questions

OT – mental health recovery / skills/vocation perspective/ attempts to encourage “work-readiness”		Type of study	MMAT Appraisal questions
Nursing – alleviation of boredom, supporting patients to cope on the wards		Qualitative	1. Is randomization appropriately performed? 2. Are the groups comparable at baseline? 3. Are there complete outcome data? 4. Are outcome assessors blinded to the intervention provided? 5. Did the participants adhere to the assigned intervention?
Psychiatry – searching for biological markers common to mental ill-health		Mixed Methods	1. Are the participants representative of the target population? 2. Are measurements appropriate for the outcome and intervention? 3. Are there complete outcome data 4. Are confounders accounted for in the design and analysis? 5. Was the intervention administered as intended?
Recovery in the community – preventive approach			

Study	Study Type	Main findings	Key strengths	Key limitations	6) Overall quality
8	Qualitative Carlson et al., (2020)	Themes emerging from grounded theory methodology – Using the senses, thinking (I didn’t have time to think), autonomy and purposefulness, embodiment (felt dirt between fingers, smelling soil), memory activation, social interaction, caring as personal agency (nature as reflecting their own capacity to care for others), loving as extension of self (I love touching/smelling flowers).	Clear evolution of themes to Sensing-thinking, Embodying – autonomising, Remembering – connecting Caring – motivating.	No discussion of limitations. The study does not specify the exact number of sessions each participant completed nor how many sessions were effective. The study indicates that 18 individual sessions were held over a nine-month period without indicating time between sessions or how many sessions each participant attended. No apparent consideration of confounding factors such as medication and length of time in hospital.	1) Yes , grounded theory is appropriate to answer the research questions 2) Yes , data collection methods are suitable -semi-structured interviews with open questions 3) Unclear Findings are adequately derived from the data, but data limited 4) Yes , Interpretation supported by quotes and detailed descriptions of themes. 5) Unclear Some coherence but this is limited by the vagueness over participation and intervention. Comments Lack of clarity in participation, limited demographic and treatment duration information.

Study	Study Type	Main findings	Key Strengths	Key limitations	Overall quality
9	Qualitative Cipriani et al., (2018) USA	The study aimed to uncover how the Greenhouse Program could support Recovery goals and personal growth within an inpatient setting. Themes uncovered were Growing with Nature (that participants valued nurturing plants, fostering a connection to nature), Personal Growth (supported a more positive outlook and increased physical activity). Improved self-esteem. Social interaction with public at sales events, also gaining work related skills leading to potential employment.	Rich detailed details due to phenomenological approach Perspectives of staff and participants included. Ecological validity. Triangulation of data sources and peer debriefing.	Due to facility restrictions interviews were not audio-recorded, leading to less precise data-capture. Only one participant was able to identify their recovery goals and speak to how programme supported it. Several participants mentioned the negative effects of medication on thoughts processes.	1) Yes. Study uses a phenomenological approach which is appropriate 2) Unclear Semi-structured interviews were not audio recorded which impacts richness of the data. 3) Yes. Approach was systematic involving multiple researchers. 4) Yes. Themes and sub-themes were clearly identified. 5) Yes. Coherence between data sources and findings. 1) Comments: Limitations were openly discussed demonstrating transparency and context. Despite some limitations and a small sample (n=6 service users) the study provides meaningful insights into the impact of the programme.
10	Qualitative Fieldhouse et al., (2014) UK	The Natureways project, a collaboration between NHS and voluntary sector CIC was found to be effective in producing positive employment outcomes. Of the 16 trainees, 6 gained paid employment, 3 found voluntary work and 4 joined Natureways' external landscaping team.	Themes were identified and analysed from trainee and staff/manager perspectives, providing a comprehensive understanding of the project. There was a degree of reflexivity in the process. Integration within the local community and connections with the horticultural industry promoted social inclusion and recovery. Horticulture effective means for work preparation,	Limitations are acknowledged, particularly regarding the separation of the trainee and staff/manager workshops, which may have impacted the integration of perspectives.	1) Yes Rich qualitative data from many sources and perspectives, 2) Yes. Primary focus on qualitative data, but quantitative employment statistics used to justify findings. 3) Yes. Two methodologies well integrated qualitative themes support quantitative results. 4) Yes. Divergences and limitations are addressed 5) Yes. Quality requirements of both methodologies are met. Comments: Study is of good quality
11	Qualitative Pieters et al., (2019) USA	Qualitative Descriptive inquiry Data collected through semi-structured interview followed by thematic analysis. Key findings from participants: Motivation: desire to be outside, novelty of activity Experience: staff engagement, sense of community, reduced stress, distraction from personal issues, improved mood, and increased social interaction Symbolic meanings in gardening associating it with personal growth	Qualitative design is suitable to capture the subjective experiences of participants. There is some coherence between the data sources, collection, analysis and interpretation.	The study is not replicable as it is unclear how many sessions took place, or the nature of the horticultural activity depending on the season. A time frame is given of July 2017 – Feb 2018 but number of sessions completed by participants before interview is unclear. The study is skewed towards female patients (n = 14) and those with depression (n = 13)	1) Yes. Qualitative approach is appropriate to answer the research question and aligns with study aim 2) Yes. Methods are appropriate. 3) Yes. Findings are well supported by direct quotes and thematic analysis 4) Unclear Interpretation is impacted by lack of clarity about intervention and participation. 5) Unclear Some coherence between data sources, collection and interpretation but this is limited by the methodological flaws Comments: This study is of moderate quality but is flawed by attrition and lack of participant information.

Study	Study Type	Main findings	Key Strengths	Key limitations	Overall quality
12	Mixed – methods Smidl et al., (2017) USA	The methods, (interviews, survey and journaling), appear adequate, but details on their implementation are needed for confirmation. The findings are logically derived from the data, though the study should clearly describe how themes were identified. Three themes identified: <i>Pride and self-worth, happiness and connecting past and present</i> , but these are based on 7 journals kept by some participants Participants felt the programme enhanced personal and social responsibility.	Quantitative measures (VQ and VAMS) appear relevant and appropriate for assessing outcomes of therapeutic horticulture programme. The qualitative component effectively captures participant experiences. The integration of methods is logical.	Limited generalizability due to a small, specific sample from one recovery centre Insufficient detail on non-response bias and participant recruitment and retention e.g. only 13/20 participants completed the survey Quantitative analysis could be more robust. The statistical methods maybe adequate but lack deeper insights – data only given in percentages and meaning is unclear. No inter-rater reliability for VQ and so a more standardized measure would have strengthened the analysis.	Yes. The rational for using mixed methods is clear. Yes. The two components are effectively integrated Unclear Interpretation of results only partly supported by the data: the study provides examples to support interpretations, but more direct quotes or evidence might strengthen the findings. Unclear Divergences and inconsistencies are only partially addressed: the study addresses potential divergences inadequately. Unclear Lack of clarity about the limitations of the study Comments: Lack of clarity on how qualitative measures were administered and insufficient analysis of quantitative data.
13	Mixed methods Trkulja et al. (2021) Serbia	Study aimed to establish the clinical benefits of the nature-based rehabilitation programme. 27 day-hospital participants were split between the nature-based group and art group. Quantitative CGI data complements qualitative observations, aiming to provide a holistic understanding of the intervention's impact. Restorative potential of the garden was investigated through observed interaction. Positive findings on the psychological recovery of the participants seem to be related to NBRP.	Integration of qualitative and quantitative methods; but the rationale for using a mixed methods ethnographic / observational approach with patient group division was unclear. The researchers noted particular species and locations that appeared to be experienced as particularly restful for participants.	Limited generalisability due to small sample size. Process for group allocation unclear. Potential biases in participant selection and observation. Recruitment procedure was biased towards more motivated participants assessed as suitable by psychiatrist. Categorization of observed behaviours within an ethnographic / behaviour mapping approach risk researcher interpretation bias and subjectivity. Any attempts to mitigate this were unclear. Research took place in spring therefore cannot control for weather and temperature factors of other seasons.	Unclear. Adequate rationale, the CGI scale and observations complement each other. Yes. Measurable outcomes integrated with contextual insights. Yes. Outputs are well interpreted. No. Divergencies and inconsistencies are not addressed Unclear about study limitations. Comments: Both quantitative and qualitative components meet some respective methodological standards, however there was no voice for the service users other than Clinical Global Impression Scale as all qualitative data information was based on staff observations.

Study	Study Type	Main findings	Key Strengths	Key limitations	Overall quality
14	Qualitative Wastberg et al. (2021) Sweden	The study used narrative methodology aimed to investigate what is understood as meaningful in an NBI for persons with CMD (Common Mental Disorders). The study also addressed ability to work following the study. A narrative analysis was used, including iterative reading, identification of themes, and consensus discussions among researchers.	The study provides a detailed description of the therapeutic garden's design, structure, and activities, ensuring the context is integral to the findings. The researchers reflected on their own backgrounds and potential biases, and external researchers conducted the analysis to minimize undue influence. Group leaders important in development of trust.	Participant numbers were small n = 8 with only 6 being interviewed at two time points. The sample had an overrepresentation of women, and findings are not generalizable. This limitation is acknowledged by the authors. One conclusion is that horticultural activity should be individually tailored which is difficult to replicate and subjective.	1) Yes. The narrative methodology is appropriate for exploring subjective experiences. 2) Yes. Appropriate data collection for in-depth experiences. 3) Yes. Findings are presented in a way that reflects the conclusions drawn. 4) Yes. Findings are adequately interpreted. 5) Yes. There is coherence between the data collection, analysis and interpretation. Comments: Overall, it is a high-quality study with well-addressed limitations, although the sample is small and not all participants adhered to the programme.

Literature search synthesis

Summary Quality Appraisal

The studies outlined above vary significantly in terms of intensity, duration, setting, and facilitation of intervention, making direct comparison difficult. Quantitative and mixed-methods studies employed validated tools and measures; however, these were highly diverse, further hindering comparison and generalizability. The studies also varied greatly in their focus, ranging from anxiety for inpatients (3), to group cohesiveness (8), work behaviour (4, 9 & 10) and stress-related illness (7). This reflected the diverse range of populations and contexts represented by the studies, with samples that varied in age, health status, cultural background, and motivation. Some studies did not make their theoretical underpinning explicit. However, two were modelled on SRT (2 and 7), three were grounded in ART (6, 2 and 13), and studies 8, 13, and 14 referenced the Biophilia hypothesis. Three studies also cited Place Attachment theory (5, 8 and 13). Finally, many studies provided inconsistent and often minimal reporting of key details, such as the intervention protocol (although Study 6 provided an excellent example of this), facilitator training, and the staff/service user ratio.

For the RCTs, significant challenges were encountered related to the placebo, control group, and blinding. Study 2 was intended to be an RCT, but no participants wished to be in the control group, and so it became a non-randomised study. Study 1 provided no information about the control group. Study 4 described the control as attending “sheltered workshop training” with no subsequent details. Studies 5 and 6 had a control group that received treatment as usual (TAU) or no intervention. The control groups in studies 7 and 13 attended a CBT group and art sessions, respectively. This heterogeneity complicates the comparison of intervention effects, as different control conditions carry distinct implications for outcomes. Interventions may appear more effective when compared to no treatment than when compared to an established therapy. Furthermore, TAU varies widely across different

clinical settings, introducing an additional layer of inconsistency. This diversity in control group design not only limits the comparability of outcomes across studies but also poses difficulties in drawing firm conclusions about the relative efficacy of nature-based interventions.

For this narrative synthesis, variability in the interventions, study designs, outcome measures, control groups, populations, and health and social care contexts across the studies was a key contextual factor influencing the interpretation of outcomes. Given this heterogeneity, and indeed the low and moderate quality of many of the studies, direct comparisons of intervention effectiveness were not attempted. Instead, consistent with the principles of narrative synthesis (Popay et al., 2006), attention was given to identifying themes across the evidence base. This thematic approach enabled a nuanced interpretation of the findings, taking into account differences in study design and comparator conditions. The identified themes, patterns and relationships across the literature are outlined below.

Theme one: Gardening can support people with an inpatient life

The in-patient studies comprised two randomised controlled trials (RCTs) (1 and 6) and three qualitative studies (8, 9, and 10), as well as a mixed methods study (12), with sample sizes ranging from 8 to 211 participants. Study 3, despite a high attrition rate, supported the finding that engagement with an NBI was effective in reducing anxiety on an inpatient ward, although study 1 found “garden rehabilitation” relieved some inflammation markers but not depression symptoms for inpatients. The qualitative studies aimed to elucidate the mechanisms that made NBIs effective for in-patient populations, using Grounded Theory and Thematic Analysis of semi-structured interviews with patients and staff. Both patients and staff indicated that physical activity and social interaction were helpful aspects of NBIs. Study 9 additionally emphasised that public engagement was an essential factor to promote “work-readiness”, self-esteem and support a return to life in the

community. A mixed methods study (12) found that nature-based activities stimulated positive memory activation and increased subjective feelings of well-being among inpatients by helping them make connections between the past and present. However, this study was also impacted by a low adherence rate (13 out of 20 participants).

It is important to note that none of the studies addressed the impact of psychotropic drugs or additional therapy that inpatients may attend as potential confounding factors.

However, groups were said to be comparable at baseline.

Theme two: The mechanisms of nature-connection

Study 8 was a comprehensive inpatient investigation that used semi-structured interviews to examine the connection to nature among patients and the significance of symbolic meanings within gardening, such as understanding metaphors related to personal growth and self-care. Some studies highlighted a “place attachment” theme, as participants enjoyed taking elements of the garden home or to their room—such as seeds, clippings, or flowers—as “transitional objects” (Studies 5, 8, and 13). Studies 2, 5, 6, and 13 focused on the effects of strengthening nature connection for service users living in the community. These individuals described gardening and interaction with nature as methods of relaxation and as spaces that ground the senses. Service users also reported memory recall after participating in an NBI. Study 13 employed an ethnographic approach to further examine the concept of place attachment, noting that participants tended to be drawn to solitary species. The study also found that the NBI could most effectively support individuals when different activities were linked to specific landscapes, elements, and species.

Theme three: Development of social and work skills

The remaining studies examine the value of NBIs for service users in developing social agency and/or work skills. Studies 4, 7, 10, and 14 were particularly focused on developing skills to foster a sense of autonomy and independence, preparing people for return

to work, and as a means of empowerment. Study 10, in particular, links “work-readiness” with social inclusion and recovery, reporting that developing work-related skills instils hope and that the business ethos of the project is “therapeutic.” Study 9, conducted with inpatients, also noted that patients valued selling garden produce to the public and found it to be an empowering experience. Participants in study 4 express that their involvement in an NBI helped them to manage work stress and promoted emotional health and “social performance” in the form of an extension of their social network, “a sense of being respected”. Participants in Study 4 were scored on the Work Behaviour Assessment (WBA), yielding insignificant results ($p = .076$). However, in qualitative interviews, participants reported that the 10-week intervention had improved their work motivation and performance, indicating the tension between qualitative and quantitative results in mixed methods studies when disconfirming results are found.

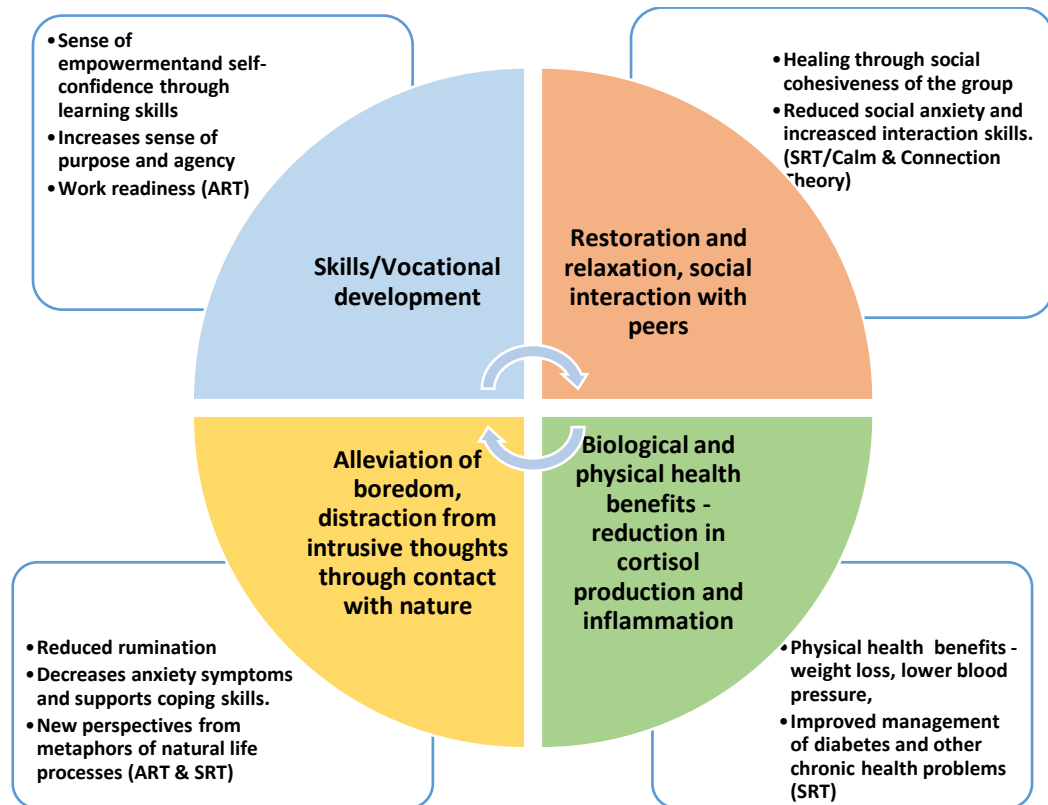
Study 2, although only fully meeting two MMAT criteria, was one of the few studies to include follow-up with patients and found that the significant improvement in depression scores persisted after three months. However, improvements in stress and anxiety scores were not present at follow-up. Study 2 focuses particularly on group cohesiveness as a mediator of beneficial change, concluding that the NBI enhances interpersonal style and social skills in the long term. Patients emphasised the importance of group size (less than 12) and having knowledgeable staff to feel safe and engaged.

Theme four: Relationship between physical and mental health

Study 5 reports significantly reduced depression and anxiety scores and significantly increased self-identity scores following a 12-week programme of nature-based activities. Studies 8 and 1 both link inflammation, urinary catecholamines and pro-inflammatory cytokines with depression and suggest that the physical exercise and outdoor elements of NBIs may reduce the risk of obesity and these biological markers of depression.

I have summarised the above synthesis in Figure 2 below, in which I hope to bring together these different emphases and suggest how they all relate to each other:

Figure 2



A synthesis of the possible mechanisms by which NBIs can effect positive change in participants, adapted from Carlson et al. (2020)

Role of Clinical Psychology in NBIs

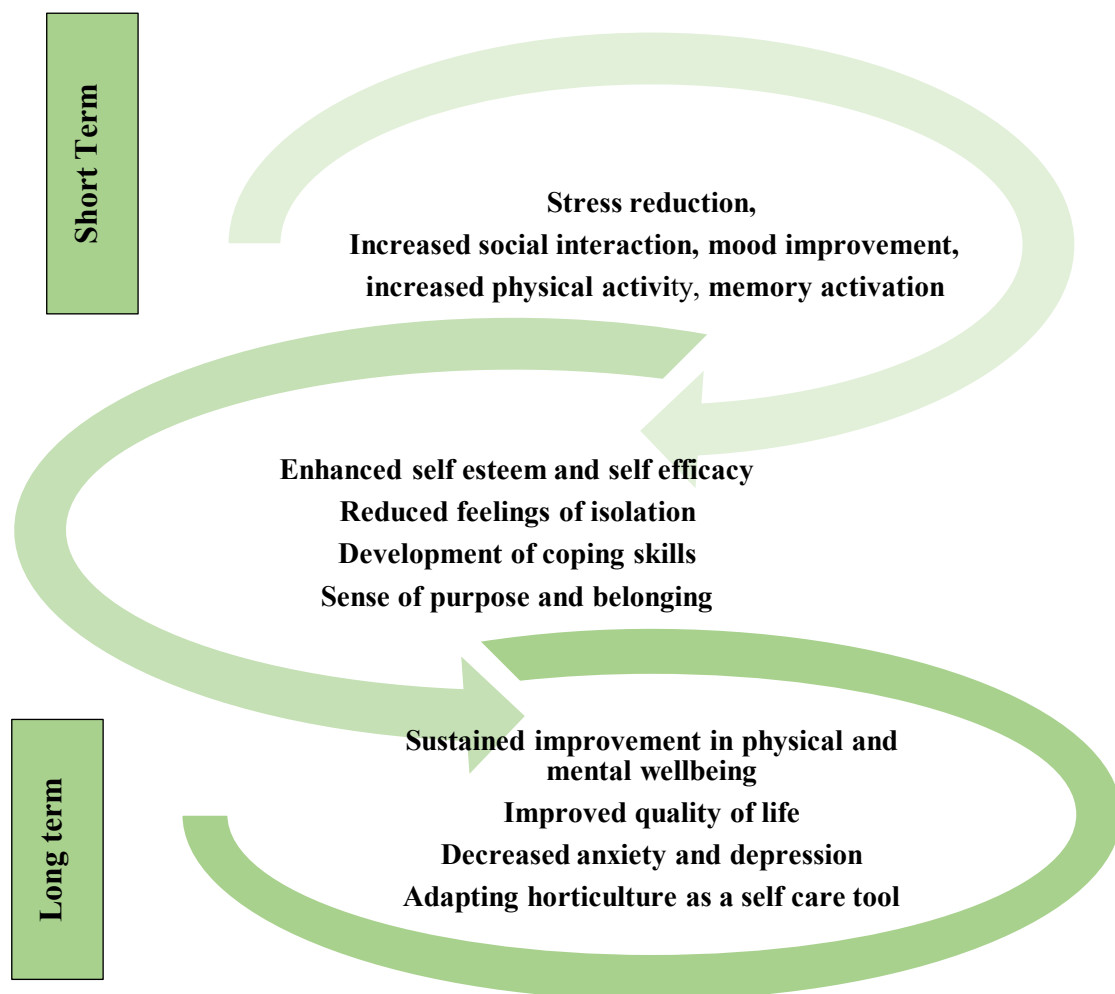
Notably, no studies identified were published in clinical psychology journals or written by individuals with a background in psychology. Woodson (2023), in her thesis investigating the potential role for therapeutic horticulture in clinical psychology, notes “despite the findings around the effectiveness of therapeutic horticulture in benefiting clinical practice, as well as the theoretical and clinical relevance to psychology, there is an astonishingly disproportionate amount of research on this topic from psychology journals”

(Woodson, 2023, p. 1). In her view, this gap in the literature raises professional and ethical concerns, suggesting that clinical psychology is currently content to leave the function of nature connection in mental health recovery primarily to the fields of nursing and occupational therapy.

Mechanisms for Change

To further synthesise the findings from the literature search above and make a case for the inclusion of NBI's into clinical psychology treatment planning, Figure 3 summarises how the evidence base suggests that increased nature connection may provide the mechanisms for supporting positive changes in psychological wellbeing.

Figure 3



Proposed mechanisms of change

Summary of literature review

The literature review highlights several key domains through which gardening and NBIs can support mental health recovery. The included studies suggest that NBIs offer a valuable counterbalance to life's challenges by providing structure, purpose, and respite from clinical environments. Mechanisms of nature connection, such as sensory engagement and mindfulness, are linked to emotional regulation and cognitive restoration. Additionally, participation in gardening can facilitate the development of social and work-related skills, enhancing self-efficacy and community integration. Ultimately, the interdependence of physical and mental health is evident, with physical activity, outdoor exposure, and embodied engagement all contributing to enhanced psychological wellbeing.

Aims and Objectives of the current study

Building on the themes identified in the literature above, this study will investigate how NBIs, based on STH principles can support mental health by seeking the perspectives of staff, service users, and Social prescribers on the impact and efficacy of one NBI, Together We Grow (TWG). The current study aims to address some knowledge gaps suggested in the literature search, for example exploring the experiences of inpatient service users leaving inpatient wards to attend an NBI in the community, as all relevant studies from the literature search involved NBIs on hospital grounds. The current study aims to investigate the impact of participating in TWG for participants, examining whether it is an effective treatment or an adjunct to treatment as usual for primary and secondary mental health care service users. I also aim to explore the perspectives of social prescribers and staff members who can or are already effectively linking service users with the project.

Research Questions

The study aims to answer the following research questions:

1. What are social prescribers (SPs) perceptions of the value and purpose of GSP?
(using survey data distributed by Qualtrics)
2. What are the perspectives of staff and volunteers at TWG? (Semi-structured interview)
3. What is the impact of the NBI clinically on participants? (measuring levels of anxiety, depression, loneliness and quality of life at two time points, pre- and post-intervention)
4. What are service users' views of the impact of TWG on mental health recovery?
(Semi-structured interview)

Hypotheses

This study proposes that participating in a nature-based intervention (Together We Grow) might:

- a. reduce loneliness, depression and/or anxiety amongst participants from primary or secondary care (assessed from GAD 7, PHQ 9 & UCLA loneliness measures)
- b. increase wellbeing and quality of life (evaluated from WHOQOL/SWEMWBS and interview)

Summary

In this study, I employ a mixed methods study design, outlined in the following chapter, to explore the perspectives and experiences of staff, service users, and social prescribers regarding the participant experience of TWG. My study seeks to address gaps in the evidence-base by investigating a) the perceptions of social prescribers in the local area about linking service users with TWG, b) the impact on mental health and quality of life (QoL) outcomes for secondary care patients accessing an NBI from an in-patient setting c) the impact of TWG on mental health outcomes and QoL for primary care patients. To do this, I will be referencing the theories, research, and policies summarised above.

CHAPTER TWO: Methodology

Chapter Overview

This chapter begins by outlining the study's ontological and epistemological position, followed by the rationale for adopting a mixed methods research design. The specific type of mixed methods approach used is described, along with an implementation matrix to illustrate the data collection process (Table 8). I then detail the procedures for analysing and interpreting both quantitative and qualitative data, including the use of Reflexive Thematic Analysis (RTA). Consideration is also given to how missing data and potential threats to validity were addressed. The chapter concludes with a discussion of ethical concerns and plans for dissemination.

“Combining the power of numbers with the power of stories” - Why choose a mixed methods approach?

The above phrase, coined by Pluye and Hong (2014, p. 29), resonated with me as I was drawn to the idea that statistical patterns and personal narratives can enrich each other. A mixed methods design enabled me to integrate quantitative data with qualitative accounts, revealing the depth and nuance of lived experience. Quantitative research is grounded in objective, systematic processes that explain phenomena using numerical or statistical data (Creswell, 2013; Bahari, 2012), whereas qualitative methods aim to explore individual, subjective meanings through participants' own words. While each approach carries its limitations and strengths, combining them can maximise a study's capacity to address complex, real-world questions (Cohen et al., 2017; Tuli, 2011; Creswell & Plano Clark, 2018).

I was aware that service users at TWG were diagnosed with either a CMI or SMI, and most were prescribed medication with significant side effects as well as psychological benefits. Many were involved in therapy or therapeutic groups during their inpatient stays,

and primary care participants often lived in difficult circumstances with social, environmental and relational challenges. These factors introduced confounding variables which the study could not control for. A mixed methods study design enabled me to ask participants about their clinical outcome measures and to explore with them how they attributed any positive or negative fluctuations in their scores during semi-structured interviews.

Philosophical Assumptions

A research approach encompasses various aspects, including ontology, epistemology, methodology, and methods, each of which influences the study's intention, design, and implementation (Ritchie et al., 2013). I shall address each of these in turn below.

Ontology

A research ontology is concerned with how reality itself is understood (Creswell & Poth, 2018; Braun & Clark, 2022). A key ontological issue is whether the social world is considered to be comprised of truths waiting to be discovered or whether reality is more fluid and continually being constructed through social interaction (Guba & Lincoln, 1994; Crotty, 1998). Positivist paradigms view reality as external and discoverable, whereas constructivist and interpretivist paradigms see reality as socially constructed and evolving through interaction (Creswell, 2013; Braun & Clark, 2022). The philosophical underpinnings of qualitative studies are often interpretivist (Mertens, 1998) or constructivist (Berger & Luckmann, 1966), as they investigate the meanings participants construct within their social and cultural contexts through interviews, focus groups, or observations. In contrast, quantitative studies tend to be underpinned by a positivist philosophical stance, that there is a knowable world that can be discovered through observation and experiment. From an ontological perspective, the current study is grounded in *critical realism*, consistent with the pragmatic worldview (Maxcy, 2003). As an ontological perspective, critical realism views reality as existing independently of social constructs, while recognising that social and

historical contexts influence our observations of this reality. This is particularly true for research into the social world, which is acknowledged to be more complex and subject to human social construction. In the current study, I have adopted a critical realist perspective, which posits that an objective reality exists regarding the impact of NBIs on mental health; however, our empirical observations can only provide an approximation of the deeper mechanisms at play.

Epistemology

An epistemology is the study of *how* knowledge is acquired (Creswell & Poth, 2018), directly addressing the relationship between the researcher, participant and their context (Guba & Lincoln, 1994). I considered various epistemological stances in planning this research, including social constructionism, which posits that knowledge is created through shared social processes and that "truth" is shaped by culture, language, and interactions between people. I also considered constructivism, which assumes multiple realities and emphasises the individual's active role in constructing knowledge through their own experiences and interpretations (Jonassen, 1991). As an epistemology, critical realism posits that a real world exists independently of our thoughts, but social, cultural, and historical contexts continually shape our understanding of it. In other words, reality is "real", but our knowledge of it is imperfect and influenced by interpretation (Braun & Clark, 2022).

Pragmatist epistemology

Pragmatism, the epistemological stance I selected to underpin this research, can be summarised as a belief that knowledge is best gained through the combination of different methods and perspectives to answer specific research questions (Allemang et al., 2022a; Morgan, 2007). Rather than adhering solely to either social constructionism, constructivism or critical realism, pragmatism allows for the inclusion of both hypothesis-driven inquiry and contextually rich, interpretive accounts of experience, working concurrently from the "top

down” and from the “bottom up” (Creswell & Plano Clark, 2018). Pragmatism allows for knowledge to be constructed through both objective and subjective processes, proposing that the research question should be of primary importance rather than the method or worldview, thus abandoning the “forced choice” between quantitative and qualitative paradigms (Morgan, 2007; Tashakkori & Teddlie, 2003a).

Pragmatism posits that quantitative approaches provide important but partial insights, which are complemented by qualitative approaches that focus on the lived experiences of participants. The current study integrates structured outcome data with semi-structured interviews to explore both “what works” and how and why it works (Creswell & Plano Clark, 2018). A pragmatist epistemological position aligns well with the mixed methods approach, where different types of data contribute to a more complete understanding of the research problem. Pragmatist epistemology is particularly well-suited to mental health research, where both measurable symptom change and personal recovery narratives are essential components of understanding the impact of interventions (Creswell & Plano Clark, 2018; Morgan, 2007; Allemang et al., 2022a).

Reflexivity

According to Olmos-Vega et al. (2023), the researcher’s participation in qualitative research from conception through to data collection and analysis is a significant aspect of the research process that should be analysed and interpreted. Others further suggest that the researcher’s prior experiences, motivations, and characteristics should be made explicit (Finlay, 2002, 2002b), and I will outline these aspects below.

I am a White female of British and German heritage. Childhood memories include spending time with my family in Germany on their smallholdings and, with my English family, learning different bird songs and the names of wildflowers. There is a significant family history of MI, including lengthy hospital stays and suicidality. Prior to clinical

training, my primary career was as a social worker with children and their families, believing that early intervention might be a way to prevent chronic mental illness. Still, this career served to emphasise further how adverse childhood experiences can negatively affect adult mental health. I have observed that people can be reluctant to take medication due to uncomfortable and unpleasant side effects affecting sleep, digestion, motivation and ability to experience emotions. I have also observed that clients can find talking therapy uncomfortable and have told me that they think therapists tend to over-emphasise their impact, forgetting that therapy is an hour a week. In contrast, they are coping with their symptoms as a full-time job. Therefore, I have always been interested in alternative treatments, particularly those that are non-medical, easily accessible, and support service users in taking a more active and engaged part in social life.

As a trainee clinical psychologist, I approached this research with a personal interest in NBIs and recovery-oriented practice. My role as a researcher positioned me as an outsider to the participants, which shaped my engagement with them and, consequently, influenced the data collection process. For example, my belief in the value of relational and community-based approaches to both physical and mental health shaped the measures that I chose and how I framed and asked questions, often encouraging participants to reflect not only on their individual experiences but also on how these were situated within group dynamics and community contexts. It is important to acknowledge that the data may have been shaped by a particular sensitisation on my part to certain topics; for instance, when participants spoke about the side effects of their medications, I found myself recalling previous conversations with family members who had expressed similar frustrations. This personal resonance may have influenced the attention I gave to these narratives and the direction in which I probed further in interviews.

Conversely, my orientation towards community approaches heightened my receptivity to participants' accounts of social connectedness and any importance they placed on group belonging and shared activity, which I may have prioritised more strongly in the analytic process than a researcher with a different perspective. To manage these influences, I engaged in reflexive journaling throughout the analytic process, noting how my assumptions and values might have shaped the interactions and interpretations. In line with the principles of RTA (Braun & Clarke, 2022; Byrne, 2022), I acknowledge that the themes presented are not “discovered” but actively constructed through my interaction with the data.

Mixed methods research strategy

Mixed methods research strategies aim to combine positivism and constructivism, which can be perceived as an uncomfortable fit, as these are two distinct and opposing paradigms. Critics question the possibility of combining qualitative and quantitative paradigms due to their fundamentally different epistemological assumptions. (Adu et al., 2022; Guba & Lincoln 1994). Nevertheless, proponents argue that integrating structured quantitative data with human stories, to investigate both *what* happens and participants' interpretations of *why*, has the potential to hear the voices of participants and enhance understanding of patterns and disparities in quantitative data (Gillespie et al., 2024).

Convergent-parallel mixed methods design

A convergent parallel mixed methods design was used to explore the effectiveness and experiential impact of participation at an NBI, TWG. Quantitative data examined changes in wellbeing and quality of life (QoL) during the intervention period, while qualitative interviews provided insight into how participants experienced and attributed meaning to various aspects of the intervention. In line with my chosen pragmatic philosophical stance, this study utilises multiple knowledge sources and prioritises the usefulness of findings in informing practice, service development, and policy. As shown in

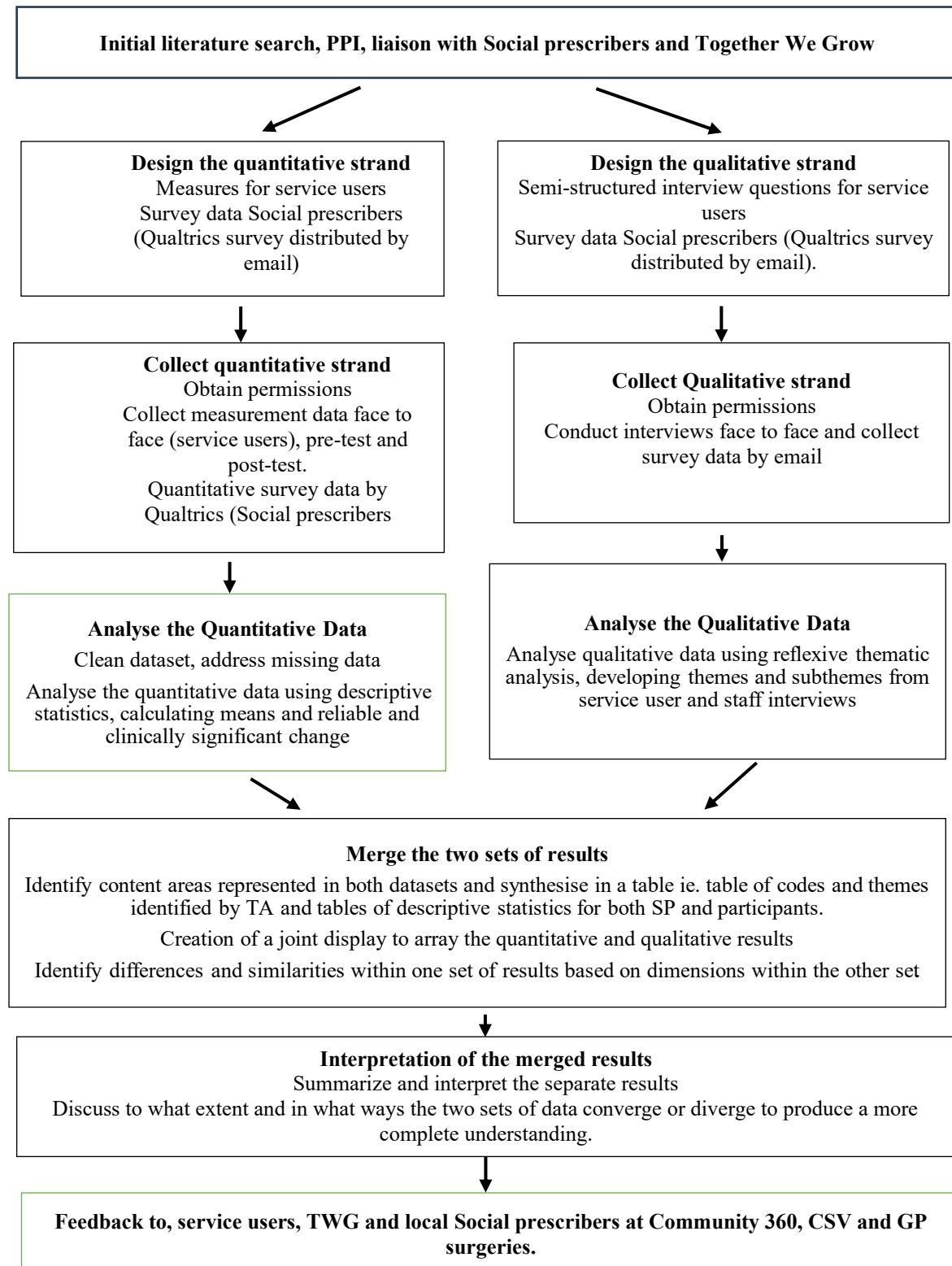
Figure 4 below, quantitative and qualitative data were collected concurrently, analysed independently, and then interpreted together (Creswell & Plano Clark, 2018).

Rationale for study design

In order to collect and analyse a variety of perspectives, I wished to design a study that could explore the views of social prescribers able to link with TWG and set these alongside participant views and clinical data about the effectiveness of this NBI. There was a further pragmatic dimension to the choice of a convergent parallel design. Participants began the intervention at different time points, and due to the unpredictable nature of secondary care inpatient services, attendance could be affected by factors such as staff availability, housing issues, discharge planning, or self-discharge. To accommodate this variation and to meet the study's time constraints, it was most feasible to collect pre- and post-intervention data concurrently from different participants at different stages of their involvement.

Critique of mixed methods methodology

Controversies persist regarding the effective integration of mixed methods research, particularly in terms of consequent threats to validity (Adu et al., 2022; Wasti et al., 2022). Adu and colleagues recommend that researchers make their epistemological stance explicit at the outset and attend carefully to the development of both the qualitative and quantitative strands during data collection, followed by the sound integration of quantitative and qualitative findings. Proponents argue that good-quality mixed methods methodology has been successfully adopted in nursing, occupational and psychology research (Adu et al., 2022; Creswell & Plano Clark, 2018) and the method has evolved as a “separate methodological orientation with its worldview, vocabulary and techniques” (Tashakkori & Teddlie, 2003, p. x).

Figure 4

Flow chart for basic procedures in implementing a convergent parallel design (adapted from Creswell and Plano Clark, 2018)

Sampling Strategy

Setting

Together We Grow (TWG), formerly known as the Big Garden, operates as a Community Interest Company (CIC) that delivers nature-based programmes aimed at improving wellbeing through engagement with gardening and community activities. The organisation operates from a garden and orchard site within High Woods Country Park and works in partnership with NHS services and allied health professionals. As part of this collaboration, occupational therapy students and practitioners from participating units support structured sessions, with TWG staff and volunteers facilitating activities and providing transportation for participants. TWG staff and volunteers are horticulturally trained. The majority of TWG volunteers have received horticultural and woodland management training from the Park Ranger service within Highwoods Country Park. Accompanying staff from the relevant units do not receive additional horticultural training. Many have attended TWG as part of their working week for at least a year but their role is to support service users 1:1.

Figure 4 illustrates the location of the two-acre community garden, which serves participants from primary care on Mondays (accessed through social prescribing and GP referrals) and secondary step-down participants from rehabilitation wards and acute inpatient care on Tuesdays. Transport is provided for rehabilitation participants; those in more acute care can access the project with a ten-minute walk accompanied by staff from the wards. There are opportunities to eat together in all the groups, and each intervention is approximately 2–2.5 hours long, taking place on a weekly basis.

Uniforms are not worn, and the project operates with a flat hierarchy; for the most part, participants are consulted and given choices about the work that needs to be done on a given day. Tasks range from physically demanding to relatively light, and participants can choose whether to complete them with one-on-one support or in groups. At the end of each

session, non-acute participants could choose produce to take back to the ward and were encouraged to cook with it, sometimes bringing dishes made with TWG produce to share the following week.

Figure 5



Location of Together We Grow

TWG is an example of an NBI with a STH focus, providing individuals with mental illness structured opportunities to engage in gardening and land management. The programme aligns with ecotherapy principles, embedding therapeutic activity within a natural context, and is situated within the subfield of STH, defined as the purposeful use of

horticultural activities to achieve clinically relevant goals in mental, physical, and social health (Sempik, et al, 2003).

Thrive's "five-level model" of therapeutic gardening illustrates how STH can be targeted to a range of needs from universal community gardening initiatives to structured programmes targeting individuals with severe and enduring mental illness, each with differing requirements for practitioner training, therapeutic structure, and clinical oversight (Thrive, 2019). In the Thrive model, Level 0 refers to incidental contact with plants, Level 1 to informal community gardening, Level 2 to structured community projects with light facilitation, Level 3 to STH delivered through regular, purposeful sessions led by trained facilitators, and Level 4 to enhanced STH/HT involving higher structure, clear therapeutic goals, and closer collaboration with health professionals.

Sessions at TWG incorporate several STH components: horticultural activity (planting, nurturing, and harvesting), nature immersion (sensory engagement), social interaction and skill or confidence building. TWG's programme structure, emphasis on skill-building and meaningful activity, and collaboration with healthcare providers indicate a strong fit with Level 3 (STH) for primary care referrals. However, for secondary care participants, where the sessions are more intensively supported and aligned with rehabilitation and recovery aims, TWG's delivery is best described as approaching Level 4 (enhanced STH). While the programme does not constitute formal clinical treatment, its degree of structure, practitioner expertise, and focus on sustained therapeutic engagement position it at the upper end of the Thrive STH model. This situates TWG as a bridge between community-based wellbeing activity and clinically adjacent therapeutic provision for secondary care participants.

Due to the applied nature of the research and the small-scale, real-world setting, in line with best practices in participatory research, a Patient and Public Involvement (PPI)

group was consulted before data collection to ensure the study was ethically sensitive, accessible, and relevant to participants.

Patient and Public Involvement (PPI)

To enhance the quality and relevance of the research, informal consultations were conducted with participants who had attended the project for more than six months during coffee breaks, held two weeks apart in the primary care group. Seven participants attended these sessions, during which I introduced myself as a trainee clinical psychologist and presented early-stage materials, including the recruitment poster, interview questions, and demographic forms.

The aims of the study, the ethical process, and how anonymity and confidentiality would be preserved were explained. Participants were informed that no identifying information would be collected and all data would be anonymised. Feedback from the group led to several meaningful changes. For example, participants with autism requested that the interview and questionnaire verbal instructions clarify that eye contact was not expected. It was also agreed that questions about diagnosis and medication would be optional. The group made minor edits to the interview schedule, and although some found the outcome measures lengthy, others valued the opportunity to reflect on their wellbeing. Due to feedback that the form was very long, it was agreed that the researcher would emphasise that participants were free to stop at any time. The researcher agreed to return following ethical approval to commence formal data collection.

Inclusion/exclusion criteria

To select a representative sample, service users were recruited from TWG using a purposive sampling strategy set out in Table 7 below. The secondary aim of the research project was to investigate the views of community social prescribers (SPs) who were able to link service users to TWG. For this, a purposive sampling strategy was also employed for

recruitment. The criteria for SP inclusion in the study are also clearly defined and presented in Table 7.

Table 7

Inclusion and Exclusion Criteria

Inclusion criteria	Exclusion criteria
To be included service user participants must 1. Regularly attend TWG 2. Be adults between the ages of 18 - 65 3. Have a history of mental illness (participants with dual diagnosis of mental illness and mild intellectual disabilities were included) 4. Have recently started attending Together We Grow.	1. A mental capacity assessment was completed by the researcher with every potential participant. Those who lacked sufficient capacity to understand, retain, use and communicate information about the study would be excluded. I attended specific training at the University of Essex to equip me with the skills and sensitivity for this process.
To be included in the social prescriber, staff and volunteer participants were 1. Currently working as social prescribers in the North East Essex area OR 2. Currently attending TWG with service users OR 3. Currently volunteering at TWG	

Procedures

Recruitment

Social Prescriber Recruitment

Social Prescribers (SPs) were recruited via targeted outreach to two local social prescribing hubs and 16 general practices within North East Essex. Recruitment materials (Appendix B) were distributed via email and included a poster and QR code linking to the survey. The purpose and aims of the research were communicated to managers at both local social prescribing hubs via phone and email. Recruitment posters and a Participant

Information Sheet (PIS) (Appendix E) were distributed to support the recruitment process. Managers were asked to circulate this information among their teams. Social prescribers could express interest by emailing the researcher directly or scanning the QR code to access study details, consent and participation information.

Social prescriber participants were invited to complete a questionnaire (see Appendix C), which was distributed twice, at the beginning of the study in September 2024, and again in February 2025. They were also asked to sign a consent form (Appendix D), confirming that they understood the aims and process of the project and agreed to take part. These were distributed via email with a Qualtrics link, and all responses were submitted through the Qualtrics platform. Data from the completed surveys were exported to an Excel spreadsheet for analysis. Only community social prescribers completed the online survey.

Service User Recruitment

While several local NBIs were approached, TWG was the only project able to participate, with others explaining that due to staffing and participant shortages, the research was unlikely to be viable. The researcher met with TWG staff during two team meetings to explain the study's purpose and procedures. Recruitment posters were then displayed at the project site. Before the research period, the study was introduced to both primary and secondary care groups.

For this study, “recent starters” were defined as service users who had commenced engagement with the project within the last one to three months. In secondary care, participants were recruited within approximately one month of starting, while in primary care, recruitment was slower due to winter months and a change in facilitators, so recent starters were defined more flexibly. Recruiting as soon as possible is optimal to accurately measure changes in outcomes attributable to participation; however, the research timeline, my availability as a solo researcher, and practical constraints limited early recruitment,

particularly in primary care. Consequently, the study captured fewer early-stage experiences in primary care, representing a methodological weakness, though secondary care participants provided insights soon after starting. Future studies could benefit from extended or staggered recruitment to ensure more balanced representation and to capture outcomes closer to initiation.

Participants were informed that involvement was entirely voluntary, with the right to withdraw at any time. An emphasis was placed on anonymity and confidentiality. During regular site visits on Mondays and Tuesdays, the researcher provided interested participants with a Participant Information Sheet (PIS), which was read independently or with support as needed, followed by completion of a consent form.

For participants referred from secondary care, a simplified summary PIS was provided to aid understanding, and a mental capacity assessment (MCA) was conducted. Participants were only included if they demonstrated sufficient capacity to understand, retain, and communicate informed consent, as well as a clear understanding of their involvement in the study (see Appendices F, G, and H for the Participant Information Sheet, consent forms, and capacity assessment protocol, respectively).

With the secondary care group, the temporary nature of placements and the unpredictability of care planning meant it was anticipated that some service user participants might move on during the research period. As such, some post-test data is missing.

Measures and methods used

An overview of the methods and tools employed to address each research question, as well as the processes by which these methods were integrated after data collection and analysis, will be discussed later in the chapter. Firstly, Table 8 presents the measures and techniques employed to address each research question.

Table 8*Implementation Matrix (adapted from Creswell & Plano Clark, 2018)*

Research question	Strategy	Sample	Analysis
What are social prescriber perceptions of the value and purpose of GSP?	Survey (quantitative and Qualitative)	Social prescribers and accompanying staff	Descriptive statistics
What are the perspectives of volunteers at Together We Grow?	Semi structured interview (Qualitative)	Volunteers	Reflexive Thematic Analysis (RTA)
What is the impact of the NBI clinically on participants?	Outcome measures (Quantitative)	Service users	t-tests, non-parametric tests clinical significance tests
What are service user views of the impact of TWG on their mental health recovery?	Semi structured interview (Qualitative)	Service users	RTA

The research questions were intentionally paired with methodological approaches that best aligned with their aims. For example, the survey for social prescribers combined quantitative and qualitative elements, enabling both a broad overview of their perceptions of the value and purpose of GSP, STH and engagement with structured activity based in nature. Semi-structured interviews with volunteers and service users were analysed using Reflexive Thematic Analysis (RTA), which allowed rich accounts of personal experience and recovery to be examined in depth. In contrast, outcome measures with service users generated quantitative evidence of clinical impact, assessed through t-tests, non-parametric tests and clinical significance testing.

Integrating these strands of evidence after analysis supported stronger interpretation of the data. For instance, social prescriber perceptions of the benefits of a green social prescription to TWG could be considered alongside volunteers' accounts of their involvement

and service users' reflections on recovery, offering complementary perspectives on value and impact. Similarly, qualitative themes around mental health improvements were contextualised with outcome measure data, ensuring that participants' subjective reports were interpreted alongside measurable change. This mapping across aims, methods, and results therefore strengthened the overall conclusions by situating individual findings within a broader, multi-dimensional understanding of the NBI.

Service User Quantitative Measures

Quantitative data were collected from service users in person, on-site at TWG. The pre-test measures were collected once the participant had been informed about the research, had agreed to participate, had signed a consent form, and had completed an MCA assessment if appropriate. Alongside the measures, a demographic questionnaire consisting of questions about gender, ethnicity, duration, and severity of illness (see Appendix I) was presented to participants. The measures outlined in Appendix J were administered again after participants had completed at least eight sessions at TWG. All data were anonymised, and the collected measures are summarised in Table 9. Once scored, the data were exported and stored in a SPSS (version 29 for Mac) spreadsheet for analysis.

Table 9*Mental Health and Quality of Life measures*

Anxiety Symptoms	Anxiety symptoms were measured using the validated, brief, self-report Generalised Anxiety Disorder-7 scale (GAD-7; Spitzer et al. 2006). Löwe et al. (2008) substantiated the 1-dimensional structure of the GAD-7 and its factorial invariance for gender and age. <i>Scores above 10 are considered to be in the clinical range</i> (Spitzer et al., 2006). Higher scores indicate <i>increased</i> anxiety. The GAD-7 has shown good reliability and construct validity (Kroenke et al., 2007; Löwe et al., 2008)
Depressive symptoms	Depressive symptoms were measured using the validated, self-report PHQ-9 scale (Kroenke et al. 2001). The diagnostic validity of the 9-item PHQ-9 has been established (Kroenke et al. 2001). Reliability and validity of the tool have indicated it has sound psychometric properties. Internal consistency of the PHQ-9 has been shown to be high; cronbach α .86 and .89 (Kroenke et al 2001). The PHQ-9 total score ranges from 0 to 27 (scores of 5–9 = mild depression; 10–14 = moderate depression; 15–19 = moderately severe depression; ≥ 20 = severe depression. Kroenke and colleagues conclude the PHQ-9 is a reliable and valid measure of depression severity.
Eudaimonic and/or hedonic wellbeing	Wellbeing was measured using Shortened Warwick-Edinburgh Mental Wellbeing Scale or SWEMWBS, (Stewart-Brown et, al. 2009). The SWEMWBS has been validated for the general population (Ng Fat et al., 2017) and for some clinical populations (Vaingankar et al. 2017; Haver et al., 2015). The SWEMWBS has good convergent construct validity (Ringdal et al., 2018; Koushede et al., 2019). Based on a mean score of 23.5 and a standard deviation of 3.9 (Ng Fat et al., 2016), approximately 15% of the population is expected to score above 27.4. Therefore, a score of 27.5 or higher is used as the cut-off for <i>high wellbeing</i> while a score of below 19.5 is considered indicative of <i>low wellbeing</i> .
Loneliness and social isolation	The 10-item UCLA Loneliness Scale (Russell, 1996) is a widely used self-report instrument designed to assess subjective feelings of loneliness and social isolation. It is a shortened version of the original 20-item scale developed by Russell et al., (1978), but retains strong psychometric properties while reducing respondent burden. Each item is rated on a 4-point Likert scale ranging from 1 = Never to 4 = Often. Scores range from 10 to 40, with higher scores indicating greater loneliness. The 10-item version is suitable for use in a variety of populations and is often used in public health, psychology, and social care research.

Quality of Life	The WHOQOL-BREF is a shortened version of the World Health Organization's original Quality of Life assessment, the WHOQOL-100 (Skevington et al., 1996). It is a widely used instrument designed to assess an individual's quality of life across four key domains: physical health, psychological health, social relationships, and environment. The tool comprises 26 items, each rated on a five-point Likert scale, where higher scores indicate better quality of life. The WHOQOL-BREF provides separate scores for each domain, allowing for a more nuanced understanding of different aspects of an individual's wellbeing. In addition to the domain scores, the measure includes two standalone items that assess overall quality of life and general health perception. The WHOQOL-BREF preserves the validity and reliability of the longer WHOQOL-100 while being more practical for use in clinical settings and large-scale surveys. It has undergone extensive cross-cultural validation, making it appropriate for use in diverse populations and across various health conditions (WHO, 1998)
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Qualitative data collection

Service user semi-structured interview

Before the post-test measures were collected, participants' memory and understanding of the study, as well as their expectations of participation, were revisited. Participants were reminded that participation was optional and that the semi-structured interview would be recorded. The interviews were designed to take approximately 40 minutes and aimed to explore participant' experiences of the intervention, any perceived changes, and broader impacts on their daily lives. The interviews were guided by a pre-determined question schedule (Appendix K), allowing for both consistency across participants and flexibility to probe deeper based on individual responses. All interviews were audio recorded with participants' informed consent and conducted in a quiet, private space, ensuring clear audio quality. Audio recordings were securely stored and transcripts anonymised to protect participant confidentiality.

Volunteer and staff interview

Staff who linked participants with the project were interviewed on-site at TWG using the same processes as for participants. The interviews followed the outline set out in Appendix L, and the recordings and transcripts were stored on an NHS-encrypted laptop. Volunteers were interviewed using relevant questions from the same schedule.

Data recording and transcription

These interviews were audio recorded on an NHS-issued Dictaphone, exported, and the audio recording was transcribed using software provided by the Olympus DSS player. Transcripts were stored on an NHS-encrypted computer under the same anonymous code selected by the researcher above and exported to NVivo 14 for Mac.

De-briefing techniques

Debriefing was an essential step following research interviews, especially when sensitive topics were involved. I thanked the participants for their time, revisited the study's purpose in more detail, and asked if they had any additional thoughts or feedback. I ensured that I asked if they had any questions or concerns. Secondary care participants were left with staff members who were aware that they had been interviewed that day. With the primary care participants, I asked them what they planned to do for the rest of the day and reminded them of the distress protocol (Appendix M) that they had agreed to when they initially participated in the study. I did my best to ensure that participants left feeling respected and emotionally supported, offering resources or support contacts if needed. At the pre-test, I reminded them that I would see them again in approximately eight weeks. After the interview, I confirmed that their involvement was complete and reassured them about the confidentiality of their responses.

Ethical Considerations

Capacity and Consent

It was anticipated that participants “stepping down” from a stay in hospital might have varying mental capacity depending on the length of time since diagnosis, duration and severity of illness. For all secondary care participants, an MCA was conducted using the simplified PIS provided to assess understanding, and a Distress Protocol was established for each participant. Once a participant had demonstrated they had sufficient capacity to understand the process and any consequences of the research, a consent form was signed by the participant. It was made clear that participants have the right to withdraw at any stage, including after they have given their consent. At the post-test stage, the capacity and understanding of the research process and consent were revisited verbally, as per the IRAS ethical guidance, and following my consultation and training in Mental Capacity Act procedures (see Appendix U).

Confidentiality

Confidentiality and anonymity were carefully explained to participants, who were reassured that I would not have any access to their records or any liaison with professionals caring for them, unless safeguarding concerns arose. Care was taken to conduct interviews in a private space.

Ethical approval

Ethical approval was obtained from Leeds East REC 24/YH/0115, IRAS project 342373 (See Appendix M), and received HRA approval in July 2024 (ETH 2324-2071) (See Appendix N).

Handling of sensitive data

All interviews and data were anonymised, and no names or identifying data were collected. The interviews were audio recorded on an NHS-issued Dictaphone, exported, and

the audio recording was transcribed using software provided by the Olympus DSS player. Transcripts were stored on an NHS-encrypted computer and exported to NVivo, where they were stored under their anonymised names. All data was stored on a secure computer and uploaded to the University of Essex “Box” secure cloud storage and collaboration platform.

Reflections on data collection

Data collection was not always straightforward. While some service user participants were enthusiastic from the start, others required more time for trust to develop. Sometimes measures were collected informally while participants engaged in activities side by side; at other times, they preferred to complete paper versions independently and return them. A few expressed concerns about whether their responses might be added to their medical records. For most participants, a consistent approach was possible; questionnaires were administered in paper format, and I read the questions aloud and explained the scoring structure if needed. This approach was generally preferred and often led to extended discussions, allowing me to build rapport and gain a deeper understanding of the participants' experiences.

Due to the time-consuming nature of this approach, I visited TWG most weeks. Over time, trust developed and engagement increased. I retained the original paperwork, and for the post-test, we used a different coloured pen. The risk of demand characteristics was reduced by first asking the participant the question and subsequently comparing to previous answers if relevant. This helped both the participant and me to see changes in responses, such as increases or decreases in scores related to anxiety, loneliness, or low mood. These changes often informed the follow-up interviews, prompting discussions about other life circumstances that may have influenced the scores.

Data Analysis

Quantitative analysis

Demographic and Clinical Data

Demographic information provided by participants is reported descriptively to offer contextual background for the sample. Data from TWG service users' pre- and post-intervention measures were entered into SPSS 29. Before analysis, all data were screened and cleaned: missing values were identified, outliers were checked, and data were inspected for entry errors.

Prior to conducting the analyses, the distribution of pre–post change scores were examined using Shapiro–Wilk tests and visual inspection of histograms and Q–Q plots. Although some of the quantitative data did not meet strict normality assumptions, paired *t*-tests were employed for the pre–post comparisons, as this test is well documented to be robust to moderate violations of normality, particularly with balanced sample sizes (Boneau, 1960; Glass, Peckham and Sanders, 1972; Lumley et al., 2002). Research has consistently shown that the *t*-test maintains appropriate Type I error rates under a wide range of non-normal conditions, with non-parametric alternatives generally only offering advantages in cases of very small sample sizes or highly skewed distributions (Zimmerman, 1998; de Winter, 2013). Nevertheless, non-parametric Mann–Whitney U tests were also conducted as a sensitivity check, given the small overall sample size, to confirm that the pattern of results did not depend on distributional assumptions.

To examine whether outcomes differed between the two care levels, between-groups analyses were conducted on change scores (post–pre). Change scores were used as they provide a direct measure of improvement or decline and help account for any baseline differences between groups. Independent-samples *t*-tests were initially applied as a parametric approach. Prior to running these tests, assumptions of normality and homogeneity

of variance were assessed. Levene's test for equality of variances was performed first to check whether the assumption of equal variance could be retained, and descriptive statistics including skewness and kurtosis were examined to evaluate distributional assumptions. Given the already very small sample size was further divided and with evidence of non-normality in some variables, non-parametric Mann-Whitney U tests were this time reported as a more robust alternative, as these do not assume normality and are less affected by unequal variances or outliers.

Both statistically significant and clinically significant changes in scores were calculated. Clinically significant change was determined using the Minimal Clinically Important Difference (MCID) for each outcome measure. Effect sizes (Cohen's d) were calculated to assess the magnitude of change.

Survey Data

Social prescribers' survey data were coded where possible to obtain descriptive statistics on their current perspectives regarding the impact of nature-based interventions (NBIs). Recurring themes and concepts from open-ended survey responses were explored using a thematic coding approach to provide qualitative context to the quantitative findings.

Missing Data

Participants who did not complete post-test questionnaires were excluded from the paired t-test analyses, although their pre-test data were retained for descriptive reporting. Mixed-effects models, which can handle missing data while preserving incomplete cases, were considered but not used due to the small sample size and the specific aim of assessing group-level change over time. A straightforward paired-samples t-test approach was chosen to maintain clarity and interpretability.

Qualitative Analysis

Thematic Analysis of semi-structured interviews

Reflexive Thematic Analysis (RTA) follows the same six stages outlined by Braun and Clarke (2006) in their original Thematic Analysis paper; however, the authors now recommend using their contemporary approach (Braun & Clarke, 2019; Byrne, 2022). Using RTA, these stages are approached more flexibly and reflexively, in a recursive approach rather than rigid steps. The researcher is seen as an active meaning-maker, and themes are interpreted rather than discovered (Braun & Clark, 2022). An analysis using RTA reflects the researcher's exploration of the dataset, theoretical assumptions, and resources combined with the subjectivity of participants (Byrne, 2022). Below, I will outline how I followed the six-stage process to analyse participant interview transcripts using NVivo 14 software, as well as hand-coding and an Excel spreadsheet.

Familiarisation with the data: Having uploaded each interview transcript under the participant's pseudonym, I read each transcript several times to become deeply familiar with the content of the data. I began to note early impressions and patterns, allowing ideas to form about potential meanings within the data. I recalled the gestures and mannerisms of participants and recorded my thoughts and feelings at the time of observation (Byrne, 2022). While I used NVivo to organise and manage the transcripts, my approach to coding remained flexible and interpretive, in line with Braun and Clarke's (2022) practical guide.

Coding: I began generating initial codes both manually and using NVivo (Appendix P). By hand-coding printed transcripts, I was able to interact with the data and closely annotate emerging insights. NVivo was used to organise coded data extracts under flexible, evolving nodes. These codes were not predefined but developed inductively through my engagement with the data. Coding was active and interpretive, focusing on capturing meaning rather than quantifying frequency. In line with RTA, I allowed codes to change and

multiply as my understanding deepened. There was an additional deductive element to this process, as I remained mindful of both the environmental psychology theories and the literature search that informed this study, and the impact these might have on my understanding of the data.

Generating Initial themes: I began grouping related codes to construct initial themes. This was not a linear or rigid process, but an iterative one, involving movement between data and code, and abandoning developing ideas where necessary. I also worked offline, using an Excel spreadsheet (Appendix Q) to explore how codes might be rearranged within broader conceptual patterns or categorised under different themes. At this stage, I treated themes as provisional analytic constructions.

Developing and Reviewing Themes: Once a set of candidate themes had taken shape, I reviewed how well each theme captured the essence of the coded material and whether the boundaries between themes were clear and distinct. I found this aspect of coding the most challenging and tended to retain themes when I did not need to, resulting in themes that blurred into one another or were extraneous to the story. Clarifying the process was supported by Excel, where I visually mapped out themes and sub-themes in a matrix format, which helped me identify overlaps, gaps, or inconsistencies. In keeping with Braun and Clarke's guidance, this phase was interpretive and recursive, moving back and forth between data and themes to refine the structure, ensuring analytic clarity and depth.

Refining and Defining Themes: I finalised the themes after discussing them with my supervisor. This discussion helped to clarify what each theme was about and how it contributed to the overall narrative of the data. I reflected on how the main themes connected to the research questions. I decided that one of the domains or overarching themes, "Implementation", was entirely redundant and contributing to a messiness and lack of clarity in the data. Much of the rich and layered quotes could be captured in other, more relevant

themes without losing their emotional resonance. This phase required critical judgment and reflexivity, acknowledging my role in shaping meaning from the data, as well as a certain amount of ruthlessness.

Writing the report: The final phase involved weaving the themes into a coherent and compelling narrative for the thesis. In the analysis chapter, I presented each theme alongside vivid data extracts, using these quotes to illustrate interpretive claims rather than as evidence of frequency or consensus. I aimed to tell a story that was both grounded in participants' accounts and informed by my theoretical framework.

Integration of qualitative and quantitative data

The purpose of integration in a convergent parallel design is to develop findings by combining and synthesising the data. To achieve this, I identified common concepts across the quantitative and qualitative results, determining in what ways the data sets confirm, disconfirm, or expand upon each other. I initially considered quantifying some of the qualitative data by scoring each theme and counting the frequency of its appearance across participants. However, I ultimately rejected this approach as it conflicted with the principles of RTA. Braun and Clarke (2022) explicitly caution against relying on frequency counts, as RTA prioritises the meaning and contextual richness of data over the number of occurrences. The integration was presented and summarised in joint comparison tables at the end of Chapter 3.

Assessing Quality

Principles and best practices of mixed methods research

Throughout this study, I have sought to identify and apply the best practices of mixed methods research. Mixed methods research should have a clear rationale that is appropriate for the research question, explaining how the combination of qualitative and quantitative data will offer complementary insights (Creswell & Plano Clark, 2018). I have followed a

coherent design and shown when integration occurs. I have reflected on how my position and experiences may impact this choice of research above and used a reflective journal to review the potential impact of any biases in both the qualitative and quantitative phases (Tashakkori & Teddlie, 2010). Ethical standards were consistently maintained across all phases of the research, with a focus on obtaining informed consent, maintaining confidentiality, and treating participants with respect in both strands (Creswell & Plano Clark, 2018).

Trustworthiness in qualitative design

To ensure the trustworthiness of the qualitative analysis, the principles outlined by Lincoln and Guba (1985) were followed. Credibility was supported through prolonged engagement with the data and the use of participant quotes to illustrate key themes. Transferability was addressed by providing rich contextual descriptions to allow readers to assess the relevance of findings to other settings. Dependability and confirmability were enhanced by maintaining an audit trail of decisions made during the analysis process and engaging in reflexive practice throughout the research process

Trustworthiness in quantitative design

In quantitative research, trustworthiness is established through ensuring validity, reliability, objectivity, and generalisability. There are specific threats to validity that can arise in mixed methods studies, which are addressed below. Although the sample size is very small, reliability was maximised by using reliable statistical methods and ensuring effective integration with qualitative data. Objectivity was maintained by using standardised measures and minimising researcher impact and bias in the quantitative aspect of the project. Generalisability is limited due to the small, specific sample and the unique nature of TWG; however, the findings of this study can best be described as transferable rather than generalisable, given the rich contextual detail provided by the participants.

Threats to Validity

Creswell & Plano Clark (2018) suggest that with a convergent design, threats to validity arise if researchers fail to use parallel concepts in data collection for quantitative and qualitative concepts, have unequal sample sizes or fail to report disconfirming results. Therefore, I developed parallel qualitative questions to address similar concepts to those measured quantitatively, ensuring a coherent approach to data collection (see Appendices K and L). In the analysis phase, both qualitative and quantitative data were carefully triangulated to verify and cross-check the findings. To minimise researcher bias, I maintained a journal for reflections and acknowledged my own positionality.

Prominent voices in the field have suggested that mixed methods research closely parallels everyday human problem solving by utilising multiple approaches concurrently or in sequence (Tashakkori & Teddlie, 2010). Mixed methods research can, from this perspective, be described as bringing the “human” into research processes. To make sense of the multiple approaches and perspectives that I used to understand my research questions, I aimed to establish a transparent coding process. I regularly reviewed emerging themes until I was satisfied with a coherent narrative (Appendices P, Pb and Q). Furthermore, to strengthen internal validity, statistical significance was considered in conjunction with clinically significant changes in scores. All disconfirming results were reported.

Critiques of the Methodology

Pragmatism is not without its detractors and has faced criticism for being a "paradigm of convenience", prioritising practicality over philosophical principles and values (Hampson & McKinley, 2023; Biesta, 2010). Critics argue that its focus on "what works" and the primacy of research questions over underlying philosophical assumptions can lead to neglect of core theoretical principles, a potential conflation of paradigm and method, and a “consequentialist view of truth” (Hampson & McKinly, 2023, p. 124). Hampson and

McKinley (2023) argue that in prioritising flexibility and practicality over philosophical position, pragmatism is not the optimal “world view” for mixed methods researchers.

While the convergent parallel mixed methods design offers a robust approach for capturing both numerical trends and in-depth experiences, it is also not without critique. Morse (2010) and Bryman (2006) highlight the interpretive complexity of integrating divergent data strands, warning against superficial or disjointed analyses, and I did indeed find it a challenge to integrate and present these diverse strands effectively.

Nevertheless, the current study adopted a pragmatic paradigm, allowing for methodological flexibility grounded in practical inquiry. Careful attention was given to the integration process through the use of a joint integration display and a side-by-side comparative analysis, ensuring that both data strands informed and enriched one another (Creswell & Plano Clark, 2018). This approach helped generate meaningful inferences while maintaining the integrity of each method, thus mitigating concerns around philosophical incompatibility and interpretive ambiguity.

Summary

The current study adopted a convergent parallel design within a pragmatic methodological framework to explore the impact of NBIs on mental health. By collecting and analysing quantitative and qualitative data concurrently, the research aimed to capture both measurable outcomes and personal experiences associated with these interventions. Pragmatism guided the integration of findings, emphasising practical insights that can inform real-world mental health practices. The next chapter presents the results and findings derived from this integrated analysis.

CHAPTER THREE: Results

Chapter Overview

This chapter presents the findings from three primary data sources: a survey of social prescribers, quantitative outcome measure responses from service users, and qualitative semi-structured interviews with staff, volunteers and service users. Quantitative results are presented and supported by relevant graphs. This is followed by thematic data supported by relevant quotations to illustrate key themes: Reclaiming Health, Being Away, Temporal Integration, Building Self-Agency and Belonging.

Service user participants

Data collection took place between September 2024 and April 2025. During this period, I visited Together We Grow most weeks to introduce the project and recruit participants. The interval between participant pre- and post-intervention interviews varied from 12 to 19 weeks, influenced by fluctuations in attendance due to weather conditions or staff availability.

Initially, it had been anticipated that twenty participants could be recruited over the study period. However, due to the research taking place over the winter months rather than the summer of 2024 and facilitator changes in the primary care group, only twelve service users were recruited. Of these, nine completed both sets of measures and the interview. There was, therefore, a 25% attrition rate. Some participants declined to participate in interviews due to factors such as a desire not to be recorded. Several attendees chose not to participate in either stage of the research, while others attended only once and did not return. As a result, data collection progressed slowly, and I was mindful of the tension between my research timeline and the participants' needs.

At each visit, I made observations and participated in activities and breaks, aside from interviewing or completing questionnaires, which allowed me to notice participant responses,

fluctuations in mood, motivation, and social interactions. This more informal data is not reflected in the results of this chapter, but enriched my understanding and immersion in the garden.

Table 10 presents the characteristics of all participants recruited. The service user sample consists of 42% females and 58% males, with 17% identifying as Black, while the remainder reported their ethnicity as White. All participants reported being of UK nationality. Ages of participants ranged from 19 to 62; the average age was 41.7.

Table 10*Service user participants*

	Participant Pseudonym	Age	Gender	Ethnicity	Diagnosis	Duration
					(self-reported by participant)	
1	Rose	19	F	White UK	Psychosis / Depression	2 years
2	Carter	21	M	Black/UK	Psychosis, Depression	2 years
3	Alex	52	M	White UK	Bipolar Disorder, memory and mood problems	10 + years
4	Judith	55	F	Undisclosed	Bipolar Disorder, Anxiety, Depression and EUPD	10 years
5	Amanda	62	F	White UK	Unknown diagnosis	20 + years
6	Kim	19	F	White UK	Unknown diagnosis	5+ years
7	Phil	21	M	White UK	Autism, Psychosis, Anxiety	1+ years (psychosis)
8	Oscar	61	M	White UK	Paranoid Schizophrenia, Anxiety, Depression, Mood disorder	30 + years
9	Sarah	56	F	White UK	Histrionic personality disorder, bipolar, anxiety and depression	10 years
10	John	55	M	White UK	Bipolar Disorder, Anxiety, Depression and mood disorder	15 + years
11	Harry	57	M	White UK	Depression, Alcohol Dependency	25 years
12	Rob	23	M	White UK	Psychosis	3 + years

Social prescriber participants

A Qualtrics survey was distributed to North East Essex GP surgeries that indicated that they had social prescribers among their staff on the “primary choice” website <https://gpprimarychoice.co.uk/specialist-social-prescribers/>. It was also distributed to two local social prescribing hubs: Community 360 and Community Voluntary Service (CVS) Tendring. Social prescriber participants were not asked to provide identifying or demographic information to promote openness in their responses and reduce the burden of completing the survey. Therefore, no demographic information is available for participants in the social prescriber group.

The survey was designed to gather social prescriber (SP) perspectives on the value and utility of NBIs in general for people with MI. The survey included structured questions that capture numerical or categorical data, allowing for some quantitative analysis of SP perceptions. The qualitative component featured open-text entry fields, enabling respondents to elaborate on their experiences and opinions. Six social prescribers responded to the initial Qualtrics survey, and a repeat call for recruits in February 2025 yielded two additional data sets.

Staff participants

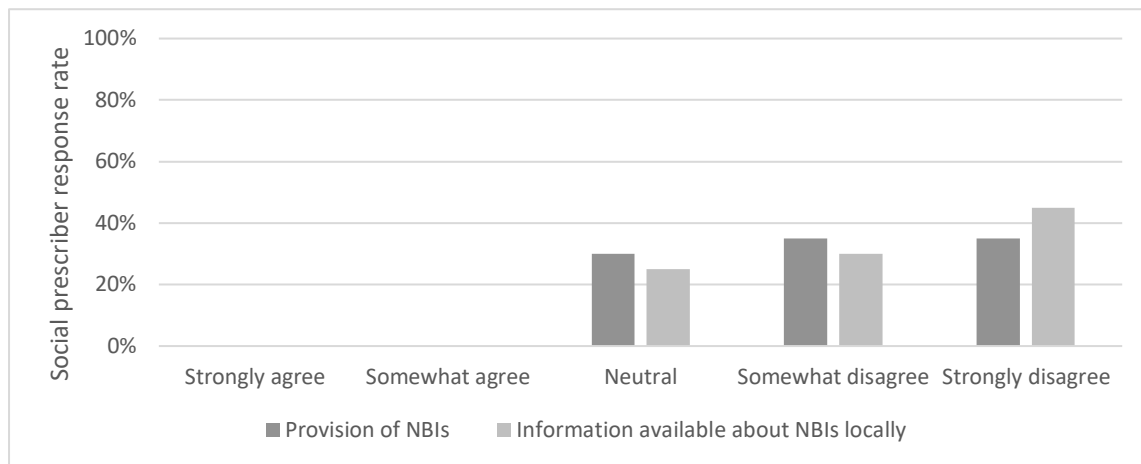
Two volunteers from the staff team agreed to be interviewed as well as two members of staff from the respective rehabilitation and acute units, one OT and one OT assistant, their characteristics are presented in Table 11 below.

Table 11*Staff participant details*

Number	Pseudonym	Gender	Role	Involvement with TWG
1	David	Male	NHS Occupational Therapist	3 years
2	William	Male	TWG Volunteer	8 years
3	Andy	Male	TWG Volunteer	5 years
4	Christopher	Male	NHS OT assistant	2 years

Social prescriber quantitative responses*NBI provision*

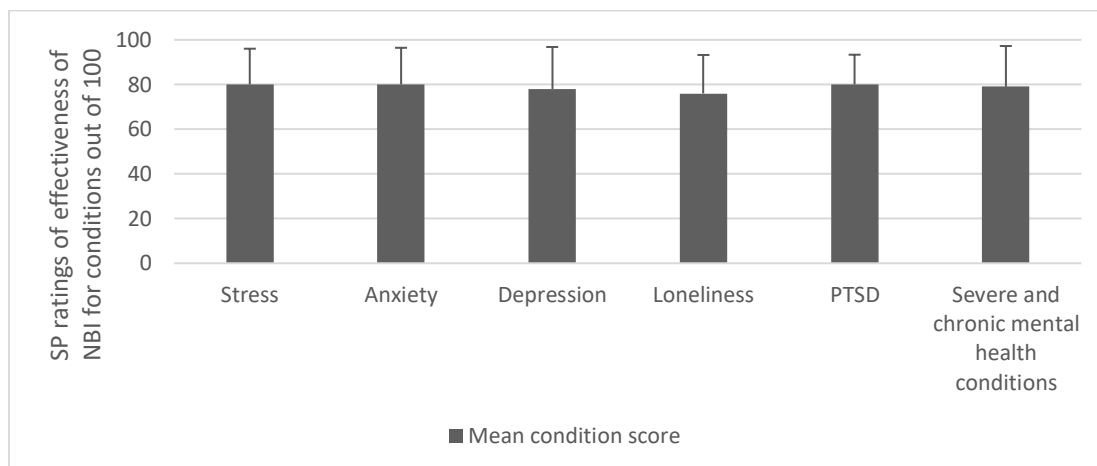
This section sets out to address the research question “*What are social prescriber’s perceptions of the value and purpose of GSP?*” The initial statement, “There is enough provision for nature-based intervention in your area”, aimed to explore social prescribers’ perceptions of local NBI provision. A further statement followed: “There is enough information available to you and other social prescribers in your area about nature-based interventions”. Responses were scored: 1 = strongly agree, 2 = somewhat agree, 3 = neutral, 4 = somewhat disagree and 5 = strongly disagree. Figure 6 indicates that the SP sample believed there is both insufficient provision and insufficient information about NBI provision in their local area.

Figure 6

SP perceptions of local NBI provision

SP perceptions of whether NBI's can support service users' mental health

Social prescribers indicated that they believed participation in an NBI could support people with specific, severe, and enduring mental health conditions at primary and secondary levels of care. Social prescribers were asked to rate their perception of the efficacy of NBIs to support patients with various MIs on a sliding scale ranging from 0 (not effective at all) to 100 (very effective). Their responses are presented in Figure 7 below.

Figure 7

Note: SD indicated using error bars

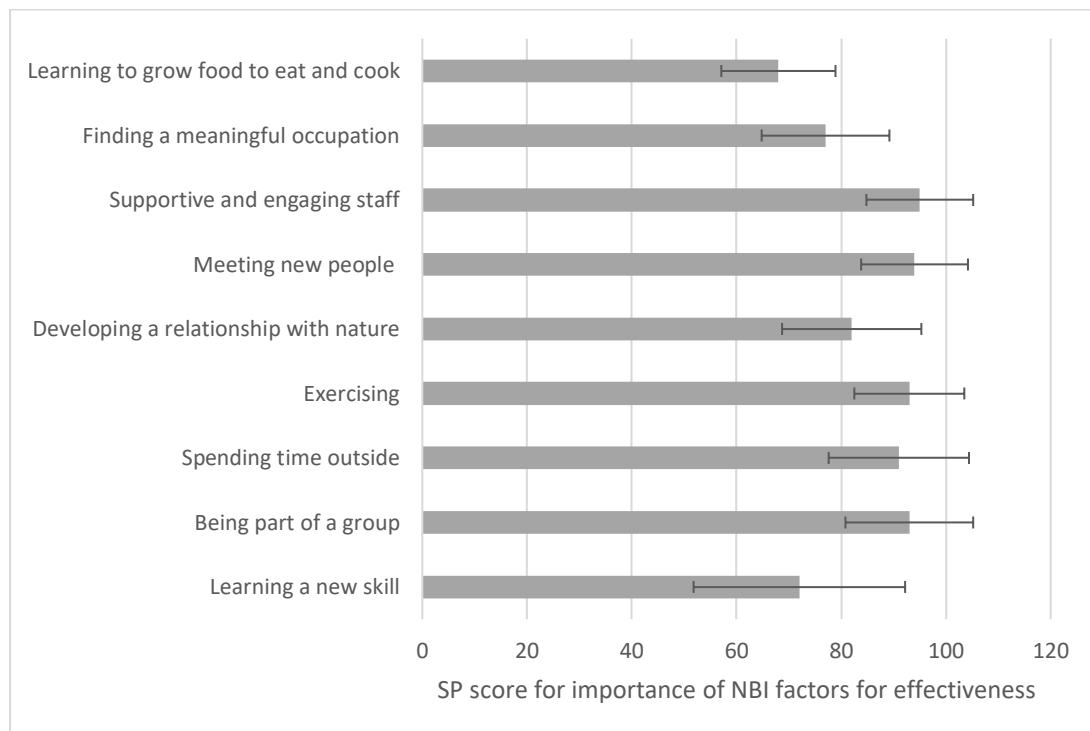
SP perceptions of mental health conditions which an NBI can support

Social prescribers scored loneliness as the least likely (mean 76) of social factors for which an NBI could offer effective support. The range of responses was between 72 and 94.

What makes an effective NBI? Social prescribers' perceptions of the key elements

Social prescribers were asked to rate different elements that may contribute to the success of an NBI. As illustrated in Figure 8 social prescribers indicated a strong preference for the social aspects; being part of a group, meeting new people, and support from staff were scored particularly highly. Physical health benefits, such as spending time outdoors and exercising, were also highly valued. In contrast, elements more directly related to nature connection received lower average scores, the range reported was between 68 and 95.

Figure 8



Note: SD for each score represented by error bars

Social prescriber perceptions of important factors relating to the success of NBI

Social prescribers' perceptions of Green Social Prescribing (GSP)

Benefits of GSP

Given the brevity and variable depth of responses, a formal thematic analysis (Braun & Clarke, 2006; 2022) was not conducted on SP survey data. Instead, the following recurrent patterns and ideas are presented, accompanied by illustrative quotes to support their interpretation. However, these should not be understood as fully developed qualitative themes. The aim was to provide a summary of key perspectives reported in the survey data.

1: A bridge between service providers and users

The concept of linking patients with community services was made explicit by SP3, who stated:

"I think of it as me being like a bridge, from the individual to the support services they require." (SP3)

This idea was extended further by SP8 and SP5, who saw the role as:

"Linking people up with activities or groups which support them with their mental or physical health and hopefully leads to less reliance on medication." (SP8)

However, despite the emphasis in policy documents (NHS, 2019, 2020) on the importance of partnership working, or "bridging," between social prescribers and community organisations such as TWG, this aspect of the role was not mentioned by any SP participants.

2: Extending the medical model

The surveyed social prescribers indicated they saw their role as essential in supporting patients' wellbeing in ways that are non-clinical and non-medical. SP6 noted their work aimed to maximise quality of life, and SP5 emphasised the importance of supporting community-based health and wellbeing. SP1 reflected on the influence of social and environmental factors in perpetuating mental health conditions, viewing GSP as a way to address these without reliance on medical intervention:

"Social prescribing involves interacting with and supporting individuals to make positive (non-medical) changes within their lives, which can improve their general wellbeing. This can include improvements to their mental and/or physical wellbeing. Through this, there can be less reliance upon seeking medical advice and solutions for issues which do not require and cannot be resolved through medical interventions." (SP1)

SP5 echoed the benefits of connecting people with activities to improve their wellbeing:

"We work with what matters to them. For example, wanting to connect them with different social groups, getting back to work, and opportunities to meet and make new friendships." (SP5)

3: Encouraging nature-connectedness

SP2 and SP4 emphasised their role in encouraging a connection with nature. SP4 described this process in detail:

"They can get out of the building, see how growing vegetables and fruits on an allotment or garden works, appreciate all of the seasons, understand when things are growing, especially when we are making something to eat from produce in the garden." (SP4)

Similarly, SP2 highlighted the therapeutic value of engaging with nature:

"Green social prescribing—opportunity to plant seeds and watch them grow—is something really beautiful for people, and I have seen the benefits of this." (SP2)

These responses reflect a belief among some SP that connecting patients with green spaces and natural cycles has a positive impact on mental health and wellbeing.

Barriers to making prescriptions to nature-based interventions (NBIs)

Community-based social prescribers identified multiple barriers in successfully referring patients to NBIs, including organisational restraints such as limited awareness or understanding of the value of NBIs among both potential participants and other staff members. SP5 noted:

"Not enough is known about social prescribing and the service. There are not enough green activities." (SP5)

All of the social prescribers mentioned either service or participants' financial constraints as a barrier to participation. Poor accessibility to the projects was frequently mentioned, and transport was consistently identified as the most significant barrier facing service users living in the community. SP1 emphasised the financial and logistical obstacles many service users face:

"Public transport to rural green spaces is limited, then there is the cost of clothing and footwear, which allows people to be outside in all weathers." (SP1)

Social prescribers also emphasised psychological barriers including a lack of awareness of the potential impact of nature connection, highlighting:

"Lack of interest and/or motivation to participate in nature-based activities, not seeing the relevance or importance of being outdoors. Not believing in the positive impacts (on the mind and body) brought about by spending time connecting with the natural environment." (SP1)

Other participants noted emotional and social concerns. SP2 raised issues around social anxiety, while SP6 suggested that unfamiliar settings or unpredictable experiences might be off-putting. SP4 also remarked:

"People they mingle with probably won't be garden people, their medication makes them too tired, no motivation." (SP4)

Many social prescribers indicated that medication was a factor in why people found it challenging to make their way to an NBI. Other factors were physical ill-health, either related to their mental health or separate conditions. Some social prescribers were concerned about wheelchair accessibility and site safety for service users with physical disabilities. Summarising these challenges, SP8 said:

"I feel that in reality there are a lot of reasons why people aren't linked to nature-based projects. They can be very hard to get to, if it isn't summer they can be cold and muddy. It also involves doing new things and meeting new people. These are all things that people with mental health and chronic physical health problems really struggle with, and I think motivation is a key issue." (SP8)

These barriers, ranging from practical to psychological, are summarised in Figure 9 below. These suggest that voluntary organisations, commissioners, and other stakeholders must take a tailored and empathetic approach when designing accessible and inclusive GSP opportunities.

Figure 9

Note: Bracketed numbers in the figure indicate the number of Social prescribers who identified each barrier.

Summary of barriers to GSP as perceived by the SP sample

Quantitative data from service user measures

This section of the results sets out to address the research question “*What is the impact of the NBI clinically on participants?*”

Paired-samples t-tests were conducted to examine pre- to post-intervention changes across outcome measures. Two-sided tests were reported for variables where no specific directional hypothesis was made, allowing for the possibility of a change in either direction.

One-sided tests were reported for variables where a clear directional hypothesis had been specified, namely that the intervention would improve psychological wellbeing and quality of life domains. Statistically significant improvements were observed in GAD-7 anxiety scores, SWEMWBS wellbeing scores, and UCLA loneliness scores. Changes in PHQ-9 depression scores were in the expected direction but did not reach statistical significance. These results suggest that participation at TWG was associated with meaningful improvements in anxiety, wellbeing, and loneliness among participants.

Tables 12 and 13 below present the means and t-values for outcome measures before and after the intervention. It is important to note that although the baseline data includes 12 participants, only 9 participants completed the post-test data; therefore, the sample size is $n = 9$ for both tables.

Table 12

Pre- and post-intervention means and t-test results for mental health measures $n = 9$

Paired Measure	Mean		Difference	Standard Deviation		95% confidence interval of the difference		Cohen's d	t	One-sided p
	Pre	Post		Pre	Post	Lower	Upper			
PHQ9 – Post PHQ9	14.42	10.22	-4.2	7.37	6.32	-1.81	6.249	0.40	1.27	.119
GAD7 – Post GAD7	11.83	6.33	-5.5	5.56	4.66	.144	7.189	0.80	2.40	.022
SWEMWBS – Post SWEMWBS	17.28	20.56	+3.28	3.04	3.46	-4.95	-.18268	0.83	-2.48	.019
UCLA – Post UCLA	28.58	22.78	-5.8	7.18	9.16	.81	8.304	0.89	2.80	.012

Further paired-samples t-tests were conducted to assess the changes in Quality of Life (QoL) from pre- to post-intervention. No statistically significant changes were observed in physical, psychological, social, or environmental QoL domains (all $p > .05$). While there were trends toward improvement in physical and environmental QoL, these did not reach statistical significance. This may reflect a reality that QoL scores are often influenced by many external factors (housing, finances, social network) that are not so easily impacted by a community intervention such as TWG. Altogether, the paired t-test suggests that the intervention appears most effective in reducing anxiety and loneliness, while improving

wellbeing; however, the wide confidence intervals indicate considerable variability between participants.

Table 13

Pre- and post-intervention means and t-test results for QoL measures n = 9

Paired Measure	Mean		Difference	Standard Deviation		95% confidence interval of the difference		Cohen's d	t	One sided p
	Pre	Post		Pre	Post	Lower	Upper			
PHYSICAL - Post PHYSICALQOL	32.33	42.44	+10.11	19.48	21.97	-13.000	3.223	0.48	-1.39	.101
PSYCH - Post PSYCHQOL	36.08	41.33	+5.25	21.56	20.35	-10.447	12.670	0.06	.22	.415
SOCIAL QOL - Post SOCIAL QOL	43.75	46.56	+2.81	30.44	29.09	-14.412	13.078	0.04	-.11	.457
ENVIRO QOL - Post ENVIRO QOL	53.83	66.78	+12.95	22.62	25.62	-18.558	3.003	0.54	-1.66	.128

The standard deviation (SD) around the SWEMWBS wellbeing scores appears consistent among participants, and there is reasonable consistency among participants on the other mental health measures. However, the QoL scores indicate a far greater SD spread, reflecting a greater disparity between participants. This suggests that while participants varied greatly in their experiences of quality of life, their psychological symptoms were more homogeneous.

Interpretation of scores

The effect sizes of the pre- and post-intervention t-tests were calculated in SPSS using Cohen's *d*, which is the ratio of the participant mean difference to the pooled standard deviation and are presented in Tables 12 and 13. Analysis of pre–post scores indicate meaningful improvements across several domains of mental health and wellbeing. Anxiety symptoms (GAD-7) reduced from the moderate to the mild range, with average scores moving from 11.8 to 6.3, well below the clinical cut-off (10) and closer to a general population mean of around 2 – 3 identified in Germany (Kliem et al., 2025). Wellbeing scores (SWEMWBS) improved from 17.3 to 20.6, approaching the UK average of 23–24 (Ng

Fat et al., 2017; Shah et al., 2021) and slightly above the clinical cut-off (19.5) for lower wellbeing (Stewart-Brown et al., 2009). Loneliness (UCLA) showed the most pronounced change, with scores decreasing from 22.8 to 17.0, bringing participants below the community average of around 20 and suggesting a substantial reduction in perceived loneliness (Russell et al., 1996). Depression symptoms (PHQ-9), despite not being statistically significant, reduced from 14.4 to 10.2, shifting from the moderate to the mild range, though remaining far higher than the population mean of 3–4, suggested by German and UK studies (Kocalevent et al., 2013; Crawford et al., 2011) .

QoL outcomes presented a more mixed picture although no statistically significant changes were observed as illustrated in Table 13. Physical and environmental QoL domains improved by 10 and 13 points respectively, moving participants closer to normative values reported in population studies (Skevington et al., 2024) though psychological and social QoL domains showed little or no meaningful change. Taken together, these findings suggest that the intervention was most effective in reducing anxiety and loneliness and in enhancing overall wellbeing, while also showing promising trends in depression and certain aspects of QoL. Importantly, participants' post-intervention scores approached general population norms for wellbeing and loneliness, suggesting a clinical significance for these changes.

Individual differences

Individual participant score differences pre- and post-intervention were calculated in SPSS and added as new variables (DiffScore). For the majority of participants, depression (PHQ-9), anxiety (GAD-7) and loneliness (UCLA) scores decreased while wellbeing scores (SWEMWBS) increased. In Judith's case, scores are in the reverse direction: loneliness and anxiety increased, and wellbeing decreased. Discussion about these scores indicated that she had been moved to a different room in preparation for moving out of the rehabilitation unit, which was causing her sleepless nights and anxiety. Harry's scores also did not go in the

expected directions, and the interview suggested this was due to his extreme isolation and deterioration in his physical health. Individual differences between participants in mental health and quality of life (QoL) measures are presented in Appendices S and T.

Between-group comparison

The between-groups analyses compared change scores across the two care levels to assess whether outcomes differed following the intervention. As shown in Table 14, the mean changes were generally modest, and large variability was observed within each group, reflected in wide standard deviations. Mann–Whitney U tests did not reveal any statistically significant differences between groups on any of the outcome measures. Although social QoL showed the largest numerical difference between groups and a moderate effect size, this difference was not statistically significant, likely reflecting the limited sample size and substantial variability in responses. Overall, these findings suggest no reliable evidence of differential effects between care levels, although trends in some measures may warrant further investigation in larger samples.

Table 14

Means, SD and Mann-Whitney U between groups tests

Outcome measure	Primary Care level N = 4		Secondary Care level N= 5		U	Z	p (2- tailed)	Effect size (r)*
	Means	SD	Means	SD				
PHQ-9 (Δ)	0.25	1.50	3.80	6.80	6.00	−0.98	.41	−.33
GAD-7 (Δ)	2.38	2.41	2.72	3.86	8.00	−0.49	.73	−.16
SWEMWBS (Δ)	−2.75	4.75	−4.40	4.98	9.50	−0.13	.91	−.04
UCLA Loneliness (Δ)	−4.00	3.46	−5.20	6.22	7.50	−0.62	.56	−.21
Physical QoL (Δ)	3.25	8.14	6.20	12.97	8.00	−0.49	.73	−.16
Psychological QoL (Δ)	−2.75	9.98	0.20	19.31	9.00	−0.25	.91	−.08
Social QoL (Δ)	−9.25	11.93	8.60	18.86	4.00	−1.50	.19	−.50
Environmental QoL (Δ)	1.50	8.10	9.60	16.99	7.00	−0.74	.56	−.25

Note: Δ = change score = post – pre

*Effect size r calculated as $Z / \sqrt{N}$ (N = 9)

Clinical Significance

The Minimal Clinically Important Difference (MCID) score for each measure was used to determine whether any of the changes highlighted above constituted a clinically significant change. The MCID refers to the smallest change in a score on a health-related measure that patients perceive as beneficial (Jaeschke et al., 1989). There have been challenges associated with the use of MCID (Hays & Woolley, 2008; Copay et al., 2007; Revicki et al., 2008). Nevertheless, others argue that when applied thoughtfully, MCIDs remain a valuable tool in interpreting health outcomes and supporting evidence-based practice (King, 2011). MCIDs for each measure are presented in Table 15 below.

Table 15

MCIDs for each outcome measure

Measure	Clinically Significant Change (MCID)	Interpretation	Reference
PHQ-9 (Depression)	≥5 points	Indicates meaningful improvement or worsening	Kroenke et al., 2001
GAD-7 (Anxiety)	≥4 points	Reflects clinically important change	Toussaint et al., 2020
SWEMWBS (Wellbeing)	≥3 points (raw) or ≥1 point (metric)	Suggests improved mental wellbeing	Taggart et al., 2015; DoH, 2011
UCLA Loneliness Scale	No universally established MCID, but a 3+ point reduction is often used	Represents a meaningful reduction in perceived loneliness	Russell, 1996; Cattan et al., 2005
WHOQOL-BREF (Quality of Life)	No fixed MCID, but >10% change in domain scores (e.g. ~2–3 points on 0–100 scale) is often considered meaningful	Should be interpreted domain by domain (physical, psychological, social, environmental)	WHOQOL Group, 1998; Maruish, 2012

Clinically significant change for each participant, both positive and negative, are illustrated in Table 16 below. Clinically significant changes in a positive direction are indicated with green, and negative clinically significant changes are marked in red. White cells indicate no MCID.

Table 16*Clinically significant changes in each participant*

Participant	PHQ9	SWEMWB	GAD7	UCLA	PHY QoL	PSYC QoL	SOC QoL	ENV QoL
S1Rose	0	5.99	-4	-6	19	-5	0	-6
S2 Carter	-11	2.37	-12	-2	6	19	38	38
S3 Alex A	-6	4.11	-4	-11	18	0	6	6
S4 Judith	6	-3.76	2	4	0	-12	-13	10
S7 Phil	-8	4.89	-4	-10	-12	19	12	0
P1 Oscar	1	3.1	-4	-5	13	-7	-12	0
P2 Sarah	1	4.48	-5	-7	6	12	-15	13
P3 John	-2	3.03	-6	-5	-6	-10	0	-6
P4 Harry	-1	-1.09	4	1	0	-6	0	-1

Note: *S* denotes secondary care participant, and *P* primary

The table suggests that many participants, particularly those in secondary care, made clinically significant changes in the measures above. However, Harry's scores suggest that his anxiety and psychological QoL deteriorated significantly over the intervention period. The table indicates that Rose, Phil, John and Oscar made clinically significant negative changes in QoL, but clinically significant positive changes on the mental health measures.

Cognition

Table 17 presents a series of paired t-tests conducted to examine the changes from pre- to post-intervention across four cognitive outcome measures: difficulty concentrating (PHQ-7), restlessness (GAD-5), clear thinking (SWBS-5), and perceived ability to concentrate (QOL-7). Each item was chosen in order to investigate the ART (Attention Restoration Theory) framework, which posits that exposure to nature can help restore depleted cognitive resources.

Table 17

Means and paired t-tests of participants on cognition outcome measure.

Paired Measure	Mean		Difference	Standard Deviation		95% confidence interval of the difference		Cohen's d	t	Two sided p
	Pre	Post		Pre	Post	Lower	Upper			
PHQ-7 (Trouble concentrating on things, such as reading the newspaper or watching television) – Post PHQ7	1.44	1.11	-0.33	1.33	1.17	-.68	1.35	-0.24	.756	.471
GAD5 Being so restless it is hard to keep still - Post GAD5	1.11	.78	-0.33	1.05	1.30	-.33	.99	-0.33	1.15	.282
SWBS5 (I've been thinking clearly) - Post SWBS5	3.00	2.78	-0.22	1.22	.97	-.70	1.14	-0.19	.55	.594
QOL7 (How well are you able to concentrate?) - Post QOL7	1.89	2.33	-0.44	.601	.866	-.850	-.039	+0.51	-2.53	.035

There was a statistically significant improvement in participants' self-reported ability to concentrate (QOL7). This suggests that engagement in the intervention may be associated with the perceived capacity to focus; however, there is an apparent contradiction between this and the nonsignificant finding for PHQ7. Participants explained that they did not read newspapers and therefore answered this question differently.

Physical Health

A series of paired-samples t-tests was conducted to assess the changes in participants' self-reported physical health, sleep, appetite, energy, and body satisfaction from pre- to post-intervention and the findings are presented in Table 18. Across six measures, no statistically significant changes were observed. The largest observed mean difference was in reported tiredness, although this was not statistically significant. Measures of sleep satisfaction and satisfaction with health showed minor improvements, but again, these changes did not reach significance.

Table 18*Means and paired t-tests of participants on physical health outcome measures*

Paired Measure	Mean		Difference	Standard Deviation		95% confidence interval of the difference		Cohen's d	t	Two-sided p
	Pre	Post		Pre	Post	Lower	Upper			
PHQ3 Trouble falling or staying asleep, or sleeping too much – Post PHQ3	2.00	2.00	0.00	1.12	1.00	-.941	.941	0.00	.00	1.00
PHQ4 Feeling tired or having little energy – Post PHQ4	2.00	1.67	-.33	.87	1.00	-.684	1.350	-0.38	.76	.471
PHQ5 Poor appetite or overeating – Post PHQ5	1.78	1.56	-.22	1.48	1.51	-.618	1.062	-0.15	.61	.559
QOL2 How satisfied are you with your health – Post QoL2	2.22	2.44	0.22	1.20	1.24	-.863	.418	0.18	-.80	.223
QOL4 How much do you need medical treatment to function in everyday life – Post QoL4	1.78	1.78	0.00	.97	.83	-.769	.769	0.00	.00	1.00
QOL11 Are you able to accept your bodily appearance – Post QOL11	3.33	3.33	0.00	1.41	1.00	-.769	.769	0.00	.00	1.00

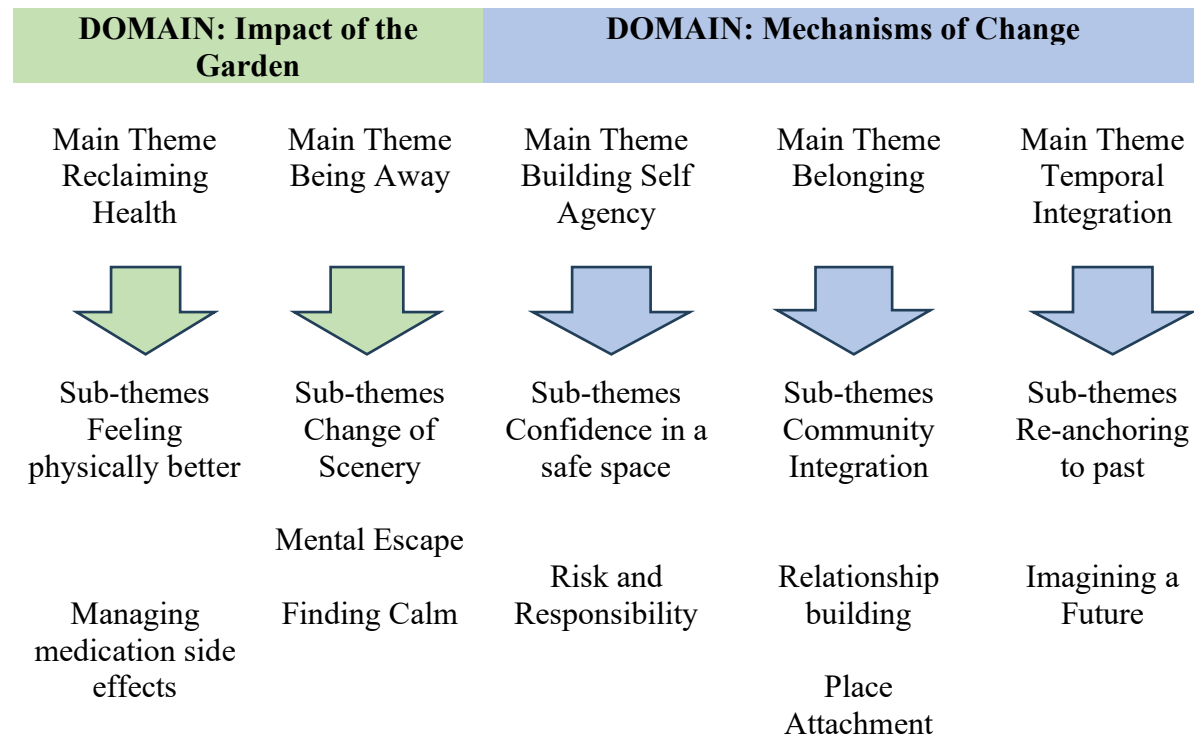
Given the exploratory nature of the study and the limited statistical power, all the above results should be interpreted cautiously.

Qualitative Data from service users, volunteers and staff

This final qualitative section of the results aims to address the research questions “What are service user views of the impact of TWG on their mental health recovery?” and “*What are the perspectives of volunteers at Together We Grow?*”

Overall, nine service user interviews were conducted, each lasting between 40 minutes and an hour. Only one acute service user completed the post-test measures and interview; four completed the measures from secondary care rehabilitation, and four from the primary care group. Additionally, two TWG volunteers and two accompanying staff were interviewed. All staff and service user participants are referred to by pseudonyms as set out in Tables 8 and 9 above.

To analyse the qualitative data provided by the interviews, the interview transcripts were imported into NVivo 14 and analysed using the six-phase framework outlined by Braun and Clarke (2006, 2022). Five main themes were developed and grouped under two domains: the Impact of Garden and Mechanisms of Change as illustrated in Figure 10 below.

Figure 10

Main themes and sub-themes of “Impact of the Garden” and “Mechanisms of change” domains

DOMAIN 1: Impact of the Garden

The focus of this domain was *how* the garden directly impacted participants.

Participants described how time in the garden helped reduce anxiety and bring about a sense of peace, perceiving that the garden supported their physical wellbeing and helped them to manage some side effects of their medication.

THEME ONE: Reclaiming health

Figure 11 illustrates the ideas that developed within this theme about the benefits of physical activity in natural environments and the sensory experience of being outdoors.

Participants reported that movement through nature stimulates physiological restoration, while breathing fresh air, feeling sunlight, and working in nature grounds individuals in the present. In this way, attending TWG promotes overall health by incorporating both motion and stillness to enhance wellbeing.

Sub-theme: Feeling physically better

Almost all of the service user participants referred to participation in TWG as supportive for living with chronic conditions or as part of a process aimed at becoming fitter towards the end of their “mental health recovery journey” (Rose). Alex indicated that he saw coming to the garden as a way to access the physiotherapy and gym time currently unavailable to him:

“Yeah, I like coming because I'm trying to keep fit at the moment. I'm trying to also get into the gym because I'm putting on weight because of the food. They feed us too much. And I used to do window cleaning, so I climbed up and down ladders and I've got cartilage missing from the inside of my knee. Yeah, so that's why I do a lot of walking to build the muscle up.” (Alex)

Andy (volunteer) reported that attending TWG had had a direct positive impact on his physical health after he had been signed off from work due to stress and high blood pressure:

“My blood pressure was up and down like nothing on earth, I was off work for three months because of it. But I don’t really have health problems anymore although physically I work much harder coming here three days a week. But I don’t have the stress of two phones in my hand and someone tapping me on the back.” (Andy)

Harry, a primary care attendee, suffers from Addison’s disease, COPD, Meniere’s disease and diabetes. In addition, he spoke of alcohol dependency and frequent suicidal thoughts due to extreme loneliness. He travels to TWG by electric bike and has some debilitating shoulder injuries due to recent falls from his bike. He is very limited in what he can do but enjoys attending TWG, particularly when the weather is good. Phil agreed that attending TWG helps him manage COPD, back problems and weight gain. This was supported by Christopher, who linked him to the project:

“[Phil] is another person who sort of like... limits himself. After the garden last week, we had this conversation, because I think he overexerted himself and hurt himself a bit. And I was like, right, Phil, you’re doing great exercise at the garden, but you need to do some other things in between to get the most benefit from them. So we used improving his performance at the garden as a motivation to do some more exercise during the week.” (Christopher)

David (OT) hoped to reduce the severity of both positive and negative psychosis symptoms through attendance at TWG, reflecting NHS structured programmes designed to increase inpatient physical fitness and overall health. David notes that:

“So projects like this, I think it’s a positive step because people can come along and they can do as much as they feel motivated to do, really. So, if they’re motivated to do loads, they can, but if they just want to come for a walk and do a little bit and sit and have a cup of coffee, at least they’ve done a bit of exercise.” (David)

This feeling amongst the staff was supported by Harry who told me

“I’ve always loved nature and when the sun’s out I feel so much better being here. I can’t do much at the moment, but I can sit in the polytunnel and I can talk to people. I used to do more, but I can’t now, I can just stand and point. But I’ve been here twice this week, because the weather’s been so nice and it’s nearly spring”. (Harry)

The above quotations suggest that for many participants, physical benefits are experienced alongside improvements in mood, energy, and overall vitality, contributing to a more integrated sense of wellbeing.

Sub-theme: Managing medication effects

Most participants mentioned their medication as essential to function, but also spoke of debilitating side effects, particularly fatigue and weight gain.

“I take Aripiprazole because I had psychosis from my last bad relationship and unfortunately it has really made me put on weight and I want to eat all the time. I hate looking like this but I just can’t stop.” (Phil)

My partner says that I probably want to sleep too much sometimes. My medication for bipolar has been changed a few times. They put me on lithium, which made me really ill. That made me sicker, feel sicker and everything. The medication I’m on now has really made me gain weight and I feel so unfit, I used to be really good at football and go to the gym. It gives me the shakes in my left arm. (John)

Participants felt attending TWG helped to mitigate at least some of these effects. They felt better physically and were more motivated to exercise, for example, considering cycling to TWG rather than taking a lift (John), walking both ways from home (Oscar), attending the gym (Rose), and engaging with physiotherapy exercises rather than avoiding them (Phil).

Oscar was able to distinguish between the support from TWG and the psychological benefits of medication, saying the garden complemented his medication and helped him cope at home. Altogether, the theme of reclaiming health reflected that TWG provided a space

where participants felt they could develop a renewed sense of physical wellbeing, support in managing medication side effects, while increasing motivation to spend time outside and exercise.

THEME TWO: Being Away

According to ART, “being away” refers to a mental shift in which individuals temporarily feel removed from the routines, demands, and cognitive load of everyday life (Kaplan & Kaplan, 1989). Within the present context, the theme captures how participants experienced the garden as a refuge. Consistent with ART, TWG provides a setting where stressors recede, enabling participants to disengage from negative thought patterns and replenish attentional resources. This sense of “being away” was geographical, but it also represented an opportunity for cognitive quiet and a renewed perspective on personal difficulties.

Sub-theme: Change of Scenery: “It’s just good to get out and do some different things”

Both staff members and patients reported that TWG was helpful for inpatients to alleviate boredom and frustration on the wards, providing an opportunity to connect with staff in a different context, reducing frustration and angry feelings. Alex was often in conflict with staff about whether he should have unescorted leave to resume caring responsibilities for his mother:

“I love coming here [TWG], I get stuck in and do every job possible, because I can’t stand being in hospital, I just come here, get stuck in and work hard”. (Alex)

David, (OT), noted that the opportunity to take a break from conflicts such as these benefited staff as much as Alex and other service users:

“It is quite nice for patients and staff to get off the ward for a couple of hours, be out in the fresh air, because, often people have restricted leave, which they resent, but it also

means they spend too much time on the ward, which isn't always very conducive and healthy for them.” (David)

Christopher reflects that even passive social interaction can help participants re-engage with life beyond the ward environment. The garden facilitates moments of informal connection and subtle social reconnection, regardless of whether individuals strongly identify with gardening itself.

“Again, it's like a change of scenery. Something to do, even if they are not garden people. So, a little bit of social interaction. Even if it's just a little bit, you know, passive social interaction. Where people have like, you know, we'll get the cake out on the break. And people will just say, oh, these are nice. Did you make it? So, it can be a little bit of conversation between people and that just really helps people feel they have done something, something different.” (Christopher)

Phil reported that for the rehabilitation patients, living in close proximity could lead to conflict, but that being able to leave the hospital environment was helpful:

“Sometimes we fall out, but we learn to resolve things. Whether that's, like, having a heated argument can turn into an unheated argument. So we learn to de-stress when coming here, and that teaches us, you know, to take it easy at the same time.” (Phil)

The above quotations suggest that being geographically “away” provides the opportunity to regain perspective on negative thinking patterns or conflict and engage in social interaction with different people.

Sub-theme: Mental Escape: “The thoughts come into my head sometimes, but I can push them away here”

While a change in environment refers to a physical relocation, mental escape denotes a psychological shift that allows individuals to detach from internal stressors or demands. Participants reported that TWG could facilitate cognitive and emotional disengagement,

providing an opportunity cognitively to detach from both internal and external stressors.

Sarah attended TWG whilst in hospital, then, after discharge, she began to attend on a Monday, describing it as the “focus of my week”. Although she now relies far less on the garden, it still provides a necessary respite from the challenges of her day-to-day life:

“Well I do suffer with anxiety and I think that is my main mental health problem but I also have a lot going on, I’m working four days a week now. I find work difficult, it’s a really nice team but I feel different. I need my medication to function but it makes me quite slow and I work shorter hours. Although they are nice, I find it is hard to keep up. I still need to come here once a week because I can just be myself without worrying.” (Sarah)

Oscar tends to manage his symptoms by compulsively reading and studying, which he also finds distressing and stressful. Coming to the garden is a way that he can distract himself and, after attending TWG, can resist the compulsion to pick up his books for a while, feeling both pleasantly tired and better able to cope:

“I did struggle with some things at home, which I’m now getting on much better with. Just coping in the flat and that kind of thing. And the garden, the garden has really helped. It’s actually made a radical difference really. I think, my family are saying I’m a different person having gone to the garden, because I have a break, I’m outside and I don’t get so overwhelmed by my difficulties”. (Oscar)

Oscar reported that throughout his long experience of mental illness, coming to the garden has been one way that he has been successfully able to disengage from his compulsive symptoms and enjoy a break, or mental escape from them.

Sub-theme: Finding Calm: “It calms me down. I feel calmer, less stressed”

This sub-theme was developed to reflect participants’ accounts of reduced stress and tension resulting from work in the garden. Reports of “finding calm” appeared to relate to

relaxation and reduced anxiety and rumination. Both primary and secondary care participants seemed intuitively to find that they found nature calming and restorative:

“As soon as I walk in, I can breathe more, my shoulders go down and untense, I can forget my worries while I am here” (Judith)

“Sometimes it's a bit difficult to get myself going, but usually, that's only because I haven't slept for 48 hours over the weekend. Even if I don't sleep, I always come here. But even though I'm talking non-stop in this interview, I feel a lot calmer than I did. I like the environment; I like being outdoors. I've always loved the outdoors. And I feel calmer surrounded by trees, which I've read about 14 books about recently. And it's nice to be on land.” (Oscar)

Accompanying staff reported that participants were gaining a calming effect, even if it was not immediately apparent to observers. Some service users appear quite agitated, constantly pacing around the garden. Pacing was noted as a way of coping with symptoms; however, due to the outside environment, it was likely to be more calming than it would be in a hospital setting. In general, staff felt that:

“They can be quite anxious or low on the wards. It can be very loud, there can be a lot of shouting, a lot of doors banging. The alarms go off every so often. So it is quite a loud, sort of intimidating environment with a lot of sensory input. You take them here and they are busy and occupied or just in a calmer environment. You do notice a positive change in them. They seem a bit brighter, a lot calmer and it has a positive impact on all of their moods and stress levels.” (David, OT)

Sarah described that she tends repeatedly to dwell on negative thoughts and potential problems, leading to mental exhaustion, difficulty focusing, headaches and stomach aches. However, she reported that coming to TWG helped:

“I think it’s mindful and it helps me stop thinking about things that are running through my mind. I suffer with anxiety and quite often I will wake up and can’t sleep, I then get headaches and feel like I can’t go to work. Everything gets too much, I can’t stop myself worrying even more about things but if I come to the garden it is easier to relax and stop thinking about it.” (Sarah)

One participant became increasingly anxious over the intervention period about a plan, later abandoned, that she would be discharged to a hostel, which caused her a great deal of anxiety:

“What I’m really worried about is, you know, how am I going? What’s it going to be like when I see my children again when I come out of here? So those sorts of things really worry me. But when I come here I can just forget about it for a few hours”.

Mindfulness was a recurring concept for several participants, who reported that repetitive gardening tasks and sensory engagement with the environment helped them momentarily step back from distressing thoughts and emotions. Sarah noted that the garden helped her appreciate the plants, the weather and the surroundings and learn to relax.

“But even at this time of year, it’s strange, even weeding and things like that, or chopping wood, it takes your mind off things and I’m just in that moment” (Sarah)

“I enjoy having the heat of the sun and the feeling of being in nature” (Judith)

William, when recovering from an operation, found that specific routine activities such as label cleaning had a soothing effect when he was too physically ill to do anything more active:

“...And again, you know, it’s a very almost therapeutic job, it is mindful because you see, I know it sounds a bit silly, but you start with this really grubby, horrible label, and then you give it a clean-up, and I wouldn’t say it’s like new, but not far off it.” (William, volunteer)

Oscar felt that the soothing and mindful element of the garden develops over time, in contrast to how life can be outside of the project:

“Excuse the pun, but you have to grow into it. And I think one of the really big benefits for people with mental health is to learn to relax. And it’s really difficult to learn to relax and be able to take that into the outside world with you because in the outside world it’s just all rush, rush, rush, rush, rush and you’ve got to do this thing and then that thing and then the garden just isn’t really like that (Oscar)

Christopher (staff) noted some caveats to TWG’s ability to support service users in coping with stress and finding calm. He felt that people might be triggered by the presence of the group, some of the activities, and facilities they were not accustomed to, such as a compost toilet. In addition, some patients, such as Carter, had a germ and dirt phobia for which he needed support to be in the garden:

“I think with managing stress and stuff like that, it can help. But getting people to come when they are stressed is tricky because if they are stressed, then they tend to kind of like not want to come that far away from home. But for the people who are here, it’s very, very rare that someone needs to kind of like leave because they’re sort of stressed while they’re here. Even though it is kind of a triggering environment, potentially for some people.”(Christopher)

Nevertheless, the above quotations suggest that primary and secondary care patients almost universally experienced TWG participation as a place where they could find an oasis of calm, away from the stresses of their lives.

DOMAIN 2: Mechanisms of Change

This domain is concerned with the mechanisms by which changes in participants may have occurred as a result of the intervention. While the garden environment itself was valued, there were specific experiences that built confidence, fostered relationships, and

developed a greater sense of temporal integration through memory activation and imagining the future, allowing for an understanding of *how* changes may have occurred. These mechanisms reflect how TWG supported both momentary wellbeing and longer-term shifts in self-perception, agency, and connectedness.

THEME THREE: Building Self-Agency

All of the participants attending from secondary care mental health units were aware of the need eventually to return to life in the community. For most, this evoked trepidation, but also self-belief that they were considered capable of moving on. Alongside community integration and a restorative environment, *building self-agency* was a significant mechanism of change within the intervention. Participants highlighted the opportunity safely to take risks and experience growth in confidence as a key factor contributing to their recovery. This theme captures the gradual and often fragile process through which individuals begin to reclaim a sense of agency that had been eroded by illness and institutionalisation.

Sub-theme: Confidence in a safe space: “I’d totally lost my confidence in myself. But here I felt confident,”

All participants from secondary care expressed anxiety about transitioning back into the community. Many described attending TWG as a stepping stone, as improved attendance boosted confidence and provided a route to regaining independence and identity. TWG provided the opportunity to learn social skills that some participants struggled to acquire in school and work environments. Phil spoke of how his social confidence had increased over the intervention period, enabling him to move to supported accommodation, partly due to mingling with service users, volunteers and facilitators at TWG:

“and being there [rehabilitation unit] has been really helpful to me and it has helped me to understand how to get on with people. And a big part of it has been coming here. Sometimes I’ve been really down coming here and the people have just lifted my mood. Now,

I get excited when I see a new person to talk to. I just love it to be honest, coming here”

(Phil)

He went on to explain that due to social anxiety, trauma and autism, he had always struggled to relate to people:

“Sometimes what they say doesn't seem to be what they mean. That's usually the case. And I guess it's kind of decoding, so I've learnt to do that here a little bit, I'm much better than I was. I couldn't have talked to you like this a few months ago, but now it's OK.” (Phil)

Most participants reported that attending TWG had boosted their confidence. Rose became ill with psychosis at college but was hoping to move out of the hospital to supported accommodation and return to studying. Reflecting on her recovery, she said:

“I think TWG has been a big part of it. I think being in hospital has really helped me, being on medication has helped me. But I think coming here has also been a part of it because it's really helped my confidence. And it's helped me with my socialising, meeting new people. It's been good to be outside and do things that I'm familiar with. I will miss coming here. It's been good for my confidence. I'm in hospital but I can mix with people from other wards, different staff and I really like the staff who bring us here and Wayne. One day I'd like to have my own garden and to do gardening, but that's a long way.” (Rose)

Judith also identified TWG as a central part of her recovery journey. Christopher (OT assistant) described her progress:

“She [Judith] struggled a lot with confidence, picking up a new task, and having the volition and getting out and doing things, so it's kind of like a safe environment where there are semi-familiar faces, but they're different from what you'd see on the ward. I think it [TWG] helps to build confidence by gently challenging things that people might struggle with in a controlled, safe environment.”

Sarah felt the inclusivity of the environment supported her when she was newly discharged and had found the project uniquely understanding:

“I did always feel accepted and included, and that I could talk about it if I wanted. I think I’ve always wanted just to recover and get better. But here is one of the only places where I can feel if I did want to talk about it, people would understand. I don’t have many friends as I told you and I often feel different from other people but not here.”

Oscar echoed these sentiments, explaining that while he had a strong family network and many social contacts through music, he found talking about his mental health was more meaningful at TWG:

“I spend a lot of time talking to my family about their problems, but I’ve given up talking to them about my mental health. They tend to say, well, you know, stop playing, sell your bass, sell your piano, sell your keyboard. And, you know, don’t read if you find it difficult and just do something, do something you like. But here I can talk to people who’ve had similar experiences.” (Oscar).

Altogether, the sub-theme of *confidence in a safe space* highlights how the garden provided a foundation for participants to experiment with self-expression without fear of failure or stigma. This sense of psychological safety was essential to enabling personal growth and rebuilding confidence that had been diminished through illness or negative experiences.

The data suggest that motivation functioned less as a static precondition for engagement and more as a *dynamic process* that was supported and reinforced through participation. Participants described an evolving capacity to manage and overcome demotivating factors, indicating that motivation was both drawn upon and cultivated over time. Initial motivators, such as the perceived safety and structure of TWG sessions, helped individuals to establish attendance habits. Through repeated engagement, these habits became

associated with a growing sense of resilience and self-efficacy. Seasonal perseverance (e.g., attending through the winter) and problem-solving around transport exemplified how participants developed strategies to sustain their involvement. In this way, motivation emerged as a skill-like resource that facilitated ongoing engagement with TWG and, indirectly, supported mental health recovery.

Sub-theme Risk and Responsibility: “people feel a bit more trusted to be individuals rather than patients”

Some of the garden management tasks involved participants using equipment which could be dangerous. A favourite activity, particularly for Phil, was collecting and sawing wood used for kindling to make hot drinks at break times, as there is no power at the project. A further important seasonal task was hedge-trimming, which involved the use of loppers and pruning saws. Younger participants such as Phil, Rose, and Carter particularly enjoyed more physical activities, such as wood chopping and hedge cutting, and learnt to use this equipment with the support of accompanying staff, park rangers, and volunteers. Staff saw this as an important part of wider mental health recovery:

“Yes, so it's kind of like if people are starting to become a bit institutionalised, I think there is an infantilising that happens. So I think using dangerous tools here prevents a little bit of that and undoes it, so using the saws and loppers is kind of like building confidence and learning skills that you might never have learned before”. (Christopher, OT assistant)

Christopher observed that the challenges of physical work and the distraction of being in a group can push people's self-imposed limitations both at TWG and outside. He made these points in specific reference to one of the service users (Amanda):

“Her reports on what she's physically able to do change an awful lot, so it's difficult to assess what her actual baseline is. But seeing her today, she's doing a task that she enjoys and she seems more able.” (Christopher)

Due to this aspect of attending Together We Grow, David (OT) emphasised the importance of assessing the service user's suitability to participate as a multi-disciplinary team decision:

"You'd have to assess whether they were appropriate for it. You wouldn't take someone who was a big self-harm risk or risk of harming others, you wouldn't allow them to use saws and this sort of equipment. And people would need to not be psychotic or confused. If they were very elated and not able to concentrate all over the place, this wouldn't be the place to take them because they'd probably be quite unsafe and quite disruptive to the environment. ' (David)

The theme of *risk and responsibility* emphasises the importance of allowing participants to re-engage with tasks that mirror aspects of everyday life gradually. The opportunity to take on responsibility within a supportive setting encourages personal growth, while managing small risks helps rebuild resilience and trust in participants' capabilities.

THEME FOUR: Belonging

The theme of *belonging* highlights how social experiences played a key role in participants' recovery journeys. The opportunity to build relationships with peers, volunteers, and facilitators helped create a sense of community where participants felt accepted and valued, gaining confidence to engage with others beyond the intervention.

Sub-theme: Relationship building: "they've become like family now".

Relationship building emerged as an important aspect of participants' experiences in the garden. Particularly for primary care participants, loneliness and isolation were very real threats to recovery and wellbeing, with most reporting no significant friendships outside of TWG or the healthcare network. The informal, supportive setting of TWG provided opportunities to form connections that offered a sense of trust, mutual understanding, and social inclusion, extending beyond the garden sessions themselves.

“Everybody’s really helped me. So I’d like more social meetings so I don’t lose that connection. It’s just given me the ability to think positive about myself” (Rose)

“And particularly if you are doing a patch with someone, you can talk as you’re doing it. It’s really nice. Being here and talking to people who were so accepting really makes a difference” (Judith)

A central concern among the primary care attendees was the sudden departure of their group facilitator, Richard, from TWG. It was clear that there was a feeling of “family” in the primary care group, which made the change of facilitator disruptive:

“People come and go but the volunteers are always here, Richard was always here, and Oscar and John. They become like family now and we know each other’s struggles. They were really here for me when I first came out of hospital and I could talk to them and feel safe here”. (Sarah)

It is possible that this feeling of security provided Sarah with the “secure base” she needed to feel safe in other relationships. She reflected that she doesn’t need the garden in the way that she used to, but is not ready to let go completely:

“to be honest, because my mental health is okay, on the whole, I’m functioning. I don’t feel the need to talk about my mental health as much as I used to. So, I just come to do the gardening and it’s not the priority of my life anymore”.

There were many reflections on the importance of developing trust and the difficulty and hard work of building new relationships at the garden, including with facilitators:

“No, he’s [Abdul] only just come on board really. Last week was the first week I’d actually spoken to him. I tend not to project my troubles onto somebody else. Even if they’re, in a sense, being my carer for the day. I don’t really go forth. If they ask, then I’m forthcoming and I will honestly reply.” (Harry)

Oscar highlighted how the change in facilitator necessitated adapting to different roles from his previous jobs of maintaining the tool shed and equipment:

“And it was always sparkling, sweeping it all out, cleaning up all the tools, putting them all back and rearranging them. I don’t do that now. There’s no cooking and I don’t do the cabin or the maintenance. (Oscar)”

Oscar implies that there had been little consultation or discussion about his changing role, but seems accepting and inclined to see the positives about what a new group leader could offer:

“I rather like the guidance that this project manager Abdul actually has. And basically, he just says, this, this, this and this, and we get on with it. We don't quite... well, you know, there is choice, you know. But it's nice to have that guidance, this needs doing, we go and do it. I liked the idea of the choice, but I've worked with this new project manager quite a few times. We've pruned the trees together. Particularly on a couple of occasions I can think of, I've actually purposely gone to speak to him and got involved with what he's doing.” (Oscar)

Conversely, Harry, John and Sarah found it more challenging to accommodate to the change, although Sarah recognised she also relies on the project less, due to work commitments and recently getting engaged:

“My life’s turned around and that is probably one of the reasons why I don't come as much as I used to. And I think also the change with Richard leaving as well, you know, he was so funny that, you know, he was just such a nice character. I miss him as well. But I love all the people here and I’m not ready to let it go yet”. (Sarah)

“Yeah, that I found difficult at first. I mean, there's nothing wrong with Abdul. I like him, he's all right. But it's just, obviously, they're totally different people. Very different styles. Where Richard was probably that little bit more telling jokes all the time and having a

laugh I found Abdul a little bit more... He's not so much now, but I think when we first met him he seemed a bit more serious". (John)

Connection with staff and facilitation style were also important considerations in the secondary care group. Participants valued facilitators who provided structure without pressure, fostered a welcoming and inclusive atmosphere, and modelled respect, patience, and encouragement with humour. This supportive style was central to enabling participants to engage at their own pace and feel safe to take risks in a non-judgmental environment.

Having a choice of activity was noted to be important by many participants:

"So it's this very free openness that they have for these jobs. What would you like to do? So it's always the people are given the choice of what they'd like to do. And I think that's a really great idea". (Carter)

David (OT) noted that for acute patients in particular, the option to work alone with 1:1 staff is very important, as being outside with patients allowed staff to engage with participants in more effective ways than on the wards:

"So here, people sometimes will open up a bit more. Rather than sitting in a room and just being across the table with someone, it's sort of a bit intimidating, isn't it?"

In every interview, participants were asked directly if there was anything negative or challenging about attendance, and if there was anything that they would change. The secondary care group has an unpredictable mix of staff and patients attending from the acute unit. For service users coming from the rehabilitation unit, this uncertainty brought mixed feelings. Most described it as slightly daunting but ultimately beneficial; however, this uncertainty may have prevented the same sense of "family" from developing in the secondary care group as in the primary care group. However, there were other benefits in the form of social challenge and working toward community reintegration:

“Sometimes when lots of people come from the [acute unit], I don’t really know them, sometimes that’s hard. Sometimes I know some of them and sometimes I don’t know them at all and then I’ve got to get to know them and I don’t really know who’s going to come and who’s going to be there. Although I think it’s good for me to talk to new people. I know that Wayne or the volunteers will help me if I’m struggling so it didn’t really challenge me that much.” (Rose)

“But mostly I talk to the member of staff that I came with or the other people at my hospital. I don’t really talk to other people that much, but just being in a place where there are different people is something that I haven’t done for a long time.” (Carter)

Relationships with fellow participants, volunteers, and facilitators were viewed as a crucial source of connection and identity within the garden. Through these connections, individuals developed new social skills, gaining confidence in interacting with others and adapting to changes. These relational experiences contributed to a sense of belonging and participants’ broader personal development and recovery.

Sub-theme: Community Integration – “It’s good to actually be walking around the supermarket and be noticed”

The sub-theme of *community integration* highlights how TWG provided a bridge between participants and the wider community. Through connections with volunteers and local networks, participants experienced a greater sense of belonging and inclusion, helping to support their re-engagement with life beyond the intervention. Christopher described experiences of loneliness, social anxiety, and social disconnection as both precipitating and consequential to mental ill-health:

“I think a lot of what can happen when someone is mentally ill, whatever that mental illness is, it can be quite isolating. And one of the main symptoms of mental illness, in order for it to kind of take root, it almost like a virus needs to control your behaviour so that it can

kind of take over your mind. And to do that, it needs to isolate you and get you to kind of like close off to people who might be able to help.”

From this perspective, attendance at TWG offers more than just structured activities; it also creates opportunities for meaningful social interaction with volunteers, rangers, students on placement, and group facilitators. This seems particularly important in the context of recovery following long-term psychiatric hospitalisation, where community integration and social re-engagement are key to reducing relapse risk and improving quality of life. Andy, a volunteer, reflected on the continued relationships and increased community presence of participants:

“Some are very quiet but then after a while, they will open out to you and you can talk to them. For example, Phil, I keep bumping into in Tesco. So, yeah, he knows me wife now as well. And Judith as well, I often see her. She's very quiet. But she is gradually coming out of herself. And Isobel, we often see her at our church with her children. I mean, at the end of the day, I've got very little hobbies, and my wife's got no hobbies at all. We haven't lived here long—if I didn't come here, we would know no one.” (Andy)

This illustrates how TWG not only supports service users in re-establishing social routines and confidence but also benefits volunteers. At the end of the intervention, Andy told me that he was arranging a coffee for the volunteers to meet up with Richard at a local café and had invited Oscar to extend his social network further.

Harry described deep-seated experiences of loneliness, demonstrating that community-based projects can provide critical emotional support:

“Coming here is basically good for me because it's talking to people. Otherwise, the only people I talk to are the checkout girls at Tesco. They're the only people I actually come face to face with to have a laugh.” (Harry)

Having cared for his father following his stroke for most of his adult life, Harry lives alone and, although active in photography online forums and a weekly cycling group, described feelings of intense loneliness and difficulty motivating himself day-to-day:

“I think it [TWG] boosts my confidence because, as I say, I don’t really talk to anybody else. You know, I can actually relate to people. I can talk to more or less strangers. I haven’t gone totally loopy. It brings a reality check I think more than anything. Perspective to my life. Can I be bothered to get up tomorrow? All that sort of thing.” (Harry)

John, who lives with his partner and two children, also spoke of emotional isolation and difficulty expressing his mental health struggles within his immediate family:

“I find that if I’m with my children and partner, if they’ve either annoyed me or whatever, I’ll go up to the bedroom. And when me and my daughter argue, my partner always takes her side and my son. So I feel like I’m being ganged up on. I would be like thinking, well, maybe they’re better off without me. Then I’ll just sit in me room and isolate myself. Talking to Oscar does help though, he’s a nice bloke.” (John)

John went on to describe how his supportive relationships with extended family were diminishing:

“I’ve got no one, no one really to talk to. Me and my brother, we used to play a lot of snooker as well, like I used to with my uncle as well and my dad. But we don’t go to snooker halls and stuff like that now. For some reason, it just doesn’t happen, I suppose, because we’ve got families and stuff and all that.”

These accounts show how TWG not only provides a space for rehabilitation and confidence-building but also addresses wider social and emotional needs, benefiting both service users and volunteers.

Sub-theme Place attachment: “I like planting things, coming back and watching them come up”

Participants reported two distinct but complementary psychological experiences at TWG. Many developed an emotional connection to the TWG garden itself, a sense of familiarity and security that aligns with the concept of *place attachment* (i.e. the garden taking on symbolic meaning as a safe and restorative space). Most participants also indicated that gardening reminded them of precious memories and family members. Together, these processes contribute to the therapeutic richness of the garden, facilitating both emotional safety in the present and reflective access to the past. While few participants explicitly identified a single favourite location on site, aspects of place attachment (Lewicka, 2011) were evident in how participants related to specific spaces and activities. For example, Judith mentioned the warmth of the polytunnel during winter and the reward of seeing the seeds she had planted the previous week come up. Phil described a sense of connection to the area where he engaged in wood chopping and sawing with the volunteers¹. Oscar offers a particularly rich insight into place attachment, drawing a parallel between nurturing plants and nurturing relationships:

“You see the lettuces grow, you look after the lettuces and then we are all like a family... Looking after the garden, it’s almost like looking after your children.” (Oscar)

During the intervention period, the groups faced a series of upsetting incidents. First, the bike shed was vandalised, and later, both polytunnels were destroyed by fire. These events were distressing for everyone involved and underscored the deep emotional connection participants had to the site, and by extension, to each other:

¹ This provides an example of Scannell & Gifford’s (2010) tripartite framework of place attachment: process (working with wood), place (area in the shed, and now TWG where this is done), people (grandparents, and now volunteers)

“I don’t like this vandalization. It makes me cry, it’s not right, people coming here and trashing it”. (Harry)

“Yes, we’ve had two polytunnels burnt, and it’s made everyone feel a bit distressed, physically, because we’ve put so much time and effort into creating things inside these polytunnels, and the polytunnels are designed to protect the things on the inside. Especially some of the plants that are not supposed to be outdoors, they’re now out in the cold wind. If we have another frost come around soon, it’ll most likely destroy them”. (Phil)

As noted earlier, participants frequently expressed how safe and understood they felt on the site. The vandalism disrupted that sense of safety, bringing in outside realities and triggering feelings of vulnerability and powerlessness:

“And I guess it’s a bit of a reminder that, you know, things like that kind of happen. You know, people sort of, you know, do things like that, and it’s really hard to sort of understand why”. (John)

“Yeah. I mean, as I’ve stated before, we all put our time and effort into this, but when someone just comes along and destroys it, it puts us all back. And we think, right, what are we going to have to do now to protect what we love and know?”. (Alex)

In response, a group meeting was held where all participants and volunteers were encouraged to contribute their thoughts and feelings, reinforcing the sense of shared ownership and collective care for the space, emphasising the flat hierarchy by which TWG is run. The above quotations illustrate attachment to the TWG site and a sense of emotional investment in the wellbeing of both the plants and the people within it. The site becomes more than a physical space, but a place of care, responsibility, and belonging, analogous to the rootedness of familial relationships (Scannell & Gifford, 2010).

THEME FIVE: Temporal Integration

The theme of *temporal integration* reflects how TWG supported participants to connect different aspects of their life story. Engaging with the natural world and participating in ongoing activities appeared to evoke (usually) pleasant memories of feeling more secure and connected, which had been disrupted by a period of mental ill-health or traumatic difficult life events. Participants were also enabled to look forward to a better future.

Sub-theme: Re-anchoring to the past: “It brings back happy memories”

Positive memory activation emerged as a powerful mechanism amongst most participants. Several individuals described how engaging in horticultural tasks at TWG evoked warm, personal memories tied to family and place. Here Phil relates his favourite activity of chopping and sawing wood to his grandfather’s wood-working in the garage of his family home:

“It [attending TWG] sort of reminds me of doing things with people who are really special to me. Yeah, it reminds me a lot of being at home.” (Phil)

Phil further noted that spending time with older volunteers reminded him of his grandfather:

“I love spending time with the volunteers. Because they’re all around the same age as grandpops, those volunteers.”

Similarly, Alex reflected on childhood experiences in his grandparents’ nursery business:

“My grandad had a nursery so I used to like gardening, they used to grow tomatoes, strawberries and grapes. And flowers. Now my grandparents are gone and the land’s been sold off. I escaped out of the hospital and went to visit to try and get in.” (Alex)

Rose also linked her current experience to a meaningful past activity:

“I don't mind hedge trimming. I used to do that a lot when I was growing up... I had a massive garden that was all bushes and trees that needed to be cut.”

Phil found value through emotional reconnection with memories and a sense of social belonging with volunteers, but, in the context of his struggles with social interaction due to autism, he also appreciated the emotional clarity and consistency offered by nature itself:

“... plants and wood in particular, you know, I don't get any mixed messages from them. Whereas people do tend to kind of give mixed messages” (Phil)

Although these reflections illustrate how NBIs can activate positive autobiographical memories, it is important to note that this is not always the case. Amanda did not return to the garden after her first day when she filled in her pre-test measures. I was later told that this was because being in the garden had triggered negative memories and associations and she had told staff she did not wish to return. Altogether, the above section illustrates that sensory and physical experiences of gardening serve as powerful memory cues, grounding participants in positive recollections, but also potentially reminding them of negative experiences, as they create a bridge between past and present.

Sub-theme: Imagining a Future “I’m combining something I used to do with what I would like to happen”

Many of the secondary care participants were in an “in-between” phase, no longer acutely unwell, but not yet fully reintegrated into community living. Living in secure accommodation while attending TWG provided a form of semi-independence, but for many, thoughts of the future brought a mix of hope, apprehension, and unresolved questions. This stage of recovery was marked by a growing self-awareness and an emerging sense of personal development, tempered by ongoing vulnerabilities. This sub-theme describes how, in this transitional phase, TWG provided an important bridge between clinical care and fuller

community participation, offering a structured environment where participants could assume responsibilities and experience small successes.

Rose reflected on the emotional and psychological shifts at TWG and her growing confidence in engaging with volunteers who taught her growing, planting and pruning skills, reviewing the role of TWG in her mental health recovery journey:

“I feel more reassured with how I’ve grown as a person with my mental health and separately from my mental health. Yeah. I’ve grown in self-confidence. Self-esteem. That’s the same thing, isn’t it? But a little bit. I wouldn’t say that I have a lot of self-esteem.”

Rose’s comment captures the dual process of recovery, healing not just from symptoms, but also rebuilding identity and confidence. Despite her progress, there is an honest acknowledgement of the work still to be done. For others, future orientation was closely tied to uncertainty about housing and relationships outside the hospital. Judith articulated how these unknowns were affecting her sleep and sense of security:

“I haven’t really been sleeping too well. It’s partly because I’m in a different room and partly because I’m worried about where am I going to be living? Who am I going to be living with? I can’t go and live with my parents.”

Such concerns reflect how recovery extends beyond symptom remission, encompassing questions of stability, belonging, and independence, particularly for those transitioning from institutional care. However, some participants expressed a greater sense of readiness and optimism about what lay ahead. Carter spoke with enthusiasm about his future plans, linking this progress back to his experience at TWG as a rehearsal for reintegration into the wider world:

“Yeah, yeah, I’m excited. You know I’ll be closer to my family. So, I feel pleased about that and I feel like I’m ready to leave. Coming here played a bit of a part. I think, because at

hospital we always see the same people. You know, it's good to come and, you know, see, you know, just get out of the place. And, and yes, it was good coming here.”

In the context of temporal integration, participants described how the garden provided opportunities to reconnect with positive memories from the past, experience a sense of grounding and purpose in the present, and envision possibilities for the future. This process supported a stronger sense of identity and continuity, contributing to recovery by helping individuals to rebuild a coherent and hopeful life narrative.

Data Integration

According to Creswell and Plano Clark (2018), the interpretation of mixed methods findings should go beyond presenting quantitative and qualitative results in isolation and instead focus on how these strands are integrated. They recommend explicitly discussing areas of convergence (where quantitative and qualitative findings support or confirm one another), complementarity or agreement (where different types of data address related aspects of the same phenomenon), and divergence (where findings appear contradictory or raise new questions). Reporting in this way helps to demonstrate the added value of a mixed methods approach, showing not only whether the results align but also how differences can provide deeper insight into the research problem. The authors write that *“divergent findings, in particular, should not be treated as weaknesses but as opportunities to reconsider assumptions, refine interpretations, and highlight the complexity of the phenomenon under study”* (Creswell & Plano Clark, 2018, pp. 230–231).

In this study, quantitative outcome measures suggested no statistically significant differences between pre-post testing on the PHQ-9 and psychological or physical QoL. However, the qualitative interview data provided important context for understanding these results. Several participants across both groups described feeling they benefitted physically and psychologically due to the intervention, but also emphasised that improvements were

gradual and sometimes difficult to quantify. This convergence between modest quantitative changes and participants' subjective accounts highlights that even small numerical gains may represent meaningful shifts in lived experience. At the same time, divergence was observed in the social QoL domain: while the quantitative analysis showed a moderate but non-significant effect favouring one group, qualitative interviews revealed mixed experiences. Some participants reported feeling more socially connected and supported, whereas others described ongoing challenges with loneliness. This divergence indicates that group-level differences may not capture the variability of individual experiences, and suggests that social outcomes may be more complex and context-dependent than the quantitative data alone imply. The integrated quantitative and qualitative findings are presented in joint displays, comparing quantitative and qualitative data, and also setting themes from social prescriber survey against service user data, as shown in Tables 19 and 20 below.

Table 19

Integrating qualitative and quantitative staff, social prescriber and participant data (adapted from Creswell and Plano Clark 2018)

Main Theme	Relevant Sub-themes	Illustrative Quotes Indicates quotes not used in qualitative write up *	Quantitative Results	Integration Insight
Reclaiming Health	Feeling physically better	<i>"I've started caring about my health again"</i> (Sarah) * <i>"it's good exercise. Definitely good cardio".</i> (Alex) *	WHOQOL 2 p = .447 ↑ PHQ9 p = .239 ↓ WHOQOL Physical p = .202 ↑	DIVERGENCE: Participants qualitative health self-report was not supported by quantitative physical health data.
	Managing medication effects	<i>"I would say it is medication or boredom related. Sometimes I want to have a sleep in the afternoon. So coming here is good because I've got to be out of the house and then I feel better."</i> (John) *	WHOQOL 4 p = 1.00 (no change in perceived reliance on medication)	DIVERGENCE: Perhaps reflective of the cohort, participants felt medication was vital for their functioning after the intervention, but qualitative and quantitative data diverged on whether TWG helped participants to cope with side effects.
Being Away	Change in Scenery	<i>"Getting out of the hospital environment is key"</i> (Rose) *	UCLA p = .023 ↓ PHQ9 p = .239 ↓ WHOQOL Env p = .135 ↑	CONVERGENCE: The importance of a change in environment afforded by TWG is supported a significant reduction in loneliness, anxiety and wellbeing scores.
	Mental Escape	<i>"It's nice just to have a break, like I say work is hard, it can be hard fitting in. I don't feel self-conscious and awkward here"</i> (Sarah) *	UCLA p = .023 ↓ WHOQOL Psy p = .830 ↑ PHQ9 p = .239 ↓	CONVERGENCE: The opportunity to have a cognitive break was supported by participant quotes and increase in wellbeing scores.
	Finding Calm	<i>"And I feel calmer surrounded by trees",</i> (Oscar) <i>Yeah, it's a really good distraction from anxious feelings. And even though it's cold, it's nice to be outside and be doing different things.</i> (Judith) *	GAD 7 p = .023 ↓ SWEMWBS p = .038 ↑	AGREEMENT: Strong convergence between finding calm, reducing stress, relaxing and reduced anxiety supported by qualitative and quantitative data.

Building Self Agency	Confidence in a safe space	<i>It's been good for my confidence. I'm in hospital but I can mix with people from other wards, (Rose)</i> <i>"I don't have many friends as I told you and I often feel different from other people but not here." (Sarah)</i>	PHQ9 p = .239 ↓ SWEMWBS p = .038 ↑ UCLA p = .023 ↓ WHOQOL Social p = .914 ↑	CONVERGENCE: Suggestion that social engagement may buffer depressive symptoms Although feeling understood may reduce loneliness momentarily, it might not impact perceived loneliness away from TWG.
	Risk and Responsibility	<i>"using the saws and loppers is kind of like building confidence and learning skills that you might never have learned before" (Christopher)</i>	SWEMWBS p = .038 ↑	AGREEMENT: between increased responsibility and increased wellbeing
Belonging	Community Integration	<i>"They're the only people I actually come face to face with to have a laugh." (Harry)</i>	UCLA p = .023 ↓ SWEMWBS p = .038 ↑ WHOQOL Env P = .135 ↑	AGREEMENT: Participation at TWG as a springboard for wider engagement, decreasing loneliness and increasing wellbeing. Participation appears to strengthen positive outlook and QoL.
	Place Attachment	<i>"I like planting things and watching them come up"</i>	WHOQOL Env P = .135 ↑	CONVERGENCE: This was very evident in participant's protectiveness of the site, and appreciation of one site of security may transfer to others.
	Building Relationships	<i>"he was so funny that, you know, he was just such a nice character. I miss him as well" (Sarah)</i>	WHOQOL Social p = .914 ↑ UCLA p = .023 ↓	SOME CONVERGENCE: However, for some participants loneliness was so deep-seated the project could only make superficial impact.
Temporal Integration	Re-anchoring to past	<i>"It [attending TWG] sort of reminds me of doing things with people who are really special to me. Yeah, it reminds me a lot of being at home." (Phil)</i>	WHOQOL Psy p = .830 ↑ SWEMWBS p = .038 ↑	CONVERGENCE: Positive memory activation and increased connection increased feelings of wellbeing but did not significantly reduce depression scores or increase perceived psychological quality of life.
	Imagining a future	<i>"I'm excited. You know, it will be really nice and I'll be closer to my family. So, so yeah, I feel, I feel pleased about that and I feel like I'm ready to leave. Coming here played a bit of a part" (Carter)</i>	WHOQOL Env P = .135 ↑ WHOQOL Social p = .914 ↑	SOME CONVERGENCE: Thinking about the future change in environment could bring about feelings of wellbeing but also strong feelings of anxiety, reflected in small improvements in WHOQOL scores

Table 20

Integration of Social Prescriber and Service User data

Participant Data	Social Prescriber Data	Integration insight
Barriers to Participation Participants named many barriers, medication, fatigue, transport, weather. Once they had got out of the habit it was difficult to re-engage without support due to social anxiety and lack of confidence. <i>“Obviously I haven’t been here for a few weeks, cos of the bereavement, I didn’t feel up to it, went into myself. So then I think my confidence has gone back down again a bit” (John)*</i> <i>“Yeah, I’ve just got to constantly try and motivate myself constantly. Like sometimes in the mornings or whatever, I feel like I just don’t want to go and have a shower. I’ll have a wash usually, maybe, but it’s just like the motivation for doing it is just really hard sometimes.” (Harry)</i> Loneliness – qualitative data and quantitative scores suggested that attendance at TWG was valued by participants as a buffer against loneliness.	Figure 4 indicates that SP’s worried about many of the same barriers or de-motivators: medication effects, ill-health, poor weather, transport and social anxiety. Loneliness was rated lowest out of social or health factors for which TWG could be effective	CONVERGENCE about barriers to both referral and participation, which are broadly similar between SP, staff and participants. Participants’ accounts indicate that positive impacts on mental health were contingent upon maintaining adequate levels of motivation, and that difficulties in this area could act as a significant barrier to attendance. Motivation is therefore best understood here as a necessary precondition for impact, rather than as an outcome of participation. Further research would be required to examine motivational processes in their own right. DIVERGENCE – Social prescribers may under-estimate the value of participation in an NBI for those who are lonely
Role of Social prescribers The value of Social prescribers connecting them to the project was made clear by Oscar, John, William and Harry. <i>“It was the GP who made the brilliant decision to refer me here” (Harry)</i>	Figure 1 SP’s felt insufficient provision or information about NBIs, but did not describe seeing themselves as a bridge between participant and the project and community Social prescribers did not talk about accompanying people to projects but providing a link.	DIVERGENCE – time pressures and organisational barriers. Participants and organisations may want more input from social prescribers than they can deliver. Social prescribers appeared unaware of an expectation that they could or should develop relationships with organisations and follow up

John's experience revealed the importance of support to overcome social anxiety, preventing attendance. Without the social prescriber accompanying him on his first few visits, he might not have managed to attend at all. However, their subsequent unexpected departure left him unsettled: <i>“they sent a person and then there was a person who actually talked to me and then brought me, he brought me here for the first day and stayed with me here for the first day. And then after, I think a couple of weeks, he said, oh, I'm not going to be doing it anymore, it'll be someone else. I was like, oh. And I don't like change. No. I hate change.”</i> (John) As noted earlier, Social prescribers generally did not spend much time at TWG building relationships with the project or its participants. However, several participants felt that more active involvement from Social prescribers could be highly beneficial.: <i>“I think it's just really important for them to, and it's a real shame, you know, not to be referring more people because I think this is a really amazing resource. It's run by really caring people.. And I just think that this has been the best thing for my mental health that has been prescribed for me. I just think that they should come here and see for themselves.”</i> (Oscar)	Social prescribers believe in value to NBI for mental health conditions (Figures 2 & 3) During the intervention period, there were a few referrals to primary care for patients who had attended TWG while in hospital, but most of these failed to attend on a Monday. There were no successful referrals from the primary care network to service users who had <i>not</i> already been in the secondary care system, and therefore, no preventive referrals were made. This quote provides a useful contrast with Social prescribers concerns about referrals (Figure 4) and with some Social prescribers concerns about the relevance of NBIs (Figure 3)	with participants once they have started at a project. CONVERGENCE – about the potential value of a referral for service users, but there are barriers to making referrals and lack of adherence to attendance following referrals.
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Summary

The integration of qualitative and quantitative data revealed a complex but broadly convergent picture of the impact of the nature-based intervention. Key outcomes, including reduced anxiety, increased wellbeing, and decreased loneliness, were supported by both participant narratives and significant clinical and statistical improvements in outcome measures, the GAD-7, SWEMWBS, and UCLA. In areas where quantitative change was not statistically or clinically significant, qualitative data offered descriptions of perceived improvement. Additionally, participant and social prescriber data highlighted shared perceptions around facilitators, group dynamics, and common barriers to participation. However, divergences also emerged, for example, participant, staff, and social prescriber perceptions that being at TWG supported physical health, which were not confirmed by the quantitative findings. There were divergences regarding the continuity of support and referral processes, with participants expressing needs that often exceeded what social prescribers felt resourced to provide. The discussion chapter will further explore the limitations of the study and its methodology, as well as barriers and enablers for intervention outcomes, and implications for practice.

CHAPTER FOUR: Discussion

Chapter overview

This study aimed to explore the perceived value and clinical impact of a nature-based intervention (TWG) using a mixed methods approach combining data from quantitative outcome measures and semi-structured interviews with service users, staff, and volunteers. Quantitative findings partially support the original hypotheses, which predicted that participation in an NBI would decrease anxiety, loneliness, and depression while increasing wellbeing and QoL. Qualitative themes further supported these outcomes, highlighting participants' sense of social inclusion, increased self-confidence, and the value associated with engaging in meaningful activities. Overall, some expected effects were observed, while others (in particular impacts on participant QoL and PHQ-9 scores) were less evident, suggesting either that longer-term engagement may be required to achieve these effects, that adjustments could be made to the intervention itself, or that participation at TWG would be more effective if better integrated into individual participant's treatment context.

Brief Overview of Findings

Quantitative findings

Statistically significant reductions in both anxiety and loneliness were observed following the intervention, accompanied by a statistically significant increase in participants' overall mental wellbeing – evidenced by SWEMWBS and UCLA data. There were trends towards improvement, but no statistically significant changes in participants' perceived QoL measures and depression (PHQ-9) measures.

In contrast to participant perspectives, no significant changes were observed in quantitative measures of physical health, suggesting that the intervention's primary benefits were psychological and social rather than somatic. While some cognitive and attentional measures were included, only one (QoL 7 – How well are you able to concentrate?) showed a

statistically significant improvement, suggesting limited but possible cognitive impact. No statistically significant differences were observed between the primary and secondary care groups.

Qualitative Findings

The qualitative analysis revealed five distinct themes suggesting mechanisms through which TWG can support recovery from MI. Under the domain *Impact of the Garden*, participants described the importance of *Being Away*, a restorative sense of escape from clinical settings, family, and work stress. *Reclaiming Health* included themes where participants described feeling physically healthier and coping better with medication side effects. Three themes captured the *Mechanisms of Change* that helped participants move toward personal growth: *Building Self-Agency*, *Belonging*, and *Temporal Integration*, each reflecting ways in which the garden facilitated a growing sense of confidence and identity, social reconnection, and a more coherent acceptance of self, past, present and future.

Social prescriber data

Across staff, participants, and social prescriber accounts, there was widespread agreement on key barriers to engagement and referral, such as seasonal variation, medication effects, fatigue, physical health issues, transport problems, financial constraints, and social anxiety. Despite these concerns, all social prescribers who completed the survey believed in the effectiveness of NBIs. However, many noted a lack of accessible information about local NBI opportunities. It is also worth noting that recruiting social prescribers for the study proved difficult, as shown by the small number of social prescribers in the area who responded to the survey, indicating limited enthusiasm for the research, possibly due to time constraints.

Integration of Quantitative and Qualitative Data

Quantitative and qualitative datasets are integrated and presented in Tables 19 and 20, which summarise areas of agreement, convergence, and divergence between the datasets. There are some notable areas of divergence. As noted, the physical health measures of service user participants contrast with their subjective reports under the theme *Reclaiming Health*, in which they consistently described feeling healthier or more physically active as a result of participating in TWG. This could suggest that these standardised measures may not always capture perceived health benefits or that the perceived sense of physical health benefit is limited to times of participation at TWG and recedes in the intervening week.

In contrast with social prescribers, service user and volunteer accounts indicated it would be valuable for social prescribers to develop and maintain relationships with third sector organisations such as TWG as well as with participants. This is consistent with the research base, which suggests strong relationships between SPs and organisations providing services is crucial for successful GSP (National Academy for Social Prescribing, 2025; NHS, 2019, 2020; Munro & Dayson, 2025).

Another area of divergence between SP perception and the data pertains to perceptions of the value of NBIs for reduction in loneliness. The qualitative and quantitative data suggests participation predicts a decrease in felt loneliness, however social prescribers surveyed felt TWG was least likely to support attendees with chronic loneliness. This suggests SPs may therefore underestimate the potential value of projects such as TWG to address long-term loneliness and social isolation.

Gonzalez et al. (2011), one of the few studies in the literature review to include follow-up data, found that while lower depression scores were maintained three months post-intervention, reductions in stress and anxiety were not sustained. The findings of the current study also suggest that NBIs such as TWG are effective in fostering interpersonal and social

skills but primary care data indicates that continuous, long-term engagement, rather than a time-limited intervention, may help to consolidate these benefits. Ongoing initiatives such as the TWG primary care group may be particularly valuable for supporting enduring connections and a sense of social presence, as reflected in the “*Belonging*” theme and participants’ references to love and familial bonds within the group.

There are many areas of agreement and convergence between qualitative and quantitative datasets. The decreases in depression, anxiety, and loneliness scores align with the *Confidence in a Safe Space* and *Belonging* sub-themes, where participants discussed increased social engagement and social confidence. Participant quotes within the *Finding Calm* theme encompass concepts of reduced stress, relaxation, and decreased anxiety, which align with improved scores in quantitative measures.

There is also agreement in the *Community Integration* sub-theme, suggesting that participation in TWG serves as a springboard for playing a more visible role in the community, thereby decreasing social isolation, which again aligns with decreased UCLA loneliness scores. Loneliness is increasingly recognised as a major public health concern, linked to heightened risks of depression, anxiety, cognitive decline, cardiovascular disease, and premature mortality. Evidence suggests that its impact on health is comparable to other established risk factors such as smoking and obesity, underscoring the need for interventions that promote social connection and belonging (Valtorta et al., 2022; Wang et al., 2024).

Taken together, these qualitative and quantitative findings highlight the intervention’s role in supporting social integration and fostering a renewed sense of personal wellbeing, two key aspects of mental health recovery, as reflected in both the quantitative results and participants’ lived experience accounts.

Links with Existing Literature

The literature review for the current study identified four relevant themes: *Gardening can support inpatient life*, *Mechanisms of nature connection*, *Development of social and work skills*, and the *relationship between physical and mental health*. The current study identified similar themes, also finding that participants valued the extension of their social network, “*a sense of being respected*” within their communities, feeling healthier and managing their hospital stay, in addition to the value of spending time in nature. Social prescriber data from the current study aligns with the broader field of research in suggesting such themes should be considered alongside persistent structural and access barriers. Such consideration would provide useful context for the modest quantitative changes and the qualitative gains observed within this study, particularly as some mechanisms of benefit may be hard to identify through standardised outcome measures.

A substantial body of research specific to social and therapeutic horticulture (STH/TH) reports improvements in mood, anxiety, and social participation from structured gardening with therapeutic intent. Clatworthy and colleagues (2013) reviewed clinical and community-based STH interventions and found consistent reductions in depression and anxiety, alongside gains in social and vocational functioning, although the authors also identified methodological weaknesses such as small sample sizes. Empirical work focusing on TH for people with depression has also shown reductions in rumination and distress, with possible contributions from mechanisms such as “being away” and soft fascination (Ives & Abrahams, 2008; Gonzalez et al., 2011; 2011a). Beyond single studies, systematic reviews and meta-analyses of gardening interventions, many of which include STH programmes, report significant benefits across mental health outcomes (depression, anxiety, life satisfaction, quality of life) and, in some cases, physical health markers (Soga et al., 2017; Spano et al., 2020).

Controlled evaluations of horticultural programmes for people with mental illness further support decreases in stress and improved quality of life for participants, although the reliability of the data remains a challenge due to the heterogeneity of programme design and outcome measures (Kamioka et al., 2014). More recent evaluations of structured therapeutic horticulture suggest that qualitative accounts of well-being, belonging, and meaning often capture benefits more richly than short-term quantitative scales (Gonzalez et al., 2011; 2011a).

Alongside benefits, STH/TH research has also highlighted barriers that mirror findings in the present study. Commissioners report limited awareness of STH, a commissioning culture favouring traditional medical approaches, and difficulties scaling voluntary and community sector provision, all of which constrain referrals and group sizes (Buck, 2019; Buck & Ewbank, 2020; Chatterjee et al., 2018). Service-user reviews and qualitative syntheses also point to practical and psychological barriers, such as low confidence, stigma, transport difficulties, seasonality, and accessibility, which can restrict uptake and retention (Annerstedt & Währborg, 2011). In addition, realist and community gardening analyses have emphasised that outcomes are shaped by local factors such as referral pathways, staff support, and how well activities fit participants' needs (Genter et al., 2015). These studies often reflect a similar context to the low participation rates and access challenges observed in TWG, and they reinforce the importance of aligning provision with demand and the pressures of ensuring consistent organisational support and funding.

The combined datasets presented in this study support evidence that enhanced emotional wellbeing predicts reductions in depressive symptoms (Lamers et al., 2011) and that depression and anxiety impair multiple domains of QoL, particularly social functioning (Rapaport et al., 2005). The interconnected nature of these constructs, as noted in this study, aligns with broader reviews of NBIs, which suggest that various mechanisms, including

physical activity, sensory engagement, social interaction, and meaningful occupation, can work together within an NBI to improve overall mental health (Bragg & Atkins, 2016; Hartig et al., 2014) subject to individual differences between participants and community and population variation. Below, I will discuss how this multifaceted model of benefit was visible in both qualitative and quantitative outcomes, connecting these to relevant theory and the wider evidence base.

Stress Reduction Theory (SRT)

The qualitative and quantitative data from the current study broadly align with Stress Reduction Theory (Ulrich, 1983), which suggests that exposure to natural environments can foster emotional recovery by decreasing physiological stress. The reduction in anxiety and improved wellbeing scores support this interpretation, while qualitative themes such as *Belonging* and *Finding Calm* echo participants' reports of feeling more settled and at ease. However, these results should be treated cautiously. Physiological stress was not directly measured, so the assumption that improved psychological outcomes reflected biological stress reduction remains inferential rather than evidenced. Moreover, not all participants described relaxation or calmness, and some emphasised social rather than environmental or “nature-connected” aspects of their improvement. This suggests that SRT may capture only part of the mechanism at work, and that the interplay of social connection, context, and activity may be as important as the natural setting itself.

Attention Restoration Theory (ART)

Attention Restoration Theory (Kaplan & Kaplan, 1989) proposes that nature restores directed attention through components such as “being away” and “fascination.” In this study, cognitive outcomes were largely unchanged, with only a tentative improvement in concentration. Participants did describe *Being Away* and feeling more focused, but these accounts were sparse compared with their emphasis on stress reduction and social

connection. This suggests that the “top-down” cognitive restoration proposed by ART may have been less relevant to these participants’ experiences than the “bottom-up” reductions in arousal captured by SRT. It is also possible that the tools used in this study were not sensitive enough to detect subtle changes in attention, or that the relatively structured activities at TWG did not strongly engage the mechanisms of “soft fascination” central to ART. Future research might therefore need more targeted cognitive testing, both pre- and post-session, to assess whether ART mechanisms are genuinely at play.

Attachment to People and Places

Themes of *Temporal Integration* and protective feelings towards the site support theories of autobiographical memory and place attachment (Lewicka, 2011; Scannell & Gifford, 2010). Participants’ reflections on personal memories highlight the way gardening can reinforce identity and continuity. Yet, these findings may also reflect context-specific features of TWG, such as its community culture, rather than generalisable NBI effects. Unlike theories that emphasise the intrinsic qualities of natural environments, attachment theories highlight relational and cultural meaning, suggesting that the garden’s impact may be less about nature per se and more about the particular social and symbolic value of this site. Participant accounts of the current study particularly stress the social value of participation, the feeling of “family” and the theme of *Belonging*. Conversely, Amanda’s experience, whereby despite her love of gardening and nature, she could not return to the garden due to negative associations with this place in her past, illustrate that sometimes these attachment mechanisms are negative for service users.

Community Integration and Recovery

The relationship between the intervention's effects and Stress Reduction Theory also aligns with recovery-oriented frameworks, especially the CHIME model (Leamy et al.,

2011)² and Calm and Connection theory. Participants clearly valued connectedness and empowerment, but again, the data raises questions about whether these outcomes were primarily nature-driven or whether they reflect group-based social support that could, in theory, be achieved in other communal settings. This challenges the assumption that NBIs or STH are uniquely effective, instead suggesting that their distinctiveness may lie in the *combination* of natural and social affordances.

Altogether, these findings suggest that no single theoretical framework fully accounts for participants' experiences of TWG. Elements of Stress Reduction Theory and Attention Restoration Theory were evident, but their explanatory power was limited by the lack of direct physiological or cognitive measures, and by participants' greater emphasis on social connection than on environmental restoration alone. Place attachment and recovery-oriented frameworks such as CHIME offered stronger alignment with the qualitative data, yet these too may reflect context-specific dynamics of TWG rather than universal features of NBIs. Overall, the study indicates that multiple mechanisms—including stress reduction, social integration, identity reinforcement, and community belonging—likely work in combination. This highlights the need for future research to adopt integrative, multi-theoretical approaches and to include both biological and psychosocial measures in order to capture the full complexity of how NBIs may support mental health and recovery.

Social prescribing

The current study also draws on the perspectives of social prescribers and staff who connect participants to TWG. Their insights mirror wider findings on barriers to Green Social

² The CHIME model is a framework for understanding and supporting personal recovery from mental health challenges. It emphasizes five key components: **Connectedness** (having positive relationships and a sense of belonging and social support), **Hope** (believing that recovery is possible and maintaining a positive outlook, with motivation to change), **Identity** (developing a positive sense of self, distinct from the illness itself), **Meaning** (purpose and meaning in life, which can be found in personal experiences, social roles, and goals), and **Empowerment** (focusing on personal strengths, and making choices).

Prescribing (GSP), including limited access to green spaces, transport and financial constraints, and referral hesitancy stemming from low awareness or understanding of nature-based interventions (NBIs) (Fixsen & Barrett, 2022; Surrey Heartlands ICS, 2023; Husk et al., 2020; Carnes et al., 2024). Such barriers highlight the practical challenges that shape participation and the uneven accessibility of GSP opportunities across communities.

Despite these obstacles, evaluations of the government's GSP "test and learn" sites indicate promising outcomes. For example, Darcy et al. (2025) found that participants in a Humber and North Yorkshire intervention experienced significant improvements in mental health and wellbeing after five to twelve weeks of nature engagement, supporting existing evidence that even brief exposure to nature can yield measurable benefits (Coventry et al., 2021; White et al., 2019). These findings suggest that when access barriers are addressed, GSP can meaningfully contribute to wellbeing and recovery.

However, many individuals engage with NBIs outside formal referral pathways, through community initiatives, personal networks, or self-referral (Robinson et al., 2020; Bloomfield, 2017). Recognising these informal routes is crucial to understanding the broader landscape of NBI participation and ensuring that GSP systems complement, rather than duplicate, existing community-based avenues.

This distinction between *engagement benefits* and the *systems that enable them* is central to the effectiveness of GSP. Delivery relies on collaboration between health services and third-sector organisations, yet support and funding remain inconsistent across regions. Fragmented implementation and opaque referral pathways limit replication and evaluation (Thomas et al., 2023; Darcy et al., 2025). Achieving greater consistency will require sustained investment in both human and social infrastructure, particularly given disparities between Integrated Care Systems (ICSs) and continuing funding uncertainties (Marx & More, 2022; Porter et al., 2025; Bragg & Atkins, 2025).

Within this context, social prescribers in the present study reported hesitancy linked to limited knowledge of NBI benefits, accessibility issues, and participants' motivation. Weak or inconsistent relationships between prescribers, NBI providers, and service users may further constrain engagement, helping explain low initial uptake and irregular attendance. These findings reinforce calls for a more person-centred, relational approach to SP that supports participants in overcoming psychosocial barriers and strengthens integration of NBIs within mental health care (Wood et al., 2022, 2025). Enhancing coordination across sectors and improving the reliability of GSP pathways remain essential steps toward unlocking the full potential of NBIs to support mental illness recovery and reduce pressure on health services.

Strengths and Limitations of the Study

The current study has many significant limitations. Constraints in terms of my own time to devote to it, as well as the research time span (being over winter and only 6 months long), each contributed to a very small sample being recruited. A smaller sample limits statistical power, meaning that quantitative data findings should be treated with caution and have limited generalisability. Thus, the current study's ability to make meaningful inferences from the quantitative findings was limited due to the small sample size. Larger samples and more appropriate measures would be required to detect potential subtle effects of NBIs on physical health-related outcomes and cognition outcomes. Additionally, I could not determine whether the two groups were comparable at baseline, as participants had all started attending TWG at different times, and additional interventions were not controlled for, which introduced the possibility of bias and confounding factors.

Another limitation is the absence of follow-up. Data were collected only during participation at TWG, which prevents assessment of whether the benefits reported were sustained over time. This is particularly important because many existing studies on NBIs

and green social prescribing have highlighted high attrition and uncertainty regarding the durability of benefits (Bragg & Atkins, 2016; Bickerdike et al., 2017; Husk et al., 2020; Pescheny et al., 2022). Without follow-up data, it is unclear whether the positive outcomes observed represent short-term mood improvements or longer-term changes in wellbeing. It is also important to note that this would apply only to secondary care participants; primary care participants have the opportunity to attend on an ongoing basis, regardless of whether they attend regularly or consistently.

Limitations also arise from the way outcome measures were administered. In addition to the limitation of reliance on self-report measures, questionnaires were completed by hand in the presence of an interviewer. While this ensured completeness of data and supported participants who found the forms challenging, it also introduced the potential for demand characteristics and social desirability bias. Participants may have felt encouraged to give more favourable responses due to the presence of a researcher or the perceived expectations of staff. This could have inflated positive responses, reducing the objectivity of the self-report measures.

Finally, the absence of a control group limited the ability to compare outcomes with individuals who did not participate in TWG, but otherwise received comparable treatment at the rehabilitation unit. The study design did not allow exploration of how different aspects of the intervention (such as frequency or type of activity) may have contributed to outcomes.

Directions for future research

Bragg and Leck (2017) note that the NHS aims to focus on individual and community involvement in healthcare and shift towards more local delivery of health and care services (NHS LTP 2019). The authors also highlight the underutilisation of existing NBIs and suggest there is potential to develop current provisions more effectively. According to pre-

COVID-19 data³, many Colchester residents struggling with MI might be eligible for referral to TWG or another NBI; however, during the research period, participation numbers in the TWG primary care group were very low. Primary-care participants indicated a preference for larger group sizes, with around 10–12 participants seen as ideal for both participants and staff (see also Gonzalez et al., 2011a; Owens & Bunce, 2022; Coventry et al., 2021). However, attendance generally did not reach half this number for primary care in most weeks. Future research is needed to understand the relationship between community need, social prescriptions issued, and organisational provision, both locally and nationally.

It is also important to review access to NBIs for vulnerable populations who may be less inclined or able to participate. Younger people seem to be simultaneously vulnerable to “nature deficit disorder” (Louv, 2005) and climate anxiety. The widely reported ‘mental health crisis’ among young people is well documented in the media⁴. If it is true that this may partly result from lower biophilic traits and a disconnect from nature (Louv, 2005; Friedman et al., 2022; Liu et al., 2022; Whitburn et al., 2020), then age-appropriate, developmentally informed pilot studies could evaluate outcomes such as eco-anxiety, emotional regulation, and nature connection in younger populations.

Fixsen & Barrett (2022) observed that adults with complex mental health needs or physical disabilities might be inappropriately referred to and insufficiently supported by NBIs following their discharge from hospital. Longitudinal research could explore engagement

³ In Colchester, approximately 8,405 people received NHS mental health services in 2018-19, which is about 4% of the population. A survey in 2020 indicated that more than one in three of the 1,000 respondents were struggling with stress, depression, or anxiety. Furthermore, Colchester has a higher suicide rate than the national average, with 15 deaths per 100,000 people compared to 10.6 for England (Public Health England, 2019 NHS Digital 2021).

⁴ According to the Children’s Commissioner, almost one million children and young people had active referrals for Children and Young People’s Mental Health Services in England in 2022-23. A third (28%) of children referred to mental health services (270,300) were still waiting for support, while almost 40% (372,800) had their referral closed before accessing support (Children’s Commissioner, 2024)

levels, recovery paths, and perceived barriers to access, such as stigma, transport issues, and clinical risk management for this group of service users.

Recent qualitative syntheses have emphasised the importance of service user readiness, the quality of relationships, and contextual factors such as transport, stigma, and accessibility, areas often overlooked in quantitative studies (Fixsen & Polley, 2023; Bhatti et al., 2023). These gaps suggest the need for further theoretically informed, mixed methods research to understand not only whether NBIs are effective, but also how to enhance their reach and impact. Implementation-focused research could map referral pathways, link worker training and confidence, while demographic mapping could help address inequalities in access and inform more consistent service delivery (Darcy et al., 2025).

In addition, future studies should consider incorporating physical health outcome measures to complement psychological and social wellbeing data. Potential approaches include objective indicators such as blood pressure, resting heart rate, heart rate variability, or body mass index (BMI), as well as biomarkers of stress and immune function (e.g., cortisol levels). Wearable technologies could provide continuous data on activity levels, sleep, and heart rate variability, offering insight into physiological changes associated with participation. Self-report measures of physical functioning and perceived health could also be triangulated with clinical data to provide a richer picture of how NBIs affect physical as well as mental wellbeing.

Finally, the present study could be improved and expanded by adopting a larger and more representative sample, ensuring the inclusion of both control and follow-up conditions to assess the sustainability of outcomes over time. A mixed methods, longitudinal design would allow integration of quantitative outcome measures with qualitative accounts, clarifying not only whether NBIs based on STH are effective but provide clarification over timeframes, impact of specific nature-based activities, and follow up over time. However ,as

mentioned above, STH interventions are complex and varied, incorporating a number of mechanisms that may be effective for different groups and cohorts, making it unlikely that a “one size fits all” approach is possible.

Improvements in study design could also include more rigorous baseline assessments, clear recording of concurrent treatments, and measures to minimise demand characteristics (e.g., anonymous self-completion of questionnaires). By extending the scope of measurement and refining the methodology, future research could make a stronger contribution to the evidence base on NBIs and their role in health and social care.

Clinical Implications –the relevance for clinical psychology

There is an increasing recognition of the need to engage with the development of a more ecologically aware approach to both mental health care and addressing the impact of the climate crisis (Watts et al., 2021; Hollway et al., 2022). Clinical psychologists are trained to play a leadership role within NHS services by shaping care systems, policies, and culture, influencing service development with their relational, systemic, and evidence-based expertise (BPS, 2010). It could be argued that clinical psychologists are uniquely positioned to engage with nature-connectedness therapeutically by bringing individual or group therapy outdoors or to advocate for an “environmental safe uncertainty” stance – one characterized by openness, curiosity, collaboration with clients, contextual flexibility, and informed risk management – which enables therapists thoughtfully to consider outdoor therapy as a viable option (Cooley et al., 2020, 2022; Berger, 2009; Jordan & Hinds, 2016).

Psychologists might also utilise psychological theories to shape systems that are more sustainable and climate-aware, for example, creating pathways that integrate NBIs run by the third sector into primary and secondary care pathways, moving beyond optional add-ons to treatment to becoming recognised components within care planning (Drinkwater et al., 2019). This would involve exploring how NBIs can be embedded within multidisciplinary team

discussions, recovery-focused care plans, and outcome tracking systems to ensure better continuity, clinical oversight, and personalisation of the intervention, particularly for individuals with more complex needs. Important groundwork on mapping and enhancing the reach of NBIs already exists within the STH field. For example, the gardening charity “Thrive” has developed frameworks that align therapeutic gardening approaches to five different levels of mental health and wellbeing need, supporting appropriate referral and intervention matching. National mapping of provision is also being undertaken through organisations such as the Scottish gardening charity “Trellis” and “Gardening for Health”, based in Bristol and Somerset. Natural England has piloted initiatives such as the “Buddy scheme” to help participants overcome barriers to accessing NBIs. Local coalition groups, including the Reading Green Wellbeing Network and the Nature & Mental Health initiative, are also emerging as platforms to share learning, strengthen referral pathways, and promote community-based provision. Drawing on such examples can provide clear and practical ways for psychologists to advocate for more consistent, embedded, and equitable access to NBIs.

In terms of the therapeutic environment, in addition to the encouragement of interventions outside or in clients’ home environments, clinical psychologists could utilise some principles of environmental psychology to enhance therapeutic and team spaces by introducing biophilic elements (Aristizabal et al., 2021), whether it be encouraging the incorporation of natural elements into office design, such as the use of indoor plants or maximising natural light and outside views, or modelling more sustainable “earth positive” attitudes in the use of resources.

The bigger picture

In response to the growing climate crisis, the NHS declared a climate “health emergency” in 2020, acknowledging the far-reaching physical and mental health consequences of rising temperatures and air pollution. These include projected increases in

heart disease, stroke, asthma, Lyme disease, encephalitis, depression, and anxiety. Preparing the health system and individuals for the impact of climate change will require both mitigation and adaptation strategies (NHS, 2020; 2025). These strategies could be psychologically informed, recognising both that climate change functions as a significant psychological stressor, contributing to growing levels of eco-anxiety and distress, but also that there are substantial psychological and structural barriers that continue to hinder pro-environmental behaviour change (Clayton, 2020).

Psychology, particularly clinical psychology, could play a vital role in supporting climate adaptation within the health service by modelling sustainable behaviours, fostering individual and community resilience, and incorporating climate awareness into psychological wellbeing, policy, and health system planning. To effectively serve this purpose, the discipline must shift to recognising the natural world as essential and view climate change as a threat to both psychological and physical safety. White et al. (2023) suggest a theoretical enhancement of ART and SRT to assist psychologists in building individual resilience and communities through the utilisation of surrounding natural ecosystems. The authors believe that natural environments and elements can help individuals become more resilient cognitively and emotionally. According to the authors, biopsychosocial resilience resources can minimise the risk of various stressors, improve adaptive responses to stressful circumstances, and support faster recovery (White et al., 2023).

Reflections

As a solo researcher, I sometimes felt awkward, straddling the roles of volunteer and staff member. Despite introductions and explanations, some participants and volunteers appeared to struggle to understand why I was there. I reflected that the chosen methodology was not the most appropriate. As I had to spend a significant amount of time at TWG developing relationships with participants to complete measures and interviews, an

ethnographic approach might have been more effective, where my role would have been more authentic and defined, as I would have been more fully integrated into the project. I would also not have been completing outcome measures with participants, which often triggered concerns about what would happen to the data, as it was reminiscent of hospital processes. As previously discussed my presence while these were filled in may have contributed towards demand characteristics and been further shaped by my beliefs, although these were not made explicit, about the value of community based approaches to mental health services.

As it was, my partial knowledge of participants' histories and problems may have introduced bias and further confounding factors to the quantitative data collection. My frustrations with the lengthy recruitment process likely impacted my interactions with the qualitative data at the collection, analysis, and integration points. More positively, I think the qualitative data was richer due to the relationships I built with service users.

A further challenge in the research process was engaging social prescribers, both as research participants and at the management level. At times, the SP angle of the project seemed peripheral, and I felt tempted to abandon it, particularly during the stage of integrating the datasets. Now that I have completed the process, I believe that the inclusion of SP perspectives provides a more comprehensive picture of the challenges, areas for improvement, and potential opportunities for developing TWG and STH in the local area generally, and I hope that my data is transferable to other, similar NBI evaluations.

Conclusions

This thesis aimed to explore the perceived value and impact of a STH-informed NBI, Together We Grow (TWG), by drawing on the perspectives of service users, staff, and social prescribers across both primary and secondary care settings. Using a convergent parallel mixed methods approach, based on a pragmatist epistemology, the study utilised both

quantitative mental health and QoL outcome measures and qualitative semi-structured interviews with participants, analysed using RTA. The findings demonstrate modest but meaningful improvements in anxiety, wellbeing, and loneliness outcomes, with qualitative data providing rich insights into the mechanisms behind these changes. Five main themes were identified: *Reclaiming Health*, *Finding Calm*, *Temporal Integration*, *Belonging*, and *Building Confidence in a Safe Space*. Combined, these themes provided insights into how participants experienced increased social connection, discovered ways to find calmness, enhanced their self-confidence, developed skills, and gained hope for the future, all of which contributed to their recovery from mental distress.

Although social prescribers expressed positive views about the effectiveness of NBIs, they reported barriers related to their knowledge about local NBIs and understanding of the benefits of nature connection. Referral hesitancy due to concerns about accessibility, transportation, participant motivation, and sustained engagement was evident, and I have illustrated how these concerns are reflected in the wider literature; as such, they are both national and local concerns.

This study contributes to the limited evidence base around NBIs in clinical contexts, particularly for those accessing care from inpatient mental health settings. It also highlights the importance of integrating NBIs not as peripheral or optional activities, but as structured, relational, and therapeutic components of care. For clinical psychology, this presents a timely opportunity to reimagine how nature and green spaces can be integrated into recovery-focused practice, both as settings for therapy and as active partners in healing and social reintegration.

Future research should expand on these findings by testing scalable models of GSP tailored for individuals with complex needs, including young people, those with trauma histories, and participants with complex and chronic MI. It is also crucial to further explore

the role of social prescribers in maximising therapeutic value by developing and nurturing relationships with participants and service providers such as TWG. Efforts to embed NBIs into the core of mental healthcare will require close collaboration between NHS services and voluntary sector providers, alongside policy support and investment to ensure equitable access is prioritised. As challenges like health inequality, social isolation, and ecological crisis continue to intersect, NBIs may provide a grounded, cost-effective, and compassionate approach to psychological recovery and community wellbeing.

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APPENDIX A

The MMAT framework as applied to different study methodology (Hong et al. 2018)

Category of study designs	Methodological quality criteria	Responses			
		Yes	No	Unclear	Comments
Screening Questions for all research studies	1. Are there clear research questions? 2. Do the collected data allow to address the research questions? <i>Further appraisal may not be feasible or appropriate when the answer is 'No' or 'Can't tell' to one or both screening questions.</i>				
Qualitative	1. Is the qualitative approach appropriate to answer the research question? 2. Are the qualitative data collection methods adequate to address the research question? 3. Are the findings adequately derived from the data? 4. Is the interpretation of results sufficiently substantiated by data? 5. Is there coherence between qualitative data sources, collection, analysis and interpretation?				
Quantitative RCT	6. Is randomization appropriately performed? 7. Are the groups comparable at baseline? 8. Are there complete outcome data? 9. Are outcome assessors blinded to the intervention provided? 10. Did the participants adhere to the assigned intervention?				
Quantitative non-randomised	6. Are the participants representative of the target population? 7. Are measurements appropriate for the outcome and intervention? 8. Are there complete outcome data? 9. Are confounders accounted for in the design and analysis? 10. Was the intervention administered as intended?				
Quantitative descriptive	6. Is the sampling strategy relevant to address the research question? 7. Is the sample representative of the target population? 8. Are the measurements appropriate? 9. Is the risk of nonresponse bias low? 10. Is the statistical analysis appropriate to answer the research question?				
Mixed methods	1. Is there an adequate rationale for using a mixed methods design to address the research question?" 2. Are the different components of the study effectively integrated to answer the research question?" 3. Are the outputs of the integration of qualitative and quantitative components adequately interpreted?" 4. Are divergences and inconsistencies between quantitative and qualitative results adequately addressed?" (disagreements); 5. Do the different components of the study adhere to the quality criteria of each tradition of the methods involved?"				

APPENDIX B

PARTICIPANTS NEEDED!

Come and join our study!

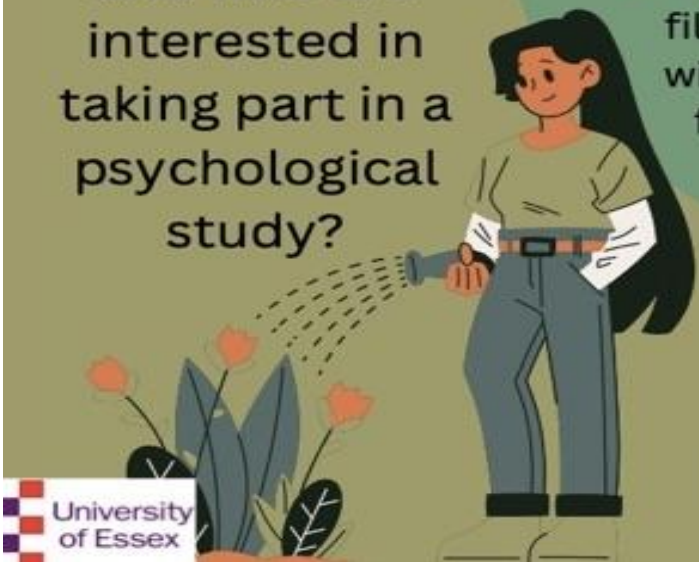
We are interested in looking at how spending time on a horticultural project helps people. We are looking for people who have just started attending Together We Grow and who are interested in taking part in a psychological study?

Interested in research about the relationship between time spent in nature and mental health?

Requirements to participate in this study:

- Be aged over 18
- Attend Together We Grow
- Spending 20 – 30 minutes filling in questionnaire data with a trainee psychologist, followed by a 30-minute interview.

If interested let Richard or Wayne know at Together We Grow or contact Hilary Trevelyan ht22411@essex.ac.uk



PARTICIPANTS NEEDED!

We are keen to find social prescribers who are willing to share their experiences!

INTERESTED IN RESEARCH ABOUT THE RELATIONSHIP BETWEEN TIME SPENT IN NATURE AND MENTAL HEALTH?

We are interested in looking at the effects on people of spending time in nature.

Requirements to participate in this study:

If interested please contact

Hilary Trevelyan
Email:
ht22411@essex.ac.uk

- Be working as a link worker
- Be willing to share experiences and thoughts about green social prescribing
- Be able to spend 20 minutes filling in an online questionnaire data

APPENDIX C

Qualtrics questions for Social prescribers

1. What does the term green social prescribing mean to you?
2. Is there enough local provision for nature-based intervention in your local area?
3. Is there enough information about local provision available to you and other social prescribers in the area?
4. On a scale of 0 – 100 (where 0 is not at all and 100 is definitely) how likely do you think it is that a nature-based intervention would support people experiencing:

Condition

Rating
0 - 100

Stress
Anxiety
Depression
Loneliness
PTSD
Any other mental health conditions

5. How do you think a nature-based intervention works to support people with the above conditions? Please rate each of the below between 0 and 100 for how important you think they may be in contributing towards a person's recovery?

Skill

Rating 0
- 100

Learning a new skill
Being part of a group
Spending time outside
Exercising

Developing a relationship with nature
Meeting new people
Supportive and engaging staff
Finding a meaningful occupation
Learning to grow food in order to eat and cook

6. Can you think of any barriers preventing engagement in green social prescribing activities?
7. Would you be willing to participate in a future online focus group to discuss your views on the above and the data from this study?

Email address if willing to interview

APPENDIX D



Consent Form – Social prescribers

To correspond with PIS for Social prescribers dated 25/03/24

Title of the Project: **How can a horticultural project support people living with mental health conditions? Exploring the views of service users and Social prescribers**

Research Team: Hilary Trevelyan, Dr Nicholas Cooper, Dr Joe Rehling

Please initial box

1. I confirm that I have read and understand the Information Sheet provided at the beginning of my involvement in the focus group for above study. I have had an opportunity to consider the information, ask questions and have had these questions answered satisfactorily.

2. I understand that I can stop being part of the study without giving a reason, but we will keep information about you that we already have.

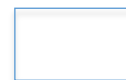
3. I understand I will be protected in accordance with the General Data Protection Regulation (GDPR) and in compliance with University of Essex Ethics Data Protection guidance.

4. I understand that the identifiable data provided will be securely stored on an encrypted computer and accessible only to the members of the research team directly involved in the project, and that confidentiality will be maintained.

5. I consent to an audio recording of the focus group to be made for research purposes only. This will be recorded on Teams and transcribed.

6. I understand that the data collected about me may be used to support other research in the future, and may be shared anonymously with other researchers.

7. I agree to take part in the above study.



Participant Name

Date

Participant Signature

Researcher Name

Date

Researcher Signature

APPENDIX E



SOCIAL PRESCRIBER PARTICIPANT INFORMATION SHEET

- I am a trainee clinical psychologist at the University of Essex.
- As part of my research, I am conducting a study concerning how attendance at Together We Grow or similar nature-based interventions can impact people with mental health conditions. Part of the study will take place with service users at Together We Grow. However Social prescribers WILL NOT be attending together We Grow, unless they are already linking a participant with TWG.
- You are being invited to participate in a research study based at Together We Grow because you are a social prescriber in the Colchester area who could link participants with Together We Grow. We are interested to find out whether you would refer to this project and why. Before you agree it is important that you understand what your participation would involve. Please take time to read the following information carefully.

Aims

To investigate how Social prescribers understand how attending “Together We Grow” supports people with mental health conditions.

Why?

- Research, and the NHS Long Term Plan (2019), indicates a need for alternative approaches to treating mental health conditions apart from talking therapies and medications. Some research suggests that learning skills, gaining friends and social connection through green social prescribing is another way to support people with mental health problems.

What will the research involve?

1. A questionnaire will be distributed to Social prescribers by email asking for their views on how and whether they think nature-based interventions work for people (5 – 10 minutes to complete).
2. At the final stage, Social prescribers will be invited to an optional focus group where the findings of the study (including data collected at Together We Grow from service users) are presented by the researcher. (20 – 30 minutes)

Who has reviewed the research

My research has been given a favourable opinion from the Leeds East Research Ethics Committee. This means that my research follows the standard of research ethics set by the British Psychological Society and the NHS Health Research Authority.

Why have you been asked to participate?

You have been invited to participate in my research as you are a social prescriber who could refer to Together We Grow or other nature based interventions.

What will your participation involve?

The data collection will take place at Together We Grow, **but Social prescribers will participate online**. If you agree to participate you will be asked to:

- Fill in a short Qualtrics questionnaire about your views on nature-based interventions (around 5 – 10 minutes to complete)
- Indicate whether or not you would be able or willing to attend an online focus group.
- Attend an OPTIONAL online focus group where the findings of the study will be presented (focus group anticipated 20 – 30 minutes long).

Payment

I will not be able to pay you for participating in my research.

How will we use information about you?

We will need to use information from you for this research project.

This information will include demographic information such as your age, gender and ethnicity. People will use this information to do the research.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

What are your choices about how your information is used?

- You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.
- We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how your information is used?

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- by asking the Chief Investigator or research team on the email addresses below.
- by contacting the **sponsor's Data Protection Officer**

Information Assurance Manager

Telephone: 01206 872285

Email: dataprotectionofficer@essex.ac.uk

Your taking part will be safe and confidential

- Your name will not be used in data analysis, storage or written material based on the data and the researcher will store all information according to the Data Protection Act (2018) and General Data Protection Regulation (EU 2016/679).
- The material that you provide will be stored on an NHS encrypted computer.
- No personal details will be stored at any point during the research.
- Participant identity will be protected using a code which the participant will choose and provide.
- Only my supervisor, examiners and myself will be able to see the anonymised data.
- Participants do not have to answer all questions asked of them and can stop their participation at any time.
- Opportunities to seek support after the study will be detailed following the semi-structured interview.

- What you tell the researcher will be private. Confidentiality will only be broken if there are concerns about harm to yourself or others.
- The focus group will be recorded and transcribed anonymously from Teams. Transcripts will be stored on an NHS computer and backed up to the University of Essex Box Drive.
- No personal details will be stored with the data, but all data collected will be allocated a code.
- Participant identity will be protected using this code which the participant will choose.
- Only my supervisor, examiners and myself will be able to see the anonymised data.
- What you tell the researcher will be private. Confidentiality will only be broken if there are concerns about harm to yourself or others.

Potential risks and benefits

- No significant risks identified.
- Potential benefit in learning more about the impact of nature-based interventions, referral criteria and referral options, and the opportunity for your views to form part of research in this area.

Concerns and Complaints

If you have any concerns about any aspect of the study or you have a complaint, in the first instance please contact the principal investigator of the project, Hilary Trevelyan (ht22411@essex.ac.uk) or her supervisor Dr Nicholas Cooper n.cooper@essex.ac.uk

If are still concerned, you think your complaint has not been addressed to your satisfaction or you feel that you cannot approach the principal investigator, please contact the departmental Director of Research in the department responsible for this project, Dr John Day, jday@essex.ac.uk.

If you are still not satisfied, please contact the University of Essex Research Integrity Manager, Mantalena Sotiriadou (email: ms21994@essex.ac.uk). If you are not happy with their response or believe they are processing your data in a way that is not right or lawful, you can complain to the Information Commissioner's Office (ICO) (www.ico.org.uk or 0303 123 1113).

Please include the IRAS reference 342373

Contact Details

If you would like further information about my research or have any questions or concerns, please do not hesitate to contact me.

Hilary Trevelyan: ht22411@essex.ac.uk

If you have any questions or concerns about how the research has been conducted please contact the research supervisor Dr Nick Cooper. School of Psychology, University of Essex,

Dr Nicholas Cooper: n.cooper@essex.ac.uk

APPENDIX F



PARTICIPANT INVITATION LETTER

I am a trainee clinical psychologist at the University of Essex. As part of my research, I am conducting a study concerning how attendance at Together We Grow can impact people with mental health conditions.

You are being invited to participate in this research because you have recently started to attend “Together We Grow”. We would like to know whether attendance is helping you, and if so why? However, before you agree it is important that you understand what your participation would involve. Please take time to read the following information carefully.

Aims

To investigate how Social prescribers and participants understand how attending “Together We Grow” helps people with their mental health.

Why?

- Research indicates a need for other approaches apart from talking therapies and medications as they don’t always work for everyone. Some research suggests that learning skills, gaining friends and social connection through green social prescribing (attending projects like Together We Grow) is another way to help people.

What will the research involve?

3. **Data will be collected from you at Together We Grow when you start participation and again after 8 - 12 sessions** to see whether attendance has affected your loneliness, depression, anxiety or had any other effect.
4. Semi-structured interviews would be completed with participants after 8 - 12 sessions about how and whether attendance at the project works for you.

Who has reviewed the study?

My research has been given a favourable opinion from the Leeds East Research Ethics Committee. This means that my research follows the standard of research ethics set by the British Psychological Society, the Health Research Authority and NHS.

Why have you been asked to participate?

You have been invited to participate in my research because you attend “Together We Grow”.

What will your participation involve?

The research will take place at Together We Grow. If you agree to participate you will be asked to fill in a number of questionnaires:

- One questionnaire asks for *demographic information* e.g. age, gender, ethnicity and history of illness.
- Most questionnaires ask about *how you are feeling* – e.g. levels of anxiety, depression or loneliness and wellbeing.
- Filling in questionnaires would take between 20 to 30 minutes on Week 1 and again following 8-12 weeks of attending Together We Grow with the researcher.
- An interview at the end of your 8-12 weeks attendance will take about 30 minutes and be audio recorded.

Payment

I will not be able to pay you for participating in my research.

How will we use information about you.

We will need to use information from you for this research project.

This information will include demographic information such as your age, gender, ethnicity and medical history. People will use this information to do the research.

People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead.

We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

What are your choices about how your information is used?

- You can stop being part of the study at any time without giving a reason, but we will keep information about you that we already have.
- We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- from the Chief Investigator Hilary Trevelyan or Together We Grow.
- by sending an email to the email addresses below.
- by contacting the **sponsor's Data Protection Officer**

Information Assurance Manager

Telephone: 01206 872285

Email: dataprotectionofficer@essex.ac.uk

Taking part in this research is safe and confidential

- Your name will not be used in data analysis, storage or written material based on the data and the researcher will store all information according to the Data Protection Act (2018) and General Data Protection Regulation (EU 2016/679).
- The material that you provide will be stored on an NHS encrypted computer and backed up to the University of Essex secure Box system.
- No personal details will be stored at any point during the research.
- Participant identity will be protected using a code which the participant will choose and provide.
- Only my supervisor, examiners and myself will be able to see the anonymised data.
- Participants do not have to answer all questions asked of them and can stop their participation at any time.
- Opportunities to seek support after the study will be detailed following the semi-structured interview.
- What you tell the researcher will be private. Confidentiality will only be broken if there are concerns about harm to yourself or others.

Potential risks and benefits

- As above the researcher is not able to pay you for taking part in this research project. However, we hope that you will have an opportunity to give your opinions on how attending TWG is benefitting you. This might influence future research and service provision and may help others in a similar position to yourself.
- There is a small risk that taking part in the research may distressing, in which case the researcher will follow the distress protocol agreed with you at the beginning of the project.

Debrief

- At the beginning of the study, the researcher will ask what the participants wants to do in the event of them becoming upset. Should there be any distress the researcher will let TWG staff know, care co-ordinators, friends or family members, staff support workers according to participant wishes and follow the agreed distress protocol.

Concerns and Complaints

If you have any concerns about any aspect of the study or you have a complaint, in the first instance please contact the principal investigator of the project, Hilary Trevelyan (ht22411@essex.ac.uk) or her supervisor Dr Nicholas Cooper (n.cooper@essex.ac.uk).

If are still concerned, you think your complaint has not been addressed to your satisfaction or you feel that you cannot approach the principal investigator, please contact the departmental Director of Research in the department responsible for this project, Dr John Day, jday@essex.ac.uk.

If you are still not satisfied, please contact the University of Essex Research Integrity Manager, Mantalena Sotiriadou (email: ms21994@essex.ac.uk). If you are not happy with their response or believe they are processing your data in a way that is not right or lawful, you can complain to the Information Commissioner's Office (ICO) (www.ico.org.uk or 0303 123 1113).

Please refer to IRAS number 342373.

Contact Details

If you would like further information about my research or have any questions or concerns, please do not hesitate to contact me.

Hilary Trevelyan: ht22411@essex.ac.uk

If you have any questions or concerns about how the research has been conducted, please contact the research supervisor Dr Nick Cooper. School of Psychology, University of Essex,

Dr Nicholas Cooper: n.cooper@essex.ac.uk

BRIEF SUMMARY OF PARTICIPANT INFORMATION SHEET

Taking part in the project will involve

- Attending Together We Grow on the same day and at the same time as normal.
- Filling in some forms at the beginning of your attendance at Together We Grow.
- Filling in the same forms again after 8 - 12 weeks of coming to Together We Grow.
- Speaking to the researcher for 30 – 45 minutes

Information and Data

How will we use information about you?

In this research study we will use information from you. We will only use information that we need for the research study. We will let very few people know your name and contact details and only if they need it for this study.

Everyone involved in this study will keep your data safe and secure. We will also follow all privacy rules.

At the end of the study we will save some of the data in case we need to check it and for future research. We will make sure no-one can work out who you are from the reports we write.

You will be able to keep this Participant Information Sheet and Summary Information Sheet for your reference.

If you get upset about anything the researcher will

- Ask you if you want to carry on with the interview.
- Follow the procedures that were agreed with you at the beginning
- Contact details if you have any questions:
Researcher Hilary Trevelyan: ht22411@essex.ac.uk
Supervisor Nick Cooper: ncooper@essex.ac.uk

APPENDIX G

Consent Form – Together we Grow participants

To Correspond with PIS for TWG Participants dated 25/03/2024 V1

Title of the Project: **How can a horticultural project support people living with mental health conditions? Exploring the views of service users and Social prescribers**

Research Team: Hilary Trevelyan, Dr Nicholas Cooper, Dr Joe Rehling

Please initial box

- | | |
|---|--|
| <p>1. I confirm that I have read and understand the Information Sheet provided at the beginning of my involvement in the focus group for above study. I have had an opportunity to consider the information, ask questions and have had these questions answered satisfactorily.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>2. I confirm that I understand I can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>3. I understand I will be protected in accordance with the General Data Protection Regulation (GDPR) and in compliance with University of Essex Ethics Data Protection guidance.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>4. I understand that the identifiable data provided will be securely stored on an encrypted computer and accessible only to the members of the research team directly involved in the project, and that confidentiality will be maintained.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>5. I understand that my fully anonymised data will be used for the purposes of this research project only.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>6. I consent to an audio recording of the interview to be made for research purposes only. This will be deleted once the interview is transcribed and will be recorded on a Dictaphone.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>7. I understand that the data collected about me may be used to support other research in the future, and may be shared anonymously with other researchers.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |
| <p>8. I understand that the data collected about me may be used to support other research in the future, and may be shared anonymously with other researchers.</p> | <input style="width: 80px; height: 30px; border: 1px solid black;" type="text"/> |

Participant Name

Date

Participant Signature

Researcher Name

Date

Researcher Signature

APPENDIX H



Capacity Assessment Form

Participant ID Code:

Date of assessment:

Assessor details:

CAPACITY ASSESSMENT FORM	
Following discussion of the Participant Information Sheet between Chief Investigator and subject	
Does the person understand the information you have told them that is relevant to their decision about participation?	☐ Y ☐ N
Comments:	
Can the person retain the information long enough to make a decision about participation?	☐ Y ☐ N
Comments:	
Can the person weigh up the information provided to make a decision about participation?	☐ Y ☐ N
Comments:	
Can the person communicate their decision about participation?	☐ Y ☐ N
Comments:	
Do you believe that the person has the capacity to consent to participation?	☐ Y ☐ N
Comments:	

APPENDIX I**DEMOGRAPHIC QUESTIONNAIRE**

REMINDER: All information is optional and will be anonymised. The researcher has no access to your medical records.

Age	
Gender	
Diagnosis	
Ethnicity	
Duration of illness	
Severity of illness	



APPENDIX J

PHQ-9

Not at all: 0
 Several days: 1
 More than half the days: 2
 Nearly every day: 3

Patient Health Questionnaire (PHQ-9)	
Over the last two weeks, how often have you been bothered by any of the following problems?	
Little interest or pleasure in doing things?	Not at all Several days More than half the days Nearly every day
Feeling down, depressed, or hopeless?	Not at all Several days More than half the days Nearly every day
Trouble falling or staying asleep, or sleeping too much?	Not at all Several days More than half the days Nearly every day
Feeling tired or having little energy?	Not at all Several days More than half the days Nearly every day
Poor appetite or overeating?	Not at all Several days More than half the days Nearly every day
Feeling bad about yourself - or that you are a failure or have let yourself or your family down?	Not at all Several days More than half the days Nearly every day
Trouble concentrating on things, such as reading the newspaper or watching television?	Not at all Several days More than half the days Nearly every day
Moving or speaking so slowly that other people could have noticed? Or the opposite - being so fidgety or restless that you have been moving around a lot more than usual?	Not at all Several days More than half the days Nearly every day
Thoughts that you would be better off dead, or of hurting yourself in some way?	Not at all Several days More than half the days Nearly every day

The total score ranges from 0 to 27, and can be interpreted as follows:

- **0–4:** None
- **5–9:** Mild
- **10–14:** Moderate

- **15–19:** Moderately severe
- **20–27:** Severe

GAD 7

To score a Generalized Anxiety Disorder 7-item (GAD-7) questionnaire, you can:

1. Assign a score of 0 to "not at all", 1 to "several days", 2 to "more than half the days", and 3 to "nearly every day" for each question
2. Interpret your score using the following cut-off points:
 - **5:** Mild anxiety
 - **10:** Moderate anxiety
 - **15:** Severe anxiety

Generalised Anxiety Disorder Questionnaire (GAD-7)	
Over the last 2 weeks, how often have you been bothered by any of the following problems?	
Feeling nervous, anxious or on edge?	Not at all Several days More than half the days Nearly every day
Not being able to stop or control worrying?	Not at all Several days More than half the days Nearly every day
Worrying too much about different things?	Not at all Several days More than half the days Nearly every day
Trouble relaxing?	Not at all Several days More than half the days Nearly every day
Being so restless that it is hard to sit still?	Not at all Several days More than half the days Nearly every day
Becoming easily annoyed or irritable?	Not at all Several days More than half the days Nearly every day
Feeling afraid as if something awful might happen?	Not at all Several days More than half the days Nearly every day



The Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS)

Below are some statements about feelings and thoughts.
Please tick the box that best describes your experience of each over the last 2 weeks

STATEMENTS	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5

Scoring

The SWEMWBS is scored by first summing the scores for each of the seven items, which are scored from 1 to 5. The total raw scores are then transformed into metric scores using the SWEMWBS conversion table which can be found

here: https://warwick.ac.uk/fac/sci/med/research/platform/wemwbs/using/howto/swemwbs_raw_score_to_metric_score_conversion_table.pdf

Interpretation

Scores range from 7 to 35 and higher scores indicate higher positive mental wellbeing. The idea of wellbeing is fairly new, therefore, it is difficult to fully interpret what the scores mean for each individual. However, you can see how individual's scores compare with national survey data (from adults) which can be found

here: https://warwick.ac.uk/fac/sci/med/research/platform/wemwbs/using/howto/wemwbs_population_norms_in_health_survey_for_england_data_2011.pdf

Further interpretation will depend on your study design.

The **UCLA Loneliness Scale (Version 3)** is one of the most widely used tools to assess loneliness in individuals. The **UCLA Loneliness Scale - 10 Item Version** (often referred to as the **UCLA Loneliness Scale-Short Version**) is a shorter form of the original 20-item scale.

UCLA 10-Item Loneliness Questionnaire

Here are the **10 questions** on the UCLA Loneliness Scale (version 3):

- 1 = Never
- 2 = Rarely
- 3 = Sometimes
- 4 = Often

1. **How often do you feel that you lack companionship?**
2. **How often do you feel left out?**
3. **How often do you feel that you are isolated from others?**
4. **How often do you feel that you are no longer close to anyone?**
5. **How often do you feel that your relationships are not meaningful?**
6. **How often do you feel that you are unable to reach out and communicate with others?**
7. **How often do you feel that you have nobody to talk to?**
8. **How often do you feel that there is no one you can turn to?**
9. **How often do you feel alone?**
10. **How often do you feel that people are around you but not with you?**

Reverse Scoring:

The first four items (1, 2, 3, 4) are **positively worded** (i.e., "feeling lonely" is indicated by higher scores), and the last six items (5, 6, 7, 8, 9, 10) are **negatively worded** (i.e., "feeling connected" or "not lonely" is indicated by higher scores).

Therefore, for the **negatively worded** items (items 5–10), you need to reverse the scores:

- 1 → 4
- 2 → 3
- 3 → 2
- 4 → 1

Example of Reverse Scoring:

- If a respondent answers "Never" (1) to item 5 ("How often do you feel that your relationships are not meaningful?"), you reverse it to 4 (which is a higher score indicating less loneliness).
- If a respondent answers "Often" (4) to item 6 ("How often do you feel that you are unable to reach out and communicate with others?"), it stays as 4 (indicating more loneliness).

THE WORLD HEALTH ORGANIZATION QUALITY OF LIFE (WHOQOL) -BREF

The World Health Organization Quality of Life (WHOQOL)-BREF

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WHOQOL-BREF

The following questions ask how you feel about your quality of life, health, or other areas of your life. I will read out each question to you, along with the response options. **Please choose the answer that appears most appropriate.** If you are unsure about which response to give to a question, the first response you think of is often the best one.

Please keep in mind your standards, hopes, pleasures and concerns. We ask that you think about your life **in the last four weeks**.

		Very poor	Poor	Neither poor nor good	Good	Very good
1.	How would you rate your quality of life?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
2.	How satisfied are you with your health?	1	2	3	4	5

The following questions ask about **how much** you have experienced certain things in the last four weeks.

		Not at all	A little	A moderate amount	Very much	An extreme amount
3.	To what extent do you feel that physical pain prevents you from doing what you need to do?	5	4	3	2	1
4.	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5

		Not at all	A little	A moderate amount	Very much	Extremely
7.	How well are you able to concentrate?	1	2	3	4	5

8.	How safe do you feel in your daily life?	1	2	3	4	5
9.	How healthy is your physical environment?	1	2	3	4	5

The following questions ask about how completely you experience or were able to do certain things in the last four weeks.

		Not at all	A little	Moderately	Mostly	Completely
10.	Do you have enough energy for everyday life?	1	2	3	4	5
11.	Are you able to accept your bodily appearance?	1	2	3	4	5
12.	Have you enough money to meet your needs?	1	2	3	4	5
13.	How available to you is the information that you need in your day-to-day life?	1	2	3	4	5
14.	To what extent do you have the opportunity for leisure activities?	1	2	3	4	5

		Very poor	Poor	Neither poor nor good	Good	Very good
15.	How well are you able to get around?	1	2	3	4	5

		Very dissatisfied	Dissatisfied	Neither satisfied nor dissatisfied	Satisfied	Very satisfied
16.	How satisfied are you with your sleep?	1	2	3	4	5
17.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
18.	How satisfied are you with your capacity for work?	1	2	3	4	5
19.	How satisfied are you with yourself?	1	2	3	4	5

20.	How satisfied are you with your personal relationships?	1	2	3	4	5
21.	How satisfied are you with your sex life?	1	2	3	4	5
22.	How satisfied are you with the support you get from your friends?	1	2	3	4	5
23.	How satisfied are you with the conditions of your living place?	1	2	3	4	5
24.	How satisfied are you with your access to health services?	1	2	3	4	5
25.	How satisfied are you with your transport?	1	2	3	4	5

The following question refers to how often you have felt or experienced certain things in the last four weeks.

		Never	Seldom	Quite often	Very often	Always
26.	How often do you have negative feelings such as blue mood, despair, anxiety, depression?	5	4	3	2	1

Do you have any comments about the assessment?

[The following table should be completed after the interview is finished]

		Equations for computing domain scores	Raw score	Transformed scores*	
				4-20	0-100
27.	Domain 1	$(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18$ $\textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6}$	a. =	b:	c:

28.	Domain 2	$Q5 + Q6 + Q7 + Q11 + Q19 + (6 - Q26)$ $\textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6}$	a. =	b:	c:
29.	Domain 3	$Q20 + Q21 + Q22$ $\textcircled{6} + \textcircled{6} + \textcircled{6}$	a. =	b:	c:
30.	Domain 4	$Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25$ $\textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6} + \textcircled{6}$	a. =	b:	c:

APPENDIX K



Semi structured questions for Together We Grow participants

1	What was it like being part of and attending Together We Grow?
2	How do you experience horticultural therapy at Together We Grow?
3	How would you describe the effects on your wellbeing/feelings of anxiety/low mood or symptoms?
4	What have you most enjoyed (choices given) e.g. Learning a new skill? meeting different people? being outside? Gardening? developing a stronger connection with nature? Any new skills that you have learnt? Will you continue to garden or develop a connection with nature?
5	What would you describe as positive
6	Is there anything you would describe as negative?
7	Can you suggest any improvements to the intervention?
8	Have you any favourite places in the garden?
9	Anything you particularly like to do?
10	Have you found that coming to the garden makes you feel less stressed?
11	What about loneliness, social confidence, assertiveness, speaking to people, feeling part of a community
12	Any differences in cognition and focus?
13	Looking at anything in scores what sense do you make of any differences in scores.
14	What part do you think coming to Together We Grow played in how you scored?
15	What, if anything, changed for you during the group?
16	Was anything challenging or unhelpful about TWG?
17	Any thoughts about how it could be improved? ➤ Transport or accessibility ➤ How activities are decided or graded
18	Is there anything else you would like to say about the group?

APPENDIX L

Social prescriber Interview schedule

1. Is the data (emerging so far) from the current study consistent with your expectations or in any way surprising?
2. What benefits have you observed in clients attending nature- based therapies?
3. Have you observed any negative effects?
4. How would you characterise the amount of green social prescribing activity in your area?
5. What is working well about nature-based social prescribing practice in your area?
6. Do you have any examples of effective projects in the area?
7. What are the barriers to participation?
8. How can these be most effectively addressed?
9. How do we facilitate collaboration between Social prescribers and green providers?
10. Do you think that nature-based interventions especially suit particular groups (e.g. based on gender or race)
11. What could be improved?
12. What are the barriers to participation?

APPENDIX M



Distress Protocol

Effectiveness of nature based interventions in mental health

Interview distress protocol:

Prior to interview the researcher will

1. Ask the participant what they would like me to do should they find the interview distressing.
2. Options for unaccompanied attendees: to contact a family member or friend, a follow up call from the researcher, or to advise Together We Grow (TWG) staff.
3. Options for accompanied attendees, for their support worker to be with them in the interview or to be alone. If they become distressed the options would be to advise TWG staff, their support worker or the care co-ordinator/keyworker at the unit

If a participant appears to become distressed during the interview, the researcher will:

4. Acknowledge that talking about problems can be distressing.
5. Encourage the participant to take a break from answering questions.
6. Offer support by reassuring participant that they do not need to answer a question(s) if they do not wish to.
7. Ask if they would like to continue with the interview or prefer to stop.
8. If they prefer to stop follow steps 2 -3 above.

If they prefer to stop then:

9. Finish the interview and offer to return at another day/time.
10. If the participant withdraws their consent to participate in the study, then this will be recorded in writing.
11. Follow points 2 – 3 above.

If the interview continues:

12. Take time at the end of the interview to talk informally, and encourage the participant to access further support dependent on their level of distress, such as meeting with the appropriate Together We Grow staff member, or phoning their unit and speaking to their keyworker or care co-ordinator.
13. If the participant has any questions or requires reassurance about the research they should be encouraged to contact the researcher (details on Participant Information Sheet).
14. In that there may be distress following the research, the participant will be signposted to
 - a. Samaritans 116 123,
 - b. Crisis Line 111 option 2 and/or
 - c. relevant web chat organisations such as Young Minds 0808 802 5544, or Shout 85258.

APPENDIX N



Health Research Authority

Yorkshire & The Humber - Leeds East Research Ethics Committee

2 Redman Place
Stratford
London
E20 1JQ

Please note: This is the favourable opinion of the REC only and does not allow you to start your study at NHS sites in England until you receive HRA Approval

12 July 2024

Ms Hilary Trevelyan
Department of Health and Social Care
University of Essex
Wivenhoe Park
CO3 4SQ

Dear Ms Trevelyan

Study title:	How can a horticultural project support people living with mental health conditions? A mixed method study exploring the views of service users and Social prescribers
REC reference:	24/YH/0115
Protocol number:	N/A
IRAS project ID:	342373

Thank you for your letter of 26th June 2024, responding to the Research Ethics Committee's (REC) request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Vice-Chair and Committee Member, Dr Andrew Pollard.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Good practice principles and responsibilities

The [UK Policy Framework for Health and Social Care Research](#) sets out principles of good practice in the management and conduct of health and social care research. It also outlines the responsibilities of individuals and organisations, including those related to the four elements of [research transparency](#):

1. [registering research studies](#)
2. [reporting results](#)
3. [informing participants](#)
4. [sharing study data and tissue](#)

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

Confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or NHS management permission (in Scotland) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for HRA and HCRW Approval (England and Wales)/ NHS permission for research is available in the Integrated Research Application System.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations

Registration of Clinical Trials

All research should be registered in a publicly accessible database and we expect all researchers, research sponsors and others to meet this fundamental best practice standard.

It is a condition of the REC favourable opinion that **all clinical trials are registered** on a public registry before the first participant is recruited and no later than six weeks after. For this purpose, 'clinical trials' are defined as:

- clinical trial of an investigational medicinal product
- clinical investigation or other study of a medical device
- combined trial of an investigational medicinal product and an investigational medical device
- other clinical trial to study a novel intervention or randomised clinical trial to compare interventions in clinical practice.

A 'public registry' means any registry on the WHO list of primary registries or the ICMJE list of registries provided the registry facilitates public access to information about the UK trial.

Failure to register a clinical trial is a breach of these approval conditions, unless a deferral has been agreed by the HRA (for more information on registration and requesting a deferral see: [Research registration and research project identifiers](#)).

Where a deferral is agreed we expect the sponsor to publish a [minimal record](#) on a publicly accessible registry. When the deferral period ends, the sponsor should publish the full record on the same registry, to fulfil the condition of the REC favourable opinion.

If you have not already included registration details in your IRAS application form you should notify the REC of the registration details as soon as possible.

Where the study is registered on ClinicalTrials.gov, please inform deferrals@hra.nhs.uk and the Research Ethics Committee (REC) which issued the final ethical opinion so that our records can be updated.

Publication of Your Research Summary

We will publish your research summary for the above study on the research summaries section of our website, together with your contact details, no earlier than three months from the date of this favourable opinion letter. Where a deferral is agreed, [a minimum research summary](#) will still be published in [the research summaries database](#). At the end of the deferral period, we will publish the [full research summary](#).

Should you wish to provide a substitute contact point, make a request to defer, or require further information, please visit: [Research summaries - Health Research Authority \(hra.nhs.uk\)](#)

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

After ethical review: Reporting requirements

The attached document “After ethical review – guidance for researchers” gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study, including early termination of the study
- Final report
- Reporting results

The latest guidance on these topics can be found at [Managing your approval - Health Research Authority \(hra.nhs.uk\)](#)

Ethical review of research sites

NHS/HSC sites

The favourable opinion applies to all NHS/HSC sites taking part in the study, subject to confirmation of Capacity and Capability (in England, Northern Ireland and Wales) or management permission (in Scotland) being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Non-NHS/HSC sites

I am pleased to confirm that the favourable opinion applies to any non-NHS/HSC sites listed in the application, subject to site management permission being obtained prior to the start of the study at the site.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

<i>Document</i>	<i>Version</i>	<i>Date</i>
Copies of materials calling attention of potential participants to the research [Poster recruitment]	Version 2	23 June 2024
Covering letter on headed paper [Covering letter]	V1	25 March 2024
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Professional Indemnity]	V1	01 August 2023
Interview schedules or topic guides for participants [Semi structured interview]	V1	25 March 2024
Interview schedules or topic guides for participants [Interview schedule]	V1	25 March 2024
Interview schedules or topic guides for participants [Focus Group]	V1	25 March 2024
Letter from sponsor [Sponsor letter]	V1	19 April 2024
Non-NHS/HSC Site Assessment Form [Risk Assessment]	V1	25 March 2024
Non-validated questionnaire [Demographics]	V1	25 March 2024
Other [CV J Rehling]	V1	25 March 2024
Other [Distress Protocol]	Version 2	22 June 2024
Other [Capacity Assessment]	Version 2	22 June 2024
Other [Response to amendments]	Version 2	29 June 2024
Other [Response to amendments]	Version 1	29 June 2024
Other [Certificate]	V1	29 June 2024
Participant consent form [Service user]	V1	25 March 2024
Participant consent form [Social prescribers]	V1	25 March 2024
Participant information sheet (PIS) [PIS]	Version 2	22 June 2024
Participant information sheet (PIS) [PIS]	Version 2	22 June 2024
REC Application Form [REC_Form_02052024]		02 May 2024
Research protocol or project proposal [Protocol V2]	Version 2	29 June 2024
Summary CV for Chief Investigator (CI) [CV]	V1	25 March 2024
Summary CV for supervisor (student research) [N Cooper]	V1	25 March 2024
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Flow diagram]	V1	25 March 2024
Validated questionnaire [Validated questionnaires]	V1	25 March 2024
Validated questionnaire [WHOQOL]	V1	25 March 2024

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: [Quality assurance - Health Research Authority \(hra.nhs.uk\)](https://www.hra.nhs.uk/quality-assurance)

HRA Learning

We are pleased to welcome researchers and research staff to our HRA Learning Events and online learning opportunities– see details at: [Learning - Health Research Authority \(hra.nhs.uk\)](https://www.hra.nhs.uk/learning)

IRAS project ID: 342373 Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely

pp. S Khatun

Dr Anna Schuberth Vice Chair

Email: leedseast.rec@hra.nhs.uk

Enclosures: "After ethical review – guidance for researchers"

Copy to: Dr Mantanela Sotiriadou

APPENDIX O

Decision - Ethics ETH2324-2071: Ms Hilary Trevelyan

Ms Hilary Trevelyan
Health and Social Care
University of Essex

Dear Hilary,

Ethics Committee Decision Application: ETH2324-2071

We are writing to advise you that your application to register an external ethical approval of your research project entitled "How can a horticultural project support people living with mental health conditions? Exploring the views of service users and social prescribers" has been reviewed by the REO Research Governance Team. We are pleased to inform you that the University of Essex will accept the ethical approval granted by HRA NHS REC for the project named above and you will not be required to make a full application for ethical approval through the University's ethics review process.

Please do not hesitate to contact the REO Research Governance Team (reo-governance@essex.ac.uk) if you require any further information or have any queries.

Yours sincerely,

REO Research Governance Team

Ethics ETH2324-2071: Ms Hilary Trevelyan

This email was sent by the University of Essex Ethics Review Application and Management System.

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Visualizations

Name	Files	References	Created on	Created...	Modified on	Modified by	Color
☐ Accessibility	1	1	14 Mar 2025 at 14:...	HFT	14 Mar 2025 at 14:...	HFT	
☒ Anchoring to past and...	0	0	5 Mar 2025 at 20:09	HFT	5 Mar 2025 at 20:16	HFT	
☐ Connection with the...	4	6	4 Mar 2025 at 09:20	HFT	17 Apr 2025 at 14:42	HFT	
☐ Links between pres...	5	11	23 Feb 2025 at 14:...	HFT	1 Apr 2025 at 16:00	HFT	
☒ Connection and attach...	0	0	5 Mar 2025 at 20:02	HFT	5 Mar 2025 at 20:08	HFT	
☐ attachment to speci...	4	14	4 Mar 2025 at 15:02	HFT	17 Apr 2025 at 14:43	HFT	
☐ Connection built in...	3	6	4 Mar 2025 at 09:27	HFT	4 Mar 2025 at 19:36	HFT	
☐ Protectiveness of th...	4	10	23 Feb 2025 at 15:15	HFT	17 Apr 2025 at 15:09	HFT	
☐ Relationships with v...	5	5	4 Mar 2025 at 15:13	HFT	17 Apr 2025 at 14:49	HFT	
☐ Role of facilitator	9	26	18 Feb 2025 at 18:...	HFT	5 Mar 2025 at 09:52	HFT	
☐ Support from facilit...	3	6	18 Feb 2025 at 18:11	HFT	4 Mar 2025 at 19:45	HFT	
☐ Wider community s...	1	1	4 Mar 2025 at 15:15	HFT	4 Mar 2025 at 19:46	HFT	
☒ Empowerment through...	0	0	5 Mar 2025 at 20:17	HFT	5 Mar 2025 at 20:19	HFT	
☐ Contribution	3	3	5 Mar 2025 at 09:46	HFT	17 Apr 2025 at 14:41	HFT	
☐ Exposure to nature (...)	2	4	4 Mar 2025 at 09:39	HFT	14 Mar 2025 at 14:12	HFT	
☐ Individual developm...	3	6	23 Feb 2025 at 16:...	HFT	5 Mar 2025 at 09:54	HFT	
☐ Learning resilience...	3	3	23 Feb 2025 at 14:41	HFT	5 Mar 2025 at 20:04	HFT	
☐ Motivation	3	7	4 Mar 2025 at 09:22	HFT	14 Mar 2025 at 14:...	HFT	
☐ Understanding of n...	2	2	23 Feb 2025 at 15:...	HFT	17 Apr 2025 at 14:44	HFT	
☐ Value of learning ski...	3	7	23 Feb 2025 at 16:16	HFT	17 Apr 2025 at 14:42	HFT	
☒ Facilitation and imple...	0	0	5 Mar 2025 at 19:58	HFT	5 Mar 2025 at 20:34	HFT	
☐ Assessment value	2	3	4 Mar 2025 at 09:21	HFT	Tuesday, 4 March 2025 at 19:35	HFT	
☐ Capacity issues	1	1	4 Mar 2025 at 09:24	HFT	4 Mar 2025 at 19:36	HFT	
☐ Choice of activity	5	10	18 Feb 2025 at 18:...	HFT	5 Mar 2025 at 09:58	HFT	
☐ Impact of change of...	5	18	18 Feb 2025 at 18:11	HFT	14 Mar 2025 at 14:41	HFT	
☐ Moving from Tuesd...	2	3	4 Mar 2025 at 09:57	HFT	1 Apr 2025 at 16:04	HFT	
☐ Referral process	2	3	23 Feb 2025 at 16:10	HFT	14 Mar 2025 at 14:...	HFT	
☐ Relationship betwee...	1	2	4 Mar 2025 at 15:17	HFT	5 Mar 2025 at 09:51	HFT	
☐ Seasonality and vari...	5	7	23 Feb 2025 at 15:01	HFT	1 Apr 2025 at 15:58	HFT	

0 item selected

APPENDIX Pb

Coding process on NVivo

The screenshot displays the NVivo software interface during a coding process. On the left, a sidebar menu is organized into sections: **IMPORT** (Data, Files, File Classifications, Externals), **ORGANIZE** (Coding, Codes, Cases, Case Classifications), **Notes**, **Sets**, and **EXPLORE** (Queries, Visualizations). The main workspace is divided into three panes. The top-left pane lists interview transcripts, with 'Sarah' selected. The top-right pane shows a 'Summary' and 'Reference' tab. The central pane displays a transcript snippet with text from 'HT' and 'S'. The right pane, titled 'CODE STRIPES', shows a list of codes with corresponding colored bars indicating where they are applied in the text. The codes include: 'Seasonality and variance in tasks', 'Social isolation and loneliness', 'Connection with the past', 'Individual development from the project', 'Becoming more future focussed (step down)', 'Value of family or social support', 'Understanding and support outside the project', 'Learning resilience accepting change', 'Managing stress', 'Mutual support from peers', 'Impact of medication', 'distraction from anxiety', 'Unique acceptance and support from project', 'social interaction value', 'Primary level', 'Difficulty of communicating about MH outside of the project', 'Choice of activity', 'Improvement in mood', 'Impact of change of facilitator', and 'Physical health benefits'.

APPENDIX Q

Hand-coding on Excel

[illegible]

APPENDIX R

Participant EIGHT interview

INTERVIEWER There we are. It's recording us. So, you were saying that you feel that you've been on the up, and you've got some radical plans. So what are your plans?

PARTICIPANT: Well, basically it comes down to the fact that for 61 years, since I first started learning my ABCs, I've basically been studying. I've read books and gone on courses, and tried to partly broaden my knowledge, but also improve my mind, and also it's helped with the mental illness that I've suffered from, because I had cognitive problems. So I just kept studying until now, and now I feel I've got to the point where I can have a reasonable conversation with someone. 30 years ago I certainly couldn't, because I was so ill. And over the intervening 30 odd years until now, and also about the 18 years before that, when I first became ill, I found that studying has helped me to just be able to speak better, speak more clearly, and also to think more clearly.

INTERVIEWER I just wanted to ask you about the questionnaires that we just did – there have been some changes – why would you say that is?

PARTICIPANT: All sorts of things. All sorts of things. It's the garden, that's definitely making me feel better but it is also all the studying I've been doing. I study a variety of different subjects. For 30 years I did some courses, anything ranging from playing jazz bass, to doing a bit of martial arts. I studied A-Level, basic maths to A-Level.

INTERVIEWER Oh wow.

PARTICIPANT: I did a year of training and counselling. Yeah. I studied with a composer. I did three years of yoga.

INTERVIEWER Oh my goodness, you really have kept yourself busy, haven't you?

PARTICIPANT: A year of Pilates. I played with a jazz pianist for a couple of years, and also played in a jazz band.

INTERVIEWER So you're still in the jazz band?

PARTICIPANT: No, that's quite some years ago, about 15 years ago. Right, okay. It's about halfway through the 30 years. So really it's been a combination of reading about both subjects, and reading about nature, which I've done quite extensively. I think extensively is the wrong word, because I have struggled with studying quite substantially, but I just kept forcing myself to do it, because I knew the beneficial effects of it.

INTERVIEWER So what would you say the beneficial effects were?

PARTICIPANT: Mainly on my cognition.

INTERVIEWER Yeah, so you've been training yourself kind of in a way.

PARTICIPANT: I've been basically training myself to think more clearly.

INTERVIEWER Yeah, amazing. So now do you feel like you've come to a point where you can stop studying? Is that the radical decision?

PARTICIPANT: It's not so much that I can stop the studying, although I can. It's got to the point where I just can't stand the pain anymore. Because I also have a mental illness, so I have a mood disorder, and I have read some books about mental illness. And it's quite remarkable how, with a bit of the link between the artistic temperament, which is my main interest with music, I started writing on different subjects as a sideline, and I kept studying those for those years. I'd say from when I first started to read, from very young, I became interested in it. It was certainly a family interest, my father was studying all his life. But it's been a very painful process, and I think I just want to do something different. I think I've come to the point where it's become such a burden, and it's so depressing now, to force myself to do the same things that I've been doing for 61 years. Well, it's not quite so much with the music, because I didn't start that until I was 8. And then I finished it when I was 12. But I just feel like I need a change.

PARTICIPANT: I have no idea what I'll do, except that becoming involved in the garden has been very helpful. And I do enjoy the garden.

INTERVIEWER So what would you say you enjoy about coming here?

PARTICIPANT: Just about everything. Sometimes it's a bit difficult to get myself going, but usually, that's only because I haven't slept for 48 hours over the weekend. I did only have a couple of hours this morning, which is why I was up here a bit late. But the things I like about the garden are the people, I like the environment, I like being outdoors. I've always loved the outdoors. I love long distance walking in my time, and exercise, as well as swimming. I mentioned Pilates and yoga, and I also love cycling. And it's nice to be surrounded by trees, which I've read about 14 books about those recently. And it's nice to be on land. Oh, there's a cat there. One of my favourite things in life is cats.

INTERVIEWER Oh really, do you have a cat?

PARTICIPANT: No, I haven't got one of my own, but I did have. Lovely sight to see a cat. So yeah, I love everything about the garden.

INTERVIEWER Well that's good. How long would you say you've been coming here?

PARTICIPANT: Since the 30th of May 2024.

INTERVIEWER Oh right, okay, so quite a while now, a good few months.

PARTICIPANT: Seven and a half months.

INTERVIEWER Is there anything about the group itself, and the people that run the group, and the people who you're in a group with, that you find... I mean there's quite consistent people that come to this group, isn't there?

PARTICIPANT: It's about the same group, with a few additions over the months I've been here. Yeah, so Sarah, and I forget the guy's name, the other guy who..is it, John that's it.

INTERVIEWER Is there anything that you think could be better about it, or that you would change?

PARTICIPANT: There's only one thing. I'm not sure about it, but when I was here with the previous project manager, I used to take care of a lot of the maintenance, just like keeping the cabin tidy. So the cabin, you mean where you make... where people have breaks?

INTERVIEWER Yeah, oh right, yeah.

PARTICIPANT: We did about six weeks of cooking. And during that time, I was doing quite a lot of the things that kept the garden tidy. When you were to find things, the tools were always clean. And

things like that, I was always making sure that what was needed pots were always arranged, and the netting was folded, and that kind of thing. And I made sure when I put the chairs away that they were stacked, that everything fitted nicely in the wall barriers and the other cupboard there. And since the new project manager, I've got more involved with the gardening. The cooking stopped for various reasons. It had to do with me, but that stopped for a managerial reason. I think it had to do with the quantity of oil and detergent that was going into the ground. And they decided that until they could find some way of disposing of it, they had to stop the cooking. So that's changed quite a lot since the new project manager. I've got much more involved in the gardening, which I really like. So it's better for me, but there is something in the back of my mind that the cabin is... I don't know whether or not... I don't know how we could go about... I've been trying to think of ways we could go about incorporating the gardening into keeping the cabin tidy. I used to take everything out of the cabin, doing it all.

HT Did you do that every week?

PARTICIPANT;; No, no, but regularly. And it was always sparkling, sweeping it all out, cleaning up all the tools, putting them all back and rearranging them. Put the boxes on the shelves in ways. I don't do that now. There's no cooking and I don't do the cabin or the maintenance. So it's nice, because at that time when I was doing the cabin and the cooking, I wanted to do the gardening. Now that I'm not doing the maintenance and the cooking, I am doing the gardening and I'm wondering about how useful what I did was. The cooking and the maintenance.

INTERVIEWER What sort of things did you cook? Did you cook a lunch?

PARTICIPANT;; They're all stir-fries. Yeah, with the vegetables.

INTERVIEWER So was there a gas-fired stove then?

PARTICIPANT: Gas-fired stove, yes.

INTERVIEWER And then did you all have a stir-fry together for lunch?

PARTICIPANT;; We'd sometimes cook for 14, yeah.

HT; So you had 14 people in the group then?

PARTICIPANT: In total. I think that was the most one day. I think that was because they were carers having food as well.

INTERVIEWER Right, okay, yeah.

PARTICIPANT;; That happened in one day, but we'd often cook for six or seven or eight.

INTERVIEWER That sounds really nice.

PARTICIPANT;; But that's not possible now until there's another way of going about it. But not on a Monday, anyway. But generally speaking now, that's the only thing I can possibly think of. Because I'm actually, in a way, kind of happier doing the gardening. I like the fact that I'm actually involved in the process of the actual garden itself. I was before, incidentally. I would combine the maintenance with the gardening, but I wasn't at the time I wanted to do the gardening. So I'm happy, in a way I'm kind of happier now.

INTERVIEWER Yeah, oh right, okay, that's good. Is there anything in the garden that you particularly like to do?

PARTICIPANT: There's quite a lot of pruning and cutting back at the moment, isn't there? I don't dislike anything about the garden, so I don't find things that I don't like doing.

INTERVIEWER Oh okay, that's great.

PARTICIPANT: I'll turn my hands in any aspect of it.

INTERVIEWER Okay, good.

INTERVIEWER And so it sounds like the next question is, is there anything challenging or unhelpful about Together We Grow?

PARTICIPANT: I can't think of anything. No.

INTERVIEWER How do you get here, actually? Because lots of people find transport a bit of a problem?

PARTICIPANT: I live literally around the corner from here.

INTERVIEWER Oh right, so that's not an issue for you.

PARTICIPANT: No. I did actually walk here and back.

INTERVIEWER How did you get here today?

PARTICIPANT: I took the bus here and I walked back.

INTERVIEWER Right, okay.

PARTICIPANT: I do that nowadays, I get the bus here and walk back. I found that when I used to walk here, I would make sure that I got here early. I get here at half past nine. And I found that walking there and back was too much to do with gardening as well. So now I make sure I have enough energy by arriving by bus to get going. And I walk back just to enjoy walking through the woods and have a bit of exercise.

INTERVIEWER And can you walk through the woods to get back home? (nods) Oh, very nice. Do you come to Highwoods much?

PARTICIPANT: Oh yes, lots and lots. Yeah.

INTERVIEWER So, in terms of how activities are decided, what do you prefer, Having a choice or being given options?

PARTICIPANT: Well, it's slightly different with previous project managers than this one. Because before, there would be a list of things and you would choose the ones that you wanted to do, the ones you wanted to get involved in. And it's now getting to a similar process with this project manager. Because he... what we tend to... I noticed the first couple of weeks we were here with the new project manager, we tended to do a task all together, with the people that were here, the four of us. Which was different before. We tended to do things individually or in a group or two.

INTERVIEWER Yes, I have seen you all doing the raking together.

PARTICIPANT: And I quite like the... I rather like the guidance that this project manager actually has. Because he's... well, as a big project, they're clipping back the hedges. So that's an ongoing thing that we haven't quite finished yet. And basically, he just says, this, this, this and this, and we get on with it. We don't quite... well, you know, there is choice, you know. But it's nice to have that

guidance, this needs doing, we go and do it. I liked the idea of the choice, but I quite like... I quite like the fact that I've worked with project manager quite a few times. We've pruned the trees together. And for a few weeks, particularly on a couple of occasions I can think of, I've actually purposely gone to speak to him and got involved with what he's doing. He has a lot of experience of farming.

INTERVIEWER Does he? I didn't know that.

PARTICIPANT: And he's also a very knowledgeable linguist, a PhD linguist.

INTERVIEWER Yes, yeah.

PARTICIPANT: Again, because I've read so much. Yeah. It's nice to discuss language with him. And that's... coming back in full circle, there is one thing about the garden I really like, is the fact that I can talk about language to Abdul, the project manager.

INTERVIEWER Oh, right, okay, because Abdul speaks Arabic, doesn't he? Does he speak other languages as well?

PARTICIPANT: I'm not sure.

INTERVIEWER Yeah, and do you speak other languages?

PARTICIPANT: I don't, no. Only in a cursory way. I can speak... I know some sort of etymology, a little bit of... a few words of this language. I know some words that derive from other languages.

INTERVIEWER Because Richard was very different in lots of ways, but I guess it sounds like you've found that Abdul has brought something new?

PARTICIPANT: Yeah. Richard was a great humorist, and he was very good at bringing us all together, and also very friendly, so I got to know him really well. Abdul seems to have something that I really like too. Again, the two things I've mentioned. The fact that he's very focused on what he's doing in the garden, not that Richard didn't, because he definitely did, and he was very knowledgeable. He did a lot of different activities that we got involved in, which he promoted. And also, Abdul, I really like the fact that I can talk to him about language, I can talk to him about science, I can talk to him about gardening, I can talk to him on a level of studying. Yeah.

INTERVIEWER You can ask him to talk about things like that.

PARTICIPANT:; And also, I like the fact that he's very energetic, and I like working with him. I mean, literally, being actually involved in exactly what he's doing. I think he's been pruning the trees, or doing the tipping... so far he's been pruning the trees or clipping the hedges, and doing some... clearing some dried grass to put as a mulch over some of the plants. So that's the main things I've done with him so far. So yeah, I really enjoy what both project managers brought to the garden.

INTERVIEWER So what was it like? Did you feel... was it a bit scary to have a change of project manager?

PARTICIPANT: At first it was, because I was very... I think it was difficult to say goodbye to Richard, really. It was quite difficult, because he'd been very supportive of me, even though I'd had some major problems. I'd had some time off, a couple of bouts of hospitalisation.

INTERVIEWER Did he contact you in between?

PARTICIPANT: No. I mean, partly, yes. I would contact him and tell him... He would contact us to tell us about days that were cancelled, or bank holidays, or holidays. But I was always initiated speaking to him if I'd just come back from hospital. And I would discuss with him when I came back. And

he was very supportive during the actual process of me arriving back, and my integration back into the garden after having been ill, quite severely ill, mentally ill. And so yeah, there was a very much a... very much a... he was extremely supportive of me. Very humorous. He always pulled my leg. He kept me on my toes that way. He was kind of... I was after the butt of the jokes, you know, that he would make. But in a nice way. In a nice way. At first, I didn't quite know what to say. But I took a little pinch of salt afterwards.

INTERVIEWER Harry said that as well, that he was very supportive.

PARTICIPANT: Yeah, very, very supportive. He had a real way with people. He really knew how to get a conversation going.

INTERVIEWER Yeah?

PARTICIPANT:; And, you know, I mean, when, when I struggled with the illness. I can't think exactly what I was going to say now. But, erm, when, erm... when we would say, for instance, say for instance, in the morning we would arrive, and then we'd be discussing about what we'd done in the week. Yeah. What we'd done the previous week. And, erm, I can remember when I was... I mean, I mean, I struggled with reading for... it's been the most recent years I've been considering... considering doing something else. Erm... he would, he would say, you know, you know, read, you know, keep going, keep going with it. Yeah. He would encourage me. Yeah. In fact, I can honestly say that every time I, every time... it's the same with Abdul, by the way. Yeah. As a project manager now. If I struggle with, with reading, I sometimes say, I can't do this anymore. Yeah. I literally cannot do this anymore. Yeah. And he, and erm... every time I would be at the garden, suddenly the enthusiasm would appear again. Yeah.

INTERVIEWER Oh, that's really interesting.

PARTICIPANT: That's something I found really, really good. Yeah. It might disappear when I got home. And it'll be a struggle again.

INTERVIEWER Right, okay.

PARTICIPANT: But I found the garden extremely motivating.

INTERVIEWER Right.

PARTICIPANT: Still do.

INTERVIEWER Yeah. And that's partly being in nature itself, from what you're saying, but also the people that you're with. It's also the project managers.

PARTICIPANT: Yeah. And it's also the fact that I can, I can talk and listen with the other people who are the volunteers.

INTERVIEWER Yeah.

PARTICIPANT: Here. And we, it's kind of, there's a mutual understanding somehow of the fact that we can say things to each other about our struggles. Yeah. And it's nice. And it's quite supportive, and it's rather supportive in that way too. Yeah. You know, one doesn't have to kind of keep being completely positive, but one can be understanding, and that's kind of enough to get the person who's struggling going again. Even just listening. I make a point of mostly just listening or maybe saying a few words here and there, sort of relating my own experience a little bit. But that I find very helpful too.

INTERVIEWER So the other people who you're volunteering with, you know, that you find talking to them, I guess with other people outside of that community, there feels a pressure to be positive and to be well and to, is that what you're saying?

PARTICIPANT: It's actually almost impossible. That gave up years ago. Talking to friends outside of, outside of hospital and here. Right. I mean, family have never pressured me. In fact, they probably pressure me in the opposite way. Whenever I struggle with my, you know, the years I've struggled with my reading and my bass playing and piano playing, you know, the sheer onslaught of doing the same things for such a long time and having to force myself to do them, to achieve. Family tend to, they say, stop playing then.

INTERVIEWER Right.

PARTICIPANT: They say things like, well, you know, just do what you like.

INTERVIEWER Yeah.

PARTICIPANT: Do things you like. Why, why are you forcing yourself to do something which you find so difficult? Yeah. And I find that quite difficult to handle. But in many ways, I'm glad they don't push me to the limit. Yeah. Or rather it's that. Yeah. That actually being forced by them to, what I should do. Yes. Yeah. They're encouraging me to be happy at the end of the day. Even though I find, the curious thing about it, I find, I find that like, I want to, I almost like want them to say to me, yeah, you can do it, you know. I know it's difficult but you can do it. Yeah. But they tend to say, well, you know, stop playing, sell your bass, sell your piano, sell your keyboard. And, you know, don't read if you find it difficult and just do something, do something you like. You know. Yeah. So, it's great that, you know, give up and do what you like they say, you know. Yeah. Because they want you to be happy. Because they want you to be happy. Yeah. Although it's difficult to handle when they say it because I feel like I say a few words, give up then. Yeah. It's like, throw the baby out with the bath water, you know. Yeah. But the truth is, I'd rather that than be very pressured by them. Yeah. It's a kind of a pressure to give up.

INTERVIEWER Yeah. But it seems they are extremely supportive in most other ways? Your family.

PARTICIPANT: That's the only, that's the only way, the only thing I find difficult. Right. But I, again, I'll prefer that. Yeah. So, so, but other, although I can talk to family about, you know, they've been extremely supportive over the years with my condition. Yeah. Yeah. But with friends, with other friends, it's a waste of time.

INTERVIEWER Right.

PARTICIPANT: You know, I, I listen to them endlessly. But, I understand and, you know, and, and, you know, I'm supportive. But I don't talk to them about much. Mostly they haven't got a clue what's going on with me. There's, there's one who, well that's not quite true. There's, I've got a collection of friends I've known for years and years and years and years. One that I knew since he was 13.

INTERVIEWER Right, really, a school friend?

PARTICIPANT: No, no, a musical, musical friend.

INTERVIEWER Oh, okay.

PARTICIPANT: Yeah. And, the others I've known, two of them I've known since I was 17. Yeah. Standing together. I watched their children and grandchildren grow up. Yeah, yeah. I was in a relationship for the last 22 years but she's now very, very, very ill and won't last very much longer.

INTERVIEWER I'm so sorry to hear that. Yeah. Yeah. So is she living with you?

PARTICIPANT:; No, no, we didn't live together but she lived just around the corner from me and I supported her with her terrible illnesses, you know, terminal, for about 10 years. A bit more than 10 years. Yeah, I think she's now has three terminal illnesses and, so, you know, I sit there for hours now listening to her talk. But, again, you know, I couldn't really talk about my stuff. I helped her with her adopted son who's now, you know, has now a successful mortgage broker and financial advisor and he had his own business at 25, you know. So, so, although I, it's kind of the other way, I tend to be the one that does the, the helping. But, my friends do tolerate and they do understand in a, in a kind of accepting way.

INTERVIEWER Do you find that it's only really possible to talk about things that you might, well here, but with people who've had a similar experience?

PARTICIPANT: I do think, I've had a similar experience well most of the time with the hospital. You know, the counselling that I've had over the years and the psychiatric help is where I really talk about what actually happens.

INTERVIEWER Right, okay.

PARTICIPANT: I don't really talk about that to anyone else.

INTERVIEWER Well, it's good that you found that helpful?

PARTICIPANT:; It's, it's basically something that I learned to do. I realised that if I wanted to take control to have a, have a better life, I would understand myself better. I would have to be able to convey what I experienced to them and then learn how to relate what I experience, because I've only been able to describe in words, to the psychiatric symptomatic terminology.

INTERVIEWER Right, yeah.

PARTICIPANT: Although I'm very, very aware of my experience, I can't really define it in my own way, but I can using metaphors and similes. I've always been afraid of talking that way in case I'm misunderstood. So I learn how to relate the symptoms to what I experience in terms of the terminology.

INTERVIEWER So you have to learn their language?

PARTICIPANT: I learn their language. Yeah. So I could communicate. Yeah. And then I would get the best help. Yeah. And it's shorthand too, because you say psychosis.

INTERVIEWER Yeah.

PARTICIPANT:; And it covers a broad spectrum of experience. Yeah. And I've never talked about my psychosis to anyone, even the hospital. Yeah. They just call it psychosis. Yeah. And so, but I will talk about, I don't have a problem with my feelings, even though I have a mood disorder. It's mood, really.

INTERVIEWER Yeah.

PARTICIPANT: And, but I do have, you know, sort of paranoid schizophrenia experiences. So it's just a useful way of being able to communicate with a consultant or a nurse or a doctor. Yeah. Those experiences that kind of, so we can be on the same wavelength. Yeah, yeah. Although truthfully, I can't say that I understand what I'm talking about. How would I understand what psychosis is? I've never studied that. I know what it feels like. I know what the experience is like. But I don't know what happens in the brain to make it happen. You know, and so when I say to a psychiatrist, psychosis, I'm really describing an experience. I'm not describing an understanding of what psychosis is. Yeah. So really, I don't find it useful to use the labels other than, I don't label

myself at all. I just know my experience. Yeah. I know how to recognize it. I know how to manage it. Yeah. As far as you can. Yeah. I've learned a lot how to manage it over the years. But as far as the terminology is concerned, I only know because I learned it from the consultants. I would talk to them about my experience, and they'd say, oh yes, that sounds, sounds, sounds like. So I then would learn that relating my experience to that word, but have no idea of what mental illness actually is.

INTERVIEWER But it sounds like various kinds of learning has been a way to manage your illness, would you say?

PARTICIPANT: Oh, it's the primary one. Yeah. Although I don't think I would have lived without my family, frankly. They've been so supportive. Yeah.

INTERVIEWER So I'm just curious, because you've described learning about so many things, I'm just curious about what drives you.

PARTICIPANT:; There is one thing that comes to mind, but I don't know what drives me really. I think it's the need to achieve. Yeah, yeah. I think it's the need to be better than I was. Right, yeah. I think it's the need to, yeah. I mean, I've talked, when I first started talking just now, starting this interview, I talked about wanting to do something different. Part of me doesn't. Part of me wants to continue, but I just find it so difficult. It almost like ruins me these days, trying to study.

INTERVIEWER Oh, I'm sorry to hear this...

PARTICIPANT: And I want to keep, in fact, I know I'll go back to it. Yeah. But I wish I could find something different. Yeah. I wish I could find something different. And I am doing some different things. I'm a bit more practical than I used to be. I did struggle with some things at home, which I'm now getting on quite well with. Just on a general instance with the flat and that kind of thing, which I struggled with for a few years. Not all the time, but for a few years I did, and now I'm back on track with those. Yeah. And the garden, going back to the garden, the garden has really helped. It's actually made a radical difference really. I think it's, my family are saying I'm a different person having gone to the garden.

INTERVIEWER Is that right, really? So what changes do you think they've noticed in you?

PARTICIPANT: Just, I think my mood is different. I think it's led to some changes in my life that probably wouldn't have happened otherwise. Yeah. The things probably aren't described. You know, things like, it's a bit subtle really. I just feel different. I feel, I'm not as, I talk differently as well. I don't kind of wallow in things in the same way.

INTERVIEWER Right, okay.

PARTICIPANT: I think, although I've hardly stopped talking since I've been talking in this interview, I would have talked very differently before the garden. I would have been very desperate, as I was for many years. And I think it's resolved some issues really. It's resolved quite a few things. I think as a result of the garden I have actually made some changes. It's quite possible that because I feel somewhat more content in myself, I think that may have led me to, going back to the first thing I said, led me to think, well maybe there is a better way. Maybe studying will always cause a problem. I have no idea, it's only a silly prediction really. But maybe there is a better way. And I think the garden has led to that. But there is something about the garden which I would like to keep studying and I find it so difficult. It's not the fact that I can't read. I can read alright. It's just the pain and the depression that comes along is terrible. The darkness that I feel. It's really to do with what I'm actually reading, funnily enough. Nature conservation. I'm reading about trees. But the reason part of me wants to continue is because there are trees here and that would be my contribution to know a bit about the trees. That's why I read 14 books about them.

INTERVIEWER So what you're learning can come to practical use.

PARTICIPANT: That's kind of why. But I have to give an example of what happens when I read. I'll read a few pages and I can't handle this. That terrible pain comes on and then I find this very dark and my visual perception changes and I kind of... everything seems dark and foreboding and frightening. There's a kind of darkness that comes on me, foreboding. I pick up the book from the shelf and put it on the table to take it to the charity shop. And then gradually there's a sense of relief. Oh, I've got to read that again. And then later suddenly the enthusiasm will come back and I'll pick up the book and put it back on the bookshelf. I will read this book.

INTERVIEWER It sounds like you've done very well to read 14 books about trees if that's the process. You mentioned difficulties with cognition. Is it the cognitive effort of the reading?

PARTICIPANT: There is a certain effort. Part of me has often wondered whether it's the fact that I have actually done the same things for such a long time that I'm basically forcing myself to do something I've lost interest in. Maybe all the interest has actually left in the actual studying. It's not sunk yet but the actual studying itself, the act of studying is the fact that I'll be able to say before I eventually conk I have read all my life. I have played the bass all these years. It's almost like I want to be able to say that's what I did. That's what I made myself able to do. That's what I achieved in spite of the fact that I'm mentally ill. That's part of what the drive is. It's almost like I'm prepared to suffer but I can't suffer because it keeps getting in the way. I can't suffer. I can't study because it's such a painful experience but I keep going back to it because I still want to be able to say that I've studied all those years. It's just a cycle. It just goes back and forth and you give up, pick it up again, give up, pick it up again, give up, pick it up again.

INTERVIEWER That does sound exhausting.

PARTICIPANT: It's utterly exhausting. But then I suppose if you didn't have it then... That's what worries me. Part of me... I tried for a month to actually give up the reading and the bass and piano and the listening and composing because I've composed all my life as well. I've written about 30 or 40 pieces.

INTERVIEWER Jazz pieces?

PARTICIPANT: No, no. Variety of different classical pieces. They're all different. That's 16 for piano, one for piano and bass and a few pieces for... some fragments of melody and also some of the pieces I wrote the other instruments and some arrangements. You had started saying that you'd given up for a month. Oh yes. I'd given up for a month. I wanted to see what would happen. Whether or not I would be free from the pain. And I wasn't. It came back anyway. The trouble is I have a feeling that in fact the pain has nothing to do with the studying. It'll be there anyway. It's just the fact that when I study it intensifies it. Or when I play bass and piano I'll read or listen to music. Or compose. Composing is the least painful of these. It's the most enjoyable. I've always wanted to be a composer. That was my primary interest. Although I'm not good enough to be a composer. They're quite nice pieces. Quite quirky and quite nice.

INTERVIEWER How many instruments do you write the pieces for?

PARTICIPANT: I've written some transcriptions from guitar to bass and piano. I've written a second half sound for keyboard some for bass and piano.

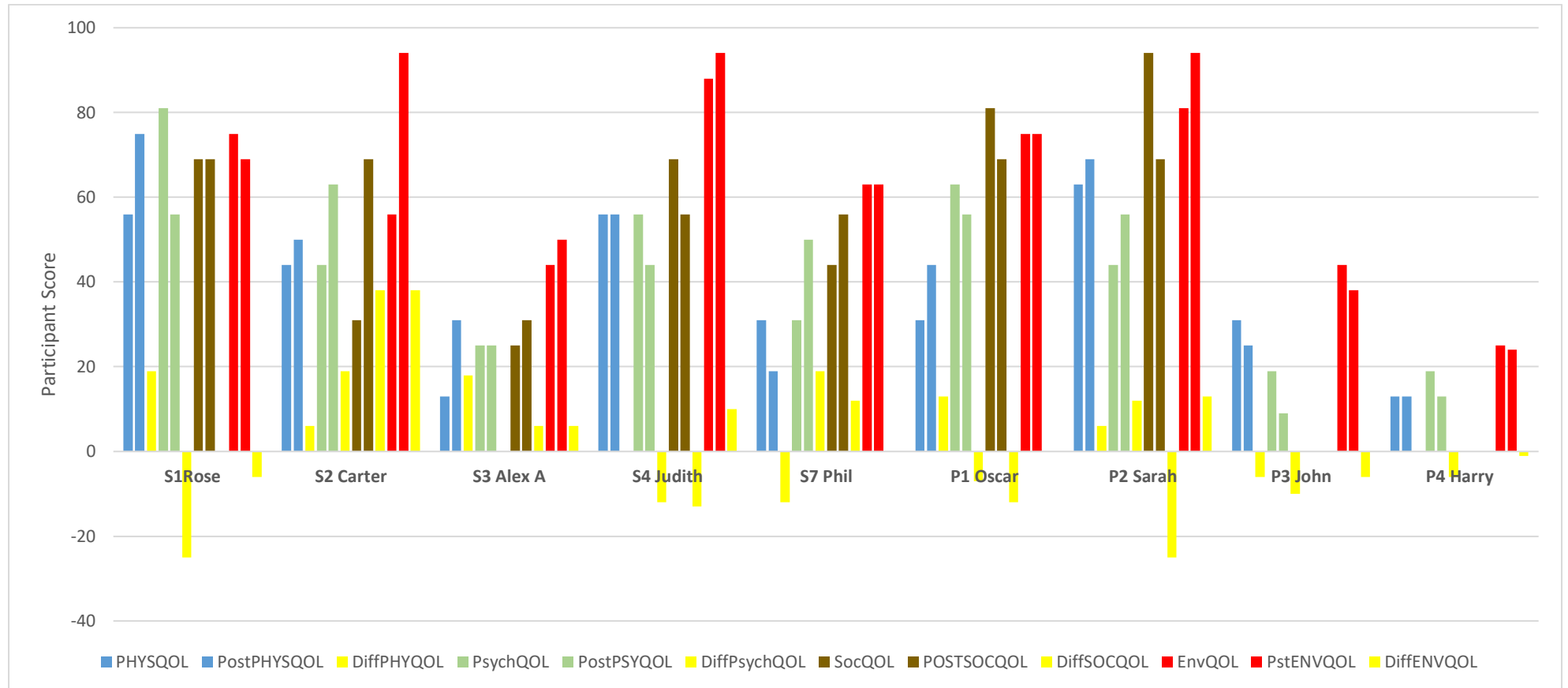
INTERVIEWER So when you compose are you composing for several instruments to play the same piece? In harmony. That's amazing.

PARTICIPANT: I studied it from an early age. I went to one of the prestigious music colleges when I was 19. I got my Associate Diploma when I was 24. I was principal bass of the second and first Essex Youth Orchestras in my youth. I played for them between the age of 12 and 22. I ended up travelling with the Orchestra world touring. I had very good training so it's not surprising that I was able to apply some of that to composing.

INTERVIEWER That's great. Thank you so much for the time you have spent with me. Do you have anything else to say about the garden – what you have told me so far has been really helpful?

PARTICIPANT: No nothing else.

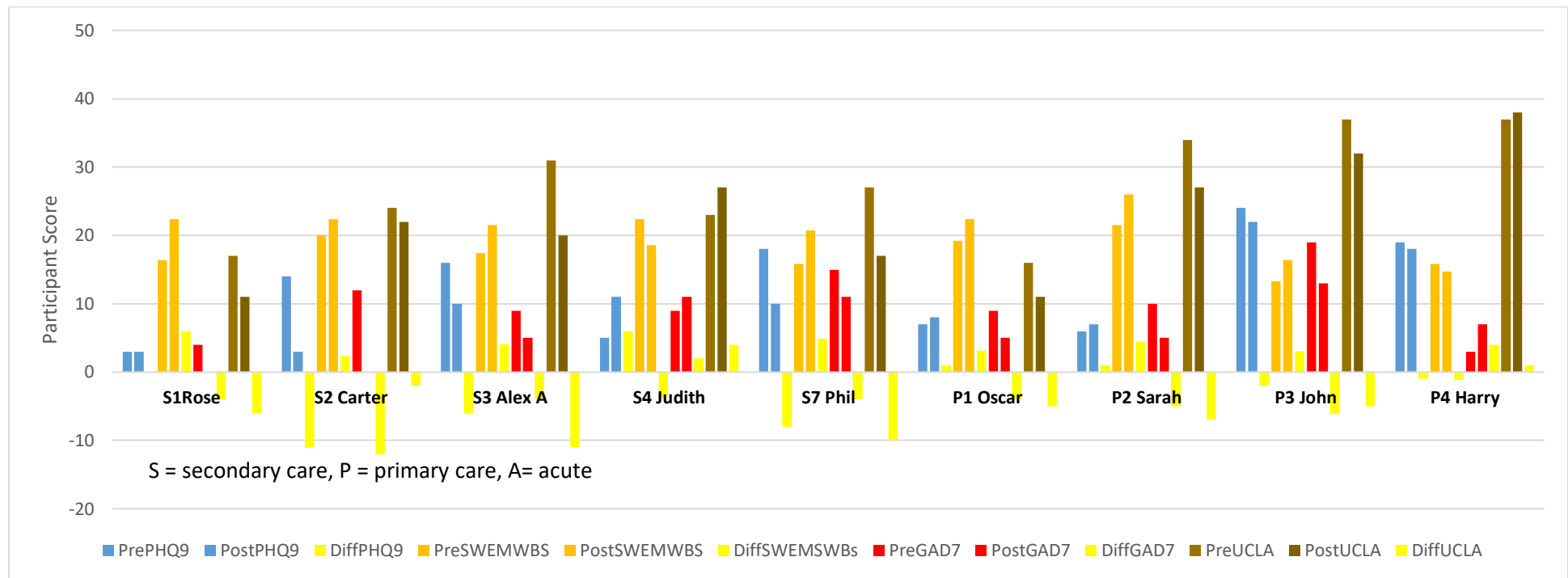
APPENDIX S

Figure 13*Pre and post participant outcomes in QoL measures*

APPENDIX T

Figure 14

Pre and post intervention scores for each participant in mental health outcomes



APPENDIX U



Completion Certificate



This is to certify that ***Hilary Trevelyan*** has successfully completed the
Half-Day Workforce Training Course
 26 June, 2024

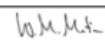
on the theme

The Assessment of Mental Capacity

Curriculum:

- The Presumption of Capacity
- The Functional Test for Decision-Making Ability
- The 'Diagnostic Threshold'
- The 'Causative Nexus'
- Support for Decision-Making Capacity
- 'Disclose & Paraphrase'
- Managing Conflicts of Interest
- Capacity Assessment in Depression
- Capacity Assessment in Brain Injury
- Capacity Assessment in Psychosis
- Assessment of Capacity to Consent to Research

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